ucit	2)	Figures to the right i	ndicate full mark	S.			
Chơ 1)	o se th What	ose the correct alternatives from the options. What has been at the back of every speech Gandhiji delivered?					
	a) A c) T	Abstinence Teetotalism	b) d)	Religion Missionaries			
2)	How d	lid Khushvant Singh	travel to school	in the city?			
	a) C c) E	Car Bicycle	b) d)	On foot Motor bus			
3)	What	does R. Tagore des	ire not to be she	Itered from?			
	a) L c) D	.ove Dangers	b) d)	Compassion Cowardice			
4)	Which a) L c) L	i flowers competed f ily and Daisy ily and Rose	or the title in 'Th b) d)	e Lotus'? Rose and Daisy Rose and Tulips			
5)	In the	word 'Powerless' th	e element '-less'	is an example of			
	a) s c) fi	uffix x	b) d)	prefix fixing			
6)	The w	ord that denotes ac	tion is termed as				
	a) p c) a	oronoun Idverb	b) d)	adjective verb			
7)	In the a) p	word 'Unhappy' the prefix	element 'Un-' is b)	an example of a suffix			
	c) b	oth a and b	d)	none of the above			
8)	l like t a) a c) n	o read <u>novels.</u> The u i verb ioun	underlined word b) d)	in this sentence is an adverb an article			
	Cho 1) 2) 3) 4) 5) 6) 7) 8)	 Choose th 1) What a) A c) T 2) How c a) C c) T 2) How c a) C c) T 3) What a) C c) T 3) What a) L c) L 5) In the a) s c) fi 6) The w a) p c) a 7) In the a) p c) a 7) In the a) p c) b 8) I like t a) a c) m 	 2) Figures to the right i 2) Figures to the right i 2) Figures to the right i 2) How did knushvant bingh a) Car c) Teetotalism 2) How did Khushvant Singh a) Car c) Bicycle 3) What does R. Tagore des a) Love c) Dangers 4) Which flowers competed f a) Lily and Daisy c) Lily and Rose 5) In the word 'Powerless' the a) suffix c) fix 6) The word that denotes act a) pronoun c) adverb 7) In the word 'Unhappy' the a) prefix c) both a and b 8) I like to read novels. The tag a verb c) noun	 2) Figures to the right indicate full mark Choose the correct alternatives from the opt 1) What has been at the back of every speec a) Abstinence b) c) Teetotalism d) 2) How did Khushvant Singh travel to school a) Car b) c) Bicycle d) 3) What does R. Tagore desire not to be shele a) Love b) c) Dangers d) 4) Which flowers competed for the title in 'The a) Lily and Daisy b) c) Lily and Rose d) 5) In the word 'Powerless' the element '-less' a) suffix b) c) fix d) 6) The word that denotes action is termed as a) pronoun b) c) adverb d) 7) In the word 'Unhappy' the element 'Un-' is a) prefix b) c) both a and b d) 8) I like to read novels. The underlined word is a verb b) c) noun d) 	 2) Figures to the right indicate full marks. 2) Figures to the right indicate full marks. Choose the correct alternatives from the options. 1) What has been at the back of every speech Gandhiji delivered? a) Abstinence b) Religion c) Teetotalism d) Missionaries 2) How did Khushvant Singh travel to school in the city? a) Car b) On foot c) Bicycle d) Motor bus 3) What does R. Tagore desire not to be sheltered from? a) Love b) Compassion c) Dangers d) Cowardice 4) Which flowers competed for the title in 'The Lotus'? a) Lily and Daisy b) Rose and Daisy c) Lily and Rose d) Rose and Tulips 5) In the word 'Powerless' the element '-less' is an example of a) suffix b) prefix c) fix d) fixing 6) The word that denotes action is termed as a) pronoun b) adjective c) adverb d) none of the above 8) I like to read novels. The underlined word in this sentence is a) a verb b) an adverb c) noun d) an atricle 		

B.Sc. (Semester - I) (New) (CBCS) Examination: Oct/Nov-2022 **ENGLISH (Compulsory)**

Literary Voyage

Day & Date: Monday, 23-01-2023 Time

		2	2) Figures to the right indicate full r	nark	S.		
 Q.1 Choose the correct alternatives from the options. 1) What has been at the back of every speech Gandhiji delive 					ions. h Gandhiji delivered?		
		a) c)	Abstinence Teetotalism	b) d)	Religion Missionaries		
	2)	How	/ did Khushvant Singh travel to sch	loor	in the city?		
		a) c)	Car Bicycle	b) d)	On foot Motor bus		
3) What does R. Tagore desire not to be sheltered from?					tered from?		
		a) c)	Love Dangers	b) d)	Compassion Cowardice		
	4)	Whi a) c)	ch flowers competed for the title in Lily and Daisy Lily and Rose	'The b) d)	e Lotus'? Rose and Daisy Rose and Tulips		
	5)	In th	e word 'Powerless' the element '-I	ess'	is an example of		
		a) c)	suffix fix	b) d)	prefix fixing		
	6)	The	word that denotes action is termed	d as	·		
		a) c)	pronoun adverb	b) d)	adjective verb		
	7)	In the word 'Unhappy' the element 'Un-' is an example of a					
		a)	prefix	b)	suffix		
		C)	both a and b	d)	none of the above		
	8)	l like a) c)	e to read <u>novels.</u> The underlined w a verb noun	ord i b) d)	n this sentence is an adverb an article		

- Q.2
 - What is the message given in the poem 'Let Me Not Pray to be Sheltered a) from Dangers'?
 - What is the subject matter of the poem 'The Lotus'? b)
 - What did the father see in his child's bedroom in the poem 'The Toys'? C)
 - Why did Gandhiji want to promote Khadi? d)
 - What is the significance of the title of the poem 'The Toys'? e)
 - Comment on the nature of the grandmother in the story 'The portrait of a f) Lady'.

SLR-FZ-1

Set

Max. Marks: 40

Seat No.

- Q.3Answer the following question. (Any one)10a)Define the word communication and state the components of the communication.
 - **b)** Write in detail about the channels of communication.
- **Q.4** Discuss the intrapersonal skills and the strategies to improve them. 10

IIme	: 12:0	U PIN	TO 02:00 PM		
Instr	uctior	15: 1) 2 3 4	 All questions are compulsory Draw neat diagrams and giv Figures to the right indicate to Use of logarithmic tables and (At. Wts. H = 1, C = 12, O = 	/. e equa full mai d scien 16, <i>N</i>	tions wherever necessary ks. tific calculator is allowed. = $14, Na = 23, Cl = 35.5$
Q 1	Cho	ose t	he correct alternatives from	the o	ntions &rewrite the sente
~	1)	The	reaction between $K_2S_2O_8$ and	d KL is a	an example of reac
	•,	a)	tetramolecular	b)	unimolecular
		c)	pseudo	(~ d)	bimolecular
	2)	The	noint of interpotion of two or	, . ,	allad
	2)	ine	point of intersection of two as	(es is c	
		a)		(U (D	oligin
		C)	co-ordinates	u)	an or these
	3)	Pc,\	/c and Tc are known as		
		a)	gas constants	b)	vander wall's constants
		C)	velocity constants	d)	critical constants
	4)	Effic	ciency of heat engine is alway	s	
		a)	greater than one	b)	less than one
		C)	equal to one	d)	all of these
	5)	lf v :	= x ⁿ then.		
	•,	a)	$dv/dx = x^{n-1}$	b)	$dv/dx = n x^{n-1}$
		c)	$dy/dx = n^{x-1}$	d)	$dy/dx = xn^{x-1}$
	6)	Rea	ictions in which the number of	molec	ules involved is more than
		still	obey the kinetic equation of the	ne first	order reactions are called
		a)	pseudounimolecular reaction	ıs b)	first order reactions
		C)	second order reactions	d)	all of these

B.Sc. (Semester - I) (New) (CBCS) Examination: Oct/Nov-2022 **CHEMISTRY** (Paper - I) **Physical Chemistry**

Day & Date: Tuesday, 24-01-2023 Time: 12:00 DM To 00

Seat

No.

- necessary.
- s allowed.

the sentence.

- reaction.

d) compressibility factor

more than one but they are called _____.

- ctions
 - c) second order reactions
- 7) In adiabatic process _____. a) q = wb) $q \neq 1$
 - c) q = 0d) q = 1

8) The parameter Z used to compare deviations of gases from ideal behavior is called b) zeeman effect

- a) gas constant
- c) critical constant
- Q.2 Answer the following questions. (Any Four)
 - Give the statement of first law of thermodynamics. a)
 - b) How temperature affects the rate of reaction?
 - Define the term critical temperature. C)
 - Define molecularity of a reaction. d)
 - What is isotherm? Represent it graphically for an ideal gas. e)

08

SLR-FZ-2

Max. Marks: 40

08

Set

Q.3 Write short notes. (Any Two)

- a) What is pseudo-unimolecular reaction? Give its example.
- **b)** What is differentiation? Explain any four rules of differentiation without proof.
- c) What is meant by heat engine? Explain the efficiency of a heat engine on the basis of Carnot's cycle.

Q.4 Answer the following questions. (Any Two)

- a) Explain definite integral and write one example related to chemistry.
- b) Write and explain the Joule-Thomson effect.
- c) Discuss hydrolysis of methyl acetate in presence of an acid.

Q.5 Answer the following questions. (Any One)

- a) What do you mean by second order reaction? Derive the expression for the velocity constant of the bimolecular reaction when the initial concentrations of the reactants are same.
- **b)** What is mean by ideal and non-ideal gases? Van der Waals' constants for hydrogen chloride gas are a = 3.67 atm lit⁻² and b = 40.8 ml mol⁻¹. Find the critical temperature and critical pressure of the gas. (R = 0.0821).

80

08

	4)	Use of logarithmic tables and cal	cula	tor is allowed.	
Choo 1)	o se ti Whic a)	ne correct alternatives from the ch one of these is not input device Speaker	opt ? b)	ions. Mouse	08
	c)́	Scanner	d)	Keyboard	
2)	Whio a) c)	ch of the following is not OS? Android Opera	b) d)	MAC LINUX	
3)	Com a) c)	nputer Monitor is also known as _ DVU VDU	b) d)	 UVD CCTV	
4)	MIC a) b) c) d)	R stands for Magnetic Ink Character Reader Magnetic Ink Code Reader Magnetic Ink Cases Reader None of these			
5)	The a) c)	output quality of a printer is meas Dot per inch Dots printed per unit time	b) d)	l by Dot per sq. inch All of above	
6)	Instr a) c)	uctions and memory address are Character code Binary word	repr b) d)	esented by Binary codes Parity bit	
7)	Whio a) c)	ch of the following memories mus Static RAM EPROM	t be b) d)	refreshed many times per second? Dynamic RAM ROM	
8)	The docu	word processing task associated ument is	with	changing the appearance of a	
	c)	Formatting	d)	All of above	
Ansv a) b) c)	ver th What What Defin	ne following questions. (Any Fo is flowchart? is RAM and ROM? e interpreter.	our)		08

Seat No.

B.Sc. (Semester - I) (New) (CBCS) Examination: Oct/Nov-2022 COMPUTER SCIENCE (Paper – I) **Fundamental of Computer**

Day & Date: Tuesday, 24-01-2023 Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.

- 2) Draw neat diagrams and give equations wherever necessary.
- 3) Figures to the right indicate full marks.

Q.1

- What is full form of EEPROM? d)
- What is cache Memory? e)
- List all the secondary storage devices. f)

SLR-FZ-3

Max. Marks: 40

Set

Ρ

Q.3	 Write short notes. (Any Two) a) Scanner b) Pseudo Code c) Assembler 	08
Q.4	 Answer the following questions. (Any Two) a) What are the difference between CRT and LCD monitor? b) What are the various input pointing devices? c) Write in details about printer and its types. 	08
Q.5	 Answer the following questions. (Any One) a) Explain the generation of computers in details. b) Explain the evolution of computers. 	08

Seat	
No.	

Day & Date: Wednesday, 25-01-2023 Time: 12:00 PM To 02:00 PM

Instructions: 1) All questions are compulsory.

- 2) Draw neat diagrams and give equations wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Use of logarithmic tables and calculator is allowed.

(At. Wts. H = 1, C = 12, O = 16, N = 14, Na = 23, Cl = 35.5)

- Q.1 Select the most correct alternative for each of the following and rewrite the 08 sentences.
 - 1) The bond dissociation energy of NO molecule is _____ kJ/mole.

a)	668	D)	494
C)	292	d)	10170

2)	The VBT has been developed by	
-,		·

- a) Pauling and Slater b) Huckel, Hund and Mullikan
 - c) K. Fajan d) H. Bethe
- **3)** According to MOT the carbon molecule _____ in nature.
 - a) unstable b) diamagnetic
 - c) paramagnetic d) antiferromagnetic
- 4) The observed bond angle in NH_3 is 107.5° is due to presence of _____ lone pairs.
 - a) four b) one
 - c) three d) two
- 5) Compared with other bonds _____ forces are very strong.
 - a) van der Walls b) hydrogen bonding
 - c) metallic d) ionic bonding

6) The size of cation is _____ its atomic size.

- a) equal to b) greater than
- c) less than d) none of these
- 7) _____ is the most electronegative element of the periodic table.
 - a) Sodium b) Fluorine
 - c) Hydrogen d) Helium
- 8) The maximum number of oppositely charged ions surrounding any particular ion is called _____ of that ion.
 - a) EAN b) atomic
 - c) bonding number d) coordination number

Q.2 Answer the following questions. (Any Four)

- a) What trend of electron affinity in periodic table?
- **b)** Define covalent with suitable example.
- c) Write any two limitations of VBT.
- **d)** How the sigma (σ) and pi (π) orbitals are formed?
- e) Give the Schrodinger wave equv*ation.



_____ າາ

SLR-FZ-4

a) Py-Py or Pz-Pz orbital overlap
b) sp² Hybridisation
c) Solubility and crystal structure property of ionic solids

Q.4 Answer the following questions. (Any Two)

- a) Discuss in detail the trends in periodic table of:
 - 1) Atomic radii and

Write the short notes. (Any Two)

Q.3

- 2) Reactivity
- b) Explain on the basis of MOT why Be₂ molecule does not exist in nature.
- c) Explain geometry of H₂O on the basis of VSEPR theory.

Q.5 Answer the following questions. (Any One)

- a) Define unit cell and stoichiometry and discuss in detail unit cell structure of cesium chloride.
- **b)** Explain bond order, stability and magnetic property of oxygen molecule on the basis of molecular orbital theory.

80

08

Seat No.						Set	Ρ
	B.Sc. (S	Semester CC	- I) (New) (CBCS OMPUTER SCIEI Programming	6) Exa NCE (g Usi	amination: Oct/No (Paper - II) ng C	v-2022	
Day 8 Time:	Date: Wed 03:00 PM T	nesday, 25- `o 05:00 PN	-01-2023 1	-		Max. Marks	: 40
Instru	uctions: 1) A 2) [3) F 4) (All questions Draw neat d Figures to th Use of logar	s are compulsory. liagrams and give en ne right indicate full rithmic tables and ca	quation marks alculate	ns wherever necessary or is allowed.	/.	
Q.1	Choose the 1)	e correct al format code %g %ld guage deve	ternatives from the e is used to read sin	e optio igle flo b) d)	ons. at type value. %d None of these		08
	a) ł c) S	Ken Thomps Steve Jobs	son	b) d)	Bill Gates Denis Ritchei		
	3) a) 2 c) 1	is the valid 24emp 12emp@	identifier in 'C' lang	uage. b) d)	_12emp Emp\$		
	 4) Which a) 'a c) 'a 	of the follov a' abc'	wing is an invalid ex	ample b) d)	of character constant? 'ab' None of these	?	
	5) a) f c) c	is the exit c or do- while	controlled loop.	b) d)	while Both a & b		
	6) printf(a) s c) c) function be stdio.h conio.h	elongs to hea	ader fil b) d)	e. string.h math.h		
	7) Which a) s c) f	of the follov struct for	wing is not Keyword	in C la b) d)	anguage? if None of these		
	8) Array i a) 1 c) (index starts 1)	from	b) d)	10 None of these		
Q.2	 Answer the a) What is b) How to c) What is d) How to e) What is f) What is 	e following s dynamic A o declare un s token? o declare str s storage cl s typedef?	questions. (Any F o Array? hion? ring? asses?	our)			08

Q.3 Write short notes: (Any Two)

- a) Table of String
- b) Nested Structure
- c) Storage Classes

Q.4 Answer of the following questions. (Any Two)

- a) What is call by address? Explain with program.
- **b)** Explain command line argument.
- c) Write a short note on random access of file.

Q.5 Answer of the following questions. (Any One)

- a) Write a program to check given number is palindrome or not using function.
- **b)** Write a program to show the concept of pointer to structure.

08

80

Seat	
No.	

B.Sc. (Semester - I) (New) (CBCS) Examination: Oct/Nov-2022 PHYSICS (Paper – I) **Mechanics and Properties of Matter**

2) Draw neat diagrams and give equations wherever necessary.

3) Figures to the right indicate full marks.

Day & Date: Friday, 27-01-2023

Instructions: 1) All questions are compulsory.

Time: 12:00 PM To 02:00 PM

		4)	Use of logarithmic tables and (At. Wts.: H = 1, C = 12, O =	calculat 16, N =	or is allowed. 14, Na = 23, Cl = 35.5)
Q.1	Choo 1)	ose tl Whie pene	he correct alternatives from t ch of the following shape of the dulum?	body c	ons. an be considered as compound
		а) С)	Cuboidal	d)	Any rigid body
	2)	lf rad diam	dius of a spherical shell is doub	oled the	n its moment of inertia about its
		a) c)	Becomes two times Becomes four times	b) d)	Reduces to half Remains constant
	3)	The a)	matter which remains in its def plastic Both of the above	formed (b)	condition is called materia elastic None of the above
	4)	In th calle a)	e statement of Hooke's, law, the d Modulus of rigidity	b)	Modulus of elasticity
	5)	Dim a) c)	ensions of moment of inertia ar $[M^{0}L^{0}T^{1}]$ $[M^{1}L^{2}T^{0}]$	re b) d)	$ \begin{bmatrix} M^{1}L^{0}T^{-2} \\ [M^{0}L^{2}T^{0}] \end{bmatrix} $
	6)	Ven a) c)	turimeter is mainly used to dete Density of the liquid Viscosity of liquid	ermine t b) d)	he Rate of flow of liquid Pressure of liquid
	7)	For Pois a) c)	copper, $\eta = 4.2 \times 10^{10} N/m^2$ son's ratio of copper? 0.3636 0.3366	and <i>K</i> = b) d)	= $14 \times 10^{10} N/m^2$. What is 0.6363 0.6633
	8)	A mo of in plan a)	etallic disc is having mass 5 kg ertia about an axis passing thro e. 0.15625 kg/m ²	and rac ough its b)	dius 0.25 m. Calculate its momen centre and perpendicular to its 0.15625 kg.m ²
		(a (= a a =)	Ń	

80

- 0.15625 g/cm^2 d)
- c) 0.15625 g.cm²

Set Ρ

SLR-FZ-6

Max. Marks: 40

Q.2 Answer. (Any Four)

- a) State Hooke's law.
- **b)** Define coefficient of viscosity. Write its unit and dimensions.
- c) A spherical shell of mass 500 gm has diameter 15cm. Calculate moment of inertia about the diameter.
- d) Define center of suspension and centre of oscillation.
- e) Write the two factors affecting surface tension

Q.3 Write short notes. (Any Two)

- a) Moment of inertia of flywheel
- **b)** Factors affecting surface tension
- c) Critical velocity and Reynold's number

Q.4 Answer the following questions. (Any Two)

- a) Derive the expression for Poisson's ratio of rubber.
- b) For a Kater's pendulum the distance between the knife edges is 1 m. The time taken for 100 oscillations of the pendulum is 200.4 sec and 200.2 sec. respectively about the two knife edges. Find the value of acceleration due to gravity (g).
- c) Water is escaping from a tank through a horizontal capillary tube 0.2 m long and 1.2 mm in diameter, when it stands 1 m above the tube. At what rate water is escaping? (Given η for water is 0.001 N.sec/m² and density of water= ρ =1000 kg/m³).

Q.5 Answer the following questions. (Any One)

- a) Describe Jaeger's method to determine surface tension of a given liquid.
- **b)** State and prove Bernoulli's theorem.

SLR-FZ-6

80

80

80

		S	SLR-FZ	2-7
Seat No.			Set	Ρ
	В.\$	Sc. (Semester - I) (New) (CBCS) Examination: Oct/Nov- MICROBIOLOGY (Paper - I) Introduction to Microbiology and Microbial Diversity	2022	
Day & Time:	& Date 03:00	e: Friday, 27-01-2023 M 00 PM To 05:00 PM	ax. Marks	: 40
Instru	uctior	ns: 1) All questions are compulsory.2) Figures to the right indicate full marks.		
Q.1	Choo 1)	ose the correct alternatives from the options.Causative agent of Tuberculosis and cholera is discovered bya)Louis Pasteurb)Robert Kochc)Antonie Van Leeuwenhoekd)Joseph Lister	<u>-</u> .	08
	2)	Genetic material of organism is either DNA or RNA. a) Bacteria b) Viruses c) Algae d) Fungi		
	3)	Peptidoglycan is a component of a) flagella b) cell membrane c) cell wall d) capsule		
	4)	Anti-phagocytosis is shown by of organism. a) flagella b) cell wall c) cell membrane d) capsule		
	5)	A group of similar species is a) Genus b) Family c) Order d) Division		
	6)	Rocky mountain spotted fever is caused by organism. a) Rickettsia b) Actinomycetes c) Protozoa d) Archaebacteria		
	7)	Cells divide in one plane and remain attached predominantly in pai are a) Streptococci b) Tetracocci c) Diplococci d) Staphylococci	rs	
	8)	type of ribosomes is present in a eukaryotic cell. a) 60S b) 80S c) 40 S d) 70S		
Q.2	Ansv a) b) c) d) e)	wer the following questions. (Any Four) Name two National Institutes related to Microbiology in India. Mention any four branches of Microbiology. Define: Genus Viroids Examples of bacteriophages		08

f) List of any four beneficial activities of Microorganisms

Q.3	Writ a) b) c)	te short notes. (Any Two) Koch's postulates Germ theory of Disease Size, shape, and arrangement of bacteria	08
Q.4	Ans a) b) c)	wer the following questions. (Any Two) Give minimum four contributions of Louis Pasteur. General characteristics and economic importance of Actinomycetes. General principles of bacterial nomenclature.	08
Q.5	Ans a) b)	wer the following questions. (Any One) Explain Spontaneous generation theory against biogenesis. Discuss any four criteria of bacterial classification and identification.	08

Dav & Date: Saturday, 28-01-2023 Time: 12:00 PM To 02:00 PM Instructions: 1) All questions are compulsory. 2) Figures to the right indicate full marks. 3) Draw neat labelled diagrams must be drawn wherever necessary. 4) Use of log table and calculator is allowed. Q.1 Choose the correct alternatives from the options. The visible range is from _____. 1) b) 3500 Å to 7500 Å 350 nm to 750 nm a) c) both a) and b) are correct d) both a) and b) are incorrect 2) Grating spectra can be achieved on side. b) middle both a) d) centred C) one 3) To increase the field of view and magnify power an extra lens introduced between objective and eye lens is called filed lens a) b) eye lens objective lens C) d) extra lens is not used

PHYSICS (Paper - II) **Optics**

Collimator is part of _____. 4)

8)

Seat

No.

- microscope b) spectrometer a) stethoscope d) optical bench C)
- 5) is used in biprism experiment.
 - optical bench b) travelling microscope a)
 - d) all of the above spectrometer C)
- In wedge shape films fringes are observed. 6)
 - a) circular b) straight line C) cylindrical d) conical
- There are _____ quantum processes to obtained laser output. 7)
 - a) 1 b) 2 3 d) 4 C)
 - The formula for diffraction grating is given by _____
 - b) $n\lambda = sin\lambda d$ a) $n\lambda = \cos\theta d$
 - $n\lambda = \sin\theta d$ d) $n\lambda = \cos\lambda d$ C)
- Q.2 Answer the following questions. (Any Four)
 - Define spherical and chromatic aberration. a)
 - b) Distinguish between interference and diffraction.
 - Draw the neat labelled energy level diagram that showing metastable state. C)
 - Mention the functions of an eve-piece. d)
 - State the important components of laser. e)
 - Comparison between Ramsden and Huygens piece. f)

Max. Marks: 40

08

SLR-FZ-8

Set

Q.3 Write short note. (Any Two)

- a) Schuster's method
- **b)** Newton's rings
- c) Two plano-convex lenses are separated by a distance of 2 cm to minimize spherical aberration. If the equivalent focal length of the combination is 6 cm find the focal lengths of the lenses.

Q.4 Answer the following questions. (Any Two)

- a) What is Fermat's principal of least time? Derive the law the reflection on the basis of Fermat's principal.
- **b)** Explain the experimental method to determine the wavelength of light using diffraction grating and hence find the grating element which has 15000 / inch.
- c) Obtain an expression fringe width of wedge shaped film for reflected ray.

Q.5 Answer the following questions. (Any One)

- a) What is the principle of gas laser? Explain construction and function of He-Ne laser.
- **b)** State and explain principal, construction and working of optical bench.

08

08

No.						Set	Ρ
	B.\$	Sc. (Semester Cell C	- I) (New) (CBCS MICROBIOLOGY Sytology and Mic) Ex ′ (P <i>I</i> robi	amination: Oct/No APER - II) al Techniques	ov-2022	
Day 8 Time:	03:00	e: Saturday, 28-0 DPM To 05:00 P	1-2023 M		·	Max. Marks	: 40
Instru	uction	is: 1) All question 2) Draw neat 3) Figures to	ns are compulsory. diagrams wherever r the right indicate full	neces mark	ssary. s.		
Q.1	Choc sente 1)	ose the correct a ences. Peptidoglycan is a) capsule	alternatives from the scomponent of	e opt of b)	tions and rewrite the bacteria. cell wall		08
	2)	The electron be a) copper c) tungsten	am in electron micros	d) scope b) d)	e is platinum nickel		
	3)	In Gram-Stainin a) alcohol c) crystal viol	g is mordant. et	b) d)	iodine congored		
	4)	In autoclave a) dry heat c) radiations	is used for steriliz	zatioı b) d)	n. moist heat filters		
	5)	Spirochaetes ar a) cocci c) spiral	e shaped orga	anisn b) d)	ns. rod comma		
	6)	Heat resistance a) fats c) ca-dipicolir	of spore is due to nate	b) d)	lipids proteins		
	7)	a) Crystal vio c) Meteytene	le of acidic stain. et blue	b) d)	Safranin Nigrosine		
	8)	The cell wall of a) Mycolic ac c) Citric acid	aid fast bacteria cont id	ains b) d)	Malic acid Lactic acid		
Q.2	Write a) b)	the answers. (Define sterilization List chemical con	Any Four) on. mponents of cell men	nbrar	ne.		08

- c) Define stain and dye.
 d) Functions of spore.
 e) Write on basic shapes of bacteria.

Seat	
No.	

Q.3	 Write the answers. (Any Two) a) Capsule staining b) Structure of endo-spore c) Resolving power and numerical aperture 	08
Q.4	 Write the answers. (Any Two) a) Types of pili b) Functions of cell membrane c) Sterilization by gases 	08
Q.5	 Write the answers. (Any One) a) Write on cell wall of Gram – Positive bacteria. b) Write on sterilization by moist heat. 	08

			Descriptive St	atis	stics-I
Day & Time	& Date : 12:00	e: Mo D PM	nday, 30-01-2023 To 02:00 PM		
Instr	uctior	is: 1) 2 3) All questions are compulsory.) Figures to the right indicate full r) Use of Calculator is allowed.	nark	S.
Q.1	Choo 1)	ose t The a) c)	he correct alternatives from the difference between the upper and The mid-point The class frequency	• opt d low b) d)	i ons. ver limits of a The class ir None of the
	2)	Whi a) c)	ich of the following is not an exam Height Wages	ple d b) d)	of quantitativ Weight Blood group
	3)	For clas a) b) c) d)	the data classified according to 'n s frequencies are equal to 3 ⁿ n ² n ³ Total no. of ultimate class freque	r' attr	ibutes, total
	4)	The from	sum of squares of deviations is n	ninin	num when de
		a) c)	mode median	b) d)	mean zero
	E \		we and ways a stand of a second stars to		

Seat

No.

B.Sc. (Semester - I) (New) (CBCS) Examination: Oct/Nov-2022 **STATISTICS** (Paper - I)

a class gives

e characteristics?

- p
- numbers of positive
- eviations are taken
- 5) The most repeated observation is
 - median b) mode a)
 - d) all the above mean C)

6) Sum of absolute deviations of observations about median is always

- Zero b) Minimum a)
- Maximum d) 1 C)

7) The variance is zero only if all observations are the

- a) Different b) Square
- d) Same Square root C)
- 8) If Mean > Mode then the distribution is
 - a) symmetric negatively skewed C)
- Answer the following questions in brief. (Any Four) Q.2
 - Define frequency and cumulative frequency. a)
 - b) Define ultimate class frequency.
 - Define A.M. and G.M. C)
 - Define raw moments and central moments. d)
 - Define quartile deviation and standard deviation. e)

Set

Max. Marks: 40

08

- b) positively skewed
- d) none of these

08

- ntervals e above

Q.3 Write short notes. (Any Two)

- a) Explain the construction of histogram.
- **b)** If \overline{X}_1 and \overline{X}_2 are the means of two groups of sizes n_1 and n_2 respectively, derive the formula to obtain mean of $(n_1 + n_2)$ values pooled together.
- c) Find the conditions of consistency of data related to two attributes A and B.

Q.4 Answer of the following questions. (Any Two)

- a) What is the effect of change of origin and scale on standard deviation?
- b) Prove that Bowley's coefficient of skewness is lies between -1 and +1.
- c) State and prove minimal property of mean square deviation.

Q.5 Answer of the following questions. (Any One)

- a) Define median and derive the formula for median in case of continuous frequency distribution.
- b) Express the first four central moments in terms of raw moments.

80

08

Seat								. [_
No.							Se	et	Ρ
	В.	Sc. (Semester	- I) (Nev ZOC An	w) (CBCS DLOGY (F iimal Dive) Exa Paper ersity	amination: Oct/Nov-2022 r – I) / - I		
Day 8 Time:	Date 03:00	: Mor PM	nday, 30-01- To 05:00 PN	2023 Л			Max. Ma	rks	: 40
Instru	ctions	: 1) A 2) [3) F	All questions Draw neat di Figures to th	are comp agrams a e right ind	ulsory. nd give equ licate full ma	iation: arks.	s wherever necessary.		
Q.1	Choo	se th	ne correct a	Iternative	es from the	optio	ons.		08
	1)	Prot a) c)	ozoans are ₋ unicellular acellular	org	anisms.	b) d)	multicellular viroids		
	2)	A va char a) c)	riety of inver acterized by Mollusca Arthropoda	rtebrate m a hard, s	arine anima piny coverir	als be ng or s b) d)	longing to the phylum, skin. Echinodermata Protista		
	3)	Myri a) c)	apoda is a c Mollusca Arthropoda	lass of ph	ylum	 b) d)	Echinodermata Protista		
	4)	The a) c)	dermal pore receptor madreporite	s present	on surface	of syd b) d)	con is called as prosopyle ostia		
	5)	Octo a) c)	pus belongs aplacophor gastropoda	s to a	_ class of ph	nylum b) d)	mollusca. cephalopoda Pelecepoda		
	6)	Nem	athelminthe	s compris	es of anima	als cor	mmonly called nematodes or		
		a) c)	tape worm flat worm			b) d)	round worm Bot fly		
	7)	Jelly med	fish is the c usozoa of m	ommon n Iajor phylu	ame given t ım cnidaria	to	phase of subphylum		
		a) C)	polyp			d)	medusa		
	8)	plac	organs pr e.	oduce by	amoeba to	trans	port from one place to another		
		a) c)	Flagella Polyp			b) d)	Cilia Pseudopodia		
Q.2	Answ a) [v er th Defin	n e following e the term 'F	questio Polymorph	ns in brief. nism'.	(Any	Four)		80

- Write any two parasitic adaptations in Ascaris lumbricoides. b)
- State any two economic importance of insects. C)
- What is the importance of water vascular system in Asteroidea? d)
- Draw and label canal system in Sycon e)

Seat

Q.3	 Write Short Notes. (Any Two) a) Write about nutrition and locomotion in Protozoa- Amoeba. b) Discuss polymorphism in hydrozoa. c) Write characteristics of kingdom protista. 	08
Q.4	 Answer of the following questions. (Any Two) a) Write about metamorphosis in insects. b) Classify with example Phylum Cnidaria. c) Write general characters of phylum Arthropoda. 	08
Q.5	 Answer of the following questions. (Any One) a) Describe life history of <i>Taenia solium</i>. b) Write general characters of phylum mollusca. 	08

Day & Date: Tuesday, 31-01-2023 Time: 12:00 PM To 02:00 PM						Max. Marks: 40
Instru	uction	ns: 1) 2) 3)	All questions are c Figures to the right Use of Calculator i	ompulsory. t indicate full ma s allowed.	arks.	
Q.1	Choc 1)	A co num a) c)	Te correct alternat in is tossed three til ber of sample point 6 3	ives from the c mes in successi s in the sample	ptio r ion ar spac b) d)	ns. 08 nd the outcomes are noted. The e is 8 9
	2)	Ever a) c)	nts A and A ^c are mutually exclusive independent event	events s	b) d)	sure events None of these
	3)	lf X a were a) c)	and Y denote numb thrown then $P(X = \frac{1}{12})$	er of points obta Y) is equal to	ained b) d)	when two six face unbiased dice $ \frac{1}{36} $ $ \frac{1}{6} $
	4)	lf A a a) c)	and B are two even P(A) = P(B) $P(A) \le P(B)$	ts such that A ⊂	: B, th b) d)	en $P(A) \ge P(B)$ None of these
	5)	lf A a is a) c)	and B are any two e 0.24 0.88	events, $P(A) = 0$).40 P b) d)	$({}^{B}/_{A}) = 0.35$, then P(A \cap B) 0.14 0.30
	6)	lf A a is a) c)	and B are independ 0.75 0.27	ent events, P(A) = 0 b) d)	.45, P(B) = 0.60, then P(A ∩ B) 0.45 0.65
	7)	lf A a a) c)	and B are independ 0.65 0.56	lent, $P(A) = 0.45$	5, P(B b) d)) = 0.20, then P(A ∪ B) is 0.09 0.60
	8)	lf A a P(B) a) C)	and B are any two e = $\frac{1}{18}$ $\frac{1}{3} \times \frac{1}{2}$	events, such tha	t P(<i>F</i> b) d)	$A B) = 1/3 P(A \cap B) = 1/6 \text{ then}$ $\frac{1}{3} \div \frac{1}{6}$ $\frac{1}{6} \div \frac{1}{3}$

Seat No.

B.Sc. (Semester - I) (New) (CBCS) Examination: Oct/Nov-2022 STATISTICS (Paper – II)

Elementary Probability Theory

SLR-FZ-12

Set P

Page 2 of 2

Q.2 Answer any four of the following.

- a) Define sure event and impossible event.
- **b)** Ten seeds are planted and total number of seeds germinated is recorded after a week. Write down an appropriate sample space for this experiment.
- **c)** Given $P(\overline{A} \cap B) = 0.1$, $P(A \cap \overline{B}) = 0.4$ $P(\overline{A} \cup \overline{B}) = 0.6$ compute P(A)
- **d)** For any two events A and B. Define conditional probability $P(A/_R)$.
- e) Define mutually independent events.

Q.3 Write short notes. (Any Two)

- a) Write down the sample space for the following events.
 - 1) A leap year will have 53 Sundays
 - 2) A non-leap year will have 53 Sundays
- b) With usual notation prove that
 - 1) $P(\phi) = 0$
 - $2) \qquad P(\overline{A}) = 1 P(A)$
- c) If $A \subset B$, then prove that 1) P(B/) = 1

)
$$P(^{D}/_{A}) = 1$$

2)
$$P(A/B) = \frac{P(A)}{P(B)}$$

Q.4 Answer any two of the following.

- **a)** If P(A) = 0.50, P(B) = 0.60, P(B/A) = 0.90. Find the probability that
 - 1) A and B both happens
 - 2) A happens given that B has happened
- **b)** A and B are two events defined on sample space Ω such that $P(A) = \frac{1}{4}$, $P(B) = \frac{1}{5}$, $P(A \cap B) = \frac{1}{7}$ Find.
 - 1) $P(\overline{\overline{A}} \cup \overline{B})$
 - 2) $P(A \cap \overline{B})$
- c) Suppose we conduct an experiment where ordered pair of integers (X,Y) are observed. The restriction on (X,Y) are as follows $1 \le X \le 3, 1 \le Y \le 3 X \ne Y$. Let A be the event that product of X and Y is less 5 and B be the event that sum of X and Y is greater than 2. Write down the appropriate sample space Ω and event A and B.

Q.5 Answer any one of the following.

- a) Prove that for any two events A and B $P(A \cap B) \le P(A) \le P(A \cup B) \le P(A) + P(B)$
- **b)** State and prove Baye's theorem on probability.

80

80

80

-						r			
Seat	t				Set	Ρ			
	B	S.Sc. (Semester - I) (Ne	ew) (CBCS) Ex	amination: Oct/No	v-2022				
	ZOOLOGY (Paper – II) Animal diversity-II								
Day a Time	Day & Date: Tuesday, 31-01-2023 Max. Marks: 40 Time: 03:00 PM To 05:00 PM								
Instru	uctior	ns: 1) All questions are com2) Draw neat diagrams3) Figures to the right in	pulsory. and give whereve idicate full marks.	r necessary.					
Q.1	Cho 1)	Protochordates are called a) Head c) Vertebralcolumn	ves from the opti d as Acraniata be b) d)	ons. cause they lack Cranium Head & Cranium	_·	08			
	2)	Agnatha are fish. a) Bony c) Cartilegenous	b) d)	Jawless None of these					
	3)	A fish is characterised by a) Dermal scales c) Pharyngealgills	/ the presence of _ b) d)	Pairedfins All the above					
	4)	Salamander belongs to th a) Reptile c) Aves	he class b) d)	Amphibia Mammalia					
	5)	Axolotl larva belongs to t a) Urodela c) Apoda	he order b) d)	Anura Stegocephalia					
	6)	The important character a) Presence of hood c) Rounded tail	of cobra is b) d)	Smallscales on head None of these					
	7)	Characteristics feature of a) Presence of beak & c) Air spaces in lung	f aves is feather b) d)	Ability to lay eggs All the above					
	8)	External ears are charac a) Birds c) Birds & Mammal	teristic of b) d)	Mammal Mammals & Reptiles					
Q.2	Ans a) b) c) d) e)	wer the following questic Cephalochordate Cyclostomata Bony fishes Chameleon Aquatic mammals	ons. (Any Four)			08			
Q.3	Wri a) b) c)	te short notes. (Any Two) Urochordate Wall lizard Morphological adaptations	s in birds			08			

Q.4 Answer the following questions. (Any Two)

- a) Explain symptoms of snake bite.
- b) Give general characters of aves.
- c) Terrestrial habitat in mammals.

Q.5 Answer the following questions. (Any One)

- a) Describe poisonous-non poisonous snake with suitable example.
- **b**) Describe the diversity in mammals with suitable example.

80

Seat No.			Set	Ρ					
	B.Sc. (Semester - I) (New) (CBCS) Examination: Oct/Nov-2022 MATHEMATICS (Paper – I)								
Day & Time:	Day & Date: Wednesday, 01-02-2023 Max. Marks: 40 Time: 12:00 PM To 02:00 PM								
Instru	uctio	ns: 1) All questions are compulsory.2) Figures to the right indicate full marks.							
Q.1	Cho 1)	ose the correct alternatives from the options. Period of cos hz is		08					
		a) 2π b) 2πi							
		c) 3π d) 3πi							
	2)	For any complex number $z, sin(iz) = $							
		a) $-isinhz$ b) $sinh(iz)$							
	•	C) isinhz (d) isinz							
	3)	General expression $\sqrt{3} + i$ in $r(\cos\theta + i\sin\theta)$ is							
		a) $2\left(\cos\frac{\pi}{6} + i\sin\frac{\pi}{6}\right)$ b) $2\left(\cos\frac{\pi}{3} + i\sin\frac{\pi}{3}\right)$							
		c) $2\left(\cos\frac{\pi}{6} - i\sin\frac{\pi}{6}\right)$ d) $2\left(\cos\frac{\pi}{3} - i\sin\frac{\pi}{3}\right)$							
	4)	If $z = cos\theta + isin\theta$ then $Z^n - Z^{-n} = $							
		a) $2\cos(n\theta)$ b) $\cos(2n\theta)$							
		c) $i sin(2n\theta)$ d) $2isin(n\theta)$							
	5)	The characteristic equation of the matrix $\begin{bmatrix} 1 & 2 \\ 2 & 4 \end{bmatrix}$ is							
		a) $\lambda^2 - 5\lambda + 2 = 0$ b) $\lambda^2 - 5\lambda - 2 = 0$							
		c) $\lambda^2 + 5\lambda - 2 = 0$ d) $\lambda^2 - 5\lambda - 2$							
	6)	The system of equations, $x - 2y = -1$ and $-x + 3y = 3$ has a) Unique solution b) Infinite solution c) No solution d) All of these							
	7)	If A is a square matrix then the matrix $A - A'$ isa) Symmetricb) Elementaryc) Unitaryd) Skew-symmetric							
	8)	The rank of the matrix $\begin{bmatrix} 2 & 1 & 1 \\ 2 & 1 & 2 \\ 2 & 1 & 3 \\ -2 & -1 & 4 \end{bmatrix}$ is							
		a) 1 b) 3 c) 2 d) 4							

- Q.2 Answer the following questions in brief. (Any Four)
 - a) Prove that, $\cosh^2 z \sinh^2 z = 1$
 - b) If z is any complex number then show that $sinh_z^{-1} = log(z + \sqrt{z^2 + 1})$
 - c) Find all values of $(-1)^{1/3}$
 - d) Find the augmented matrix [A, B] of the following equations and reduce it to echelon form.
 - x + y + 3z = 1; 2x + 3y z = 3; 5x + 7y + z = 7
 - e) Solve the equations. x - y + z = 0; x + 2y - z = 0; 2x + y + 3z = 0
 - f) Find the rank of matrix to the normal form.
 - $\begin{bmatrix} 1 & 3 & 4 & 5 \\ 1 & 2 & 6 & 7 \\ 1 & 5 & 0 & 10 \end{bmatrix}$

Q.3 Attempt any two of the following.

- a) Evaluate $\int \sin^4 d\theta$ by using $x = \cos\theta + i\sin\theta$
- **b)** Find the eigen value and eigen vector of the matrix.

$$\mathbf{A} = \begin{bmatrix} 2 & -2 & 2 \\ 1 & 1 & 1 \\ 1 & 3 & -1 \end{bmatrix}$$

c) If $cos(\alpha + i\beta) = x + iy$ then prove that

1)
$$\frac{x^2}{\cosh^2 \beta} + \frac{y^2}{\sinh^2 \beta} = 1$$

2)
$$\frac{x^2}{\cosh^2 \alpha} + \frac{y^2}{\sinh^2 \alpha} = 1$$

Q.4 Answer of the following questions. (Any Two)

- a) Find characteristic equation of matrix.
- $A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$ Also find A⁻¹ by

using Cayley-Hamiton theorem.

- **b)** Discuss the solution of the system of equations. x + y + z = 6; 2x + y + 3z = 13; 5x + 2y + z = 12
- c) If p and q are roots of equation $x^2 2x + 2 = 0$ then prove that $p^n + q^n = 2^{\frac{n+2}{2}} \cos \frac{n\pi}{4}$

Q.5 Attempt any one of the following questions.

- a) State and prove DeMoivre's theorem.
- **b)** State and prove Cayley-Hamilton theorem.

08

08



	В.	Sc. (Semester - I) (New) BOTA	(CBCS) Ex ANY (Paper	amination: Oo ' – I)	ct/Nov-2022	
			Microbiol	ogy and Ph	iycology		
Day Time	& Date : 03:00	e: Weo 0 PM	dnesday, 01-02-2023 To 05:00 PM			Max. Mar	ks: 40
Instru	uctions	s: 1) A 2) E 3) F	Il questions are compuls Draw neat diagrams and Figures to the right indica	sory. give equation ate full marks.	s wherever nece	ssary.	
Q.1	Choo	ose th	e correct alternatives i	from the opti	ons.		08
	"	a) c)	Pathology Cytology	as b) d)	Phycology Mycology		
	2)	a) c)	_ are neither prokaryotic Viruses Fungi	c nor eukaryol b) d)	tic in structure. Bacteria Algae		
	3)	Sper a) c)	ical shaped Bacteria are Coccus Spirullum	e called as b) d)	Bacillus Pleomorphic		
	4)	Nost a) c)	oc belongs to division Chlorophya Euglenophyta	 b) d)	Rhodophyta Cyanophyta		
	5)	The : a) c)	shape of chloroplast in s Axial Cup shaped	pirogyra is b) d)	Reticulate Spiral		
	6)	Virus a) c)	ses are much smaller tha Bacteria Algac	an b) d)	Fungi All of these		
	7)	A We a) c)	ell known dish of Japan, Spirogyra Ulva	'Kombu' is Pr b) d)	epared from Oscillatoria Laminaria	Sea weed.	
	8)	In Oo a) c)	ogamy, male and female Similar one larger other smaller	e gametes are b) d)	equal gametes are no	ot involved	
Q.2	Ansv a) b) c) d) e)	wer ar Write Name Name Why I Sketc	ny four of the following any four characters of v one RNA viruse and or types of conjugation in Nitrogen fixing bacteria a h and label Mycoplasma	J. iruse. he DNA viruse Spirogyra. are important f a cell?	for soil?		08
Q.3	Write a) b) c)	e sho Signif Role Repro	rt notes. (Any Two) icance of Mycoplasma of viruses oduction in Nostoc				08

Seat No.

Set P

Q.4 Answer any two of the following.

- a) Write general characters of Xanthophyta.
- b) What are the divisions of algae according to G. M. Smith?
- c) Explain Transformation process in Bacteria.

Q.5 Answer any one of the following.

- a) Explain Sexual reproduction in Sargassum along with labeled diagrams.
- b) Describe Ultrastructure of Bacterial Cell.

TITLE	. 12.0								
Instr	uctior	าร: 1) 2)	All questions are compulsory. Figures to the right indicate full m	narks					
Q.1	Cho	hoose the correct alternatives from the options.							
	1)	n y = a)	$(3x + 5)^7$ then $y_8 = \$ 7! 3 ⁷	b)	$\frac{7!}{2!}3^5 (3x+5)^2$				
		C)	$7(3x+5)^6$	d)	0				
	2)	The	formulae of L' Hospital rule is	<u> </u>	f() $f'()$				
		a)	$\lim_{x \to a} \frac{f(x)}{g(x)} = \lim_{x \to a} \frac{f(x)}{g'(x)}$	b)	$\lim_{x \to a} \frac{f(x)}{g(x)} = \lim_{x \to a} \frac{f'(x)}{g'(x)}$				
		C)	$\lim_{x \to a} \frac{f(x)}{g(x)} = \lim_{x \to c} \frac{f'(x)}{g(x)}$	d)	$\lim_{x \to a} \frac{f(x)}{g(x)} = \frac{f(a)}{g(a)}$				
	3)	The	expansion of $\frac{1}{1-x}$ is						
		a)	$1-x+x^2-x^3+x^4+\cdots$	b)	$1 + x + x^2 + x^3 + x^4 + \cdots$				
		C)	$1 - x + \frac{x^2}{2} - \frac{x^3}{3} + \frac{x^4}{4} + \cdots$	d)	$1 + x + \frac{x^2}{2} + \frac{x^3}{3} + \frac{x^4}{4} + \cdots$				
	4)	The	degree of homogeneous function	<i>f</i> (<i>x</i> ,	$y) = \frac{x+y}{x-y}$ is				
		a)	$\frac{1}{2}$	b)	1				
		C)	0	d)	2				
	5)	lf u i	s homogeneous function of $x \& y$	of de	egree 'n' then $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} = $				
		a)	$\frac{F(u)}{F'(u)}$	b)	$n \frac{F(u)}{F'(u)}$				
		C)	$n\frac{F'(u)}{F(u)}$	d)	$\frac{1}{n} \frac{F(u)}{F'(u)}$				
	6)	The	value of $\int_{-\infty}^{\pi/2} \cos^5 x dx = -$						
		a)	15/	b)	$15/_{2} \pi$				
		C)	⁸ / ₁₅	d)	$\frac{8}{15\pi}$				
	7)	lføi ⊇)	s constant then ∇ø is	b)	nositive				
		a)	V	U)	positive				

d) infinite

Seat No.

B.Sc. (Semester - I) (New) (CBCS) Examination: Oct/Nov-2022 MATHEMATICS (Paper-II) Calculus

Day & Date: Friday, 24-03-2023 Time: 12:00 PM To 02:00 PM

C)

negative

SLR-FZ-16

Max. Marks: 40

Set P

- Q.2 Answer the following question. (Any Four)
 - a) Solve $\lim_{x \to 0} \frac{3^{x} 2^{x}}{x}$ b) Solve $\int_{0}^{\pi/2} \sin^{6} x \, dx$
 - c) Solve $\int_{0}^{\pi/2} \sin^8 x \cos^4 x \, dx$

d) If
$$f(x, y) = e^{ax} \sin by$$
 then find $\frac{\partial^2 f}{\partial x \partial y}$

e) If $\overline{f} = 2x^2zi - xyzj + 3yzk$ then find div \overline{f}

Q.3 Answer the following questions. (Any Two)

- a) Find expansion of $' \cos x'$
- **b)** If z is homogeneous function of degree n then show that $x \frac{\partial z}{\partial x} + y \frac{\partial z}{\partial y} = nz$
- **c)** For gradient show that $\nabla\left(\frac{f}{g}\right) = \frac{g \nabla f f \nabla g}{g^2}$

Q.4 Answer of the following questions. (Any Two)

- a) Find nth derivative of
 - 1) $y = e^{ax}$

2)
$$y = a^{mx}$$

b) If u = f(x + ay) + g(x - ay) then show that $\frac{\partial^2 u}{\partial y^2} = a^2 \frac{\partial^2 u}{\partial x^2}$

c) Solve
$$\int_{0}^{\pi} \cos^{4}\left(\frac{x}{2}\right) \sin^{3}\left(\frac{x}{2}\right) dx$$

Q.5 Answer of the following questions. (Any One)

- a) State and prove Leibnitz's theorem.
- **b)** If $\overline{A} = xz^3i 2x^2yzj + 2yz^4k$ then find div \overline{A} and curl \overline{A} at (1, -1, 1).

08

08

08

Seat No.			Set	Ρ					
B.Sc. (Semester - I) (New) (CBCS) Examination: Oct/Nov-2022 BOTANY (Paper – II)									
Day 8 Time:	& Date 03:00	e: Friday, 24-03-2023 0 PM To 05:00 PM	Max. Marks	: 40					
Instructions: 1) All questions are compulsory. 2) Figures to the right indicate full marks.									
Q.1	Choo 1)	ose the correct alternatives from the options. The organism which lack chlorophyll are called a) Algae b) Bryophytes c) Lichens d) Fungi		08					
	2)	is called bread mould fungus.a) Aspergillusb) Penicilliumc) Cercosporad) Mucor							
	3)	is popularly known as brewers yeast. a) Saccharomyces b) Mucor c) Rhizopus d) Puccinia							
	4)	The archegoniates is group of Bryophytes pteridophytes and a) Algae b) Fungi c) Gymnosperms d) Angiosperms	<u> </u>						
	5)	The female sex organ of Dryophyte isa) Antheridiumb) Archegoniumc) Oogoniumd) Oospore							
	6)	Sexual reproduction in Riccia isa) oogamousb) anisogamousc) isogamousd) gamous							
	7)	The selaginella shows sporophyte.a) homosporous b) heterosporousc) monosporous d) tetrasporous							
	8)	The sago starch is obtained from plant.a) Ginkgob) Cycasc) Taxusd) Cedrus							
Q.2	Ansv a) b) c)	wer the following questions in brief. (Any Four) General characters of Fungi (any four) Definition of archegoniates. Give the types of rhizoids in Riccia.		08					

- Classify Cycas according to sporne's. Give the occurrence of mucor.
- d) e)

Q.3	 Write Short Notes. (Any Two) a) Give in details on morphology of Agaricus. b) Write a note on roles of Fungi in agriculture. c) Asexual reproduction in mucor. 	08
Q.4	 Answer of the following questions. (Any Two) a) Describe asexual reproduction in saccharomyces. b) Describe the economic importance of Bryophytes. c) Describe in details microsporangium of selaginella. 	08
Q.5	 Answer of the following questions. (Any One) a) Explain the sexual reproduction in cycas. b) Describe the antheridia and archegonia of Riccia. 	08

	В.	Sc. (Semester - I) (New) (CBCS) Examination: Oct/N ELECTRONICS (Paper – I)	ov-2022
		Basic Circuit Theory and Network Analysis	
Day o Time	& Date : 12:0	te: Tuesday, 28-03-2023 00 PM To 02:00 PM	Max. Marks: 40
Instr	uctior	 ans: 1) All questions are compulsory. 2) Figures to the right indicate full marks. 3) Draw neat diagrams and give equations wherever necessary. 4) Use of log tables and calculators is allowed. 	ary.
Q.1	Sele 1)	The reactance of capacitance is given by $X_c =$ a) 1/C b) C c) 1/ ω C d) ω C	08
	2)	Norton's equivalent circuit consists of with resistance. a) voltage source in series b) voltage source in pa c) current source in series d) current source in par	rallel ^r allel
	3)	The unit of impedance is a) Ohm b) Farad c) Henry d) None	
	4)	a) Resistor b) Inductor c) Capacitor d) Fuse	
	5)	A sinusoidal ac voltage has peak value of 10 volt then its RMS volt. a) 10 b) 7.07 c) 20 d) 5	value is
	6)	Quality factor of resonance circuit is high then its bandwidth is a) low b) high c) very high d) Infinity	
	7)	Transformer is based on the principle ofa) self inductionb) mutual inductionc) conductiond) none	
	8)	The π-network is also known as network.a) starb) deltac) seriesd) parallel	
Q.2	Ansv a) b)	wer the following questions. (Any Four) What is inductor? What is its unit? Define peak voltage and rms voltage.	08

- State Kirchhoff's voltage law and Kirchhoff's current law. Define bandwidth and quality factor. What is step up and step down transformer? C)
- d)
- e)

Seat No.

Set P

Q.3	Wri a) b) c)	te short notes. (Any Two) Maximum power transfer theorem. Phase relation of current and voltage in pure inductor. Electromechanical relay.	08
Q.4	Ans a) b) c)	wer of the following questions. (Any Two) Explain series resonance in LCR circuit. Explain constant voltage source and constant current source. Explain superposition theorem.	08
Q.5	Ans a) b)	wer of the following questions. (Any One) State Thevenin's theorem. Explain the steps involved in applying Thevenin's theorem. What is resistor? Explain different types of resistors.	08
Seat			
------	--		
No.			

B.Sc. (Semester - I) (New) (CBCS) Examination: Oct/Nov-2022 **GEOGRAPHY** (Paper – I) Geomorphology-I

Day & Date: Tuesday, 28-03-2023 Time: 12:00 PM To 02:00 PM

C)

C)

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Draw neat diagrams and give equations wherever necessary.
- 4) Use of stencil is allowed.

Q.1 Rewrite the sentences by choosing the correct wherever necessary.

- may be defined as the science which deals the distribution of 1) different kinds of landforms on the earth surface.
 - a) Geomorphology

Climatology

- b) Oceanography d) Soil geography
- 2) The scientist Guttenberg and Mohorovic have been divided the interior earth into _____ layers.
 - a) four b) five
 - C) three d) six
- The rock which is formed by cooling and solidifying of the molten material 3) is known as rocks.
 - a) Stratified b) Metamorphic
 - d) None of them Igneous C)
- The discontinuity is found in between SIAL and SIMA. 4)
 - Conrad a) Mohovisic

- b) Guttenberg d) none of them
- Folded mountain and sea trenches have had been formed at the 5) boundary of plates.
 - a) divergent
 - b) convergent transform d) none of them C)
- 6) Whenever the sedimentary rocks have had been formed by deposition of calcium carbonate derived from the skeletons and remains of animals and plants respectively is known as _____ sedimentary rocks.
 - a) Calcareous b) Carbonaceous
 - d) None of them Siliceous C)
- 7) Wegener believed that Africa has been the most stable landmass throughout the history of the earth. According to him, "All movements are relative, and are made relative to
 - a) North America b) Africa
 - c) Antarctica d) South America
- A 8) is one in which the hanging wall moves downward in comparison with the adjoining footwall along the fault line.
 - normal a) C) lateral

- b) reverse
- d) step

Max. Marks: 40

Set

		SLR-FZ-	20
Q.2	Ans a) b) c) d) e) f)	wer of the following any four. Classification of Interior earth by Vander Gracht. State the branches of physical geography. Classify the igneous rocks on the basis of silica content. Block mountain. Focus of earthquake. Describe the folding process.	08
Q.3	Writ a) b) c)	te a short notes on any two of the following. Classify the volcanoes on the basis of its periodicity. Describe the types of metamorphic rocks. Disadvantages of earthquake and volcanoes.	08
Q.4	Ans a) b) c)	wer any two of the following. Describe the world seismic zone on earth surface. Explain the types of fold with schematic diagrams. State Earth movement and classify it with schematic diagrams and good examples.	80
Q.5	Ans a)	wer any one of the following. Describe the concept Wegener's continental drift theory.	08

a) Describe the concept Wegener's continental drift theory.
b) State the formation process of igneous rocks with its characteristics and economic importance.

Seat No.						Set	Ρ
	B.\$	Sc. (Semester	- I) (New) (CBCS) GEOLOGY (P	Ex ape	amination: Oct/No er – I)	v-2022	
Day &	Date	: Tuesday, 28-0	Physical Ge 3-2023	eolo	ogy	Max. Marks	: 40
Time:	03:00) PM To 05:00 P	M				
Instru	iction	s: 1) All question 2) Figures to 3) Draw neat	ns are compulsory. the right indicates full labeled diagrams whe	mar ereve	ks. er necessary.		
Q.1	Multi	ple choice ques	stions				08
	1)	Ozone is found a) Stratosphe c) Mesosphe	in ere re	b) d)	Thermosphere Crust		
	2)	Composition of a) Si + Alb c) Ni + Fe	Core is	b) d)	Si + Mg Fe + Al		
	3)	Which of the fol a) Types of n c) Intensity of	lowing factors control atural agents f natural agents	wea b) d)	thering process? Type of rocks All of the above		
	4)	Process of frost a) Mountains c) Plateaus	action is common at	b) d)	Basins Deserts		
	5)	Which of the fol a) Lehmann c) Brunton	lowing is not a type of	diso b) d)	continuity of the earth ir Gutenberg Mohorovic	nterior?	
	6)	Nebular hypothe a) Nicholas S c) Jean and S	esis of earth origin wa teno leffery	s giv b) d)	en by Laplace and Kant James Hutton		
	7)	Line joining focu a) seismic wa c) seismic ve	us and epicenter of the ives rtical	e ea b) d)	rthquake is called strike Iso-seismic lines	·	
	8)	Sial and Sima a a) Atmospher c) Mesosphe	re part of e re	b) d)	Troposphere Lithosphere		
Q.2	Ansv a) b) c) d) e)	ver any four of t Define Earthqua Draw labeled dia What is Mohorov Which is the colo Give any two cha	t he following ke. Igram illustrating Focu vic Discontinuity? dest layer of the Atmos aracters of Basic lava.	is ar sphe	nd Epicenter. ere?		08
Q.3	Write a)	short notes. (A Seismograph	Any Two)				08

- **b)** Crust of the earth
- c) Rock cycle

SLR-FZ-21 Set P

Page 1 of 2

Q.4 Answer of the following questions. (Any Two)

- a) Explain characters of primary seismic waves.
- **b)** Explain Spheroidal weathering.
- c) Describe Pyroclastic products of volcano.

Q.5 Answer of the following questions. (Any One)

- a) Define Volcano. Describe Central and Fissure types of Volcanoes.
- b) Define Weathering. Explain any three types of chemical weathering processes.

80

NO.						-
B.Sc. (Semester - I) (New) (CBCS) Examination: Oct/Nov-2022 ELECTRONICS (Paper - II) Digital Fundamentals						
Day 8 Time:	Date 12:00	: Monday, 27-03-2023 PM To 02:00 PM			Max. Marks:	40
 Instructions: 1) All questions are compulsory. 2) Draw neat diagrams and give equations wherever necessary. 3) Figures to the right indicate full marks. 4) Use of a logarithmic table and calculator is allowed. 						
Q.1	Multi 1)	ple choice questions. Gray code is a a) weighted code l c) unweighted code d	b) d)	alphanumeric code error-detecting code		08
	2)	The binary equivalent of the hexadecina)00000000Ic)111100000	nal b) d)	no. (FF) ₁₆ is 00001111 11111111		
	3)	IC is a Quad two input NAND ga a) 7400 I c) 7432 of	ate. b) d)	7402 7486		
	4)	In Boolean algebra (A + A) = a) A c) 0	b) d)	1 2A		
	5)	gate is used as the parity check a) OR I c) X-OR (er. b) d)	AND NOT		
	6)	Excess code for (12) ₁₀ is a) 1100 l c) 1111 d	b) d)	1001 1010		
	7)	 The full form of ASCII code is a) American Standard Code for Inter b) American Standard Code for Infor c) American Standard Code for Infor d) American Standard Code for Inter 	rnet rma rma	: Interchange tion Interchange tion Interconnect t Interconnect		
	8)	In the 4 variable K map, the group of 2 product term. a) one I c) three	adj b) d)	acent cells yields two four	variable	
Q.2	Answ a)	ver the following questions. (Any Fou State the OR law & AND law.	ır)			08

- Give the application of the XOR gate. b)
- Draw the symbol of three inputs OR gate& state its truth table. C)
- Show that $(A B) + (A B C) + (A \overline{B}) = A$ d)
- Draw a pin diagram of IC 7486. e)

Seat No.

Set P

Q.3 Write short notes (Any Two)

- a) Perform the binary subtraction
 - 1) $(11010)_2 (10111)_2$
 - 2) $(11101)_2 (10111)_2$
- **b)** Convert the (48)₁₀ into its equivalent binary and octal number.
- c) Reduce logic equation using Boolean algebra.
 - 1) $Y = BC + \overline{BCD} + B$
 - 2) $Y = (\overline{AB} + \overline{A} + \overline{B})A\overline{B}$

Q.4 Answer of the following questions. (Any Two)

- a) State and prove De-Morgan's theorems.b) By using the K map reduce the logic equ
 - By using the K map reduce the logic equation. $Y = A \overline{B} C \overline{D} + A B C \overline{D} + \overline{A} B C \overline{D} + \overline{A} \overline{B} C \overline{D} + A \overline{B} C D + \overline{A} \overline{B} C D + A \overline{B} \overline{C} \overline{D} +$

 $A B \overline{C} \overline{D} + \overline{A} B \overline{C} \overline{D} + \overline{A} \overline{B} \overline{C} \overline{D}$

c) What do you mean by codes? State their types. Explain Excess-3 code with examples of addition.

Q.5 Answer of the following questions. (Any One)

- a) Why NOR / NAND gate is called a universal gate? Give the construct of basic gates by using NOR and NAND gates only.
- **b)** Give the construction of the half and full subtractor by using basic gates with their truth table.

80

08

: 12:0	0 PM	To 02:00 PM		
ructior	15: 1 2 3 4) All questions are compulsory.) Figures to the right indicate full r) Neat diagrams and map must be) Use of map stencil is allowed.	marks e drav	s. wn wherever necessary.
Cho	ose t	he correct alternatives from the	e opti	ons.
1)	The	water or acids dissolved content	s is ca	alled
	a)	Oxidation	b)	Solution
	C)	Carbonation	d)	Chelation
2)	The	Action of external forces causes	the ro	ock to erode, but the properties do
	not	change This action is called	_ wea	athering.
	a)	Mechanical	b)	Chemical
	C)	Biological	a)	Oxidation
3)	The	Kettle like small depression foun	d in ri	ver valley Pot holes of much
	bigg	jer size is called	L)	Caaraa
	a)	Della Waterfall	(a (b	George Bot holes
0	C) TI		u)	
4)	i ne	concept geographical cycle of er	osion	Charles Derwin
	a)		(U	None of them
-	0)		u)	
5)	Can	iyon Landforms is formed due to	b \	_ the action of river.
	a)	Erosional	d)	I ransportational Weetbering
	C)	Depositional	u)	weathening
6)	Blo/	w out or Deflation Hollows is form	ed du	e to the action of the wind.
	a)	Erosional	D)	I ransformational
	C)	Depositional	u)	weathening
7)	Roc	he Moutonnee is formed by the a	ction	of the
	a)	Wind	b)	River
	C)	Sea waves	a)	Glaciers
8)	Low	residual hills found on pene plair	ו kno	wn as

Q.2 Answer the following questions. (Any Four)

Define physical Weathering. a)

Monad nocks

Sand dunes

a)

C)

- Write the Causes of Mass Wasting. b)
- Explain the first stage of cycle of Erosion. C)
- Write the name of Depositional Landforms made by Coastal. d)

Meander

Bar khan

b)

d)

Define Bays and Headland. e)

B.Sc. (Semester - I) (New) (CBCS) Examination: Oct/Nov-2022 GEOGRAPHY (Paper - II) Geomorphology - II

Day & Date: Monday, 27-03-2023 Time

Instr

Q.1

Max. Marks: 40

80

08



Set

Ρ

Seat No.

Q.3 Write short notes. (Any Two)

- a) Mushroom Rock
- **b)** Wave Built Platform
- c) 'V' Shaped Valley

Q.4 Answer of the following questions. (Any Two)

- a) Define Chemical weathering and explain the types of Chemical Weathering.
- **b)** Describe the types of Mass Wasting.
- c) Describe Depositional Landforms made by Glacier.

Q.5 Answer of the following questions. (Any One)

- a) Explain Theory of Cycle of Erosion by W.M. Davis.
- **b)** Describe Erosional Landforms made by River with suitable diagram.

80

80

80

Q.1	 1 Choose the correct alternatives from the given options. 1) A branch of geology deals with the systematic study of ancient life preserved in the rocks is called 			n options. atic study of ancient life
		a) petrology c) petrography	b) d)	paleontology physiography
	2)	Fossils of organisms with spines a) Echinodermata c) Arthopoda	s on their sl b) d)	nells belong to phylum. Coelenterata Brachiopoda
	3)	Turritela shell belongs to a) cephalopod c) brachiopod	class. b) d)	gastropod Iamellibranches
	4)	Trace fossils indicate a) coal formation c) plant impression	b) d)	locomotion of animals none of these
	5)	The exoskeleton of phylum moll calcareous material is called as a) umbo c) shell	usca, made b) d)	e up of hard, secreted, lunule hinge
	6)	Body whorl is present at a) base c) top	b) d)	apex anterior
	7)	The main characteristic of fossil a) Soil c) Ice	is its prese b) d)	ervation in Sediments Lava
	8)	Plant leaves are preserved in a) Arenaceous c) Lava	rock. b) d)	Rudaceous Argillaceous
Q.2	Ans a) b)	wer the following questions. (A Condition of fossilization Define fossil	ny Four)	

Palaeontology Day & Date: Monday, 27-03-2023 Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.

Immprints

Pecten

Echinus

C)

d)

e)

2) Figures to the right indicate full marks.

3) Draw neat diagrams wherever needed.

B.Sc. (Semester - I) (New) (CBCS) Examination: Oct/Nov-2022 GEOLOGY (Paper - II)

Seat No. SLR-FZ-25

Set P

Max. Marks: 40

Q.3	Ans a) b) c)	wer the following questions. (Any Two) Describe petrification and carbonification. Describe the uses of fossils. Describe apical system in echinoderms.	08
Q.4	Ans a) b) c)	wer of the following questions. (Any Two) Describe morphology of gastropod shell. Describe the mould and cast. Describe Glossopteris and Gangamopteris.	08
Q.5	Ans a) b)	wer of the following questions. (Any One) Describe the classification and morphology of trilobites. Explain in details phylum brachiopoda.	08

		Literary vo	Jya	ye	
Day a Time	& Dat : 12:0	te: Monday, 23-01-2023 00 PM To 02:00 PM			Max. Marks: 40
Instr	uctio	ons: 1) All questions are compulsory.2) Figures to the right indicate full r	nark	ïS.	
Q.1	Rew 1)	vrite the following sentences by choo Gandhi was asked to deliver a speech	osing on	g the correct alternativ	ve. 08
		a) Khadi c) Religion	b) d)	Freedom Poverty	
	2)	Jadav Payeng belongs to the state of		<u> </u>	
		a) Maharashtra c) Guwahati	b) d)	Assam Sikkim	
	3)	The grandmother used to fetch the au	thor	s before school.	
	-	a) books c) uniform	b) d)	shoes wooden slate	
	4)	The poet desires not to be sheltered fi a) love c) dangers	om b) d)	compassion cowardice	
	5)	sung praises for the flowers.			
	·	a) Bard c) Saints	b) d)	Oracle None of these	
	6)	The father discovered coins.			
		a) silver c) copper	b) d)	gold nickel	
	7)	Entering into some one else's house v	vithc	ut permission is	
		a) illmannered c) illogical	b) d)	illegal illogic	
	8)	I have never heard them after t a) at c) of	hat i b) d)	ncident. by to	
Q.2	Ans	wer the following questions (any fou	ır)	tout of the freedows Otro	12

B.Sc. (Semester - I) (Old) (CBCS) Examination: Oct/Nov-2022 **ENGLISH (Compulsory)**

Literary Voyage

C

Seat No.

SLR-FZ-26

Set

- (
 - What is the importance of khadi in the context of the freedom Struggle? a)
 - b) How was Jadav Payeng inspired to start planting trees?
 - What kind of relationships did the author have with his grandmother? C)
 - What are the various qualities that Rabindranath Tagore discusses as d) important in the poem?
 - Why did Toru Dutt focus on the Lotus flower in the poem? e)
 - What is the significance of the toys in the poem 'The Toys'? f)

- Q.3 Answer the following question. (Any one)a) Write about the process of communication in detail.
 - **b**) Write about the principles of effective communication.

Q.4 Write a description about your memorable tour with your family members. 10

Time	12:00) PM 1	o 02:00 PM		
Instru	uction	is: 1) / 2) 3) 4) (A	All questions are compulsory. Draw neat diagrams and give equ Figures to the right indicate full m Use of algorithmic tables and calc At. Wt. H=1, C=12, O=16, N=14, N	uation arks culate Na=2	ns wherever neces or is allowed. 23, CI=35.5)
Q.1	Choo	se th	e correct alternatives from the	optio	ons.
	1)	All na a) c)	spontaneous reversible	b) d)	non-spontaneous isothermal
	2)	The h	alf life of order reaction is	inde	pendent of initial co
		reacta a) c)	ant. zero second	b) d)	first third
	3)	Efficie a) c)	ency of a heat engine is zero less than one	b) d)	one greater than one
	4)	The u a) c)	init for rate constant of first order lit mol ⁻¹ sec ⁻¹ sec ⁻¹	reac b) d)	tion is lit mol sec ⁻¹ sec
	5)	If the net or a)	rate expression for a given reacti rder of reaction is 3/2	on is b)	s given by $dx/dt = 1$ 1/2
	6)	The c	as compressibility factor Z for an	idea	∠ al gas is .

B.Sc. (Semester - I) (Old) (CBCS) Examination: Oct/Nov-2022 **CHEMISTRY** (Paper - I) **Physical Chemistry**

Day & Date: Tuesday, 24-01-2023

Seat

No.

sary.

oncentration of

- $kA^{3/2}B^{1/2}$, the
- - b) equal to one a) zero C)
 - less than one d) greater than one
- In a typical graph, the straight line obtained is parallel to the x-aixs. The 7) slope of this line will be
 - 0 b) 1 a) +1 d) 0.5 C)
- If integration of the term 1/x dx =8) a) b) 1/x х X + Cd) x - C C)

Q.2 Answer the following questions. (Any Four)

- Define the terms a)
 - a) Order of a reaction
 - b) Molecularity of a reaction
- Write the rate constant equation for first order reaction. b)
- For a straight line equation y-mx + C, sketch the nature of the graph. C)

SLR-FZ-27

Max. Marks: 40

80



- d) Write van der Waals equation and give the significance of the terms involved in it.
- e) Give the units for van der Waal's constant 'a' and 'b'.
- f) What do you mean by pseudo-unimolecular reaction? Give one example of this type.

Q.3 Write short notes of the following questions. (Any Two)

- a) Causes for deviations of gases from the ideality
- **b)** Slope and its characteristics
- c) Intercept and its characteristics

Q.4 Answer the following questions. (Any Two)

- a) What do you mean by second order reaction? Derive the expression for the rate constant for second order reaction where initial concentrations of the reactants are equal.
- **b)** A second order reaction, where initial concentrations of the reactants are same, is 40% completed in 480 secs. How long will it take for the reaction to go to 70% completion?
- c) Calculate the critical constants Pc and of Vc of a given gas if the van der Waals constants 'a' and 'b' are 5.4 x 10⁵ Nm²lit²mol⁻² and 0.04596 lit mol⁻¹ respectively.

Q.5 Answer of the following questions. (Any One)

- a) Mention various methods used for the determination of order of a chemical reaction. Describe any one of them in detail.
- **b)** What is an isotherm? Discuss Andrew's isotherm for carbon dioxide gas.

80

08

Seat No.					Set	Ρ	
	B.Sc. (Semester - I) (Old) (CBCS) Examination: Oct/Nov-2022 COMPUTER SCIENCE (Paper - I)						
		Fundame	ntal of Co	mputer			
Day & Time:	Date 3:00	e: Tuesday, 24-01-2023 PM To 05:00 PM		Max	. Marks	: 40	
Instru	ctio	 ns: 1) All the questions are con 2) Draw neat diagrams and 3) Figures to the right indica 4) Use of logarithmic table a 	npulsory give equati ate full mark and calculat	ons wherever necessary. s or is allowed			
Q.1	Cho 1)	ose Correct Alternatives Which of the following is the la	argest unit o	f storage?		08	
		a) GB c) MB	b) d)	KB TB			
	2)	Default extension of MS-Word	I file is	<u>_</u> .			
		a) .txt c) .docx	b) d)	.text all of these			
	3)	Default extension of Ms-Excel	is				
		a) .xlsx	b)	.exe			
	•		a)	none of these			
	4)	I he bar at the bottom of a win	dow that ho	olds no. of applications is kno	own		
		a) title bar	b)	status bar			
		c) menu bar	d)	task bar			
	5)	 UNIVAC is a) Universal Automatic Com b) Universal Array Computer c) Unique Automatic Computer d) Unvalued Automatic Comp 	puter r ter pute				
	6)	To save a new text file	short cut ke	ey is used.			
		a) Ctrl + Z c) Ctrl +V	b) d)	Ctrl +O Ctrl + S			
	7)	The physical components or p	oarts of a co	mputer called			
		a) Hardware	b)	Hard Drive			
		c) Disk Drive	d)	Software			
	8)	is the volatile memory of	of computer				
		c) Both a) And b)	(a (b	ROW None of The Above			

Q.2	Ans	wer any four of the following.	80
	a) b) c) d) e) f)	Define Input Device? Define Software? Define taskbar? What is Operating System? What is File? What is Mail-merge?	
Q.3	write a) b) c)	e short notes on any two of the following Android Secondary Storage ROM and its types	80
Q.4	Ansv a) b) c)	wer any Two of the following. Explain Keyboard. Explain Magnetic Tape with diagram. Explain services of Operating System.	80
Q.5	Ansv a) b)	wer any One of the following. What are the environmental impacts of IT? Write the features of MS-Word.	08

	 2) Draw neat diagrams and give equations wherever necessary. 3) Figures to the right indicate full marks. 4) Use of logarithmic tables and calculator is allowed. (At. Wts. H=1,C=12,O=16, N=14,Na=23, CI=35.5) 						
Cho 1)	Choose correct alternatives from the options.						
-,	a) Coordinate bondc) Van der Waals attraction	b) d)	Hydrogen bond Electrostatic force of attraction				
2)	In 1923, free electron theory was r a) Drude c) Pauling	efined b) d)	by Lorentz Lux				
3)	The shape of PCl₅ molecule is a) Linear c) Tetrahedral	 b) d)	Octahedral Trigonal bipyramidal				
4)	s-p bond is than s-s bond. a) weaker c) neutral	b) d)	stronger None of these				
5)	The bond order of C ₂ molecule is _ a) one c) three	 b) d)	two four				
6)	NO is molecule. a) homonuclear diatomic c) imaginary	b) d)	hetronuclear diatomic non-existent				
7)	Among the halogen is most a) F c) Br	reacti b) d)	ve. Cl I				
8)	Inert gas element have elec a) zero c) low	ctron a b) d)	ffinity. high medium				
 Answer the following questions. (Any Four) 1) Define bonding and antibonding MOs. 2) Define bond order. 3) Draw Mo diagram of H₂ molecule 							

Day & Date: Wednesday, 25-01-2023 Time: 12:00 PM To 02:00 PM

Seat

No.

Instructions: 1) All questions are compulsory.

B.Sc. (Semester - I) (Old) (CBCS) Examination: Oct/Nov-2022 CHEMISTRY (Paper - II) **Inorganic Chemistry**

Q.1

- molecule. 3) Jraw wo diagram
- 4) What is hybridization?
- 5) Define
- Metallic bond a) What is ionization energy? 6)
- Hydrogen bond b)

80

SLR-FZ-29

Max. Marks: 40

Set Ρ

Answer the following questions. (Any Two) 80 Q.3 Shapes of d orbitals a) Explain the formation of Ionic bond. b) Explain formation of Be₂ molecule. C) Q.4 Answer the following questions (Any Two) 08 Aufbau Principle a) Explain the formation of SiCl₄ molecule b) Distinguish between sigma bond and pi-bond. C) Answer the following questions. (Any One) 08 Q.5

- What is VSEPR theory? Explain the formation of H₂O molecule on the basis a) of VSEPR theory.
- Explain the structure of NaCl with respect to Radius ration, Unit cell, b) Co-ordination number and Stoichiometry.

	В.	Sc. (Semester - I) (Old) (CBCS) COMPUTER SCIEN Programming) Exa ICE (Using	mination: Oct/No Paper – II) g C – I	v-2022		
Day a Time	Day & Date: Wednesday, 25-01-2023 Max. Marks: 40						
Instr	uctior	 ns: 1) All questions are compulsory. 2) Figures to the right indicate full 3) Draw neat diagram and give equations. 	marks uation	s whenever necessar	у.		
Q.1	Choo 1)	ose the correct alternative from the format code is used to read si a) %g c) %ld	optio ngle fl b) d)	n: oat type value. %d None of these	08		
	2)	'C' language developed by a) Ken Thompson c) Stive Jobs	b) d)	Bill Gates Denis Ritchei			
	3)	is the valid identifier in 'C' lang a) 24emp c) 12emp@	guage b) d)	_12emp Emp\$			
	4)	Which of the following is an invalid ex a) 'a' c) 'abc'	xample b) d)	e of character constar 'ab' None of these	nt?		
	5)	a) for a) do-while	b) d)	while Both a & b			
	6)	printf() function belongs to hea a) stdio.h c) conio.h	ader fi b) d)	le. string.h math.h			
	7)	Which of the following is not Keyword a) struct c) for	d in C b) d)	language? if None of these			
	8)	Array index starts from a) 1 c) 0	b) d)	10 None of these			
Q.2	Ansv 1) 2) 3) 4) 5) 6)	wer the following questions. (Any For Define Algorithm. What is assembler? How to initialize string. What is compiler? Define Flowchart. What is Debugging?	our)		08		

Seat No.

SLR-FZ-30

Set P

80

SLR-FZ-30 Q.3 Write short notes. (Any Two) 80 Table of string 80

Answer the following questions. (Any Two) Q.4

Pseudo code

Operators

a)

b)

C)

- Explain the structure of 'C' programming. a)
- What is array? Explain the types of array. b)
- Explain the features of 'C' language. C)

Q.5 Answer the following questions. (Any One)

- a) Write a program to display addition of two matrices.
- b) How to declare string? Explain any two inbuilt string handling functions.

Seat No.						Set	Ρ
	B.Sc.	(Semester	- I) (OId) (CBCS PHYSICS (P) Ex	amination: Oct/No	ov-2022	
	Mechanics and properties of matter						
Day & Time:	Date: Fri 12:00 PM	day, 27-01-2 1 To 02:00 PI	023 VI			Max. Marks	: 40
Instru	ctions: 1 2 3) All questior 2) Figures to t 3) Use of loga	ns are compulsory. The right indicate full rithmic tables and ca	mark alcula	s. ator is allowed.		
Q.1	Choose 1) Moi trar	correct alter ment of inertinslation motic	rnatives from the o a in rotational motion on.	ptior n is a	ns. Inalogous to the	_ in	08
	a) c)	Momentum Acceleration	1	b) d)	Force Mass		
2	2) Mo	ment of inerti	a of a spherical shel	l abo	ut its tangent is	<u>.</u> .	
	a)	$\frac{2}{3}$ MR ²		b)	$\frac{7}{5}$ MR ²		
	c)	$\frac{5}{3}$ MR ²		d)	MR ²		
;	3) The	e length of an	equivalent simple p	endu	lum of the compound	pendulum is	
	a)	$\frac{k^2}{l^2} + l$		b)	$\frac{k^2 + l^2}{2}$		
	c)	$\frac{k^2 + l^2}{l}$		d)	$k^2 + l^2$		
4	4) The a) c)	time period l = k l = 2k	of compound pendu	lum i b) d)	s maximum when l = 0 l = 3k	·	
ł	5) The a) c)	e ration of she Young's mo Modulus of	earing stress to shea dulus rigidity	ring b) d)	strain is called Bulk Modulus Poisson's ratio		
	6) The a) c)	e C.G.S unit o dyne.cm dyne/cm	of surface tension is	b) d)	 dyne/cm² cm/dyne		
7	7) Poi a) c)	seuille's Cap Coefficient c Density	illary flow method is of viscosity	used b) d)	to determine c Surface tension Mass	of liquid.	
8	8) Ene a) c)	ergy is dissipa Streamline Constricted	ated more in f	low. b) d)	Turbulent Steady		

Q.2 Answer the following questions. (Any Four)

- a) Define moment of inertia.
- b) Define center of suspension and center of oscillation.
- c) Draw schematic diagram of Kater's Pendulum.
- d) Define Poisson's ratio.
- e) Define surface tension.
- **f)** Find the length of equivalent simple pendulum of compound pendulum if radius of gyration is 25 cm.

Q.3 Write short notes of the following questions. (Any Two)

- a) Show the oscillations of compound pendulum perform simple harmonic motion.
- **b)** Explain Jaeger's method to determine surface tension of a liquid.
- **c)** Find the modulus of rigidity (η) of a material for which $K = 10 \times 10^{10} \frac{N}{m^2}$ and $Y = 20 \times 10^{10} N/m^2$

Q.4 Answer the following questions. (Any Two)

- a) State and prove Bernoulli's theorem for the flow of liquids in pipes.
- **b)** Show that shear strain is equivalent to compression strain and extension strain.
- c) Find the difference of pressure between the two sides of the surface of a spherical drop of water of radius 0.6 mm. Surface tension of water is 0.075 N/m.

Q.5 Answer the following questions. (Any One)

- a) Derive and expression for M.I. of a spherical shell about one of its diameter.
- **b)** Describe the Poiseuille's capillary flow method to determine the coefficient of viscosity of liquid.

80

08

08

80

No.		Set	Ρ
	B .:	Sc. (Semester - I) (Old) (CBCS) Examination: Oct/Nov-2022 MICROBIOLOGY (Paper - I) Fundamentals of Microbiology	
Day 8 Time:	& Date 03:00	e: Friday, 27-01-2023 Max. Marks: - D PM To 05:00 PM	40
Instru	uction	 ns: 1) All questions are compulsory. 2) Figures to the right indicate full marks. 3) Draw neat labeled diagrams wherever necessary. 	
Q.1	Choo 1)	bse the correct alternatives form options. Mycology is the study of organisms. a) Viruses b) Fungi c) Bacteria d) Rickettsia	08
	2)	Genetic material of organism is either DNA or RNA.a) Bacteriab) Virusesc) Algaed) Fungi	
	3)	Peptidoglycan is a component ofa) Flagellab) Cell membranec) Cell walld) Capsule	
	4)	Anti-phagocytosis is shown by of organism.a) Flagellab) Cell wallc) Cell membraned) Capsule	
	5)	A group of similar species isa) Genusb) Familyc) Orderd) Division	
	6)	Rocky mountain spotted fever is caused by organism.a) Rickettsiab) Actinomycetesc) Protozoad) Archaebacteria	
	7)	Cells divide in one plane and remain attatched predominantly in pairs are	
	•	a) Streptococci b) Tetracocci c) Diplococci d) Staphylococci	
	8)	a) 60S b) 80S c) 40 S d) 70S	
Q.2	Ansv 1) 2) 3) 4) 5)	ver the following questions (Any Four) Define Prokaryotes Mention any four branches of Microbiology. Define Genus. Viroids Function of flagella	08

SLR-FZ-32 Set P

Seat

6) List of any four beneficial activities of Microorganisms.

Q.3 Write short notes. (Any Two)

- 1) Koch's postulates
- 2) Cell membrane of bacteria
- **3)** Size, shape and arrangement of bacteria

Q.4 Answer the following questions. (Any Two)

- 1) Give minimum four contributions of Louis Pastuer.
- 2) General characteristics and economic importance of Actinomycetes.
- **3)** General principles of bacterial nomenclature.

Q.5 Answer the following questions (Any One)

- a) Explain Spontaneous generation theory against biogenesis.
- **b)** Draw a labeled diagram and explain the cell wall structure of Gram negative bacteria.

08

80

Day & Time	ay & Date: Saturday, 28-01-2023 Max. Marks: 40 me: 12:00 PM To 02:00 PM				
Instru	uction	 is: 1) All questions are compulsory. 2) Figures to the right indicate full 3) Use of logarithmic table and ca 4) Draw neat diagrams and give e 	mark Iculati quatio	s. or is allowed. ons wherever necessary.	
Q.1	Choo 1)	Se correct alternatives from the op The rays that are incident on lens ne rays. a) Paraxial c) Co-axial	b tions ar ed b) d)	s. ges of the lens are called as Marginal Axial	08
	2)	If there are 16000 lines per inch on g a) $1.5875 \times 10^{-3} cm$ c) $1.5875 \times 10^{-4} cm$	grating b) d)	g then the grating element is $1.5875 \times 10^{-3}m$ $1.5875 \times 10^{-4}m$	<u> </u>
	3)	The medium used in formation of LAa) Electricc) Passive medium	SER b) d)	is called Active medium Magnetic medium	
	4)	The aberration due to lenses of largea) Chromaticc) Longitudinal Chromatic	e aper b) d)	ture is called as Lateral Chromatic Spherical	
	5)	The condition for achromatism is a) $F_R = F_V$ c) $F_R > F_V$	b) d)	$F_R < F_V F_R \pm F_V$	
	6)	In Newton's rings experiment the dis as the order of fringe 'n' incre	tance ases.	between the successive rings	

PHYSICS (Paper - II) Optics and Laser

	a) Chromatic c) Longitudinal Chromatic	b) d)	Lateral C Spherica
5)	The condition for achromatism is a) $F_R = F_V$ c) $F_R > F_V$	b)	$F_R < F_V$ $F_T + F_T$
6)	In Newton's rings experiment the as the order of fringe 'n' ind	distance creases.	e between
	a) Trends to infinity	b)	Remains

the same c) Increase d) Decreases

7) The condition for diffraction in Plane Diffraction Grating is $d \cos \theta = n\lambda$

- a) $d \sin \theta = n\lambda$ b)
- $d \operatorname{cosec} \theta = n\lambda$ c) $d \tan \theta = n\lambda$ d)
- Gauss eyepiece is modification of _____ 8) b) a) Huygen's
 - Kellner's c) Ramsden's d) Nicol's

SLR-FZ-33

Set Ρ

- B.Sc. (Semester I) (Old) (CBCS) Examination: Oct/Nov-2022

Seat

No.

Q.2 Answer the following questions. (Any Four)

- 1) What is Population inversion?
- **2)** Define Snell's law of refraction.
- **3)** Give the statement of Fermat's principle of extremum time.
- 4) What do you mean by coherent sources?
- **5)** Draw neat labelled diagram of He-Ne LASER.
- 6) What do you mean by grating element?

Q.3 Write short notes. (Any Two)

- 1) Explain the application of Spectrometer to determine Refractive index of Prism.
- **2)** If the Dispersive Power of Prism is 0.044 and its focal length is 30cm, then calculate the longitudinal chromatic aberration of lens.
- 3) Prove Snell's law of Refraction from Fermat's principle.

Q.4 Answer the following questions (Any Two)

- 1) Define spherical aberration. Discuss any one method to minimize spherical aberration.
- 2) The grating element of a Plane diffraction grating is 1.640 × 10⁻⁴cm and the second order Principal Maxima is obtained at 40°. Calculate the unknown wavelength of the incident light.
- 3) Compare Huygen's Eyepiece and Ramsden's Eyepiece.

Q.5 Answer the following questions. (Any One)

- a) Explain the construction and working of Ruby LASER.
- b) Explain the theory of Newton's rings experiment. Derive and expression for nth dark ring. In Newton's experiment the radius of curvature is 100cm, the diameter of 5th ring is 0.3cm and the diameter of 10th ring is 0.4cm. Calculate the wavelength of light used.

80

80

80

Seat	:					Set	Р
NO.		0 (0 (-
	MICROBIOLOGY (Paper – II) Basic Techniques in Microbiology						
Day & Time:	Day & Date: Saturday, 28-01-2023 Max. Marks: 40 Time: 03:00 PM To 05:00 PM						
Instru	Instructions: 1) All questions are compulsory. 2) Figures to the right indicate full marks. 3) Draw neat diagrams and give equations wherever necessary.						
Q.1	Choo 1)	ose the correct a Condensation of a) Objective c) Ocular	Ilternative and write f light in light Microsc	e the cope b) d)	sentence again. is by Condensor All of these		08
	2)	A substance whi a) Mordant c) Chromopho	ich increases affinity re	of st b) d)	ain for object is called _ Stain Auxochrome	·	
	3)	The population of a) Mixed c) Dual	of only one species o	f bao b) d)	cteria is know as Syntrophic Pure	culture.	
	4)	Paraffin oil is ste a) Autoclave c) Incinerator	erilized by using	 b) d)	Hot air oven Tyndallizer		
	5)	The electron pas called a) Primary elec c) Tertiary elec	ssed out from the spe ctrons ctrons	ecim b) d)	en for electron microsco Secondary electrons None of these	ope are	
	6)	Mac conkeys ag a) Enrichment c) Selective me	ar is medium edium	b) d)	Differential as well as Differential medium	selective	
	7)	Primary stain us a) Basic fuchsi c) Crystal viole	ed in gram staining is n et	s b) d)	Haematoxylon Safranin		
	8)	Limit of resolutio a) 0.018A° c) 5 ìm	on of compound micro	osco b) d)	pe is 0.1mm 1mm		
Q.2	Ansv 1) 2) 3) 4) 5) 6)	wer the following Define resolving What is basic sta Define sterilizatio Give the function What is enriched What is differentia	g questions (Any Fo power of microscope in? Give examples. n. s of objective of micr media? Give examp al staining?	our) osco les c	pe. f it.		08

Q.3	 Write Short Notes. (Any two) a) Serial dilution technique b) Cell wall staining c) Living media 	08
Q.4	 Write Short Notes. (Any Two) a) Selective media b) Sterilization by phenolic compounds c) Compare and contrast between compound and electron microscope. 	08
Q.5	 Answer the following questions (Any One) a) Sterilization by physical agents b) Gram staining 	08

08

SLR-FZ-35

Set

Max. Marks: 40

B.Sc. (Semester - I) (Old) (CBCS) Examination: Oct/Nov-2022 STATISTICS (Paper-I) **Descriptive Statistics-I**

Day & Date: Monday, 30-01-2023 Time: 12:00 PM To 02:00 PM

Seat

No.

Instructions: 1) All the guestions are compulsory 2) Figures to the right indicate full marks

Choose the correct alternative: Q.1

- 1) In an exclusive type distribution, the limits excluded are
 - a) lower limits b) upper limits
 - c) either of the lower or upper limit d) lower limit and upper limit both
- 2) In a plot of frequencies against corresponding variate values, when successive points are smoothly joined we get
 - a) Density function
 - b) frequency polygon c) frequency curve d) ogive curve
- 3) If a constant 50 is subtracted from each observation of a set, the mean of the set is
 - a) increased by 50 c) is not affected

- b) decreased by 50 d) zero
- 4) Geometric mean of two observations can be calculated only if
 - a) both the observations are positive
 - b) one of the observations is zero
 - c) one of them is negative
 - d) both of them are zero
- 5) Which one of the following is called as good measures of dispersion? a) Range b) Q.D.
 - d) S.D. c) M.D.
- 6) Mean deviation is minimum when deviations are taken from
 - b) median
 - d) zero c) mode

7) The first order moment about origin is equal to

- a) zero b) one
- c) three d) mean
- 8) For any frequency distribution, second order moment about mean is
 - a) S.D. b) Variance
 - c) C.V. d) All of the above

Q.2 Answer any Four of the following:

a) mean

- Define discrete variable and continuous variable. a)
- b) Define median and mode.
- Find A.M. and G.M of two observation 4 and 9 C)
- Define any two relative measures of dispersion. d)
- Show that second central moment is variance. e)

Q.3	Wri a) b) c)	te short note on any two of the following: Explain the construction of histogram. Show that mean square deviation is greater than or equal to variance. What is the effect of change of origin and scale on arithmetic mean?	08
Q.4	Ans a) b) c)	wer any two of the following: Explain the construction of less than ogive curve. Show that sum of deviations taken from mean is zero. State and prove minimal property of mean square deviation.	08
Q.5	Ans a) b)	wer any two of the following: Derive the formula of median for grouped frequency distribution Express first four central moments in terms of raw moments	08

B.Sc. (Semester - I) (Old) (CBCS) ZOOLOGY (F Animal Dive	Examination: Oct/Nov-2022 Paper - I) Prsity I
Day & Date: Monday, 30-01-2023 Time: 03:00 PM To 05:00 PM	Max. M
Instructions: 1) All questions are compulsory. 2) Figures to the right indicate full r 3) Draw neat diagram and give equ	narks. lations wherever necessary.
 Q.1 Choose correct alternative from the folic 1) A Hydra can suddenly contract its boo a) Interstial cells c) Nematosysts 	wing options. by by the contraction of b) Musculoepithelial cell d) Digestive cells

In sponges spicules are formed by _ 2) b) Chromocytse a) Choanocytes d) Scleroblasts c) Porocytes Earthworm belongs to class _____. 3) a) Hirudinae b) Polychaeta c) Multichaeta d) Oligochaeta Cephalothorax is found in _____. 4) a) Porifera b) Protozoa c) Arthropoda d) Mollusca class includes dentalium-elephant tusk shell. 5) a) Gastropoda b) Cephalopoda c) Decapoda d) Scaphopoda Haemocoel is characteristic of _____. 6) b) Leech a) Ascaris c) Cockroach d) Snail is connecting link of annelida and arthropoda. 7) a) Peripatus b) Sphenodon c) Neries d) Prawn _____ is the locomotaryogenelle in mastigophera. 8) a) Pseudopodia b) Cilia c) Flagella d) Setae Answer the following questions. (Any Four)

Max. Marks: 40

Seat No.

SLR-FZ-36

Set

08

- Q.2
 - Diploblastic 1)
 - 2) Torsion
 - 3) Ommatiidum
 - 4) Binary fission
 - Economic importance of leech. 5)
 - Classification of porifera upto class 6)

Q.3	 Write short notes. (Any Two) 1) General characters of phylum Annelida. 2) Water vascular system in Asteroidea. 3) Economic importance of insects. 	08
Q.4	Answer the following questions. (Any Two)	08
	 Describe life cycle of tape worm 	
	2) Explain polymorphism in coelenterates	
	3) Economic importance of molluscs.	
Q.5	Answer the following questions. (Any One)	08
	 a) Describe general characters and classification of phylum protozoa upto classes with examples 	
	 b) Give an account of life cycle of Ascaris lumbricoides. Add note on parasitic adaptations. 	

Page 1 of 2

		STATIS Probability and F	FICS (Paper – II) robability Distributions - I
ay & me:	Date 12:00	e: Tuesday, 31-01-2023 OPM To 02:00 PM	Max. Marks:
stru	uction	is: 1) All questions are computed 2) Figures to the right indic	sory. ate full marks.
.1	Choc 1)	A ticket is drawn from 25 tick number drawn is odd number a) 11	rom the options. ets numbered 1 to 25. Define an event as: the . The number of elements in this event is b) 12
	2)	c) 13 If A and B are two events, the	d) 25 probability of occurrence of A and B is given
		by a) $P(A \cup B)$ c) $P(A) + P(B)$	b) $P(A \cap B)$ d) $P(A) - P(B)$
	3)	Let <i>A</i> and <i>B</i> be two events dependence $\frac{P(A)}{P(B)}$.	fined on Ω and $P(B) > 0$ then $P(A B) =$
		c) $A \subset B$	d) None of these
	4)	Which of the following is the (a) (0.2, 0.2, 0.7) c) (0.2, 0.1, 0.9)	brobability distribution? b) (0.7, 0.2, 0.1) d) (0.1, 0.6, 0.2)
	5)	If A ₁ , A ₂ A ₃ from partition of s a) Pairwise independent c) Mutually exclusive	ample space then they are b) Mutually independent d) None of these
	6)	If A and B are independent e	vents where $P(A) = 0.6$, $P(A \cap B) = 0.3$ then
		P(B) = a) 0.1 c) 0.3	b) 0.2 d) 0.5
	7)	Which of the following may b a) $P(x) = 2 - x$ $x = 10,2$	e a p. m. f.? 0 b) $P(x) = \frac{x}{15}$ $x = 10,20$
		c) $P(x) = \frac{1}{2}$ $x = 10,20$	d) $P(x) = \frac{x}{25}$ $x = 10,20$
	8)	If A and B are two events def experiment, then occurrence a) $\overline{A} \cap B$	ned on the sample space Ω of a random of A but not B is given by b) $A \cup \overline{B}$

B.Sc. (Semester - I) (Old) (CBCS) Examination: Oct/Nov-2022

Seat

No.

Da Tir

In

Q.

- c) $A \cup B$
 - d) $A \cap \overline{B}$

SLR-FZ-37

Set Ρ

08

Q.2 Answer the following question. (Any Four)

- 1) Define finite sample space with example.
- 2) Define axiomatic definition of probability.
- **3)** If $A \subset B$ then prove that P(B|A) = 1
- **4)** Define partition of sample space.
- **5)** Define probability mass function and distribution function.

Q.3 Answer the following question. (Any Two)

1) Which of the following functions, define a probability space on $\Omega = \{w_1, w_2, w_3\}$

i)
$$P(w_1) = \frac{1}{4}, P(w_2) = \frac{1}{3}, P(w_3) = \frac{1}{2}$$

ii)
$$P(w_1) = \frac{2}{3}, P(w_2) = -\frac{1}{3}, P(w_3) = \frac{2}{3}$$

iii)
$$P(w_1) = 0, P(w_2) = \frac{1}{3}, P(w_3) = \frac{2}{3}$$

2) If A and B are mutually exclusive events, then show that

$$P(A/B) = 0$$

ii)
$$P\left(\frac{A}{\overline{B}}\right) = \frac{P(A)}{1 - P(B)}$$

3) Verify whether the following functions can be regarded as the p.m.f. for the given values of X.

$$P(X = x) = \frac{3x + 2}{24} \qquad x = 1, 2, 3$$

Q.4 Answer the following question. (Any Two)

- 1) State and prove addition law of probability for two events.
- 2) If A and B are independent events, show that A and \overline{B} are independent
- 3) A discrete random variable X has p.m.f.

$$P = (X = x) = \frac{k2^{x}}{x!} \qquad X = 0, 1, 2, 3, \dots$$

Find
i) k
ii) $P(1 \le X \le 3)$

Q.5 Answer the following (Any One)

- a) Prove that with usual notation $P(^{A \cup B}/_{C}) = P(^{A}/_{C}) + P(^{B}/_{C}) - P(^{A \cap B}/_{C})$
- **b)** The p. m. f. of random variable X is given by

$$P(X = x) = \frac{\binom{3}{x}}{8}, \qquad x = 0, 1, 2, 3$$

- i) Obtain probability distribution of X, hence the distribution function of X.
- ii) Evaluate P(0 < X < 3) and $P(X \ge 2)$.

08

80

08

B.Sc. (Semester - I) (Old) (CBCS) Examination: Oct/Nov-2022 **ZOOLOGY** (Paper – II) Animal diversity – II

Day & Date: Tuesday, 31-01-2023 Time: 03:00 PM To 05:00 PM

Seat

No.

Instructions: 1) All the questions are compulsory

- 2) Draw neat diagrams and give equations wherever necessary.
- 3) Figures to the right indicate full marks.

Q.1 **Multiple choice questions**

- 1) In which of the following jaws are found
 - a) Herdmania
 - c) Petromyzon
- 2) The petromyzon belongs to
 - a) Chondrichthyes
 - c) Cyclostomata
- 3) Balanoglossus belongs to
 - a) Hemichordate
 - c) Urochordatra
- 4) Agnatha includes
 - a) Hag fishes
 - c) Jelly fishes
- 5) Salamander belongs to the class
 - a) Pisces
 - c) Reptiles
- Scientific name of king cobra is 6)
 - a) Naja naja
 - c) Naja hunnah
- 7) Turtles are
 - a) Arthropods
 - c) Reptiles
- 8) Osteichthyes belongs to
 - a) Class amphibian
 - c) Class tetrapoda

Amphioxus d)

b) Fish

- b) Osteichthyes
- d) Amphibian
- b) Cephalochordate
- d) Cyclostomata
- b) Fishes
- d) Flying fishes
- b) Aves
- d) Amphibian
- b) Bungarus coerulus
- d) Vipera russelli
- b) Pisces
- d) Molluscs
- Super class pisces b)
- d) Division agnatha

SLR-FZ-38

Set

Max. Marks: 40



		SLF	R-FZ-38
Q.2	Ans a) b) c) d) e) f)	wer any four of the following. General characters of Squamata. Write a note on Falconiformes. Write classification of Bat. Enlist orders of Amphibia. Give an account on Osteichthyes. Write a note on agnatha.	08
Q.3	Writ a) b) c)	te short notes on any two of the following. Discuss Parental care in amphibian with examples. Explain Types of snake venom add a note on First aid treatment. Give an account on General features of Protochordata.	08
Q.4	Ans a) b) c)	wer any Two of the following Describe Venomous and non-poisonous snakes. Give an account on Anseriformes with example. Describe General features of Pisces.	08
Q.5	Ans a)	wer any one of the following. Describe in detail general features and classification of mammals with examples.	08

b) Describe General Features and classification of reptiles with examples.
2) Figures to the right indicate full marks. 3) Draw neat diagrams and give equations wherever necessary. 4) Use of logarithmic table and calculator is allowed. For any complex number z, sin(iz) = ...1) b) i sin hz a) -i sin hzd) None of these C) i sin h(-z)Period of $\cosh(z)$ is _____. 2) a) 2π b) 3π C) 3 πi d) 2*πi* If $x + \frac{1}{x} = 2\cos\theta$, then $x^r + \frac{1}{x^r} =$ _____ a) $\cos(2r\theta)$ _. b) 2r cos θ a) $\cos(2r\theta)$ c) $r \cos 2\theta$ d) $2\cos(r\theta)$ is a point in the _____. b) Line a) Sphere c) Pair of lines d) Plane Eigen vector of $\begin{bmatrix} 1 & 6 \\ 5 & 2 \end{bmatrix}$ is _____. 5) a) $\begin{bmatrix} -5\\ 6 \end{bmatrix}$ c) $\begin{bmatrix} 3\\ 2 \end{bmatrix}$ b) $\begin{bmatrix} 6 \\ -5 \end{bmatrix}$ d) The Eigen values of the matrix $\begin{bmatrix} 1 & 2 & 3 \\ 0 & 2 & 5 \end{bmatrix}$ are _____.

B.Sc. (Semester - I) (Old) (CBCS) Examination: Oct/Nov-2022 **MATHEMATICS** (Paper - I) Algebra

Day & Date: Wednesday, 01-02-2023 Time: 12:00 PM To 02:00 PM

Seat

No.

Instructions: 1) All questions are compulsory.

Q.1 Choose correct alternative from following options.

- 3)
- 4) Argand diagram states that geometrical representation of complex number

6) b) 0, 1, 2 a) 1, 2, 3 d) 0, 2, 5 c) 3, 5, 7 7)

The inverse of the matrix is $\begin{bmatrix} 2 & 1 \\ 0 & 4 \end{bmatrix}$ is _____ b) $\begin{bmatrix} 1/2 & -1/8 \\ 0 & 1/4 \end{bmatrix}$ d) $\begin{bmatrix} 1/2 & 0 \\ 1/2 & 1/4 \end{bmatrix}$ a) $\begin{bmatrix} -\frac{1}{2} & \frac{1}{8} \\ 0 & -\frac{1}{4} \end{bmatrix}$ c) $\begin{bmatrix} \frac{1}{2} & 0 \\ -\frac{1}{6} & \frac{1}{4} \end{bmatrix}$

SLR-FZ-39

Max. Marks: 40

08

Set

08

08

- The characteristic polynomial of the matrix $\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ is _____. 8)
 - a) λ^3
 - b) $\lambda^2 + 5\lambda 2$ d) $\lambda^2 5\lambda 2$ c) λ^2

Q.2 Attempt any four of the following.

- If A is any square matrix then show that A A' is a skew-symmetric matrix. 1)
- Define hyperbolic *cosin e* and hyperbolic *sin e*. 2)
- If z is a complex number then prove that, 3) $\cos^2 z + \sin^2 z = 1$
- Write the complex number $\frac{1}{2} + \frac{\sqrt{3}}{2}i$ in terms of a polar form. 4)
- Find the Eigen values of the matrix $\begin{bmatrix} 1 & 4 \\ 3 & 2 \end{bmatrix}$. 5)
- Define the term normal form of a matrix. 6)

Q.3 Attempt any two of the following.

- Find rank of the following matrix 1)
 - [1 1 1 1]
 - 3 4 5 2
 - $\begin{bmatrix} 2 & 3 & 4 & 0 \end{bmatrix}$
- 2) Solve the following linear non homogeneous equations if they are consistent. x + y + z = 6, 2x + y + 3z = 13, 5x + 2y + z = 12.
- If z is any complex number then show that 3) $\cos^{-1} z = \log \left\{ z + \sqrt{z^2 - 1} \right\}$

Attempt any two of the following. Q.4

- Prove that, $cos(z_1 + z_2) = cos z_1 cos z_2 sin z_1 sin z_2$ 1)
- If $sin(\alpha + i\beta) = x + iy$ then prove that, 2)

a)
$$\frac{x^2}{\cosh^2\beta} + \frac{y^2}{\sinh^2\beta} = 1$$

b)
$$\frac{x^2}{\sin^2 \alpha} - \frac{y^2}{\cos^2 \alpha} = 1$$

- 3) Investigate for what values of λ and μ , the following system of equations x + y + z = 6 x + 2y + 3z = 10, $x + 2y + \lambda z = \mu$ will have
 - No solution a)
 - A unique solution b)
 - An infinity number of solutions C)

Answer the following questions. (Any One) Q.5

- State and prove De Moivre's theorem. 1)
- State Cayley-Hamilton's theorem and find A^{-1} for the matrix 2)
 - $\begin{array}{cccc} 2 & -1 & -1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{array}$

SLR-FZ-39

08

Instr	uctio	 ns: 1) All questions are compulsory. 2) Figures to the right indicate fu 3) Draw neat labeled diagrams a 	III mark and give	s. e equations wherever necessar
Q.1	Cho 1)	ose the correct alternatives form The study of algae is known as a) Pathology c) Cytology	option: b) d)	s. Phycology Mycology
	2)	An example of plant virus is a) TMV c) Polio	b) d)	Influenza HIV
	3)	Rod shaped Bacteria are called as a) Coccus c) Spirullum	b) d)	Bacillus Pleomorphic
	4)	The shape of chloroplast in spirogy a) Axial c) Cup shaped	/ra is b) d)	Reticulate Spiral
	5)	Nostoc belongs to division a) Chlorophya c) Euglenophyta	b) d)	Rhodophyta Cyanophyta
	6)	MLOs generally indicates a) Mycoplasma c) Spiroplasma	b) d)	Phytoplasma None of these
	7)	A well known dish of Japan, 'Komb a) Spirogyra c) Ulva	ou' is pr b) d)	repared from sea weed. Oscillatoria Laminaria
	8)	In isogamy both male and female (a) Similar c) One larger other smaller	gamete b) d)	s are Distinct Gametes are not involved
Q.2	Ans [•] 1) 2) 3)	wer any four of the following. Write any four character of cyanoph Name two animal viruses. Name two bacterial disease in hum	iyta. an.	

Microbiology and Phycology Day & Date: Wednesday, 01-02-2023

Time: 03:00 PM To 05:00 PM

Seat

No.

B.Sc. (Semester - I) (Old) (CBCS) Examination: Oct/Nov-2022 BOTANY (Paper – I)

SLR-FZ-40

Set Ρ

Max. Marks: 40

80

- Q.

 - 3) 4) Why Nitrogen fixing bacteria are important for soil?
 - Sketch and label Mycoplasma cell. 5)
 - Give classification of Spirogyra. 6)

Page 2 of 2

08

08

80

What are the types of Life cycles in Algae? 2) Explain Ultrastructure of Bacterial cell. 3)

Write general characters of Algae?

Answer the following questions. (Any Two)

Answer the following questions. (Any One) Q.5

- Explain Scalariform Conjugation in Spirogyra along with labeled diagrams. a)
- Describe beneficial roles of bacteria. b)

Q.3 Write short notes. (Any Two)

- Classification of viruses 1)
- 2) Role of Algae in environment
- 3) Importance of heterocyst in Nostoc

Q.4

1)

	B.Sc. (Semester - I) (Old) (CBCS) Examination: Oct/Nov - 2022 MATHEMATICS (Paper - II) Calculus						
Day Time	& Date : 12:00	e: Friday, 24-03-2023 0 PM To 02:00 PM		Max. Marks: 40			
Instr	uctior	1) All questions are compulsory.2) Figures to the right indicate full	mark	KS.			
Q.1	Sele 1)	ct the correct alternative for each of If $y = (ax + b)^n$ then y_n	f the b)	following. 08 $n! a^n$			
		c) $a^n \log a$	d)	0			
	2)	If $y = e^{ax+b}$ then $y_n = $ a) e^{ax}	b)	a^n			
		c) a^n, e^{ax+b}	d)	0			
	3)	For the function two variable, domain a) R^2	is tł b)	R ³ R ³			
		c) <i>R</i>	d)	R^n			
	4)	Number of independent variables in (a) Zero c) At least 2	bartia b) d)	al derivative should be One None of these			
	5)	If { $(a,b)/a \in A$, $b \in B$ } a) $A \cup B$	b)	$A \cap B$			
		c) $A-B$	d)	$A \times B$			
	6)	$\int_0^{\pi/2} \sin^n(x) dx = \frac{(n-1)(n-3)\dots}{n(n-2)(n-4)\dots}$	3. 4	$\frac{1}{2} \cdot (\pi/2)$ when			
		a) n is even c) n = 0	b) d)	n is odd none of these			
	7)	If ϕ is 0 scalar field then grad ϕ is a _ a) Scalar field c) Zero	b) d)	 Vector field None of these			
	8)	The vector \overline{F} is called irrational if a) grad $\overline{F}=0$ c) $\overline{F}=0$	 b) d)	div \overline{F} =0 curl \overline{F} =0			

No.

Seat

SLR-FZ-41

Set

Ρ

Page **2** of **2**

Q.2	Ans	wer any four of the following.	08
	a)	Write any four indeterminate forms.	
	b)	Find n^{th} derivative of $y = \cos (ax + b)$.	
	C)	Define continuity of a function of two variables.	
	d)	If $u = x^3 - 3xy^2$ and $V = 3x^2y - y^3$ then prove that $\frac{\partial u}{\partial y} + \frac{\partial v}{\partial x} = 0$.	
	e)	Define curl.	
	f)	Find the value of $\int_0^{\frac{\pi}{2}} \sin^{10}(x) dx$	
Q.3	Wri a)	te short note on any two of the following Explain <i>L</i> ' Hospital Rule.	08
	b)	Explain Geometrical Meaning of $\nabla \phi$.	
	c)	If $y = e^{ax} \sin(bx + c)$ then find y_n .	
Q.4	Ans a) b) c)	Find n th derivative of $y = x^3 \cdot e^x$ State and prove Euler's theorem on homogenous function. Solve $\int_0^2 x^5 (4 - x^2)^{3/2} dx$.	08
Q.5	Ans a) b)	Since any one of the following. State and prove Leibnitz's Theorem. Prove that $\nabla^2(\log r) = \frac{1}{r^2}$.	08

four of the followin

B.Sc. (Semester - I) (Old) (CBCS) Examination: Oct/Nov-2022

BOTANY (Paper – II) **Fungi and Archegoniate**

Day & Date: Friday, 24-03-2023 Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.

- 2) Draw neat labeled diagrams wherever necessary.
- 3) Figures to the right indicate full marks.

Q.1 Choose the correct alternative from the following options. 08 Ainsworth (1973) classified Fungi in divisions based on presence of 1) plasmodium. a) 3 b) 2 c) 4 d) 5 is used as Fungal Bio Fertilizer. 2) a) BGA b) VAM c) NPK d) Rhizobium 3) Mucormycosis in human beings and in domestic animals is caused by . a) Cercospora b) Aspergillus c) Penicillium d) Mucor Fermentation of sugar occur by _____ 4) a) Saccaromyces b) Mucor c) Rhizopus d) Penicillium 5) In archegoniates is group of bryophytes, peteridophytes and . a) Algae Fungi b) c) Gymnosperms d) Angiosperms 6) is a living fossil from Gymnosperms. a) Ginkgo biloba b) Cycas revolata c) Taxus buccata d) Cedrus deodara 7) The are the most primitive living vascular plants. a) Algae b) Fungi d) Pteridophyte c) Bryophytes 8) The female sex organ of bryophyte is b) Archegonium a) Antheridium c) Oogonium d) Oospore Q.2 Answer the following questions. (Any Four) 80 1) Cell wall composition. Draw labelled thallus structure of mucor. 2) Give the type of rhizoids in Riccia. 3) Enlist species of Gymnosperms. 4) Write any four salient features of Ascomycotina. 5) Classify selaginella according to Smith. 6)

Seat No.

SLR-FZ- 42

Set

Max. Marks: 40

Q.3	Wr	ite short notes. (Any Two)	08
	1)	Write general characters of Fungi.	
	2)	Explain roles of fungi in Biotechnology.	
	3)	Explain sporangiophores as asexual reproduction in mucor.	
Q.4	An	swer the following questions. (Any Two)	08
	1)	Write short notes on vegetative reproduction in selaginella.	
	2)	Explain characters of archegoniates.	
	3)	Explain asexual reproduction in yeast with suitable diagram.	
Q.5	An	swer the following questions. (Any One)	08
	a)	State the economic importance of Gymnosperm.	
	b)	Describe the antheridia and archegonia of Riccia.	

Seat		C
No.		
	B.Sc. (Semester - I) (Old) (CBCS) Examination ELECTRONICS (Paper - I)	1: Oct/Nov -2022
	Basic Circuit Theory and Network A	nalysis
Day &	a Date: Tuesday, 28-03-2023	Max. M
Time: 1	12:00 PM To 02:00 PM	

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Draw neat labelled diagram wherever necessary.
- 4) Use of log table and calculator is allowed.

Q.1 Select the correct alternative from the following.

- 1) Parallel resonance circuit is also known as _____ circuit.
 - a) acceptor b) rejector
 - c) high pass filter d) low pass filter
- 2) In step up transformer
 - a) no. of turns of primary winding are greater than no. of turns of secondary winding
 - b) no. of turns of secondary winding are greater than no. of turns of primary winding
 - c) no. of turns of primary winding are equal to no. of turns of secondary winding
 - d) any of the above
- 3) Impedance parameters are same as _____ circuit parameters.

a)	short	b)	closed
C)	open	d)	hybrid

4) Four capacitors of 20 μf are connected in parallel, the equivalent capacitor is _____ μf .

a)	100	b)	80
C)	60	d)	120

- 5) After applying Thevenin's theorem, equivalent circuit will have a new
 - a) voltage source in series with resistance
 - b) current source in series with resistance
 - c) current source in parallel with resistance
 - d) voltage source in parallel with resistance
- 6) If the resistance of LCR series resonance circuit decreases then resonance frequency will _____.
 - a) Increases b) decreases
 - c) remains same d) none of these
- 7) The unit of reactance is _____.
 - a) ohm b) mhos
 - c) henry d) farad
- 8) A sinusoidal signal has maximum value of 20 A, its average value is _____.

b)

0 A

- a) 127.4 A
- c) 12.74 A d) 1.274 A

SLR-FZ-43

Q.2	Ans a) b) c) d) e)	Swer the following questions. (Any Four) Define active and passive network. An oscilloscope shows 5 cycles of sine wave in 10μ sec. Calculate time period and frequency. Define resonance frequency and band width. Write color code of $1K\Omega$ resistance with 10% tolerance. Give the classification of capacitor.	08
Q.3	Wri a) b) c)	te short note on any two of the following. Maximum power transfer theorem T network Constant current and voltage source	08
Q.4	Ans a) b) c)	swer any two of the following. Obtain Hybrid parameters for two port network net work. Explain mesh analysis for dc resistive circuit. Explain construction and working principle of step-down transformer.	08
Q.5	Ans a)	swer any one of the following. What is resistor? Give its classification. Explain carbon resistor with color codes.	08
	b)	Explain series RLC resonance circuit. Derive expression for resonance frequency and quality factor.	

				SLR-FZ-	45
Seat No.				Set	Ρ
	B.Sc. (Semester	- I) (Old) (CBCS) Ex GEOGRAPHY (Pa Geomorpholog	amination: Oct/N per – I) gy- I	ov-2022	
Day 8 Time:	Date: Tuesday, 28-03 12:00 PM To 02:00 PM	-2023 /		Max. Marks	: 40
Instru	ictions: 1) All question 2) Figures to t 3) Draw neat	s are compulsory. he right indicate full mar maps and diagrams w	ks herever necessary.		
Q.1	Multiple choice quest1)The term geomoa)Spanishc)Roman	tions. rphology derived from b) d)	word. Arabic Greek		08
	2) Geomorphologya) Physicalc) Social	is the branch ofg b) d)	eography. Economic Human		
	3) The evolution ofa) Climatologyc) Pedology	the surface features of t b) d)	he earth is studied in ₋ Geomorphology Hydrology		
	 4) The average der a) 5.5 gm/cm³ c) 7.5 gm/cm³ 	nsity of the earth is b) d)	 6.5 gm/cm ³ 4.5 gm/cm ³		
	5) The discontinuity a) Moho c) Crust	v between the mantle an b) d)	d core is known as Gutenberg None of these	discontinu	iity.
	6) rock is kn a) Igneous c) Metamorphic	own as primary rock. b) c d)	Sedimentary None of these		
	7) The term Plate wa) Humboltc) Wilson	vas first used by b) d)	Ritter Morgan		
	8) waves pa a) Primary c) Surface	ss through liquid and so b) d)	id medium also. Secondary None of these		
Q.2	 Answer the following a) What is geomorphic b) What is Volcano? c) What is Faulting? d) What is Seismic vie e) Importance of Ign f) What is Nife? 	y questions. (Any Four) hology? wave? leous rock?			80
Q.3	 Write short notes. (An a) Importance of Ge b) Types of Igneous c) Explain the scope 	ny Two) omorphology. rocks. e of Geomorphology.			08

Page **1** of **2**

Q.4 Answer the following questions. (Any Two)

- What is Folding? Explain any four types of folding? a)
- b) What is Geomorphology? Explain the nature of geomorphology.
- c) Explain the Interior of the Earth.

Answer the following questions. (Any One) Q.5

- a) What is rock? Explain the types of rock.b) What is the destructive effect of earthquake?

80

	B .	Sc. (Semester - I) (Old) (CBCS) GEOLOGY (Pa Physical Ge	Ex ape eolo	amination: Oct/Nov-2022 er – I) ogy	
Day & Time	& Date : 03:00	e: Tuesday, 28-03-2023 0 PM To 05:00 PM		Max. Marks:	40
Instr	uctior	 ns: 1) All questions are compulsory. 2) Figures to the right indicate full m 3) Draw neat labeled diagrams whe 	nark erev	s er necessary.	
Q.1	Multi 1)	iple choice questions. Material accumulated from surface do called a) Tors c) Regolith	b) d)	to solid rock including soil is Murum Talus	08
	2)	Formation of soil depends upon a) Parent material c) Climate and land forms	_ fa b) d)	ctor. Time All of these	
	3)	The Nebular hypothesis put forward b a) Chamberlin c) Kant and Lapels	y b) d)	Kant Chamberlin and Moulton	
	4)	discontinuity separate core from a) Movorovisic c) Moho	n m b) d)	antel. Conrad Gutenberg	
	5)	Earthquake wave is also called as a) Seismic c) Light	b) d)	wave. Sound None of these	
	6)	Second most abundant gas relies from a) CO ₂ c) Sulfer	n vo b) d)	lcano is Water vapour None of these	
	7)	The highest density of atmosphere oc a) Troposphere c) Stratosphere	curs b) d)	s at Thermosphere Mesosphere	
	8)	Average radious of the earth is a) 5654 c) 7413	gm b) d)	/cm ³ . 6371 6555	
Q.2	Ansv a) b) c) d) e)	wer the following questions. (Any Fo Rotation and revolution of Earth Asthanosphere Define focus and epicenter. Define weathering. What is Sima?	ur)		08
Q.3	Write a) b) c)	e short notes. (Any Two) Seismic waves Product of volcano Seismograph			08

Seat No. SLR-FZ-46

Set P

Q.4 Answer the following questions. (Any Two)

- Explain the planetismal theory of earth origin. a)
- Describe fissure type of volcanos. b)
- c) Describe causes of earthquake.

Answer the following questions. (Any One) Q.5

- a) Describe physical types of weathering.b) Describe the earth interior.

	B.Sc. (Semester -	
No.		
Seat		

I) (Old) (CBCS) Examination: Oct/Nov - 2022 **ELECTRONICS** (Paper - II) **Digital Fundamentals**

Day & Date: Monday, 27-03-2023

Time: 12:00 PM To 02:00 PM

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

3) Use of logarithmic table and calculator is allowed.

4) Draw neat diagram and give equations wherever necessary.

Q.1 Choose the correct alternative from the following options.

1)

- A Nibble is equal to _____ bit(s). 2 a) 1 b) c) 4 d) 8
- The Excess-3 Code of binary no 1001 is _____ 2) a) 1001 b) 1100 c) 0110 1010 d)

3) IC is a Quad two input AND gate. a) 7400 7402 b)

- c) 7404 7408 d)
- In Boolean algebra X + X·Y = _____. 4)
 - b) 0 a) 1 c) X Y d)
- 5) Gate is called as Controlled Inverter.
 - a) AND NOT b) c) NAND XOR d)
 - 1's complement of 11001010 is _____.
 - b) a) 11001011 11001001
 - c) 00110101 d) 00110111
- 7) The full form of ASCII code is _

6)

- a) American Standard Code for Internet Interchange
- b) American Standard Code for Information Interchange
- c) American Standard Code for Information Interconnect
- d) American Standard Code for Internet Interconnect
- In Boolean algebra A + A = _____. 8)
 - b) 2A a) A c) 0 1 d)

Answer the following questions. (Any Four) Q.2

- 1) List applications of XOR gate.
- 2) Draw the logic diagram of half subtractor.
- 3) State the radix of decimal, octal, binary and hexadecimal number system.
- 4) Perform the subtraction $(1100)_2 (1001)_2$ by using 2's compliment method.
- 5) Draw pin diagram of IC 7432
- 6) Perform addition of (96)₁₀ and (87)₁₀ by using BCD addition method.

08

SLR-FZ-47

Max. Marks: 40

Set

Q.3	Writ 1) 2) 3)	te short notes on the following. (Any Two) Full adder using basic gates Unweighted codes Controlled inverter	08
Q.4	Ans 1) 2) 3)	wer the following questions. (Any Two) State and Prove De' Morgan's Theorem. Explain parallel binary adder. Explain rules and laws of Boolean algebra.	08
Q.5	Ans 1) 2)	wer the following questions. (Any One) Explain hexadecimal number system. Convert hexadecimal number (D4) ₁₆ into its equivalent Binary, Octal and Decimal number. Why NOR / NAND gate is called as Universal Building Block? Construct basic gates by using NAND gate.	08

	В.	Sc. (Semester - I) (Old) (CBCS GEOGRAPH Geomorph) Exa ′ (Paµ nolog	imination: Oct/Nov - 2022 per - II) ly-II	
Day a Time	& Date : 12:0	e: Monday, 27-03-2022 D PM To 02:00 PM		Max. Marks	3: 40
Instr	uctior	 ns: 1) All questions are compulsory. 2) Figures to the right indicate ful 3) Draw neat labeled diagrams w 4) Use of maps and stencils allow 	l mark herev ved.	s. er necessary.	
Q.1	Choo 1)	 bse the correct alternative from the means the change of rocks f a) Earthquake c) Mass Movement 	e opti from th b) d)	ons. le massive to the classic state. Erosion Weathering	80
	2)	Oxidation is type of weatheri a) Biological c) Chemical	ng. b) d)	Physical None of these	
	3)	is erosional landform of Glac a) Horns c) Deltas	iers. b) d)	Pot Holes Waterfall	
	4)	is a function of structure, pro a) Landscape c) Earthquake	cess a b) d)	and time. Volcano None of these	
	5)	is depositional landform of Gla a) Ox-Bow-Lake c) Alluvial Cones	aciers. b) d)	Barkhan Eskers	
	6)	Barkhan is the depositional landforr a) Glacier c) Wind	ns ma b) d)	de by Ocean waves River	
	7)	landform is formed due to era) Rapidsc) Yardang	osiona b) d)	al work of wind. Delta Waterfall	
	8)	The process of disintegration and d a) Transportation c) Weathering	ecomp b) d)	oosition of rocks is called as Denudation Erosion	-
Q.2	Atter 1) 2) 3) 4) 5) 6)	mpt any four of the following ques What is erosion? What is weathering? What is Mass movement? What is Flood Plain? What is U shaped valley? What is Kettle?	tions.		08

Seat No.

~ ~ ~ ----~

Page 1 of 2

- Set P
- SLR-FZ-49

Q.3	 Write short notes on any two of the followings . 1) Trio of Devis 2) V shaped Valley 3) Drumlins 	08
Q.4	 Attempt any two of the following questions. 1) Erosional landforms of river 2) Depositional landforms of sea wave 3) Explain the agents of weathering. 	08
Q.5	 Attempt any one of the following questions. 1) Explain the Erosional landforms of Aeolian. 2) Explain the depositional landform of Glacier. 	08

Seat No.	Set F)						
	B.Sc. (Semester - I) (Old) (CBCS) Examination: Oct/Nov-2022 Geology (Paper – II)							
	Structural Geology							
Day & Time:	Day & Date: Monday, 27-03-2023 Max. Marks: 40 Time: 03:00 PM To 05:00 PM							
Instru	 actions: 1) All questions are compulsory. 2) Figures to the right indicate full marks. 3) Draw neat diagram wherever necessary. 							
Q.1	Multiple choice questions. 0	8						
	 Measure breaks in sedimentation are called a) fold b) unconformity c) conformity d) fault 							
	 2) In fault the hanging wall moved upward relative to foot wall. a) strike b) normal c) reverse d) parallel 							
	 3) The sloping sides of a fold from crest to trough are called the a) limbs b) axis of fold c) axial plane d) plunge of fold 							
	 4) faults have neither hanging wall nor foot wall. a) normal b) reverse c) vertical d) parallel 							
	 5) Joints can be developed by a) Tectonic stresses b) Residual stresses c) Surficial movement d) all of these 							
	 6) Columnar Joints divine the rock masses into columns. a) Tetragonal b) Pentagonal c) Hexagonal d) All of these 							
	 A Line is a line of constant elevation. a) strike b) dip c) contour d) seismic 							
	 8) Topographic maps represent the earth's surface with lines a) strike b) dip c) contour d) seismic 							
Q.2	Answer the following. (Any Four) 0	8						
	 a) Define strike. b) What is true dip and apparent dip? c) Define fault. d) What is the difference between fault and joint? e) What is topographic map? 							
Q.3	Write short notes. (Any Two) 0	8						
	 a) Columnar joints b) Fault terminology c) Brunton compass 							

Q.4 Answer the following. (Any Two)

- a) Describe horst and graben.
- **b**) Describe genetic classification of joints.
- c) Describe use of contour in geologic and topographic maps.

Q.5 Answer the following. (Any One)

- a) What is fold? Describe any three types of fold.
- b) Define unconformity? Describe various types of unconformities.

B.Sc. (Semester - II) (CBCS) Examination: Oct/Nov-2022 ENGLISH (Compulsory) Literary Voyage						
Day & Date: Tuesday, 07-02-2023 Max. Marks: 40 Time: 12:00 PM To 02:00 PM Max. Marks: 40						
Instr	Instructions: 1) All questions are compulsory. 2) Figures to the right indicate full marks.					
Q.1	Rewi 1)	rite the following by choosing the correctAccording to Francis Bacon, in discourseand economically.a) Fireb) Vc) Weaponsd) G	option given below each bit. 08 must be used carefully Vit Gadgets			
	2)	Bertrand Russell was against thelea)Practicalb)c)Bookishd)	earning. Experimental Experiential			
	3)	"The Spirit of Freedom" was actuallyAmerica for Indians.a) A poemb) Ac) A songd) A	_ written by Tagore from A letter A gazal			
	4)	Niyi Osundare is basically about the deteriorating earth.about the b) H c) Pessimistica) Hopefulb) H d) V	e regeneration of the lopeless Vithout hope			
	5)	Christina Rossetti didn't want her lover to bea) happyb) sc) pleasedd) b	e remembering her. ad Ilissful			
	6)	The synonym of 'accountable' isa) hopelessb) rec) richd) e	esponsible conomical			
	7)	The antonym of 'objective' isa) criticalb) ac) subjectived) fa	ictual actful			
	8)	I saw a cuckoo, when I the window a) opening b) o c) open d) o	of the room. pens pened			
Q.2	Ansv a) b) c)	ver the following questions briefly. (Any F What subjects should be kept away from jest What did Bertrand Russell as a schoolboy kr What was condition of freedom in a nation lik	Four) 12 t according to Bacon? now about the squirrels? ke America?			

- d) What was condition of freedom in a nation like America?d) How is water pollution depicted in "Our Earth Will Not Die"?
- e) What was Alexander Pope's source of comfort?
- f) Why did Christina Rossetti allow her lover to forget her?

Seat No. Set P

Q.3 a) Write an informal letter addressing your friend and inviting him to spend the 10 Diwali vacation with you and your family.

OR

- **b)** Describe the process of making tea. Use the instructions beginning from the initial preparation for making tea up to serving the tea.
- Q.4 Write a presentation on the topic "India and Democracy" by preparing slides on 10 the basis of the following data:
 - a) India's freedom struggle
 - **b)** Indian freedom fighters
 - c) India's independence
 - d) Indian constitution
 - e) Democracy
 - f) India as a nation
 - g) Place of India in the world
 - h) Future of India

No.	Seat	
	No.	

B.Sc. (Semester - II) (CBCS) Examination: Oct/Nov- 2022 CHEMISTRY (Paper – III) Organic Chemistry

Day & Date: Wednesday, 08-02-2023 Time: 12:00 PM To 02:00 PM

Instructions: 1) All questions are compulsory.

2) Draw neat diagrams and give equations wherever necessary.

3) Figures to the right indicates full marks.

4) Use of logarithmic table and calculator is allowed.

(At. Wts.: H=1, C=12, 0=16, N=14, Na=23, CI=35.5)

Q.1 Choose the correct alternatives from the options.

- 1) The intermediate species obtained by the homolytic fission of a covalent bond are _____.
 - a) Carbocations
 - c) Free radicals
- 2) Nitrenes are ____
 - a) Monovalent
 - a) Monovalentb) Divalentc) Trivalentd) None of the above

3) The hybridization of carbon involved in acetylene is _____.

- a) SP3b) SP2c) SPd) None of the above
- 4) Saturated alicyclic (aliphatic cyclic) hydrocarbons are known as _____.
 - a) Cycloalkane b) nedoalkane
 - c) all of the above d) aromatic alkane
- 5) Which of the following is not a nucleophile
 - a) BF₃ b) H₂O
 - c) CH_3OH d) NH_3
- 6) Carbocations are _____.
 - a) Electron richb) Neutralc) Electron deficientd) None of
 - Molecule that are having non-superimposable mirror image relationship
 - are

7)

a) Chiral

c) Symmetric

- b) Achiral
- d) None of the above
- 8) Benzene contains _____ number of π electrons?
 - a) 3 b) 6
 - c) 4 d) 0

Max. Marks: 40

SLR-FZ-52



08



. -

b) Carbanions

d) Carbenes

Q.2 Answer the following questions. (Any Four)

- 1) What are cycloalkanes give general formula of cycloalkanes.
- 2) What is asymmetric carbon atom? Give one example.
- 3) Give IUPAC names for the following

- 4) What are carbocations? Give any two methods of formation of carbocations.
- 5) What are cycloalkanes? Give the general formula of cycloalkanes.
- 6) Define the term hybridization. Give the type of the hybridization and shapes of the following compounds
 - a) CH_4 b) C_2H_4 c) C_2H_2

Q.3 Write short note on any two of the following.

- **1)** Explain SP hybridization with respect to acetylene.
- 2) What are dienes? Give their general formula.
- 3) What is plane polarised light? Explain optical inactivity in meso compounds.

Q.4 Answer any two of the following.

- 1) What are carbanions? Give any two methods of formation of carbanions.
- 2) What is optical activity? Discus optical isomerism of 2,3-dihydroxy butanoic acid.
- **3)** Explain and illustrate SP³, SP² and SP hybridization.

Q.5 Answer any ONE of the following.

- a) What are alkynes? Give the general formula of alkyne and explain how hydrogen atoms in acetylene are acidic.
- **b)** Explain the structure of benzene on the basis of molecular orbital theory.

08

80

08

Seat No.				Set	Ρ			
	B.Sc. (Semester - II) (CBCS) Examination: Oct/Nov-2022 COMPUTER SCIENCE (Paper-III) Introduction to Web Designing							
Day 8 Time:	& Date: Wednesday, 08 03:00 PM To 05:00 P	3-02-2023 M		Max. Mark	s: 40			
Instru	uctions: 1) All question 2) Figures to	ns are compulsory. the right indicate full m	ark	S.				
Q.1	Choose the correct a 1) HTML stands fo a) Hyper Tech	alternatives from the r n Markup Language	opt b)	ions. Hyper Text Markup Language	08			
	c) Hyper Lext2) JavaScript is noa) True	Makeup Language t case sensitive langua	d) age. b)	None of these False				
	3) HTML ta a) <h7> c) <h4></h4></h7>	ag produces the bigges	st h b) d)	eading. <h9> <h1></h1></h9>				
	4) HTML tags are sa) Anglec) Square	surrounded by which ty	ype b) d)	of brackets? Round Curly				
	5) Which of the foll a) c) <i></i>	owing is not a pair tag	? b) d)	<u></u>				
	 6) What does CSS a) Creative St c) Colorful St 	stand for? yle Sheets yle Sheets	b) d)	Cascading Style Sheets Computer Style Sheets				
	7) is the fa a) Tim Berner c) Tim Thomp	ther of HTML. s-Lee oson	b) d)	Hack on lee none of these				
	8) The declarationa) selectorc) values	in CSS consists	b) d)	property all of these				
Q.2	 Answer Any Four of a) Explain date function b) What is singular c) Define selector. d) Explain bus topo e) What is image floof f) Define opacity. 	the following: ction in JavaScript. and paired tag? logy with diagram. pating?			08			
Q.3	 Write short notes on a) Animation In CSS b) Anchor Tag c) Box model using 	any Two of the follow S CSS	win	g.	08			

٦

Г

SLR-FZ-53

Page 1 of 2

Q.4 Answer any Two of the following.

- a) What is HTML? Explain Text Formatting Tag with example.
- b) Explain for loop and while loop with example in Java script.
- c) Explain different types of computer networking.

Q.5 Answer any One of the following.

- a) Write the advantages of CSS.
- **b**) Explain table tag and its attributes with example in HTML.

0	. [
Seat No.						Set	Ρ
	B.Sc. (Semester - II) (CBCS) Examination: Oct/Nov- 2022 CHEMISTRY (Paper–IV) Analytical Chemistry						
Day 8 Time:	& Date : 12:0	e: Thursday, 09-02- 0 PM To 02:00 PM	2023		Ма	x. Marks	: 40
Instru	uctio	ns: 1) All questions 2) Figures to the	are compulsory. e right indicates fu	ull mar	ks.		
Q.1	Mult 1)	iple choice question The parachor is a) Additive c) Both additive	ons. property. and constitutive	b) d)	Constitutive None of these		08
	2)	The unit of surface a) dyne cm c) dyne ⁻¹ cm	e tension is	 b) d)	dyne cm ⁻¹ dyne ⁻¹ cm ⁻¹		
	3)	is very esse a) CO c) NO	ential for plant life	and is b) d)	s not a direct pollutant. CO ₂ SO ₂		
	4)	Cl2 + H ₂ O = a) HOCI +HCI c) HCI + HCI	·	b) d)	HOCI₂ HCI		
	5)	Filtration usually re a) Colloidal c) dissolved salt	emoves im	purity b) d)	in water. bacterial dissolved gaseous		
	6)	In combustion met organic compound a) H ₂ c) CO ₂	hod for the detec I get oxidized to _	tion of b) d)	hydrogen, hydrogen of the - H ₂ O Both b and c	e	
	7)	Carbon and hydro a) Liebig's metho c) Kjeldal'smetho	gen are estimate od ode	d by _ b) d)	Carius method None of these		
	8)	Which of the follow a) tetraethyl lead c) lead acetate	ving substance is	used b) d)	as an anti-knock compoun lead tetrachloride Lead Nitrate	d?	
Q.2	Ansv 1) 2) 3) 4) 5) 6)	wer the following of Explain the term Pa Comment on qualit What are the enviro What are the paran How are carbon an What is refining of	questions. (Any arachor. y parameters of v onmental effects o neters of potabilit d hydrogen deteo petroleum?	Four) vater. of CO y of wa cted?	and CO ₂ ? ater?		08

Q.3 Write short note on any two of the following.

- 1) What is air pollution? Comment on types of air pollutants.
- **2)** Give in detail Carius method for the estimation of chlorine in an organic compound.
- **3)** What is refining? Give the details of different constitution obtained from petroleum refining.

Q.4 Answer any two of the following.

- 1) Define dipole moment. Discuss the application of dipole moments in the determination of structures of molecules.
- 2) Discuss the types of water pollutant.
- 3) Write note on:
 - i) Detection of carbon and hydrogen.
 - ii) Quantitative analysis of nitrogen by Kjeldahl's method.

Q.5 Answer any ONE of the following.

- a) Write note on:
 - 1) Additive and constitutive properties.
 - 2) Specific and molecular refractivites.
 - 3) Refractivity index and Snell's law.
- b) Explain in detail ion exchange method.

08

08

		COMPUTER SCIENCE (Paper – IV) Programming Using C - II	
Day a Time	& Date : 03:0	te: Thursday, 09-02-2023 N 00 PM To 05:00 PM	1ax. Marks: 40
Instr	uctio	 ans: 1) All questions are compulsory. 2) Draw neat diagrams and give syntax wherever necessary. 3) Figures to the right indicates full marks. 	
Q.1	Cho 1)	Pose the correct alternatives from the options. Passing parameters to function is called as "command line" arguments. a) main() b) getch()	, 08
		c) clrscr() d) getchar()	
	2)	keyword is useful to give alternative name for exiting data tya) sizeofb) intc) chard) typedef	ype.
	3)	is used as a dynamic memory allocation function. a) release() b) realloc() c) fprintf() d) None of these	
	4)	function is used to write single integer value into file.a) putc()b) get()c) putw()d) getw()	
	5)	By default 'C' function returns type value. a) char b) int c) float d) double	
	6)	give the color of specified pixel. a) get pixel() b) put pixel() c) Both a & b d) None of these	
	7)	draws the pixel with specified color.a) get pixel()b) put pixel()c) Both a & bd) None of these	
	8)	a) & b) * c) \rightarrow d) Both b & c	
Q.2	Ansv 1) 2) 3) 4)	wer the following questions. (Any Four) Define Union. What is macro? How to initialize pointer? What is preprocessor?	08

B.Sc. (Semester - II) (CBCS) Examination: Oct/Nov-2022

- 5) Define local & global variable.6) What is structure?

Seat

No.



Q.3	Wri a) b) c)	te short note on any two of the following. Command line arguments Recursion Nested structure	08
Q.4	Ans a) b) c)	swer any two of the following. Define file and explain how to open and close the file. Explain pointer of pointer in details. Write a program to display 5 records of students using structure.	08
Q.5	Ans a) b)	swer any one of the following. Write a program to show difference between structure & union. What is Dynamic memory allocation? Explain in details.	08

Seat	t					
No.		Set P	•			
B.Sc. (Semester - II) (CBCS) Examination: Oct/Nov -2022 PHYSICS (Paper - III) Heat and Thermodynamics						
Day &	& Dat	Friday, 10-02-2023 Max. Marks: 40	0			
Time	: 12:0					
Instr	uctio	 a) All questions are compulsory. 2) Figures to the right indicate full marks. 3) Draw neat labeled diagrams wherever necessary. 4) Use of logarithmic table and calculator is allowed. 				
Q.1	Cho	se the correct alternative from the following options.	8			
	1)	Coefficient of viscosity of a gas is directly proportional to a) T				
		c) \sqrt{T} d) $1/\sqrt{T^2}$				
	2)	Lambda point temperature for liquid helium is about a) 10°K b) 2.4°K c) 4.2°K d) 2.186°K				
	3)	For liquid helium II viscosity with decrease in temperature.a) remain constantb) decreasesc) increasesd) does not change				
	4)	Change in entropy in reversible process is always a) increases b) decreases c) remain constant d) zero				
	5)	In an isothermal process change in internal energy a) increases b) decreases c) remain constant d) zero				
	6)	Any device which convert heat into mechanical work is called a) Heat Engine b) Refrigerator c) Auto generator d) Cycle				
	7)	The efficiency of Carnot's engine working between steam point and ice point is a) 0 b) 1 c) 26.81% d) 16.81%				
	8)	In refrigerator heat is extracted from and delivered to a) source and sink b) sink and source c) atmosphere and sink d) atmosphere and source				
Q.2	Ans	er any four of the following.03)Write short note on Air Conditioning.2)Explain different parts of the Carnot's ideal heat engine.3)What is irreversible process? Explain using two examples.4)Define the terms	8			

Free path Mean free path b)

Page 2 of 2

- 5) Find efficiency of Carnot's engine working between 107° Celsius and 17° Celsius.
- 6) Define the terns:
 - a) Isothermal process &
 - b) Adiabatic process, and give its equation for change in entropy

Q.3 Write short notes on any two of the following.

- 1) Work done during and isothermal process
- 2) Summer air conditioning system
- 3) Comparison between auto engine and diesel engine

Q.4 Answer any two of the following questions.

- 1) Explain how viscosity of gas depends upon temperature and pressure.
- 2) State and explain zeroth law of thermodynamics.
- A Carnot's engine working as a refrigerator between 260K and 300K receives 500 calories of heat from the reservoir at the higher temperature. Calculate the amount of work done in each cycle to operate the refrigerator.
 (1 Calorie = 4.2J).

Q.5 Attempt any one of the following.

- 1) With a neat labelled diagram explain working of vapor compression refrigeration system.
- 2) Show that PV^{γ} = constant for adiabatic process.

08

08

	B.Sc. (Semester - II) (CBCS) Examination: Oct/Nov -2022 MICROBIOLOGY (Paper - III) Microbial Physiology					
Day o Time	& Date : 03:0	e: Friday, 10-02-2023 0 PM To 05:00 PM	,	Max. Marks: 40		
Instr	uctio	 ns: 1) All questions are compulsory 2) Figures to the right indicate for 3) Draw neat diagrams and give 	ull marł equat	ks. ions wherever necessary.		
Q.1	Choo 1)	ose the correct alternatives from Peptone provides source of a) Nitrogen c) Sulfur	the op b) d)	tions. 08 Phosphorus Hydrogen		
	2)	The anticodon region is an importa a) m-RNA c) r-RNA	ant stru b) d)	ctural component of t-RNA DNA		
	3)	DNA contains sugar. a) Ribose c) Hexose	b) d)	Deoxyribose Triose		
	4)	Autotrophs obtain energy from a) Starch hydrolysis c) Sunlight	 b) d)	Any carbohydrate breakdown CO ₂		
	5)	All the following are high energy c a) ATP c) Both ATP & GTP	ompou b) d)	nds except GTP Glucose		
	6)	Caesinase is an example of a) Intracellular c) Apoenzyme	 b) d)	Extracellular Coenzyme		
	7)	In disaccharides, two monosaccha a) Ionic bond c) Hydrogen bond	arides a b) d)	are linked together by Covalent bond Glycosidic bond		
	8)	NAD is a) Coenzyme c) High energy compound	b) d)	Apoenzyme Prosthetic group of enzyme		
Q.2	Ansv 1) 2) 3) 4) 5)	wer any four of the following que Mention two functions of lipids. Write two differences between RNA What are polysaccharides? What are apoenzymes? What are autotrophs?	stions. A and E	08 DNA.		

6) What is the role of bromothymol blue in culture media?

SLR-FZ-57

Set P

Seat No.

Q.3	 Write short notes on any two of the following. 1) Structure of t-RNA 2) Lock & Key hypothesis 3) Autotrophs 	08
Q.4	 Answer any two of the following question. 1) EMP pathway 2) Indicators of culture media 3) Constitutive & Induced enzymes 	08
Q.5	 Answer any one of the following questions. 1) TCA cycle 2) Structure and function of proteins 	08

NO.					
		B.Sc. (Semester - II) (CBCS) Ex PHYSICS (Pa	kan Ipel	nination: Oct/Nov-2022 [·] - IV)	
		Electricity, Magnetism ar	nd E	Basic Electronics	
Day & Time	& Date : 12:00	e: Saturday, 11-02-2023 0 PM To 02:00 PM		Max. Mark	s: 40
Instr	uctior	1) All questions are compulsory.2) Figures to the right indicate full r	nark	S.	
Q.1	Choo	tions.	08		
	1)	The time constant (T) of L-R circuit is			
	-	a) LR	b)	 L/R	
		c) R/L	d)	R	
	2)	The time constant of RC circuit with recapacitance 20 μ F is	esis	ance 50 ohm in series with	
		a) 10 ⁻⁰³ Sec	b)	10 ⁻⁰⁴ Sec	
		c) 10 ⁻⁰¹ Sec	d)	10 ⁻⁰² Sec	
	3)	On multiplying a vector by an operato angle	orj, t	he vector is rotated through an	
		a) 90°	b)	180°	
		c) 120°	d)	360°	
	4)	Impedance (Z) of series of L-C-R circ	uit a	t resonance is	
	,	a) constant	b)	maximum	
		c) zero	d)	minimum	
	5)	In ballistic galvanometer (B. G.) the c	oil is	suspended in magnetic	
		a) uniform	b)	non-uniform	
		c) constant	d)	radial	
	6)	The of a bi-junction transistor i	s liq	htly doped.	
		a) base	b) õ	collector	
		c) emitter	d)	base and emitter	
	7)	The circuit removes positive h	alf c	vele from input voltage	
	• ,	a) positive clamper	b)	positive clipper	
		c) negative clamper	d)	negative clipper	
	0 \	Zapar diada is parmally aparated in	- /	modo	
	0)	a) forward bias	h)	_ moue. reverse bias	
		c) saturation	d)	cut-off	
			")		
Q.2	Answer the following questions. (Any Four)				
	a)	Define varying currents.			
	b)	Define Impedance and Admittance.			
	C)	Draw the circuit diagram for positive cl	amp	ber circuit.	

- d) State Biot Savart's Law
- Define active component in electronics circuit and give its examples. Find the current amplification factor β if the $\alpha = 0.98$. e)
- f)

Page ${\bf 1}$ of ${\bf 2}$

SLR-FZ-58 Set P

Seat	
No.	

Q.3 Write Short Notes. (Any Two)

- a) Explain the series LCR resonance circuit and derive the expression for resonant frequency.
- **b)** What is damping in Ballistic Galvanometer? Explain how the damping is corrected.
- c) Explain the working of Zener diode as a Voltage Regulator.

Q.4 Answer the following questions. (Any Two)

- a) Derive the expression for growth of current in a circuit containing inductance (L) and resistance (R) circuit connected to source of e.m.f. E in series.
- **b)** Explain the working of Owen's Bridge.
- c) Figure of merit of a ballistic galvanometer is $5 \times 10^{-7} \mu A/mm$. The resistance of Ballistic galvanometer is 100 ohm. Calculate the current sensitivity and voltage sensitivity.

Q.5 Answer the following questions. (Any One)

- a) Obtain an expression for the magnetic induction at a point on the axis of current carrying straight solenoid of finite length.
- **b)** Explain transistor characteristics in common emitter mode.

80

80
Soat	1					
No.		S	et	Ρ		
B.Sc. (Semester - II) (CBCS) Examination: Oct/Nov-2022 MICROBIOLOGY (Paper – IV) Applied Microbiology						
Day & Time:	Day & Date: Saturday, 11-02-2023 Max. Marks: 40 Time: 03:00 PM To 05:00 PM					
Instru	uctio	 s: 1) All questions are compulsory. 2) Figures to the right indicate full marks. 				
Q.1	Cho 1)	se the correct alternatives from the options.Kovac's reagent is used for test.a) Methyl redb) Indolec) Voges Proskauerd) Citrate		08		
	2)	Study of causative agent, spread, diagnosis of disease is calleda) Epidemiologyb) Prophylaxisc) Preventiond) Virulence	1			
	3)	In HTST method of pasteurization milk is heated at temperature 15 seconds. a) 62.8°C b) 71.7°C c) 140°C d) 200°C	for			
	4)	Efficiency of pasteurization is determined by test. a) Phosphatase b) MBRT c) DMC d) SPC				
	5)	is used for disinfection of water.a)Chlorineb)HCIc)NaCId)NaOH				
	6)	is used to determine the strength of sewage.a)BODb)MPNc)MBRTd)Phosphatase				
	7)	is air borne disease.a) Cholerab) Dysenteryc) Typhoidd) Tuberculosis				
	8)	In anaerobic digestion of sewage major gas produced is a) CH ₄ b) CO ₂ c) SO ₂ d) O ₂				
Q.2	Ansv 1) 2) 3) 4) 5)	ver Any Four of the following: Nosocomial infection Types of sewage (Enlist) Define: BOD Define: Virulence Indicators of Faecal pollution		08		

Q.3	 Write short notes on any Two of the following. a) Sources of microorganisms in water b) Imhoff's tank c) Prophylactic measures for airborne diseases 	08
Q.4	 Answer any two of the following. a) Describe MPN test. b) Describe the types of infections. c) Describe MBRT test for milk. 	08
Q.5	 Answer any one of the following. a) Describe the secondary method for sewage treatment. b) Describe the method of transmission of diseases. 	08

Seat		Se	t P
<u>NO.</u>	E	B.Sc. (Semester - II) (CBCS) Examination: Oct/Nov - 2022 STATISTICS (Paper - III) Descriptive Statistics – II	
Day 8 Time:	Date 12:00	e: Monday, 13-02-2023 Max. Mar 0 PM To 02:00 PM	ks: 40
Instru	iction	 ns: 1) All the questions are compulsory 2) Draw neat diagrams and give equations wherever necessary. 3) Figures to the right indicate full marks 	
Q.1	Choc 1)	ose the correct alternative. Regression coefficient is independent of change of	08
		a) Originb) scalec) Both origin & scaled) None of these	
	2)	If $byx = 0.4$ and $bxy = 0.9$ then the correlation coefficient (r) is a) 0.36 b) 0.6 c) -0.36 d) -0.6	
	3)	Total number of class frequencies of all order for 'n' attributes is a) 3^n b) 2^n c) $2^n - 1$ d) 2n	
	4)	If Cov (X, Y) = 50 then Cov $(10X + 10, 5Y + 5)$ isa) 50b) 2000c) 2500d) 500	
	5)	If the variables are uncorrelated then the regression lines area)Parallelb)Coincidentc)Perpendiculard)None of these	
	6)	The G.M. of Laspeyre's and Paasche's indices isa) Marshall-Edgeworth indexb) Walsch indexc) Fisher's indexd) None of these	
	7)	If the variables X and Y change in opposite direction then the correlationcoefficient (r) isa) Zerob) Positivec) Negatived) One	
	8)	If one of the regression coefficients is positive then the other must bea) Positiveb) Negativec) Zerod) None of these	
Q.2	Ansv a) b)	ver any four of the following Define a fundamental set of class frequencies with an illustration. Define Laspeyre's price index number.	08

- c) With usual notations, show that bxy * byx ≤ 1.
 d) Define Fisher's price index number.
 e) Describe Scatter diagram.

f) Define Spearman's rank correlation coefficient.

Q.3 Write short notes on any two of the following.

- a) Regression coefficients
- **b)** Properties of correlation coefficient
- c) Cost of living index number

Q.4 Answer any Two of the following

- a) Explain with an example the effect of change of origin & scale on correlation coefficient.
- **b)** What is time reversal test? Verify it for Fisher's price index number.
- c) Explain the concepts of independence and association of two attributes.

Q.5 Answer any one of the following

- a) Derive acute angle between two lines of regression.
- **b**) With usual notation prove that $Q = \frac{2Y}{(1+Y^2)}$

08

80

Seat No.					Set	Ρ		
		B.Sc. (Semester - II)	(CBCS) Exam	ination: Oct/Nov -	2022			
	ZOOLOGY (Paper – III) Comparative Anatomy of Vertebrates							
Day &	R Date	• Monday 13-02-2023	ve Anatomy o	rverteprates	Max Marks	· 40		
Time	03:0	D PM To 05:00 PM			max. marie			
Instru	uctior	is: 1) All questions are c	ompulsory.	re l				
		3) Draw neat and lab	eled diagram whe	rever necessary.				
Q.1	Choo	ose the correct alternat	ives from the opt	tions.		08		
	1)	are the characte	ers of hoofed man	nmals.				
		a) Horns	b)	canines				
	•	c) nairs	a)	naiis				
	2)	Pelvic girdle is	shaped.	1				
		a) vv c) N	(d (b	L V				
	3)	lis a digestive g	and	·				
	5)	a) Pituitary	b)	Pineal				
		c) Pancreas	ć	Thyroid				
	4)	Gills are only found in _	animals.					
		a) calotes	b)	sparrow				
		c) cobra	d)	tadpole				
	5)	Four chambered heart i	s found in					
		a) rat	(d	fish crocodile				
	6)	C) IIOg Sominiforous tubulos or	a propont in	CIOCOUIIE				
	0)	a) kidnev	e present in	 liver				
		c) testis	d)	stomach				
	7)	Brain is divided into mai	n parts.					
	,	a) two	b)	four				
		c) five	d)	three				
	8)	Function of optic lobe is	sense of					
		a) sight	b)	digestion				
		c) balance	a)	nearing				
Q.2	Ansv	ver Any Four of the foll	owing:			08		
	a)	Which are the epidermal	glands in vertebra	ates?				
	b) c)	Describe different types	of horns in mamm	la.				
	d)	Describe pectoral girdle	of rabbit.	5.				
	e)	Explain types of tongue i	n reptiles.					
	f)	Describe the different typ	pes of scales in pi	sces.				
Q.3	Write	e short notes on anv Tw	o of the followin	IQ.		08		
-	a)	Describe pectoral girdles	of Frog.	-		-		
	b)	Describe digestive gland	s and its functions	8.				
	C)	Give an account of lungs	ot dirds.					

Q.4 Answer any Two of the following.

- Describe the aortic arches in mammals. a)
- Write notes on various types of gills in fishes. b)
- Describe structure and function of mammalian heart. C)

Q.5

- Answer any One of the following.a) Describe detail structure and functions of brain of vertebrates.
- Describe in detail structure and functions of kidneys in vertebrates. b)

NO.							
	B.Sc. (Semester - II) (CBCS) Examination: Oct/Nov - 2022 STATISTIC (Paper – IV) Probability and Probability Distributions – II						
Day & Time:	Da 12:0	te: Tu 00 PM	esday, 14-02-2023 Max. Marks: 1 To 02:00 PM	40			
Instru	ctic	o ns: 1 2) All questions are compulsory. ?) Figures to the right indicate full marks.				
Q.1	a)	Choo 1)	See correct alternative. For a discrete r. v. X, the second moment about mean is called, second moment. a) raw b) factorial constrained	08			
		2)	If X and Y are independent r. v. s then a) $E(X + Y) = E(X) + E(Y)$ b) $E(X,Y) = E(X).E(Y)$ c) $P(x,y) = P(x).P(y)$ d) all of these				
		3)	If X and Y are two independent r.v.s then $v(x - y) = $ a) $v(x) + v(y) - 2 cov(x, y)$ b) $v(x) + v(y) + 2 cov(x, y)$ c) $v(x) + v(y)$ d) $v(x) - v(y)$				
		4)	The p.m.f. of one point distribution is a) $P(X = 1) = K$ b) $P(X = K) = 1$ c) $P(X = K) = \frac{1}{2}$ d) $P\left(X = \frac{1}{2}\right) = 0$				
		5)	If $X_1, X_2,, X_n$ are independent and identically distributed Bernoulli r. v.s then the distribution of $Y = \sum_{i=1}^{n} X_i$ is a) Bernoulli b) discrete uniform c) hypergeometric d) binomial				
		6)	If $P(x) = \frac{1}{5}$ $x = 10,20,30,40,50$ $= 0$ otherwisethen thae distribution of r.v. X is identifical to Distribution.a)discrete uniformb)Binomialc)hypergeometricd)two point				
		7)	Suppose a box contain 4 white and 6 black balls. Three balls are drawn randomly without replacement. A r.v. <i>X</i> is defined as number of white balls obtained. Then probability distribution of r.v. <i>X</i> is identical to distribution. a) Bernoulli b) binomial c) by pergeometric d) none of these				
		8)	The probability generating function of Bernoulli distribution is a) $(s + pq)$ b) $(p + qs)$ c) $(p + s + q)$ d) $(q + ps)$				

Seat No.

Page **1** of **2**

SLR-FZ-62

Set P

08

08

08

SLR-FZ-62

Q.2 Answer any Four of the following:

- Define expectation of function of r. v. X a)
- Define second factorial moment. b)
- If X and Y are two discrete r. vs. and a and b are any constants, then in C) usual notations state the expression for
 - 1) E(aX + bY)2) V(aX + bY)
- d) State the pmf of hypergeometric distribution with parameters N,M and n in usual notation.
- Define Bernoulli random variable. e)

Q.3 Write short note on any two of the following:

- State and prove the recurrence relation for probabilities of binomial a) distribution.
- With usual notation prove that $V(aX + b) = a^2 V(X)$ b)
- The joint pmf of r. v.(X, Y) is C)

x = 1,2; y = 1,2otherwise $P(x,y) = \frac{1}{4}$ = 0

Discuss the independence of X and Y

Q.4 Answer any two of the following:

a) A r. v. X has following probability distribution

<i>X</i> :	0	1	2	3
רי)	1	1	3	1
P(x):	6	2	10	30

Find E(X) and V(X).

- b) Define two point distribution and find its mean.
- Derive and identify the distribution of sum of independent and identically C) distributed 'n' Bernoulli random variables.

Answer any two of the following: Q.5

The joint probability distribution of r. v. (X, Y) is a)

Y X	0	1	2
0	$\frac{1}{9}$	$\frac{2}{9}$	0
1	0	$\frac{2}{9}$	$\frac{1}{9}$
2	$\frac{1}{9}$	0	$\frac{2}{9}$

Find E(X/Y = 2)

Find mean and variance of binomial distribution. b)

Seat							
No.						Set	Ρ
	E	3.Sc. (Semeste	er - II) (CBCS) Ex	ami	nation: Oct/Nov - 2022	
			Dave	ZOOLOGY (Pa	apei	r – IV) Martakratas	
		. T		elopment Biolog	у от	Vertebrates	. 10
Time:	• Date 03:00) PM To	ay, 14-02 05:00 PN	-2023 1		Max. Mark	S: 40
Instru	uction	is: 1) All	I question	s are compulsory.			
		2) Fi	gures to tl	ne right indicate full r	nark	S.	
Q.1	Choo	se the	correct a	ternatives from the	e opt	ions.	08
	1)		ecithal egg	is characteristics of	<u></u>	 Amphihians	
		c) He	erdmania		d)	Human	
	2)	In frog	sperm ent	ers through			
		a) Ar	nimal pole		b)	Vegital pole	
	2)	C) Gi	rey cresce	ent lization takao nlago i	a) r	Jelly layer	
	3)	a) Ce	imais ieru ervix	lization takes place i	n b)	 Fallopian Tube	
		c) Va	agina		d)	Both a and b	
	4)	In mam	nmals blas	tula is known as			
		a) Bla	astocyst		b) d)	Blastocoel Stereoblastula	
	5)	0) 21	twins phy	vsically connected to	eac	h other.	
	- /	a) Co	onjoined	, ,	b)	Identical	
		c) Di	izygotic	(d)	Mirror image twins	
	6)	indicate	auring me	tamorphosis degene change.	eratic	n of internal gills and gill slits	
		a) Ho	ormonal		b)	External	
	_`	c) Int	ternal		d)	Both a and c	
	7)	Syndes	smo place attles	nta found in	b)	Man	
		c) Do	og		d)	Bear	
	8)		_ is used f	or detection of abnor	mali	ties of foetus.	
		a) Do	oppler ultr BLScan	asound	d)	3D Ultrasound Radio labelling	
		C) IVI			u)		
Q.2	Ansv	ver Any	Four of t	he following:			08
	b)	Syndesr	mo choria	placenta.			
	c)	Define c	cleavage.				
	a) e)	Cortical Spawnir	Reaction				
	f)	What is	Involution	? Give example.			
Q.3	Write	short r	notes on	any Two of the follo	owin	α.	08
	a)	What is	miscarria	ge? Write causes of	misc	arriage.	
	b) c)	Functior	ns of place	enta IPE in occuto moture	ation		
	0)	Describe			auon		

Q.4 Answer any Two of the following.

- a) Significance of metamorphosis in frog
- **b**) Describe Dizygotic twins.
- c) Principle and applications of ultrasound

Q.5 Answer any One of the following.

- a) Describe extrinsic pathway of Apoptosis. Add a note on examples of Apoptosis.
- **b)** Describe fate of three germ layers in frog.

Seat No.

B.Sc. (Semester - II) (CBCS) Examination: Oct/Nov -2022 MATHEMATICS PAPER–III Geometry

Day & Date: Wednesday, 15-02-2023 Time: 12:00 PM To 02:00 PM

Instructions: 1) All questions are compulsory. 2) Figures to the right indicate full marks. Choose the correct alternative for each of the following. Q.1 1) If the coordinate axes are rotated through an angle and θ about the origin, then the transformation equations are b) $x = x' \cos \theta - y' \sin \theta$ a) $x = x' \cos \theta + y' \sin \theta$ $y = x' \sin \theta + y' \cos \theta$ $y = x' \sin \theta + y' \cos \theta$ c) $x = x' \sin \theta - y' \cos \theta$ d) $x = x' \sin \theta + y' \cos \theta$ $y = x' \cos \theta + y' \sin \theta$ $y = x' \cos \theta + y' \sin \theta$ 2) The polar form of Cartesian equation $x^2 + y^2 = 4ax$ is a) $r = 2a \sin \theta$ b) $r = 2a\cos\theta$ c) $r = 4a \sin \theta$ d) $r = 4a\cos\theta$ 3) The Cartesian coordinates of point are $(\sqrt{3}, 1)$ then it's polar coordinates are ____ a) $(2,60^{\circ})$ b) $(2,90^{\circ})$ c) $(2, 30^{\circ})$ d) $(2, 45^{\circ})$

- 4) The general second degree equation $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$ represents hyperbola if and only if _____
- a) $\Delta \neq 0, h^2 ab < 0$ b) $\Delta \neq 0, h^2 - ab = 0$ c) $\Delta \neq 0, h^2 - ab > 0$ d) $\Delta \neq 0 a = b, h = 0$ 5) Angle between the two planes 2x - y + z = 6 and x + y + 2z = 7 is b) π π a) 2 3 d) $\frac{\pi}{6}$ π C) 6) The distance of the plane 2x - 6y + 3z - 28 = 0 from the origin O(0,0) is _____. b) 2 a) 1 c) 3 d) 4 7) The centre of the sphere $x^2 + y^2 + z^2 - 4x - 6y + 8z + 4 = 0$ is _____ b) (2, 3, -4) a) (2, 3, 4) c) (-2, -3, 4) d) (-2, -3, -4)

8) The equation of tangent plane to the sphere $x^2 + y^2 + z^2 = 14$ at the point (1, 2, 3) is _____

- a) x 2y + 3z = 14b) x + 2y - 3z = 14
- c) x + 2y + 3z = 14d) x - 2y - 3z = 14

08

SLR-FZ-64

Set

Max. Marks: 40

Q.2 Answer any four of the following

- a) If the origin O(0,0) is shifted to a point O'(1,-2) keeping the axes parallel to the old axes, then find the new equation of $2x^2 + y^2 4x + 4y = 0$
- **b)** Write the transformation equations if the coordinate axes are rotated through an angle 30° about origin.
- c) Identify the conic given by the equation $x^2 + 2xy + y^2 2x 1 = 0$
- d) Find the intercepts of the plane 2x 3y + 4z = 12 on the coordinate axes.
- e) Obtain the equation of the sphere whose diameter has extremities (3, 4, -2) and (-2, -1, 0)
- f) Find the centre and radius of the sphere $x^2 + y^2 + z^2 + 2x 4y 6z + 5 = 0$

Q.3 Answer any two of the following

- a) If coordinate axes are rotated through an angle θ about the origin O(0,0) the expression $ax^2 + 2hxy + by^2$ transferms into $a'x'^2 + b'y'^2$ then prove that $\theta = \frac{1}{2} \tan^{-1} \left(\frac{2h}{a-b}\right)$
- **b)** Find the equation of the plane through the points A(2, 2, -1), B(3, 4, 2) and C(7, 0, 6)
- c) Find the equation of tangent plane at (1, 2, -3) to the sphere $x^2 + y^2 + z^2 x + 2y + 3z = 8$

Q.4 Answer any tow of the following

- a) Transform the equation $x^2 y^2 = a^2$ when the axes are rotated through an angle 45° about origin 0 (0, 0)
- **b)** Show that the general equation of the first degree in x, y, z represents a plane.
- c) Obtain the condition of tangency that the plane Ax + By + Cz = D touches to the sphere $x^2 + y^2 + z^2 + 2ux + 2vy + 2wz + d = 0$

Q.5 Answer any one of the following.

- a) It axes are rotated through an angle θ about origin O(0, 0) the expression $ax^2 + 2hxy + by^2$ transferms into $a'x'^2 + 2h'x'y' + b'y'^2$ then a + b and $ab h^2$ are invariants.
- b) i) Find the equation of the plane passing through the line of intersection of the planes x + y + z = 6 and 2x + 3y + 4z + 5 = 0, and also passess through the point (1, 1, 1)
 - ii) Find the equation of the sphere through the circle $x^2 + y^2 + z^2 + 2x + 3y + 6 = 0$, x - 2y + 4z - 9 = 0 and the centre of the sphere $x^2 + y^2 + z^2 - 2x + 4y - 6z + 5 = 0$

80

08

08

Seat No.						Set	Ρ	
	B.Sc. (Semester - II) (CBCS) Examination: Oct/Nov -2022 BOTANY (Paper–III) Plant Ecology							
Day 8 Time:	& Dat 03:0	e: Wednesday, 15 0 PM To 05:00 P	5-02-2023 M	0.	Ma	ax. Marks	: 40	
Instru	 Instructions: 1) All questions are compulsory. 2) Draw neat and labeled diagram wherever necessary. 3) Figures to the right indicate full marks. 4) All questions carry equal marks. 							
Q.1	Mult 1)	t iple choice ques is an imp a) Water c) Soil pH	stions. ortant climatic factor	b) d)	Wind Soil texture		08	
	2)	is the qua a) Density c) Phenology	antative character of	the co b) d)	mmunity. Abundance Stratification			
	3)	The is bio a) producer c) water	otic component of an	l ecosy b) d)	/stem. sunlight calcium			
	4)	The is the a) <i>Pistia</i> c) <i>Hydrilla</i>	e submerged hydrop	hyte. b) d)	Typha Cyperus			
	5)	The floating stag a) <i>Hydrilla</i> c) <i>Typha</i>	ge of hydrosere is re	preser b) d)	nted by <i>Chara Nymphaea</i>			
	6)	The base of ecc a) Predators c) Consumers	ological pyramid is al [.] S	ways r b) d)	epresented by Producers Decomposers			
	7)	is the fin a) Crustose li c) Moss stage	rst stage of Xerosere chen stage e	b) d)	Foliose lichen stage Climax			
	8)	is founc a) Air chambe c) Multilayere	l in Xerophytes. er d epidermis	b) d)	Single layered epidermis Mucilage	i		
Q.2	Ans a) b) c) d)	wer the following Define primary a What is an Ecos What are hydrop Define food chai	g questions. (Any F nd secondary succes ystem? Enlist abiotic hytes? Enlist the typ n and food web.	our) ssion. factor es of it	S.		08	

Define heliophytes and sciophytes. Define ecological adaptation e)

f)

Q.3 Write short notes. (Any Two)

- a) Hydric adaptations.
- **b)** Detritus food chain.
- c) Biotic components of ecosystem.

Q.4 Answer of the following questions. (Any Two)

- a) Define Xerophytes. State the morphological and anatomical adaptations in it.
- b) What is ecological succession? Describe various successional stages of hydrosere.
- c) Describe important quantitative characters of the community.

Q.5 Answer of the following questions. (Any One)

- a) What is the ecological pyramid? Explain pyramid of number and biomass with suitable examples.
- b) Give an account of process of plant succession.

80

80

No.		
B.Sc. (Seme	ester - II) (CBCS) Examination: Oct/Nov	- 2022
	Mathematics (Paper – IV)	
	DIFFERENTIAL EQUATIONS	
Day & Date: Thursday, 10	6-02-2023	Max.
Time: 12:00 PM To 02:00) PM	

Instructions: 1) All questions are compulsory. Figures to the right indicate full marks. 3) Draw neat diagrams and give equations wherever necessary 4) Use of calculator and logarithmic table is allowed. Choose correct alternative for each of the following. Q.1 1) The solution of $\tan x \, dx + \cot y \, dy = 0$ is b) $-\sec x \sin y = C$ a) $\cos x \cdot \sin y = C$ c) $\sec x \cdot \cos y = C$ d) $\sec x \cdot \sin y = C$ 2) The homogeneous differential equation Mdx + Ndy = 0 can be reduced to variable seperable type by using the substitution _____. a) y = vxb) $x \cdot v = v$ c) x - y = vd) None of these The linear differential equation $\frac{dx}{dy} + Px = Q$ where P and Q are functions of 3) y alone can be reduced to exact by multiplying a suitable factor _____. b) $e^{\int Qdx}$ a) $e^{\int Pdx}$ d) $\rho^{\int Pdy}$ C) $e^{\int Qdy}$ The integrating factor of the differential equation ydx - xdy = 0 is/are _____. 4) $\frac{1}{x^2}$ a) b) xyc) $\frac{1}{v^2}$ d) All the above The solution of $(D^2 - 1)y = 0$ is _____. a) $(c_1 + c_2 x)e^x$ b) $(c_1 + c_2 x)e^{-x}$ 5) C) $c_1 e^x + c_2 e^{-x}$ d) None of these. 6) The equation $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + y = 0$ how C.F. _____. b) $c_1 e^{2x} + c_2 e^{-2x}$ a) $(c_1 + c_2 x)e^{2x}$ C) $(c_1 + c_2 x) e^{-2x}$ d) $(c_1 + c_2 x)e^x$ $\frac{\sin ax}{D^2 + a^2} = -----.$ 7) b) $-\frac{x^2}{2a}\cos ax$

Soat

SLR-FZ-66

Set

Max. Marks: 40

08

a) $-\frac{x}{2a} \cdot \frac{1}{4a^2} \sin ax$ c) $-\frac{x}{2a}\cos ax$ d) $\frac{x}{2a}\sin ax$

8)	$\frac{1}{D^2}x^2 = $	
	a) x^4	b) x^{3}
	12	3
	C) x^2	d) None of these
	3	

Q.2 Attempt any four from the following.

- 1) Find the particular integral for the differential equation $\frac{d^2y}{dx^2} - 9y = e^{-3x} + 1 + e^{3x}$
- **2)** Solve : $(D^3 1)y = 0$
- **3)** Find the complementary function for $(D^4 + 10D^2 + 9)y = \cos^2 x$
- 4) Solve : $(e^y + 1) \cos x \, dx + e^y \sin x \, dy = 0$
- 5) Solve the exact differential equation $(1 + 6y^2 3x^2y)\frac{dy}{dx} = 3x y^2 x^2$
- 6) Solve $\frac{dy}{dx} + \frac{4x}{1+x^2}y = \frac{1}{(x^2+1)^3}$

Q.3 Attempt any two from the following.

- a) With usual notations prove that $\frac{1}{f(D)}e^{ax} = \frac{1}{f(a)}e^{ax}$, if $f(a) \neq 0$
- b) Solve the non homogeneous differential equation $(2x + 4y + 3)\frac{dy}{dx} = (2y + x + 1)$
- c) Solve: $(D^3 D^2 6D)y = x^2 + \sin x$

Q.4 Attempt any two from the following.

- a) Define homogeneous differential equation and explain how they can be solve.
- b) Show that $(D - \alpha)(D - \beta)y = (D - \beta)(D - \alpha)y$ Where $D = \frac{d}{dx}$ c) Solve: $\frac{d^2y}{dx^2} - 5\frac{dy}{dx} + 6y = \cos 3x + e^{4x}$

Q.5 Attempt any one form the following

- a) With usual notations, prove that $\frac{1}{f(D^2)}\cos ax = \frac{1}{f(-a^2)}\cos ax, \text{ if } f(-a^2) \neq 0 \text{ and hence solve}$ $D^2(D^2 + 9)y = \cos 3x$
- **b)** Define linear differential equation of first order and explain how they can be solved and hence solve

$$\frac{dy}{dx} + \frac{n}{x}y = \frac{a}{x^n}$$

08

08

08

Seat No.	t	Set	Ρ				
	B.Sc. (Semester - II) (CBCS) Examination: Oct/Nov - 2022 BOTANY (Paper – IV)						
Day & Time	& Dat : 03:0	te: Thursday, 16-02-2023 Max. Mark 00 PM To 05:00 PM	s: 40				
Instr	uctio	2) All questions are compulsory.2) Figures to the right indicate full marks.					
Q.1	Cho 1) 2)	Standard size of herbarium sheet is cm.a) 25x41b) 29x50c) 29x41d) 30x45A group of genus collected to form next higher unit called	08				
		a) order b) family c) genus d) species					
	3)	In the floral formula C () stands for a) corolla united b) calyx united c) stamens united d) carpels united					
	4)	Suffix of order ends witha) -alesb) -aec) -ceaed) -ieae					
	5)	The leaves of tobacco plant contain alkaloids.a) papaverineb) aconitinec) pyridined) nicotine					
	6)	<i>Gloriosa superba</i> belongs to family a) Caesalpinaceae b) Solanaceae c) Nyctaginaceae d) Liliaceae					
	7)	The rules for naming the plants are framed by a) ICICI b) ICBN c) ISRO d) IDBI					
	8)	Fresh herbarium specimen made after publication, if holotype is missing called a) isotype b) syntype c) lectotype d) neotype					
Q.2	Ans a) b) c) d) e) f)	Swer Any Four of the following: Give merits of Bentham and Hookers system of classification. Define isotype. Economic importance of potato plant. Write classification with reason of family Caesalpiniaceae. Define herbarium. Comment on arboretum.	08				

08

08

SLR-FZ-67 Q.3 Write short notes on any Two of the following. 08 Aims and principles of Taxonomy. Distinguishing characters of family Solanaceae. Significance of botanical garden.

Q.4 Answer any Two of the following.

Give principles of ICBN. a)

a)

b)

C)

- Explain in brief the lead botanical garden of Shivaji university Kolhapur. b)
- Give reproductive character (floral character) of family Nyctaginaceae. C)

Q.5 Answer any One of the following.

- Assigning any two of the given plant to their respective families giving a) reasons and give their economic uses.
 - 1) Withaniasomnifera
 - 2) Alliumcepa
 - 3) Tamarindusindica
- What is nomenclature? Describe binomial nomenclature of plant. b)

			01	
Seat No.				Set P
	B.Sc. (Semester E	r - II) (CBCS) Exam ELECTRONICS (Pa Semiconductor D	ination: Oct/Nov - 202 per – III) evices	22
Day & Time:	Date: Friday, 17-02-202 12:00 PM To 02:00 PM	23	Ma	ax. Marks: 40
Instru	ctions: 1) All questions 2) Figures to the 3) Draw neat an 4) Use of log tab	are compulsory. e right indicate full marl id labeled diagram whe ble and calculator is all	ks. erever necessary. owed.	
Q.1	Choose the correct alternation 1) In intrinsic semicon a) lies at the cern b) lies above val c) lies below cond d) absent	ernatives from the op nductor fermi energy le ntre of C.B and V.B lance band nduction band	tions. vel	08
	2)diode is us a) LED c) Varactor	sed as voltage regulato b) d)	r. Zener Tunnel	
	3) In Common emitte a) 0.90 c) 0.99	er configuration of <i>BJT ^f</i> b) d)	³ = 99 therefore α = 0.96 0.89	
4	4) In P channel JFFTa) only electronsc) any charges	current is conducted b s b) d)	by both electronics and hole only holes	S
ţ	 In n type semicono positive charge cor a) more c) equal to 	ductor negative charge ncentration. b) d)	concentration is the less	nan
(6) Photo diode is alw a) forward c) both a) and b 	vays used in bia b) b) d)	ased mode. reversed none	
-	7) BJT is con a) voltage c) current	ntrolled device. b) d)	field power	
ł	8) is unidirec a) Diac c) SBS	tional device. b) d)	triac SCR	
Q.2	Answer the following q	questions. (Any Four) s?	08

- a) What is semiconductor? What are its types?
 b) Define static and dynamic resistance of p n junction diode.
 c) Define current gain α and β in case of BJT.
 d) Give any four differentiating points between FET band BJT.
 e) Give classification of power devices.

SI R-F7-68

Q.3	Write a) b) c)	e short notes. (Any Two) construction of Diac Working of P channel FET Light emitting diode	08
Q.4	Ansv a) b) c)	wer the following questions. (Any Two) Explain IV characteristics of UJT. Explain construction of PN junction Diode. Explain biasing modes of BJT.	08
Q.5	Ansv a) b)	wer the following questions. (Any One) Define all FET parameters and derive relation between them. Explain N type of semiconductor in detail.	08

B.Sc. (Semester - II) (CBCS) Examination: Oct/Nov-2022 PHYSICAL GEOGRAPHY (Paper – III) Human Geography I								
Day Time	Day & Date: Friday, 17-02-2023 Max. Marks: 40							
Instr	uctio	 ns: 1) All questions are compulsory. 2) Figures to the right indicate full marks. 3) Draw neat and labeled diagram wherever necessary. 						
Q.1	Cho 1)	ose the correct alternatives from the options. The book 'Anthropogeography' written by a) Humboldt b) Miss Semple c) Blache d) Ratzel	08					
	2)	People engaged in activities are called red-collar workers.a) Primaryb) Secondaryc) Tertiaryd) Quaternary						
	3)	is the sub branch of social geography. a) Transport geography b) Agriculture geography c) Population geography d) Marketing geography						
	4)	has discovered blood groups in the world. a) Charles Darwin b) Landsteiner c) William Davis d) Jems Hutton						
	5)	Griffith Taylor classified races of the world into groups. a) Five b) Six c) Seven d) Eight						
	6)	is worlds most populated and most widely distributed religion. a) Islam b) Christian c) Hindu d) Buddha						
	7)	Buddh Gaya and Sarnath are the important holy places of religion. a) Hindu b) Islam c) Buddha d) Christian						
	8)	Mecca and Madina are the important holy places of religion. a) Islam b) Buddha c) Hindu d) Christian						
Q.2	Ans a) b) c) d) e) f)	wer Any Four of the following: State the any two characteristics of Jainism. Any Two Physical Characteristics of Eskimo. State the region of the Negrito. What is human geography? Define race. Scientific nature of human geography.	08					
Q.3	Writ a) b) c)	te short notes on any Two of the following. Importance of Human geography. Characteristics of Christianity. Economy of Nagas.	08					

Set P

Q.4 Answer any Two of the following.

- a) Types of Economic activities.
- **b)** State the Characteristics of Sikhism.
- c) Racial Classification.

Q.5 Answer any One of the following.

- a) Explain the Griffith Taylor's theory of human race.
- b) Explain the various language families in the world.

Sea	t	Set	P
NO.		B.Sc. (Semester - II) (CBCS) Examination: Oct/Nov - 2022	
		GEOLOGY (Paper – III)	
-	<u> </u>	Crystallography	40
Day Time	& Da e: 03:	ate: Friday, 17-02-2023 Max. Mark 00 PM To 05:00 PM	(s: 40
Instr	uctio	 ons: 1) All questions are compulsory. 2) Figures to the right indicate full marks. 3) Draw neat and labeled diagram wherever necessary. 	
Q.1	Cho	oose the correct alternatives from the options.	08
	1)	Cubic crystal system shows crystallographic axes.	
		a) 1 b) 3 c) 4 d) 2	
	2)	Normal prism has indices.	
		a) (111) b) (101) c) (110) d) (001)	
	3)	In hexagonal crystal system axes are horizontal.	
	-	a) 1 b) 2	
	4)	C) S U) 4 Tetragonal system shows planes and axes of symmetry	
	')	a) 5 b) 7	
	5)	c) 9 d) 13	
	5)	A substance having well developed faces, edges, interfacial angles with perfect atomic structure is called	
		a) mineral b) rock	
	6)	c) joint d) crystai	
	0)	a) 2 b) 4	
		c) 6 d) 8	
	7)	Basal pinacoid cuts axis.	
		c) inclined d) all the above	
	8)	Which one of the following is used to measure interfacial angle?	
		a) clinometers b) Brunton compass c) contact goniometer d) voltmeter	
0.2	A	awar Any Four of the following:	00
Q.2	ans a)	Define crystal.	08
	b)	What are closed and open forms?	
	d)	Planes of symmetry.	
	e)	What are interfacial angles?	
Q.3	Wri	ite short notes on any Two of the following.	08
	a)	Basal pinacoid	
	с)	Galena type form of cubic system	

Q.4 Answer any Two of the following.

- Describe the tetragonal crystal system. a)
- Describe the form of beryl type of hexagonal system. b)
- Describe the forms of barite types in orthorhombic system. C)

Q.5

- Answer any One of the following.a) Describe monoclinic crystal system.
- Describe the crystallographic axes of each crystal system. b)

NO.					
		B.Sc. (Semester - II) (CBCS) E ELECTRONICS Digital Elec	Exan S (Pa ctro	nination: Oct/Nov-20 aper-IV) nics)22
Day	& Da	te: Monday, 20-02-2023		1	Max. Marks: 40
lime	: 12:0	00 PM 16 02:00 PM			
Instr	uctio	 2) All questions are compulsory. 2) Figures to the right indicate full 3) Draw neat and labeled diagram 4) Use of logarithmic table and cal 	mari whe culat	ks. erever necessary. or is allowed.	
Q.1	Sele 1)	ect the correct alternatives from the The fan out of TTL device is	follo	owings.	08
	•	a) 10	b)	20	
	2)	c) SU	u) 1: 0		
	2)	a) 1	א וו h)	2	
		c) 3	d)	4	
	3)	T flip flop is a flip-flop.			
		a) Triggered	b)	Timed	
	Δ		a)	None of these	
	4)	a) Serial In Standard Out	h)	Standard In Serial Out	
		c) Standard In Standard Out	d)	Serial In Serial Out	
	5)	Mod 10 counter requires minimum _		flip-flops.	
		a) 3	b)	4	
	•	C) 5	a)	6	
	6)	a) 74138	h)	74153	
		c) 74147	d)	74193	
	7)	A four bit ring counter requires	_ nu	mber of flip-flops.	
		a) 2	b)	3	
	•	c) 4	d)	8	
	8)	IC /490 is used as	h)	flin-flon	
		c) multiplexer	d)	none of these	
Q.2	Ans	swer Any Four of the following:			08
	a) h)	Define propagation delay time in TTL Draw diagram of 4.1 Multiplexer			
	c)	Mention various types of Flip-flops.			
	d)	Enlist types of shift registers.			
	e)	What is ring counter?			

What is ring counter? What is asynchronous counter? f)

SLR-FZ-72 Set P

Seat No.

Q.3	 Write short notes on any Two of the following. a) RS flip-flop using NOR gates. b) TTL NAND gate c) Ring counter 	08
Q.4	 Answer any Two of the following. a) Explain BCD to Decimal decoder. b) Explain IC7490 as divide by 10 counter. c) Explain JK flipflop. 	08
Q.5	 Answer any One of the following. a) Explain Four bit asynchronous binary counter. b) Explain 1:8 demultiplexer with suitable diagram. 	08

Time: 12:00 PM To 02:00 PM **Instructions**: 1) All the guestions are compulsory 3) Figures to the right indicate full marks. 4) Use of stencil is allowed Rewrite the sentences by choosing the correct alternatives. Q.1 permanent or temporary shelter purpose, is known as b) settlement a) Industrialization d) None of them c) agriculture 2) a) Mixed b) commercial grain c) shifting d) Mediterranean b) commercial grain a) mixed c) shifting d) plantation 4) Whenever the houses are aligned along the sides of a road, railway line, river, canal or valley, then it is known as pattern. a) linear b) checker board c) triangular d) circular and semi-circular 5) Kalgurli and Kulgardi of Australia is famous for towns. a) Administrative b) mining c) cultural d) tourist

- 6) Ajmer and Haridwar are the towns in India a) administrative b) mining
 - c) religious d) tourist

is the topmost country in population in world since ancient time. 7)

- a) India b) China
- c) Canada d) U.S.A.
- The group of adults consists of _____ years in the developed countries. 8)
 - a) 15 to 55 b) 15 to 60 c) 15 to 65 d) 18 to 65

Q.2 Answer of the following any four.

- a) State the density of Population.
- Give the names of different types of agriculture. b)
- Concept of Sex ratio. C)
- State the types of rural pattern. d)
- Classify the agriculture on the basis of cropping pattern. e)
- State the shifting cultivation. f)

B.Sc. (Semester - II) (CBCS) Examination: Oct/Nov-2022 PHYSICAL GEOGRAPHY (Paper – IV) Human Geography – II

Day & Date: Monday, 20-02-2023

Seat

No.

- 2) Draw neat diagrams and give equations wherever necessary.
- 1) A group of houses/ huts built by man himself or group of human beings for
 - is a type of agriculture which involves both crops and livestock.

3) Rubber, tea, coffee, sugarcane are the main cash crops of agriculture.

SLR-FZ-74

Set

Max. Marks: 40

08

Q.3	 Write short notes on any two of the following. a) State the Demographic transition theory. b) Urbanization trend in India. c) State the various causes of imbalance sex ratio in India. 	08
Q.4	 Answer any two of the following. a) State the types of rural settlements. b) Describe the commercial grain farming type. c) State the various agricultural problems with special reference to India. 	08
Q.5	 Answer any one of the following. a) Classify the functional town with good examples. b) State the various factors affecting on agriculture. 	08

		Mineralogy	r – rv)
Day a Time	& Date : 03:00	: Monday, 20-02-2023) PM To 05:00 PM	Max. Marks: 40
Instr	uctior	 s: 1) All questions are compulsory. 2) Figures to the right indicate full mark 3) Draw neat diagram wherever necess 	sary.
Q.1	Choo 1)	ese the correct alternatives from the opWhich of the following mineral shows twira)Andalusiteb)b)c)Phlogopited)	tions. 08 hkling property? Calcite None of these
	2)	Mineral Garnet isa) anisotropicb)c) isotropicd)	pleochroic None of these
	3)	The refractive index of Canada balsm isa)1.658b)c)1.516d)	1.537 1.666
	4)	Uppernicol prism is called asa) polarizerb)c) condenserd)	analyzer pillar
	5)	Feldspar showssets of cleavagea)Ib)b)c)IIId)	s. II None
	6)	mineral belongs to the mica grou a) Orthoclase b) c) Biotite d)	p. Plagioclase All of these
	7)	Hardness of talc is a) 1 b) c) 7 d)	5 8
	8)	Talc mineral having hardness.a) 1b)c) 5d)	7 6
Q.2	Ansv a) b) c) d) e)	ver Any Four of the following: Define streak of mineral? How can it deter Name the parts of lowernicol prism? Define fracture of minerals. Colour of minerals. What is pleochroism of minerals.	08 mine.
Q.3	Write a) b) c)	e short notes on any Two of the followir specific gravity Twinkling of minerals Relief of minerals	ıg. 08

Seat No.

B.Sc. (Semester - II) (CBCS) Examination: Oct/Nov-2022 GEOLOGY (Paper – IV) Mineralogy

SLR-FZ-75

Set P

Q.4 Answer any Two of the following.

- a) Describe the form of mineral in physical properties of minerals.
- b) Describe the isotropic and anisotropic minerals.
- c) Describe the different chemical bonding in minerals.

Q.5 Answer any One of the following.

- a) Describe luster, cleavage and Hardness of minerals.
- b) Describe optical properties form, twinning and extension of minerals.

08

Seat No.		Set	Ρ				
	B.Sc. (Semester - III) (CBCS) Examination: Oct/Nov-2022 CHEMISTRY (Paper - V) Organic Chemistry						
Day & Time:	& Date : 09:00	e: Tuesday, 21-02-2023 Max. Marks: 0 AM To 11:00 AM	40				
Instru	uctior	ns: 1) All questions are compulsory.2) Figures to the right indicate full marks.					
Q.1	Choc 1)	ose the correct alternatives from the options. Relative configuration is also known as a) 'D' and 'L' Nomenclature b) 'R' and 'S' Nomenclature c) 'E' and 'Z' Nomenclature d) None of these	08				
	2)	 Hypsochromic shift is a shift of absorption maximum to a a) longer wavelength b) decrease in the intensity of absorption c) shorter wavelength d) none of these 					
	3)	Hell-Volhard-Zelinsky reaction is used to prepare a) unsaturated acids b) dicarboxylic acids c) halo acids d) hydroxy acids					
	4)	Preparation of ether by reacting sodium phenoxide with methyl halide is known as a) Williamson's synthesis b) Wurtz reaction c) Kolbe's reaction d) Perkin reaction					
	5)	Phenyl hydrazine is obtained by the reduction ofa) anilineb) m- dinitrobenzenec) nitrobenzened) benzene diazonium chloride					
	6)	Succinic acid on heating above its melting point sublimes largely and rest is converted in to a) malic acid b) succinic anhydride c) phthalic anhydride d) succinamide					
	7)	Acid catalysed hydrolysis of ethylene oxide givesa)HO-CH2-CH2-CH2-OHb)CH3-CH2-CH2-OHc)CH3-CH2OHd)HO-CH2-CH2-OH					
	8)	When phenol on treatment with allyl bromide in presence of aq. Sodiumhydroxide givesa) anisoleb) ethyl phenyl etherc) phenyl allyl etherd) phenyl bromide					
Q.2	Ansv a)	wer the following questions. (Any Four) Assign the 'R' and 'S' configuration to the following. i) CHO ii) CH_3 $HOOC - C - CH_3$ $C_2H_5 - C - OH$ OH H	80				

Г

- b) How will you prepare ethylene glycol from
 - i) ethylene
 - ii) ethylene dibromide
- c) Calculate λ_{max} for the following diene and enone by using Woodward-Fieser rule:



- d) What is the action of
 - i) H⁺/HgSO₄/H₂SO₄
 - ii) Na/ C_2H_5OH on acrylic acid
- e) Discuss the structure and reactivity of carbonyl group.
- f) How will you synthesize malic acid from
 - i) maleic acid
 - ii) α bromo succinic acid

Q.3 Write short notes. (Any Two)

- a) Discuss the mechanism involved in Perkin reaction.
- **b)** With suitable example, explain the following terms used in UV spectroscopy:
 - i) Chromophore
 - ii) Auxochrome
 - iii) Bathochromic shift
 - iv) Hyperchromic shift
- c) How will you prepare Congo red dye?

Q.4 Answer the following questions. (Any Two)

- a) Explain different types of electronic transitions involved in UV spectroscopy.
- b) An organic methoxy compound having molecular formula C₁₁H₉NO₃ undergo Zeisel's estimation and gave 2.52 x 10⁻⁴ kg of silver iodide. Methoxy compound used is 2.18 x 10⁻⁴ kg. Calculate the percentage and number of methoxy groups per molecule.
- c) What are products of the following:



80



Q.5 Answer the following question. (Any One)

- a) What is conformational isomerism? Explain conformational analysis of n-butane with the help of energy profile diagram.
- **b)** What are Pinacols? How they are prepared? Give the Pinacol-Pinacolone rearrangement reaction with mechanism.

Seat	
No.	

B.Sc. (Semester - III) (CBCS) Examination: Oct/Nov-2022 COMPUTER SCIENCE (Paper - V) Data Structure

Day & Date: Saturday, 04-03-2023 Time: 09:00 AM To 11:00 AM

Instructions: 1) All questions are compulsory.

- 2) Draw neat diagrams and give equations wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Use of logarithmic table and calculator is allowed.

Q.1 Choose the correct alternatives from the options.

- 1) The Data structure used in standard implementation of Breadth First Search is?
 - a) Stack b) Queue
 - c) Linked List d) Tree
- 2) Which of the following linked list below have last node of the list pointing to the first node?
 - a) circular doubly linked list b)
 - c) circular singly linked list
- b) circular linked listd) doubly linked list
- 3) Which of the following sorting procedures is the slowest?
 - a) Quick sortb) Heap sortc) Shell sortd) Bubble sort
- 4) The balance factor of a node in a binary tree is defined as
 - a) addition of heights of left and right subtrees
 - b) height of right subtree minus height of left subtree
 - c) height of left subtree minus height of right subtree
 - d) height of right subtree minus one
- 5) The in order traversal of tree will yield a sorted listing of elements of tree in
 - a) Binary trees

c) Heaps

- b) Binary search trees
- d) None of above

6) The dummy header in linked list contain_____.

- a) first record of the actual data
- b) Last record of the actual data
- c) Pointer to the last record of the actual data
- d) None of the above

7) A queue data-structure can be used for _____

- a) expression parsing b) recursion
- c) resource allocation d) all of the above
- If every node u in G is adjacent to every other node v in G, A graph is said to be _____.
 - a) isolated
 - c) finite

- b) complete
- d) strongly connected

Max. Marks: 40

Set

Q.2	Ans 1) 2) 3) 4) 5) 6)	swer the following questions. (Any Four) Define dequeue. What is Binary tree? List out various types of binary trees. What is push and pop in stack? What is prefix expression A + (B /C) * D-E + F. What is doubly linked list? What binary search tree?	08
Q.3	Wri 1) 2) 3)	te short note on any two of the following. AVL Tree. Selection Sort technique. Priority Queue.	08
Q.4	Ans 1) 2) 3)	swer any two of the following. What is Binary Search tree? Explain the process to insert new node in binary search tree with its algorithm. Write a program of Insertion sort. What is linked list? Explain various types of linked list.	08
Q.5	Ans	swer any ONE of the following.	08

a) Write a program for all traversal method of binary search tree.b) Write program of binary search.

		3 4) Draw neat and labeled diagram) Use of logarithmic table and cal (At. Wts.: H=1, C=12, O=16, N=	and culat 14, I	give equations wherever necess for is allowed. Na=23, C1=35.5)
 Choose the correct alternatives from the options. 1) Effective atomic number (EAN) of iron in [Fe(CO)₅] is 					tions. [Fe(CO)₅] is
		a) c)	34 37	d)	36 35
	2)	Glyo	cine has coordinating gro	up.	
		a)	one	b)	two
		C)	three	d)	zero
	3)	Amr	monia is		
		a)	Hard acid	b)	Soft base
		C)	Hard base	d)	Soft acid
	4)		is the oxidation state of Cr in	K ₂ C	r ₂ O ₇ .
		a)	+7	b)	+6
		C)	+5	d)	+4
	5)	elec	is the element of second tran	sitio	n series which show anomalous
		a)	Technetium	b)	Yttrium
		c)	Cadmium	d)	Palladium
	6)	DM	G is selective reagent for	ion	
	0)	a)	Ti ³⁺	b)	Bi ³⁺
		c)	Mg ²⁺	d)	Ni ²⁺
	7)	Lew	vis base is donor.		
	- /	a)	electron	b)	neutron
		c)	electron pair	d)	neutron pair
	8)	The a) b) c) d)	IUPAC nomenclature of [Cu(NHa Tetraamminecopper(II) sulphate Coppertetraammine (II)sulphate Tetraammine copper (I) sulphate None of these	s)4]S e	O4 is

B.Sc. (Semester - III) (CBCS) Examination: Oct/Nov-2022 CHÉMISTRÝ (Paper – VI) **Inorganic Chemistry**

Day & Date: Wednesday, 22-02-2023 Time: 09:00 AM To 11:00 AM

Seat

No.

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
 - ssary.

Q.

SLR-FZ-78

Set Ρ

Max. Marks: 40
08

08

08

08

Answer Any Four of the following: Q.2

Define: a) Ligand

i)

- Coordination number ii)
- What are the causes of colouration in transition metal complexes? b)
- C) State Pearson's principle.
- Write the structure of EDTA and Give its anyone application. d)
- What is geometrical isomerism? Give its anyone example. e)
- Write the observed electronic configuration of Platinum and Gold. f)

Q.3 Write short notes on any Two of the following.

- Difference between double salt and complex salt. a)
- b) Structural requirements for chelate formation.
- Catalytic properties of transition elements with examples. C)

Answer any Two of the following. Q.4

- Give the postulates of Werner's theory and explain the structure of a) CoC1₃·3NH₃.
- Give the classification of acids and bases as hard and soft acids and bases b) with example.
- Compare first transition series with second and third transition series w.r.to C) reactivity, stability of complexes, stability of oxidation state and magnetic behavior.

Answer any One of the following. Q.5

- On the basis of VBT, explain the formation of [Fe(CN)₆]³⁻ complex ion. a) Comment on its stability and magnetic property.
- What are transition elements? Give the symbol, name, atomic number and b) electronic configuration of elements of first transition series.

Quadratic Complexity

B.Sc. (Semester	- III) (CBCS) Examination: Oc
CON	PUTER SCIENCE (Paper - VI)

Design Analysis and Algorithm

Day & Date: Monday, 06-03-2023 Time: 09:00 AM To 11:00 AM

Seat No.

Instructions: 1) All questions are compulsory.

- 2) Draw neat diagrams and give equations wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Use of logarithmic table and calculator is allowed.

Q.1 Multiple Choice Questions.

- 1) Which of following is/are not a type of Complexities of an Algorithm?
 - a) Logarithmic Complexity
 - c) Exponential Complexity d) None of these
- 2) Which of the notation is used to express the lower bound of an algorithms running time?
 - a) Big -Oh notation

c) Omega Notation

b) Theta Notation d) All of these

b)

- 3) What is the best case complexity of selection sort?
 - a) O (n log n) b) O (log n)
 - c) O (n) d) O(n2)

4) What are the true about an Algorithm?

- a) To understand the basic idea of the problem.
- b) To find an approach to solve the problem.
- c) To improve the efficiency of existing techniques.
- d) All of these
- 5) 0/1 Knapsack Problem can be solved by _____ approach.
 - a) Greedy algorithm b) Divide and conquer
 - c) Dynamic programming d) All of these

6) Huffman Code is an example of _____

- a) Divide and conquer algorithm b) Greedy Algorithm
- c) Dynamic programming d) All of these
- 7) What is the objective of knapsack problem ____?
 - a) To get maximum total value in the knapsack
 - b) To get minimum total value in the knapsack
 - c) To get maximum weight in the knapsak
 - d) To get maximum weight in the knapsack
- 8) Bellman Ford Algorithm is an example for _____.
 - a) Dynamic Programming
 - b) single-source shortest path algorithm
 - c) Linear Programming
 - d) Branch and Bound Algorithm

Max. Marks: 40

80

on: Oct/Nov-2022

Q.2	Ans 1) 2) 3) 4) 5) 6)	wer the following questions. (Any Four) What is Algorithm? What is Time Complexity? What is space Complexity? What is Graph? What is Huffman Code? What is Tower of Hanoi problem?	08
Q.3	Writ 1) 2) 3)	te short note on any two of the following. Asymptotic notation Divide and Conquer Algorithm Branch and bound	08
Q.4	Ans 1) 2) 3)	wer any two of the following. What is Knapsack Problem? Explain 0/1 Knapsack Problem with example. Explain the Eight queens problem with example. Hamiltonian Circuit Problems.	08
Q.5	Ans a) b)	wer any one of the following. Explain Rabin-Karp algorithm with example. What is Travelling Sales Person Problem? Explain with example.	08

	100		I_1
C)	$\Phi = T_1 I \omega$	d)	$\Phi = T_1 \omega$
The a) c)	gradient of scalar field is Scalar constant	b) d)	Vector nonzero
Louo a) c)	d speaker converts energ optical mechanical	y int b) d)	o sound energy. electrical heat
The a) c)	C.G.S. unit of viscosity is Poise gm cm/s	b) d)	kg/ms N/S ²
The a) c)	rise and fall of axis of rotation of a nutation rotation	a rot b) d)	ating body is called precession vibration
lf	$(\vec{B} \ge \vec{C}) = 0$ then vectors \vec{A} , \vec{B} , and collinear antiparallel	nd <i>Ĉ</i> b) d)	are parallel coplanar
Ben a) b) c) d)	ding moment of a beam is Directly proportional to the modu Inversely proportional to the mod Directly proportional to the radius Inversely proportional to the radi	ulus o dulus s of o us o	of rigidity s of rigidity curvature f curvature
By g a) c)	iving torsional oscillations to the s Young's modulus modulus of rigidity	sprin b) d)	g, we can determine Bulk modulus Poisson's ratio

Seat No.

B.Sc. (Semester - III) (CBCS) Examination: Oct/Nov-2022 PHYSICS (Paper - V) **General Physics and Sound**

3) Draw neat diagram and give equations wherever necessary.

b) $\Phi = \frac{I\omega}{T}$

(At. Wts.: H=1, C=12, O=16, N=14, Na=23, C1=35.5)

4) Use of logarithmic table and calculator is allowed.

2) Figures to the right indicate full marks.

Choose the correct alternatives from the options.

The rate of precession ϕ is _____.

Day & Date: Thursday, 23-02-2023 Time: 09:00 AM To 11:00 AM

Instructions: 1) All questions are compulsory.

 $\Phi = \frac{T_1}{L_1}$

Q.1

1)

2)

3)

4)

5)

6)

7)

8)

a)

Max. Marks: 40

SLR-FZ-80

08

Page 1 of 2

Set Ρ

What is precession? a) b) State Lanchester's rule. Define neutral surface and neutral axis. C) Define transducers and give its examples. d) What is a scalar field? Give one example. e) Define critical velocity of a rolling disc. f) Q.3 Write short notes on any Two of the following. Ostwald's viscometer a) Gyroscope b) C) Carbon microphone Answer any Two of the following. Q.4 Define vector triple product and obtain an expression for it. a) Derive Sabine's formula for reverberation time. b) Obtain an expression for depression produced at the end of a bar forming a C) cantilever. Answer any One of the following. Q.5

- Define gyrostatic pendulum and obtain an expression for its period. a)
- Give the construction of Searle²s viscometer. Explain how it can be used to b) determine Viscosity of viscous liquids. Obtain an expression for coefficient of viscosity.

Q.2 Answer Any Four of the following:

08

08

08

Seat No. B.Sc. (Semester - III) (CBCS) Examination: Oct/Nov-2022 **BIO-CHEMISTRY** (Paper – I)

Biomolecules Day & Date: Wednesday, 08-03-2023 Time: 09:00 AM To 11:00 AM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Draw neat and labeled diagram and give equations wherever necessary.



- Write two components of nucleic acid with example. e)
- What is the biochemical role of niacin and pantothenic acid? f)

SLR-FZ-81

Max. Marks: 40

Set

Page 2 of 2

Q.3	Writ a) b) c)	e short notes on any Two of the following. Explain fluid mosaic model of plasma membrane. Write the structure and role of Starch. Explain Watson Crick model of DNA.	08
Q.4	Ans a) b) c)	wer any Two of the following. Explain the classification of enzymes. Write the structure and functions of tRNA. Write the deficiency disorders of thiamine and pyridoxine.	08
Q.5	Ans a) b)	wer any One of the following. Write the classification of carbohydrates and role of Maltose and Sucrose. Explain in detail types of proteins with examples.	08

Seat	
No.	

B.Sc. (Semester - III) (CBCS) Examination: Oct/Nov-2022 PLANT PROTECTION (Paper – I)

Major crops and methods of integrated plant protection

Day & Date: Wednesday, 08-03-2023 Time: 09:00 AM To 11:00 AM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Draw neat diagram and give equations wherever necessary.

08 Q.1 Choose the correct alternatives from the options. Plant protection means 1) a) Protection of plants from sunlight b) Protection of plants from wind c) Practice of management of pest, disease and weeds None of these d) Jawar belongs to family _____. 2) a) Solanaceae b) Poaceae Graminae d) Malvaceae C) 3) Glycene max is a botanical name of _ b) Sunflower Tur a) Soyabean d) Sugarcane C) Country Africa is a origin of _____. 4) b) Sugarcane Jawar a) Tur d) Papaya C) Ethanol byproduct obtained from ____ 5) Sovabean Sugarcane b) a) G. nut d) Sunflower C) 6) Ripened grape berries are used for preparation of a) Kishmish b) Floor d) Salads C) Asawa 7) _ is used as a algal biofertilizer. a) Spirogyra b) Anabaena Oscillations d) None of these C) 8) Legal control of disease transfer or disease caused Pathogen are known as . Resistance b) Quarantine a) Management d) None of these C) Q.2 Answer Any Four of the following: 08

- a) Give economic importance of Jawar.
 - b) What is rope bagging?
 - c) Give any four uses of fungicides.
 - d) Give economic importance of brinjal.
 - e) Write in brief preparation of 'Gulabjal'.

SLR-FZ-82

Max. Marks: 40

Set | F

		SLR-FZ-	82
Q.3	Wri a) b) c)	i te short notes on any Two of the following. Biological control of disease. Give role of organic farming in agriculture. Write on 'applications of biofertilizers'.	80
Q.4	Ans a) b) c)	swer any Two of the following. Explain in brief, need of plant quarantine in India. What is soil solarization? Uses of sticky bands.	08
Q.5	Ans	swer any One of the following.	08
	a) b)	Describe the gross morphology, identification, soil type, tillage, seed rate and spacing, intercultural operations, fertilizers, irrigation, intercropping, yield and economics importance of Soyabean. Describe the gross morphology, identification, soil type, tillage, seed rate	
	-	and spacing, intercultural operations, fertilizers, irrigation, intercropping, yield and economic importance of Rose.	

09:00) AM	To 11:00 AM		
iction	(1) 2) 3) 4)	All questions are compulsory. Draw neat diagrams and give eq Figures to the right indicate full r Use of log table and calculators	uatio mark is al	ons wherever necessary. s. lowed.
Choo 1)	se ti In C a) c)	ne correct alternatives from the olpitt's oscillator feedback i Positive Zero	opt s us b) d)	ions. ed. Negative One
2)	ln a a) c)	tank circuit the oscillations are Undamped Sawtooth	b) d)	damped Sinusoidal
3)	A dif a) c)	fferential amplifier is used to ampl d. c. signals both d.c. and a.c. signal	ify _ b) d)	a. c. signals None of these
4)	Nega a) c)	ative feedback in amplifier circuit increases the distortion increases the noise	b) d)	increases the bandwidth increases the instability
5)	UJT a) c)	has η = 0.6 and $R_{\scriptscriptstyle BB}$ = 10 K Ω , the 4K Ω 2 K Ω	valu b) d)	e of R _{B1} is 10KΩ 6KΩ
6)	A vo a) c)	Itage at which drain current (Id) le breakdown voltage pinch off voltage	evels b) d)	off is called reverse saturation voltage ohmic voltage
7)	The frequ a) c)	time period of waveform measure uency of wave is 50 Hz 150 Hz	ed or b) d)	n CRO is 10 ms the unknown 100 Hz 200 Hz
8)	IC 7 a) c)	805 is a volt regulator. +5 8	b) d)	-5 7
Aneu	uor a	ny four of the following question	ne	

B.Sc. (Semester - III) (CBCS) Examination: Oct/Nov-2022 PHYSICS (Paper - VI) **Electronics**

Day & Date: Friday, 24-02-2023 Time:

Seat

No.

Instru

Q.1

Q.2 Answer any four of the following questions.

- a) Draw and equivalent circuit of UJT.
- Write any two uses of CRO. b)
- What is feedback? Give its type. C)
- A power supply gives 30 volt output for no load condition, find the d) percentage of voltage regulation if the full load voltage is 25 volt.

SLR-FZ-83

Max. Marks: 40

80

Set Ρ

- e) Calculate the frequency of oscillation in Phase shift oscillator if R = 100 K Ω and C = 0.05 μ F.
- f) Draw diagram of CRT.

Q.3 Write short notes on any two of the following.

- a) What are the different methods of biasing the transistor? Explain voltage divider bias method with circuit analysis.
- **b)** Define the term land regulation and load regulation.
- c) In UJT relaxation oscillator charging resistance is 33 K Ω and capacitor is 0.01 μ F. Calculate the frequency of saw tooth waveform produced by relaxation oscillator (Given $\eta = 0.6$).

Q.4 Answer any two of the following questions.

- a) When CRO is used to determine unknown frequency, the study wave of pattern on 1 ms knob gives 10 divisions on the horizontal scale as wavelength. What is the unknown frequency?
- **b)** Explain the construction of FET and its characteristics with necessary diagram.
- c) Draw block diagram of digital multimeter and explain its applications.

Q.5 Answer any one of the following questions.

- a) Explain transistor RC coupled amplifier with special reference to advantages, disadvantages and applications.
- **b)** Draw circuit diagram of Heartly oscillator and explain its working.

08

08

80

Time	: 09:00) AM	To 11:00 AM		
Instru	uction	s: 1) 2) 3)	All questions are compulsory. Figures to the right indicate full r Draw neat diagrams and give e	nark e qua	s. tions wherever necessary.
Q.1	Multi 1)	ple C Mon a) c)	Choice Questions. Ioclonal antibodies are produced Hybridomas myeloma cells	by _ b) d)	Lymphocytes plasma cells
	2)	Elec a) c)	trophoresis is not used for the se nucleic acids amino acids	para b) d)	ition of Proteins Lipids
	3)	Broa a) b) c) d)	adford essay is applied for isolation of DNA protein purification separation of proteins determination of protein concent	tratio	n
	4)	Whio a) c)	ch radiation source has electrode Tungsten lamp Xenon Discharge Lamp	in c b) d)	onstruction of spectrophotome Hydrogen discharge lamp Mercury lamp
	5)	Amir a) c)	nobenzyloxymethyl filter paper is Southern blotting Western blotting	com b) d)	monly used for transfer in Northern blotting Eastern blotting
	6)	ln el a) c)	ectrophoresis, DNA will migrate t anode or negative electrode cathode or negative electrode	owa b) d)	rds anode or positive electrode cathode or positive electrode
	7)	lodir a) c)	ne number of cholesterol is 1 3	b) d)	2 4
	8)	The a) c)	are generally used as san aluminium tubes glass cuvettes	nple b) d)	holder in spectrophotometer. wooden blocks quartz cell
<u>_</u>	A 10 a		ny four of the following supplie		

- Q.2 Answer any four of the following questions.
 - Write the significance of monoclonal antibodies. a)
 - What is the meaning of transmittance and molar absorbance? b)
 - Write the advantages of HPLC. C)
 - What is BCA assay? d)

Seat

Day & Date: Thursday, 09-03-2023

No.

- Write the two advantages of spectrophotometer. e)
- Write the difference between acid value and saponification value. f)

B.Sc. (Semester - III) (CBCS) Examination: Oct/Nov-2022

Max. Marks: 40

SLR-FZ-84

Set

- 08

ometer? ٦

BIO-CHEMISTRY (Paper – II) Biochemical Techniques

Q.3	 Write short notes on any two of the following. a) Write the working and applications of photoelectric colorimeter. b) How chromatoplate is prepared in TLC? Explain sample application process in TLC. 				
	C)	Write note on factors affecting electrophone mobility.			
Q.4	Ans a) b) c)	 Answer any two of the following questions. a) Write the technique of polymerase chain reaction. b) Explain Zak's method for cholesterol estimation. c) Write note on southern blotting technique. 			
Q.5	Ans a)	wer any one of the following questions. Write the principle, technique and applications of Gel permeation	08		

chromatography.b) Write principle, technique and applications of 2-D gel electrophoresis.

		SLR-FZ-88	5
Seat No.		Set P)
		B.Sc. (Semester – III) (CBCS) Examination: Oct/Nov-2022 PLANT PROTECTION (Paper – II) Crop Diseases and Their Management	
Day & Time:	k Dat 09:0	e: Thursday, 09-03-2023 Max. Marks: 40 0 AM To 11:00 AM	C
Instru	uctio	 ns: 1) All questions are compulsory. 2) Figures to the right indicate full marks. 3) Draw neat and labeled diagram wherever necessary. 	
Q.1	Cho 1)	ose the correct alternatives from the options.03The ability of pathogen to cause the disease is known asa)a)Pathogenesisb)Pathogenicityc)Immunityd)Susceptibility	B
	2)	Diseases spreads throughout entire plant body. a) Localised b) Systemic c) Epidemic d) Sporadic	
	3)	A sooty or charcoal- like powdery mass is a) Rust b) Smut c) Scab d) Blotch	
	4)	disease is classified on the basis of symptoms.a) Infectiousb) Non- infectiousc) Chlorosisd) None of these	
	5)	Causal organism of Grain smut of jowar is a) Sphaceloiheca sorghi b) Xanthomonus citri c) MLOS d) Hibiscus I	
	6)	Phakospora pachyrrhiza, is causal organism of host plant.a) Groundnutb) Soybeanc) Okrad) Cucurbit	
	7)	Keeping inoculated micro-organisms on suitable medium at particulartemperature and time is process called asa) Isolationb) Infectionc) A&Bd) Incubation	
	8)	The entry of plants, plant parts and their products is conditioned, regulatedand restricted at national and international levels througha) National Actb) International Actc) Quarantine Actd) None of these	
Q.2	Ans a) b) c) d) e)	wer Any Four of the following: 03 Etiology Infection Diseases Write the causal organism of Rust of Soybean. Mention any two symptoms of viral disease of okra plant.	8

Q.3	Write a) b) c)	e short notes on any Two of the following. Methods of inoculation Control measures of Downy mildew of Graps. Kotch 's Postulates	80
Q.4	Ansv a) b) c)	ver any Two of the following. Give an account on classification of plant diseases. Write on Assessment of diseases in crop plant. Describe the Little leaf of Brinjal.	08
Q.5	Ansv a) b)	ver any One of the following. Write the Principles of plant disease management. Describe in details about Grain smut of jawar.	80

B.Sc. (Semester - III) (CBCS) Examination: Oct/Nov-2022 STATISTICS (Paper - V) Probability Distributions - I								
Day a Time	Day & Date: Saturday, 25-02-2023 Max. Marks: 40							
Instr	uction	i s: 1) 2)	All Questions are compulsory. Figures to the right indicate full n	nark	S.			
Q.1	Choc 1)	ose tl If X i is a) c)	he correct alternatives from the s a Poisson variate with variance 2 5	opt 6, th b) d)	ions. 08 nen the third central moment of X 3 6			
	2)	lf X a) c)	is a geometric r.v. then $P(X > 3 P[X > 1]$ P[X > 3]/P[X > 2]	/ X > b) d)	> 2) is equal to P[X > 3] P[X > 2]			
	3)	lf X a) c)	= number of failures before 5 th su NB((5,p) Poisson (p)	b) d)	ss then X follows B(5,p) Geometric (1/5)			
	4)	Let (usua a) c)	(X_1, X_2, X_3, X_4) be a random vector al notations, then $V(X_4)$ is nP_4 $nP_4(1 - P_4)$	b) d)	ows multinomial distribution with $\begin{array}{c} 4P_4\\ P_4(1-P_4) \end{array}$			
	5)	lf X i a) c)	s a continuous r.v. then $\frac{1}{E(X)}$ is us arithmetic mean harmonic mean	eful b) d)	to find median None of these			
	6)	The then a) c)	distribution function of X is $F(x) = \begin{cases} \sqrt{x}, \\ 0, \end{cases}$ the pdf of X is $\frac{1}{2\sqrt{x}} \\ x \end{cases}$	0 <i>ot</i> b) d)	< x < 1 herwise \sqrt{x} None of these			
	7)	lf (X a) c)	(Y) is a continuous bivariate rando 0 Var $(X - Y)$	om v b) d)	variable then $E(XY) - E(X)E(Y)$ is Corr(X, Y) Cov(X, Y)			
	8)	ln us a) c)	sual notations $E(X Y = y)$ is called Regression line of X on Y Corr(X, Y)	d the b) d)	e Regression line of <i>Y</i> on <i>X</i> None of these			

Seat No. B Sc. (Somostor) SLR-FZ-86

Set P

Q.2 Attempt any four of the following.

- a) Define Poisson distribution.
- **b)** State mean and variance of geometric distribution.
- c) Define negative binomial distribution.
- d) Define Harmonic mean for continuous random variable *X*.
- e) State multiplication theorem on expectation.

Q.3 Attempt any two of the following questions.

- a) If X is a Poisson variate with mean λ and if P[X = 2] = P[X = 1], then find a) λ b) $P(X \ge 4)$
- b) Find c.d.f. of a geometric distribution with parameter p and use it to find c.d.f. of waiting time distribution with parameter p.
- c) Verify whether the function

f(x) = x; $0 \le x \le$ = 2-x; $1 \le x \le 2$

Is a p.d.f. of a continuous r.v. X. Also find mean.

Q.4 Attempt any two of the following questions.

- a) Find moment generating function of negative binomial distribution.
- b) Obtain mean and variance of waiting time distribution.
- c) If a r.v. X has p.d.f.

f(x) = 2x ; 0 < x ; otherwise

find mean and variance of X.

Q.5 Answer any one of the following questions.

- a) Show that Poisson distribution is a limiting case of binomial distribution.
- **b)** Let *X* and *Y* be continuous random variables having joint p.d.f.

f(x, y) = 12 xy (1 - y); 0 < x < 1, 0 < y < 1

= 0 ; otherwise

Show that *X* and *Y* are independent.

08

08

08

08

		B.Sc. (Semester - III) (C METEOR C	BCS) Exam ROLOGY (Pa Climatology	ination: Oct/Nov-2 aper - I)	022
Day Time	& Dat : 09:0	e: Friday, 10-03-2023 0 AM To 11:00 AM			Max. Marks: 40
Instr	uctio	 ns: 1) All questions are computed in the second computed in	ulsory. d give equatio cate full marks and calculato	ns wherever necessary r is allowed.	<u>.</u>
Q.1	Cho 1)	ose the correct alternatives Ozone occupies % g a) 0.06 c) 0.03	and rewrite s gaseous in the b) d)	entences. atmosphere. 12 0.00006	08
	2)	The coriolis force isi a) strongest c) strong	in high latitude b) d)	es. weak absent	
	3)	An is an immense bo a) front c) frontolysis	ody of air. b) d)	air mass humidity	
	4)	Winds are called as a) Local c) Regional	primary circula b) d)	ation. Seasonal planetary	
	5)	Latitudes called as h a) 10° to 20° c) 20° to 30°	orse latitude. b) d)	15° to 25° 25° to 35°	
	6)	The line of equal surface pre a) isotherm c) isohaline	ssure of atmo b) d)	sphere is called as isohytes isobar	
	7)	Typhoon cyclone exists in a) Japan c) Australia	b) d)	China USA	
	8)	Tamil Nadu receives rainfall a) monsoon c) seasonal	during winter (b) d)	due to advancing monsoon retreat monsoon	
Q.2	Ans 1) 2) 3) 4) 5) 6)	wer the following questions. What is mean by general circl Types of air masses. Regional climatology? Define climatology? Elements of weather. Define monsoon.	. (Any Four) ulation?		08

Seat	
No.	

Set P

Q.3	Wri 1) 2) 3)	te short note on any two of the following. Composition of the atmosphere. Explain branches of Climatology. Sources region of air masses.	08
Q.4	Ans 1) 2) 3)	wer any two of the following. Explain the life cycle of cyclone. Discuss on Climatic records and statistics. Discuss on upper air circulation pattern.	08
Q.5	Ans a) b)	wer any ONE of the following. Explain the planetary wind system. Give an account of North eastern monsoon in India.	08

Seat No.					Set	Ρ			
	B.Sc. (Semester - III) (CBCS) Examination: Oct/Nov-2022 GEO - CHEMISTRY (Paper – I) Introduction to Geochemistry								
Day & Time:	Day & Date: Friday, 10-03-2023 Max. Marks: 40 Time: 09:00 AM To 11:00 AM Max. Marks: 40								
Instru	uctions: 1) All question 2) Draw neat 3) Figures to	ns are compulsory. diagrams and give equ the right indicate full ma	atior arks.	ns wherever necessary.					
Q.1	Choose the correct a 1) Co-ordination nu a) 6 c) 2 2) The detted line i	alternatives from the c umber of NaCl crystal is b c n the phase diagram re	optic S D) d)	ons. 8 4		08			
	a) stable equil c) metastable	ibrium b) equilibrium d)	epres))	true equilibrium false equilibrium					
	Which of the folla) cubicc) triclinic	owing is not a crystal s b c	ystei o) d)	m? trigonal hexaclinic					
	4) The clay mineraa) chloritec) montamorill	I Al4Si4O10(OH)8 is kr k onite	nown c) d)	as muscovite kaolinite					
	5) Phase rule wasa) Nerstc) Arrenius	first discovered by b c	 D) d)	Le Chatclier Gibb's					
	6) <u>a</u> is the ex a) gold c) silver	ample of electropositiv لا ر	ve co c) d)	lloid. Iead platinum					
	7) The phase rule a) $F = C - P$ c) $F - P + C + C$	is expressed as + 2	 0) d)	F + C = P + 2 F + C = P + 1					
	8) A saturation solea) onec) three	ution of NaCl is a b c	 c) d)	ohase system. two zero					
Q.2	 Answer the following 1) What is radius radius radius 2) What is an organism 3) What is minerate 4) What are colloids 5) What are states 6) What are kinds of 	g questions. (Any Fou tio? iic compound? gical phase rule? s? of matter? f colloidal system?	ır)			08			

Write short note on any two of the following. Q.3 80 Write the classification of organic compounds. 1) Explain one component (water and sulphur) system. 2) Write brief idea of radii of common ions in rock forming minerals. 3) Q.4 Answer any two of the following. 80 Explain Gibbs phase rule. 1) 2) Explain electrical, mechanical properties of colloids. Explain clay minerals as colloids. 3) Answer any one of the following. 08 Q.5 Explain lattice energy of crystals, coordination number and structure of a) Sodium Chloride. What is homologous series and describe empirical and molecular formula of b) organic compound.

Seat No.								Set	Ρ
	I	B.Sc	. (Semest	er - III) (CBC ZOOLOG Cell	CS) Ex SY (Pa Biolo	am pe	nination: Oct/Nov- r – V)	2022	
Day & Time:	Date 09:00	e: Frid D AM	ay, 10-03-20 To 11:00 AM	осл 023 И		.97		Max. Marks	: 40
Instru	ctior	is: 1) 2) 3)	All question Figures to t Draw neat a	s are compulso he right indicat and labeled dia	ory. œ full m Igram w	ark /her	s. rever necessary.		
Q.1	Choc 1)	ose th Micro a) c)	ne correct a otubules are Actin protei Myosin prot	Iternatives fro made up of n ein	om the	opt b) d)	ions. Globulin protein Tubulin protein		08
	2)	The a) c)	nuclear envo Karyotheca Monotheca	elope is also ca	alled as	b) d)	Atheca Diplotheca		
	3)	Histo a) c)	ones are pre Lysosomes Nucleosom	sent in es		b) d)	Spherosomes Cell membrane		
	4)	The a) c)	prokaryotic Distinct chr Absence of	cells are chara omosome nuclear memb	cterised orane	d by b) d)	Absence of chromati Presence of nuclear	n membrane	
	5)	In m subs a) c)	eiosis pairin stage Leptotene Pachytene	g of homologus	s chrom	noso b) d)	omes takes place duri Zygotene Diplotene	ng	
	6)	Fluic a) c)	l mosaic mo Singer and Darson- Da	del of plasma r Nicolson nielli	membra	ane b) d)	was proposed by Robertson Landsteiner		
	7)	The a) c)	energy gene MTP GTP	erated from mit	ochond	ria b) d)	is called ATP ADP		
	8)	In ce a) c)	ells pl Endoplasm Mitochondr	ays important r ic reticulum ia	ole in p	orote b) d)	ein synthesis. Golgi complex Lysosomes		
Q.2	Ansv a) b) c) d) e) f)	ver A Cell s Meios Euka Nucle Cell c Funct	ny Four of t signaling sis ryotic cell cosome cycle tions of golg	t he following: i apparatus					08

Q.3	Writ a) b) c)	e short notes on any Two of the following. Bacterial cell Functions of nucleus Fluid mosaic model of plasma membrane	08
Q.4	Ans a) b) c)	wer any Two of the following. Role of secondary messenger (cAMP). Define chromatin? Describe the euchromatin and heterochromatin. Describe the ultrastructure of mitochondria.	08
Q.5	Ans a) b)	wer any One of the following. Define cytoskeleton. Describe the structure and functions of microtubule. What are lysosomes? Describe the types and functions of lysosomes.	80

Ch	oose the correct alternatives f	rom the opt	ions.	C
1)	In usual notations		2	
	a) $b_{13.2} \times b_{31.2} = r_{13.2}$	b)	$b_{13.2} \times b_{31.2} = r_{13.2}^2$	
	c) $b_{13.2} \times b_{31.2} = r_{31.2}$	d)	$b_{13.2} \times b_{13.2} = r_{13.2}$	
2)	If Var $(X_{1,23}) = 0$ then $R_{1,23}$ is			
	a) 1	b)	0	
	c) 0.5	d)	None of these	
3)	The range of multiple correlat	ion coefficier	nt is	
	a) -1 to +1	b)	$0 \text{ to } \infty$	
	c) $-\infty$ to ∞	d)	0 to 1	
4)	The variance of the fraction de distribution.	efectives is c	btained by the variance of	_
	a) Binomial	b)	Poisson	
	c) Geometric	d)	Hypergeometric	
5)	 a) detect whether the process b) find the assignable causes c) reflect the selection of said d) all of the above 	ss is under s mple	tatistical quality control	
6)	The number of all possible sa population of 4 units is	mples of size	e two with replacement from a	
	a) 2	b)	4	
	c) 8	d)	16	
7)	The Corr (X_{13}, X_{23}) is			
	a) r ₁₂	b)	r ₁₃	
	c) r _{12.3}	d)	r _{13.2}	
•	The unknown constant of pop	ulation unde	r studv is called	
8)	a) a statistic	b)	an estimator	
8)		N 1		

- Distinguish between defect and defective. b)
- State the control limits for \overline{X} and R charts when standards are not given. C)
- Define partial correlation coefficient r_{12.3} d)
- Define chance causes of variation. e)
- Define a parameter. **f**)

Page 1 of 2

B.Sc. (Semester - III) (CBCS) Examination: Oct/Nov-2022 STÁTISTICS (Paper–VI)

Statistical Methods

Day & Date: Monday, 27-02-2023 Time: 09:00 AM To 11:00 AM

Seat

No.

Instructions: 1) All questions are compulsory.

- 2) Draw neat diagrams and give equations wherever necessary.

SLR-FZ-90



Max. Marks: 40

Q.3 Write short note on any two of the following.

- a) With usual notation , prove that $\sqrt{(b_{ij.k} * b_{ji.k})} = r_{ij.k}$
- **b)** Prove that, in SRSWR, expected value of product of population size and sample mean is population total.
- c) State different criteria for detecting lack of control of the process from a control chart.

Q.4 Answer any two of the following.

- a) With usual notation, prove that in SRSWR. $E(\overline{y}_n) = \overline{Y}_N$
- b) Obtain an expression for mean and variance of the residual X_{12.3}
- c) Explain the criteria of detecting lack of control chart.

Q.5 Answer any one of the following.

- a) Show that in case of SRSWOR expected value of the sample mean square is population mean square.
- b) Define residual, order of residual and state any two properties of residual.

08

80

Page **2** of **2**

Seat No.			Set	Ρ				
B.Sc. (Semester - III) (CBCS) Examination: Oct/Nov-2022 METEOROLOGY (Paper – II) General Meteorology								
Day 8 Time:	k Date 09:0	e: Saturday, 11-03-2023 I 00 AM To 11:00 AM	Max. Marks	: 40				
Instru	uction	 ns: 1) All questions are compulsory. 2) Figures to the right indicate full marks. 3) Draw neat diagrams and give equation wherever necessary. 4) Use of logarithmic table and calculator is allowed. 						
Q.1	Mult 1)	tiple Choice Questions. The atmospheric air is held to the Earth by a) Gravity b) Winds c) Clouds d) Rotation of the Earth		08				
	2)	Which of the following has the highest entropy? a) Hydrogen b) Diamond c) Liquid nitrogen d) Mercury						
	3)	The inertial frame of reference is frame of reference.a) an acceleratedb) a rotatingc) unacceleratedd) Both a and c						
	4)	The spatial variation in in density is generally called as a) pseudo force b) density gradient c) velocity gradient d) Coriolis force						
	5)	What device converts light energy to electrical energy?a) Photodiodeb) Photovoltaic cellc) Thermocoupled) Heliostats						
	6)	In solar cells material is used. a) Copper b) Silver c) Silicon d) Iron						
	7)	Which of the following is the correct expression for work? a) $W = \vec{F} \cdot \vec{S}$ b) $W = \vec{F} \times \vec{S}$ c) $W = \vec{r} \times \vec{F}$ d) $W = -(\vec{F} \times \vec{S})$						
	8)	In energy technology, worthless energy is called as a) synergy b) exergy c) anergy d) work						
Q.2	Ansv a) b) c) d) e)	wer Any Four of the following: Define atmosphere. Mention different layers of atmosphere. Mention effects of Coriolis force in nature. What is a solar cell? How chain and modules are formed using solar cells?		08				

e) How chain and modules are formed using solar cells?f) What are various sciences to which Energy science is related?

Q.3	Writ a) b) c)	e short notes on any Two of the following. Discuss effects of scattering. What is tephigram? What is pressure gradient force?	08
Q.4	Ans a) b) c)	wer any Two of the following. State and explain Buys-Ballot's law. What is geo-stationary satellite? Discuss energy, man and environment.	08
Q.5	Ans a) b)	wer any One of the following. Explain the radiation budget of earth and its atmosphere in relation with scattering, reflection and absorption. Explain the formation of ozone in the stratosphere.	08

NO.							
B.Sc. (Semester – III) (CBCS) Examination: Oct/Nov-2022 GEO-CHEMISTRY (Paper – II) Introduction to Solar System and Geo-Sphers							
Day & Time	& Date : 09:00	e: Saturday,) AM To 11:0	11-03-2023 00 AM	-		Max. Marks: 4	.0
Instru	uctior	is: 1) All que 2) Figure 3) Draw r	estions are compu s to the right indic neat labeled diagr	ilsory. cate full marks rams whereve	r necessary.		
Q.1	Choo 1)	ose the corr The elemer a) Helium c) Nitroge	rect alternatives f nt with maximum ด า en	from the opti cosmic abunda b) d)	ons. ance is Hydrogen Oxvaen	0	8
	2)	The upper of a) Sands c) Limest	crust of the earth tone tone	mainly consist b) d)	of Shale Igneous and metamo	orphic rocks	
	3)	Which one a) Iron m c) Stony	of the following ac eteorites meteorites	erolites are b) d)	? Iron-stony meteorites Metallic meteorites	5	
	4)	Elements w a) Sidero c) Lithopl	/hich readily-form phile hile	ions with an c b) d)	utermost 8-electron s Chalcophile Atmophile	hell are:	
	5)	The upper l a) Strator c) Mesop	imit of the stratos pause pause	phere is called b) d)	1 Tropopause Thermopause		
	6)	The major of a) C1, Br c) C1, Br	dissolved constitu , SO4, F , SO4, H3BO3	ent in the sea b) d)	water is C1, Br, SO ₄ , HCO ₃ C1, Br, SO ₄ , Mg		
	7)	Which plane a) Uranus c) Neptur	ets revolve in retro s and Venus ne and Pluto	ograde motior b) d)	n? Earth and Mars Mercury and Jupiter		
	8)	During seco used for a) oxidati c) carbor	ond stage of evolution ion nation	ution of the atr b) d)	nosphere, majority of reduction sulphate	oxygen was	
Q.2	Ansv a) b) c) d) e) f)	ver the follo Who coined What is trans Names of va What is pyrc Name the ty What is the o	wing questions. the concept of ge sition zone? ariable constituent blite? pes of siderites m composition of up	(Any Four) eochemical cla is of the atmos neteorites? per mantle?	ssification of the elem	ents?	8

Seat

Set P

Q.3 Write Short Notes. (Any Two)

- a) Explain in brief the cosmic abundance of elements.
- b) Discuss in short structure of atmosphere with neat labeled diagram.
- c) Write note on salinity and chlorinity of oceanic water.

Q.4 Answer the following questions. (Any Two)

- a) Explain the primary differentiation of the elements.
- b) Write short note on Aerolite type of meteorites.
- c) Describe in short, the atmospheric addition and losses during geologic time.

Q.5 Answer the following questions. (Any One)

- a) Explain in brief, geochemical classification of the elements.
- **b)** Discuss in brief the zonal structure of the earth with suitable diagram.

80

80

		ZOOLOGY (Paper – VI)	
_		Principles of Ecology	
Day a	& Date	te: Saturday, 11-03-2023 Max. N 00 AM To 11:00 AM	1arks: 40
Instr	uctior	 ons: 1) All questions are compulsory. 2) Figures to the right indicate full marks. 3) Draw neat and labeled diagram wherever necessary. 4) Use of calculator is allowed. 	
Q.1	Multi	tiple Choice questions.	08
	1)	Autecology is also called ecology. a) Species b) Habitat c) Niche d) Animal	
	2)	The study of groups of organisms in relation to their environment is calle	ed
		a) Autecology b) Synecology c) Ecosystem d) Community	
	3)	All animals eventually will die is an example of a) Natality b) Fecundity c) Mortality d) Fertility	
	4)	tables are used to construct survivorship curves.	
	-	a) Life b) Log c) Arithmetic d) Wooden	
	5)	Sharks, dolphins and seabirds often eat the same type of fish in ocean ecosystems which is example of an a) Interspecies competition b) Intra specific competition	
		c) Ecosystem d) Synecology	
	6)	Lotic and lentic are the types of ecosystem.a) Marine waterb) Fresh waterc) Grasslandd) Desert	
	7)	is a graphical representation of the energy found within the trop levels of an ecosystem. a) Survivorship curve b) Life table c) Ecological pyramid	hic
	8)	Ficus Religiosa (Peepal) tree is common example of a) Grassland b) Sacred groove c) Forest d) Hot spot	
Q.2	Ansv a) b) c)	Swer Any Four of the following: Define Mortality. Give an example of mutualism. General characteristics of lotic ecosystem.	08

- d)
- e)
- Food chain of pond ecosystem. What is ecological succession? Examples of hot spots in India. f)

Seat No.

RSc (Somostor III) (CBCS) Exa tion: Oct/Nov-2022

Q

Set P

Q.3	Wri	te short notes on any Two of the following.	08
	a)	Describe commensalism with suitable example.	
	b)	Give an account on effect of temperature on animals.	
	C)	Describe characteristics of grassland ecosystem.	
Q.4	Ans	swer any Two of the following.	08
	a)	Describe parental care in fishes.	
	b)	Give an account on community characteristics.	
	c)	Describe faunal adaptations in desert ecosystem.	
Q.5	Ans	swer any One of the following.	08
	a)	Give an account on survivorship curve.	
	b)	Describe the pond ecosystem.	
	•	· · ·	

B.Sc. (Semester – III) (CBCS) Examination: Oct/Nov-2022 MATHEMATICS (Paper – V) Differential Calculus

Day & Date: Tuesday, 28-02-2023 Time: 09:00 AM To 11:00 AM

Seat

No.

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Draw neat and labeled diagram wherever necessary.
- 4) Use of logarithmic table and calculator is allowed.

Q.1 Choose the correct alternatives from the options.1) The angle of intersection of curves is defined as the angle between their

	a) normals	b) radius vector
	c) tangents	d) none of these
2)	Polar sub normal aqual to	
2)	Polar sub normal equal to dr	dr
	a) $\frac{dr}{ds}$	b) $\frac{dr}{d\theta}$
	do	da
	c) $\frac{d\theta}{dt}$	d) $r \frac{dr}{dc}$
	' dr	, dθ
3)	The necessary condition for a function	on $f(x)$ to have maximum at $x = c$ is
	that	
	a) $f'(C) > 0$	b) $f'(C) = 0$
	c) $f'(C) < 0$	d) none of these
4)	The maximum value of $\sin x + \cos x$ i	is
	a) $\sqrt{2}$	b) 2
	c) 1	d) $1 + \sqrt{2}$
5)	If $r = r \cos \theta$, $y = r \sin \theta$, then $\frac{\partial(x,y)}{\partial x}$	=
	$\frac{\partial}{\partial r,\theta}$	- <u></u> .
	a) x	b) y
- 1	C) r	u) Ø
6)	If $x = u(1 + v)$, $y = v(1 + u)$ then $\frac{\partial (u)}{\partial (x)}$	$\left(\frac{u,v}{v}\right) = \underline{\qquad}$
	a) $u + v$	b) $1 + u + v$
	c) $1 - u + v$	d) $1-u-v$
7)	The radius of curvature at any point ((s, Ψ) on the curve $s = \log \{ \sec \Psi \}$ is
,		
	a) $c.\sin\Psi$	b) <i>c</i> . cos Ψ
	c) $c. \tan \Psi$	d) $c \cdot \cot \Psi$
8)	The radius of curvature of the curve	$y = e^x$ at the point (0,1) is
-	a) $2\sqrt{2}$	b) 3√2

c) 0 d) none of these

SLR-FZ-94

Max. Marks: 40

Set P

Q.2 Answer Any Four of the following:

- **a)** Find the radius of curvature at any point on $y = c \cdot \cos h \left(\frac{x}{c}\right)$.
- **b)** If $u = e^x \cdot \cos y$, $v = e^x \sin y$ find $\frac{\partial(u,v)}{\partial(x,y)}$.
- c) Show that the functions u = x + y z, v = x y + z, $w = x^2 + y^2 + z^2 2yz$ are dependent to each other.
- d) State the conditions for stationary value of a function of two variables.
- e) Find the equation of tangent at the point 't' to the curve $x = a \cdot \sin^3 t$, $y = b \cos^3 t$.
- **f)** Find the length of subnormal for the curve $y = b \cdot e^{x/a}$

Q.3 Answer any Two of the following.

a) For the curve y = f(x) show that,

1)
$$\frac{ds}{dx} = \sqrt{1 + \left(\frac{dy}{dx}\right)^2}$$

2) $\frac{ds}{dy} = \sqrt{1 + \left(\frac{dx}{dy}\right)^2}$

- **b)** Find the radius of curvature at any point (r, θ) on the curve $r^m = a^m \cos m\theta$
- c) If u, v, w be functions of three variables x, y, z. If J be Jacobian of u, v, w with respect to x, y, z then prove that J.J' = 1.

Q.4 Answer any Two of the following.

- a) Find the length of tangent, length of normal, length of sub tangent and length of sub-normal to the parabola $y^2 = 4ax$ at any point P(x, y).
- **b)** Find the radius of curvature for the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$
- c) Explain how to find the extreme values of the function u = f(x, y, z) subject to the condition $\phi(x, y, z) = 0$ by using Lagrange's method of undertermined multiphiers.

Q.5 Answer any One of the following.

- a) Obtain the expression for radius of curvature ρ for the curve $x = \phi(t), y = \Psi(t)$ and hence find ρ for $x = a \cos \theta, y = b \sin \theta$ at $\theta = \pi/4$.
- **b)** If u, v, w are functions of x, y, z having first order partial derivaties and x, y, z are themselves functions of p, q, r having first order partial derivatives then show that, $\frac{\partial(u,v,w)}{\partial(p,q,r)} = \frac{\partial(u,v,w)}{\partial(x,y,z)} \cdot \frac{\partial(x,y,z)}{\partial(p,q,r)}$ and hence find $\frac{\partial(x,y)}{\partial(r,\theta)}$ for x = a(u+v), y = b(u-v) and $u = r^2 \cos 2\theta, v = r^2 \cdot \sin 2\theta$.

08

80

80

Seat					
No.					
		~	(0		

B.Sc. (Semester - III) (CBCS) Examination: Oct/Nov-2022 **BOTANY** (Paper - V) **Plant Anatomy**

Day & Date: Monday, 13-03-2023 Time: 09:00 AM To 11:00 AM

Instructions: 1) All questions are compulsory.

- 2) Draw neat diagrams and give equations wherever necessary.
- 3) Figures to the right indicates full marks.
- 4) Use of logarithmic table and calculator is allowed.

Q.1 Choose the correct alternatives from the options.

- According to ______ theory, the apical meristem consists of two zones 1) (layers).
 - a) Apical
 - b) Ristogen d) All above c) Tunica-Corpus
- 2) Apical cell theory is not applicable to
 - Higher plants a) Lower plants b) **Bryophytes** c) Algae d)
- is permanent tissue. 3)
 - a) Parenchyma b) Primary meristem d) None of these
 - c) secondary meristem
 - is simple tissue.
 - a) xylem

4)

- c) sclerenchyma d) None of these
- Sclerenchyma fibres provides _____. 5)
 - a) mechanical support b) water conduction c) food conduction d) All of above

b)

phloem

- sieve tube is component _____ tissue. 6)
- a) Xylem b) Parenchyma
 - c) collenchymas d) Phloem
- Lateral cambium is normally present in _ 7) b) Monocot a) Dicot
 - c) Dicot-monocot d) None of these

Glandular hairs of Drosera is an example of tissue system. 8)

- a) Epidermal b) Secretary
- c) Mechanical d) None of these
- Q.2 Answer the following questions. (Any Four)
 - Define simple tissue with example? 1)
 - List types of vascular bundles? 2)
 - 3) What is permanent tissue?
 - What is secondary growth? 4)
 - List the four types of epidermal trichomes? 5)
 - What is functions of xylem & phloem? 6)

SLR-FZ-95



Max. Marks: 40

08

Q.3	 Write short note on any two of the following. a) Permanen tissue b) Types of Vascular bundles c) Sclernchyma tissue 	08
Q.4	 Answer any two of the following. a) Explain secondary growth in dicot stem. b) Write on primary structure in monocot stem c) Tunica- carpus theory. 	08
Q.5	 Answer any one of the following. a) Write in brief on epidermal tissue system b) Anamolous secondary growth in monocot. 	08

Page	1	of	2
I USC	÷.	U,	~

B.Sc. (Semester - III) (CBCS) Examination: Oct/Nov- 2022 MATHEMATICS (Paper - VI) Laplace Transform

Day & Date: Wednesday, 01-03-2023 Time: 09:00 AM To 11:00 AM

Seat

1)

2)

No.

Instructions: 1) All questions are compulsory. 2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives from the options.

- L{ $e^{at} t^{n}$ } = _____ a) $\frac{n!}{(p-a)^{n}}$ b) $\frac{n!}{p-a}$ c) $\frac{n!}{(p-a)^{n+1}}$ d) $\frac{n!}{(p+a)^{n+1}}$
- L{sin t cos t} = _____ a) $\frac{1}{p^2 + 4}$ b) $\frac{2}{p^2 + 4}$ c) $\frac{p}{p^2 + 4}$ d) $\frac{4}{p^2 - 4}$
- 3) $L\{\cosh at\} =$ _____ a) $\frac{a}{p^2 + a^2}$ c) $\frac{p}{a^2 + a^2}$

4)
$$L^{-1}\left\{\frac{1}{p^4}\right\} =$$

a)
$$\frac{t^2}{6}$$

c) $\frac{t^4}{6}$

5) $L^{-1}\left\{\frac{1}{p^2 - a^2}\right\} =$ _____

c)
$$\frac{1}{a}\sin at$$

6)
$$L^{-1}\left\{\frac{6}{2p-3}\right\} =$$

a) $2e^{3t/2}$
c) $3e^{3t/2}$

b)
$$\frac{p}{p^2 + a^2}$$

d)
$$\frac{a}{p^2 - a^2}$$

b)
$$\frac{t^{3}}{6}$$

d) $\frac{-t^{3}}{6}$

b) $\frac{1}{a}\sinh at$ d) $\cos at$

b) $-2e^{3t/2}$

d) $3e^{-3t/2}$



SLR-FZ-96

Max. Marks: 40
Q.5

08

B.Sc. (Semester - III) (CBCS) Examination: Oct/N BOTANY (Paper – VI) Plant Metabolism	ov-2022
Day & Date: Tuesday, 14-03-2023 Time: 09:00 AM To 11:00 AM	Max.
 Instructions: 1) All questions are compulsory. 2) Figures to the right indicate full marks. 3) Draw neat diagram and give equations wherever nece 	essary.
Q.1 Multiple Choice Questions.	

1) The coenzyme is _____.

Seat

No.

- a) Often a metal
- often a vitamin C)
- 2) The process of conversion of NO₃ to N₂ is
 - a) Nitrification
 - C) Ammonification
- 3) is a stress hormone.
 - Gibberellin a)
 - Cytokinin C)
- 4) Who proposed the idea of essential mineral nutrients of the plant? b) Aristotle
 - a) Leonhart Fuchs
 - C) Arnon and Stout
- Which of the following is trioses? 5)
 - a) Fructose b) Glucose Glyceraldehyde d) Ribose C)
- 6) Major function of phosphorus is in the formation of _
 - Cell membranes a)
 - Enzymes C)
- 7) Lactose is disaccharide made from
 - Glucose and galactose a)
 - Glucose and ribose C)
- 8) Enzyme catalysing rearrangement of atomic grouping without altering molecular weight number of atom is: b) Isomerase
 - a) Ligase
 - Oxidoreductase C)

Q.2 Answer Any Four of the following:

- What is holoenzyme? a)
- Give any two examples of oligosaccharides. b)
- What are deficiency symptoms of phosphorus? C)
- What is ammonification? d)
- Role of ethylene in plant growth. e)
- Give any two examples of organisms showing a symbiotic nitrogen fixation. f)

- b) Ethylene
- d) Absissic acid
- b) Denitrification
- d) Nitrogen fixation

b) always a protein

d)

always an inorganic compound

08

Max. Marks: 40

- b)

- b) Cell wall

d) Hydrolase

- Carbohydrates d)
- Fructose and galactose
 - d) Glucose and fructose





Q.3	Writa a) b) c)	e short notes on any Two of the following. Write a note on Role of micronutrient Fe and Mn. Broad outline of nitrogen cycle. Role of Auxin in plant growth regulation.	08
Q.4	Ansv a) b) c)	wer any Two of the following. Explain the Lock and Key hypothesis for enzyme action. Explain the significance of biological nitrogen fixation. Properties of polysaccharides.	08
Q.5	Ansv a) b)	wer any One of the following. Give the broad outline of classification of Carbohydrates. Explain the physiological role of Gibberellins in plant growth.	08

Seat No.						Set	Ρ		
	B.Sc. (Semester - III) (CBCS) Examination: Oct/Nov-2022 ELECTRONICS (Paper – V) Electronic Circuits								
Day & Time:	Date 09:00	e: Thu D AM	rsday, 02-03 To 11:00 AN	3-2023 M		Max. Marks	: 40		
Instru	iction	ns: 1) 2) 3) 4)	All question Figures to t Draw neat a Use of lag t	is are compulsory. the right indicate full i and labeled diagram table and calculator is	mark and s allo	s. give equations wherever necessary wed.	1.		
Q.1	Choc 1)	ose th Most a) c)	e correct a popularly u Voltage divi Collector to	Iternatives from the sed biasing method ider biasing base biasing	e opt for b b) d)	ions. iasing BJT is Fixed biasing All of these	08		
	2)	a) c)	circuit re rectifier amplifier	educes ripple from re-	ctifie b) d)	d dc voltage. filter oscillator			
	3)	Effici a) c)	ency of clas 25% 90	ss C power amplifier	is b) d)	50% 74			
	4)	a) c)	is radio f phase shift RC oscillate	frequency oscillator. oscillator or	b) d)	Wien bridge oscillator Hartley oscillator			
	5)	Stab a) c)	ility of negat increases remains sai	tive feedback amplifi me	er is b) d)	decreases none			
	6)	Ripp a) c)	le factor of ł 0.48 0.81	nalf wave rectifier is _	b) d)	 1.21 1.81			
	7)	ln BJ a) c)	T amplifier (in cut-off re in active reg	operating of BJT lies gion gion	b) d)	in saturation region below cut off region			
	8)	In os outpi a) c)	cillator oscil ut is 90 270	llations are sustained 	l if pł b) d)	nase shift between input and 180 360			
Q.2	Answ a) V b) C	ver A i Vhat i Give c	ny Four of t s rectifier? \ lassification	the following: What are its types? of power amplifier.	00.0	f nogative feedback emplifier?	08		

- c) What are advantages and disadvantages of negative feedback amplifier?
 d) What is biasing? What are the types of biasing?
 e) Give the classification of oscillator.

Q.3	Wr a) b) c)	ite short notes on any Two of the following. Zener diode as voltage regulator Working of LC tank circuit Fixed method of biasing	08
Q.4	An a) b) c)	swer any Two of the following. Explain how input impedance increases in negative feedback amplifier? Explain class A push pull power amplifier. Explain construction and working of center tapped full wave rectifier.	08
Q.5	An a)	swer any One of the following. Explain construction and working of RC phase shift oscillator and give the formulae of its frequency.	08

b) Explain how band width increases in negative feedback amplifier.

		Climatology	
Day a Time	& Date : 09:00	e: Thursday, 02-03-2023 D AM To 11:00 AM	Max. Marks: 40
Instr	uctior	 ns: 1) All questions are compulsory. 2) Figures to the right indicate full marks. 3) Draw neat and labeled diagram wherever necessary. 	
Q.1	Choo 1)	ose the correct alternatives from the options.Climatology is a branch of Geography.a) Culturalb) Socialc) Politicald) Physical	08
	2)	The Carbon dioxide present in the atmosphere is%.a) 0.01b) 0.02c) 0.03d) 0.04	
	3)	The energy radiated from the Sun is called asa) Insolationb) Insulationc) Convectiond) Evaporation	
	4)	The total albedo of earth surface is%.a) 35b) 45c) 55d) 65	
	5)	The standard air pressure at sea level ismb.a) 1013.25b) 1010.30c) 109.12d) 101.01	
	6)	is a type of planetary wind.a) Trade windb) Looc) Cycloned) Tornado	
	7)	types of rainfall take place at equatorial belt.a) Monsoonb) Cyclonec) Orographicd) Conventional	
	8)	The name hurricane is given to tropical cyclone ina) North Pacific Oceanb) Australiac) North Atlantic Oceand) Bay of Bengal	
Q.2	Ansv a) b) c) d) e)	ver Any Four of the following: Define the concept of weather. What is doldrum? Define the Air Pressure. Define the concept of Climate. Define the concept of Monsoon.	08

Seat No.

B.Sc. (Semester - III) (CBCS) Examination: Oct/Nov-2022 GEOGRAPHY (Paper – V)

SLR-FZ-100

Set P

Define the concept of Cyclone. f)

Q.3	 Write short notes on any Two of the following. a) Indian Monsoon b) Tropical cyclone c) Jet Stream 	08
Q.4	 Answer any Two of the following. a) Explain the types of humidity. b) Explain the composition of the atmosphere. c) Explain the terrestrial heat budget. 	08
Q.5	 Answer any One of the following. a) Explain the structure of the atmosphere. b) Explain the types of planetary winds. 	08

		3) Draw heat diagram wherever necess	ary.			
Q.1	 Choose the correct alternatives from the options. A glassy texture indicates 					
	•	 a) very rapid cooling b) c) slow followed by rapid cooling d) 	slow cooling none of the above			
	2)	The crystallization of three components m diagram.	agma can be represented by a			
		a) rose b) c) triangular d)	histogram tetragonal			
	3)	a) between 2 to 5 mm b) c) above 5 mm d)	e grained igneous rock. below 2 mm below 1 mm			
	4)	rocks crystallized at great depth. a) plutonic b) c) volcanic d)	hypabyssal Intrusive			
	5)	In crystallization of binary magma, the me a) lowers b) c) same d)	Iting temperature of liquid Increase increase or decrease			
	6)	Crystallization of cooling silicate melt expl a) N. L. Bowen b) c) Clarke d)	ained by Jean & Jeffary Moulten			
	7)	Well developed mineral grains of igneous a) subhedral b) c) anhedral d)	rock are called euhedral polyhedral			
	8)	Granite shows colour. a) mesocratic b) c) leucocratic d)	melenocratic hypermelanocratic			
Q.2	Ans	swer Any Four of the following:				
	 a) Difference between magma and lava. b) Difference between concordant and Discordant Intrusion. 					

GEOLOGY (Paper – V)

Igneous Petrology Day & Date: Wednesday, 15-03-2023

Time: 09:00 AM To 11:00 AM

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

2) Draw neet diagram whereve

Seat No.

SLR-FZ-101 Set

Max. Marks: 40

08

Q.2

- c) Difference between minerals and rock.
- d) Spreading of Acidic and Basic lava.
- e) Minerals in Granite.
- Minerals in Basalt. f)

08



Ρ

Q.3	 Write short notes on any Two of the following. a) Ophitic and Poikilitic Texture b) Vesicular and amygdaloidal Structure c) Pillow and Columnar Structure 	08
Q.4	 Answer any Two of the following. a) Any two concordant igneous intrusions. b) Ropy and flow Structure. c) Composition of magma. 	08
Q.5	 Answer any One of the following. a) Explain Differentiation by liquid immiscibility and gaseous transfer. b) Crystallization of Unicomponent and Bicomponent magma. 	08

Seat No.		Set	Ρ
	E	B.Sc. (Semester – III) (CBCS) Examination: Oct/Nov-2022 MICROBIOLOGY (Paper – V) Bacterial Cytology and Physiology	
Day 8 Time:	Date 09:00	: Wednesday, 15-03-2023 Max. Marks) AM To 11:00 AM	: 40
Instru	uction	 as: 1) All questions are compulsory. 2) Figures to the right indicate full marks. 3) Draw neat and labeled diagram wherever necessary. 4) Use of logarithmic table and calculator is allowed. 	
Q.1	Rewr 1)	ite the sentences by choosing correct alternatives is absent in the cell wall of Gram negative bacteria.a) peptidoglycanb) Teichoic acidc) lipoproteind) lipopolysauharide	08
	2)	granules are called as sudanophilic granules. a) PHB b) Volutin c) starch d) sulfur	
	3)	Clostridium titani is an example of spore forming organism.a) aerobicb) anaerobicc) facultatived) microaerophilic	
	4)	are responsible for chromosome transfers during conjugation.a) flagellab) pilic) sexpilid) cell wall	
	5)	is used to decrease the surface tension of media. a) calcium chloride b) charcoal powder c) aldehyde d) bile salts	
	6)	The type of membrane transport in which chemical modification of nutrienttakes place is calleda) Active transportb) Passive diffusionc) Group translocationd) facilitated diffusion	
	7)	is an example of thermophile.a) Bacillusb) Thermus aquaticsc) E.Colid) Clostridium titani	
	8)	Plasmolysis takes place when cells are suspended in solution.a) hypotonicb) hypertonicc) isotonicd) water	
Q.2	Answ a) b) c) d) f) \	ver Any Four of the following: Define halophile. Explain sexpili. Define facilitated diffusion. Explain carboxysomes. Define chemotaxis. What is synchronus growth?	08

Q.3 Write short notes on any Two of the following.

- a) Effects of temperature on growth of microorganism.
- **b)** Active transport.
- c) sporulation process.

Q.4 Answer any Two of the following.

- a) Effects of osmotic pressure on growth.
- **b**) Structure and functions of flagella.
- c) Write a note on reserve food materials.

Q.5 Answer any One of the following.

- a) Define growth. Explain various methods of measurement of growth.
- b) Describe in detail structure and function of cell wall of gram negative bacteria.

80

80

Seat No.	t	Set	Ρ					
	B.Sc. (Semester - III) (CBCS) Examination: Oct/Nov-2022 ELECTRONICS (Paper – VI)							
		Pulse & Switching Circuits						
Day &	& Dat · 09·0	e: Friday, 03-03-2023 Max. Marks: 00 AM To 11:00 AM	40					
Instru	uctio	ns: 1) All questions are compulsory.						
		 2) Figures to the right indicate full marks. 3) Draw neat and labeled diagram wherever necessary. 4) Use of logarithmic table and calculator is allowed. 						
Q.1	Mult	tiple Choice Questions.	80					
	1)	is high pass circuit. a) Integrator b) Rectifier c) Differentiator d) Clamper						
	2)	A transistor used as switch is operated in region. a) active b) cut off c) saturation d) cut off and saturation						
	3)	A free running multivibrators is also called as MV. a) Astable b) Monostable c) Bistable d) none of the above						
	4)	A Clipper circuit consist ofa) Resistor, Diodeb) Resistor, Capacitorc) Capacitor, Dioded) Diode, Transistor						
	5)	The UJT oscillator generate type of waveforms.a) Squareb) Triangularc) Sined) Sawtooth						
	6)	In monostable multivibrator using BJT, the timing components are 47 k Ω and 0.01 μ F then the gate width obtained will be a) 32 μ sec b) 3.2 msec c) 32 msec d) 0.32 msec						
	7)	IC74121 can be used as aa) Decoderb) Multiplexerc) Multivibratord) Memory						
	8)	Pin no.4 of IC 555 timer isa) Triggerb) Resetc) Outputd) Control						
Q.2	Ans a) b)	wer Any Four of the following: Write any four applications of IC555. Explain the general features of time base circuit	08					
	c)	What is need of lime base circuit?						

- d) What is need of lime base circuit?
 e) Draw the circuit diagram of voltage controlled oscillator using IC 555.
 f) Draw the circuit diagram of integrator.

SLR-FZ-103 Г

Page **2** of **2**

Q.3	Writ a) b) c)	te short notes on any Two of the following. Action of transistor as a switch Negative clipper circuit IC74121	08
Q.4	Ans a) b) c)	wer any Two of the following. Explain IC 555 as Monostable multivibrator. Explain UJT as relaxation oscillator. Explain Astable multivibrator using NAND gate.	08
Q.5	Ans a) b)	wer any One of the following. Explain astable multivibrator by using BJT. Derive formulae for its output frequency. Explain working of Schmitt Trigger circuit, obtain the expression for LTP and UTP.	08

			_	Geography	of I	ndia	
Day Time	& Date : 09:0	e: Fric 0 AM	day, 03-03-2023 To 11:00 AM				Max. Marks: 40
Instr	uctio	ns:1) 2) 3)	All questions are Draw neat diago Figures to the ri	e compulsory. rams wherever r ght indicate full	nece: mark	ssary. s.	
Q.1	Cho 1)	ose ti a) c)	he correct alter states of India Arunachal Prad Manipur	natives from the does not share esh	e op a bo b) d)	tions. bundary with Myanmar. Assam Nagaland	08
	2)	a) c)	is defined the Himalayan mou Aravali Range	northern frontie ntain range	rs of b) d)	India. Karakoram Range Satpura Range	
	3)	a) c)	soil is related Laterite Soil Red Soil	to the term of re	egur. b) d)	Black Cotton Soil Deltaic Alluvial Soil	
	4)	India a) c)	a is the lai Second Seventh	gest country in	the w b) d)	vorld in respect to area Third Ninth	
	5)	In O a) c)	rissa. Iron ores i Mayurbhanj Koraput	s located in	di b) d)	strict. Chandrapur Bhubaneswar	
	6)	Mine a) c)	erals are t Natural Exhaustible nat	ypes of resource ural	es. b) d)	Inexhaustible Artificial	
	7)	Petr a) c)	oleum is found u Sedimentary ro Sand	nder the cks	b) d)	Water Coke	
	8)	a) c)	is the followir Bajara Rice	ng an example o	f rab b) d)	bi crops. Cotton Wheat	
Q.2	Atte a) b) c) d) e)	mpt a Defir Defir Defir Defir Defir	any four of the former the concept of the concept of the concept of the the concept represented the concept of	ollowing. Soil. religion. sources. Climate. age and sex co	mpo	sition.	08

B.Sc. (Semester - III) (CBCS) Examination: Oct/Nov-2022 GEOGRAPHY (Paper - VI)

Seat

No.

0

Page 1 of 2

SLR-FZ-105

Set P

- (

 - Define the concept of tribe. f)

Q.3	 Write short notes on any two of the following. a) Rice distribution in India b) Industrial development c) Growth of population in India 	08
Q.4	 Answer any two of the following questions. a) Explain the distribution of population of India on the basis of religion. b) Explain the Coal production of India. c) Explain the types of forest in India. 	08
Q.5	 Answer any one of the following questions. a) Explain the Physiographic division of India b) Explain the types of Soils in India 	08

		B.Sc. (Semester - III) (CBCS) Examinat	ion: Oct/Nov-2022
		Sedimentary and Metamorphic	Petrology
Day Time	& Date : 09:0	e: Thursday, 16-03-2023 00 AM To 11:00 AM	Max. Marks: 40
Instr	uctio	 ns: 1) All questions are compulsory. 2) Figures to the right indicate full marks. 3) Draw neat diagram wherever necessary. 	
Q.1	Cho 1)	ose the correct alternatives from the options.Which type of sandstone has coarse grained, sa) Arkoseb) Gritc) ferruginous sandstoned) argil	08 sub-rounded texture? laceous sandstone
	2)	Gneiss represents Foliated fabric. a) strongly b) non c) weakly d) none	e of these
	3)	A tendency of metamorphic rock to split easily called a) slaty cleavage b) lami c) stratification d) none	along thin, smooth planes is nation e of these
	4)	The sediments having size > 256 mm are callea)gravelsb)peblc)siltd)boul	d bles ders
	5)	The sedimentary rocks are formed by or standing, quiet water environment.a) rudaceousb) aren d) cher	deposition of sediments in aceous nical
	6)	The concentric coating of calcium carbonate caa)limestoneb)fossc)oolitic limestoned)	an be seen in iliferous limestone kite
	7)	Composition of dolomite isa) CaCO3b) MgCc) CaCO3 MgCO3d) Non	CO₃ e of these
	8)	Which of the following shows non-foliated fabri a) Marble b) Schi c) Gneiss d) Non	c? st e of these
Q.2	Ansv a) b) c) d) e)	wer Any Four of the following: Define Scam deposits. What is migmatites? Give the names of minerals present in eclogitefa Define metamorphic facies. What is Arkose?	08 acies.

Seat No.

Page 1 of 2

SLR-FZ-106

Set P

Q.3	 Write short notes on any Two of the following. a) Limestone b) Eclogite Facies c) Describe in detail rudaceous rocks with its verities. 	08
Q.4	 Answer any Two of the following. a) Describe the bedding and stratification structures in sedimentary rock. b) Describe the greenschistfacies. c) Describe the Arenaceous sedimentary rock. 	08
Q.5	 Answer any One of the following. a) Describe structures of metamorphic rock. b) Describe process of formation of sedimentary rock. 	08

-			-				
Seat		S	et	Ρ			
B.Sc. (Semester - III) (CBCS) Examination: Oct/Nov-2022 MICROBIOLOGY (Paper – VI) Bacterial Genetics							
Day 8 Time:	k Dat 09:0	te: Thursday, 16-03-2023 Max. Max. Max. Max. Max. Max. Max. Max.	arks	40			
Instru	uctio	 ans: 1) All questions are compulsory. 2) Figures to the right indicate full marks. 3) Draw neat diagrams wherever necessary. 					
Q.1	Rew	vrite the sentences by selecting correct		08			
	1)	Transduction was discovered bya) Griffithb) Zinder and Lederbergc) Hayes and Woolmand) Iwanowsky					
	2)	causes death of individuals. a) Kido mutation b) Sub-vital mutation c) Lethal mutation d) Antimutational changes					
	3)	Okazaki fragments occur duringa)Replicationb)Conjugationc)Transformationd)Transduction					
	4)	add complementary bases during replication. a) Helicase b) Ligase c) Synthease d) Polymerase					
	5)	In DNA double helix the two chains are held together by bonds. a) Covalent b) Ester c) Hydrogen d) Ionic					
	6)	is largest among the following.a) Nucleotideb) Carbonc) Phosphated) Nitrogen base					
	7)	The accepted hypotheses for DNA replication is a) Conservative b) disperative c) Evolutionary d) Semi-conservative					
	8)	was identified as trans forming principle. a) DNA b) RNA c) r RNA d) E RNA					
Q.2	Writ a) b) c) d) e) f)	te answers to any four. Define phenotype Types of mutations List enzymes involved in replication What are cistrons and recons? Induced mutation. Define Genetic code.		08			

SLR-FZ-107

Г

Q.3	Ans a) b) c)	w er any two Base pair substitution Dark repair mechanism Replica plate technique	08
Q.4	Ans a) b) c)	wer any two Fate of exogenote Difference between specialized and abortive transduction. Hershey and chase experiment	80
Q.5	Ans a) b)	w er any one Mechanism of DNA replication. Conjugation	80

Seat No.		Set P					
	B.Sc. (Semester - IV) (CBCS) Examination: Oct/Nov - 2022 CHEMISTRY (Paper - VII) Physical Chemistry						
Day & Time:	& Dat 12:0	te: Tuesday, 21-02-2023 Max. Marks: 40 00 PM To 02:00 PM					
Instru	uctio	ns: 1) All questions are compulsory.2) Figures to the right indicate full marks.					
Q.1	Cho 1)	An increase in the randomness suggest that the reaction is 08 a) endothermic b) spontaneous c) non-spontaneous d) reversible					
	2)	On dilution specific conductivitya) decreaseb) increasec) both a and bd) none of these					
	3)	The total no of atoms per unit cell of FCC crystal is a) 1 b) 2 c) 3 d) 4					
	4)	The Nernst's distribution law is also known as a) Henry's law b) Raoult's law c) partition law d) equilibrium law					
	5)	In an adiabatic expansion of an ideal gas a) $q = 0$ b) $dT = 0$ c) $\Delta E = 0$ d) $\Delta V = 0$					
	6)	For the solution of NaOH which will have the lowest value of specific conductance? a) 0.1M b) 1.0M c) 0.001M d) 0.01M					
	7)	If transport number of cation is 0.52, then that of anion is a) 0.48 b) 0.78 c) 1.22 d) 0.62					
	8)	Molar conductance is expressed in a) Siemen. m ⁻¹ b) S. m ² mol ⁻¹ c) mhos. m ⁻¹ d) Ohm ⁻¹ .m					
Q.2	Ans a) b) c) d)	wer Any Four of the following:08State Kohlrausch's law.Define the entropy, and give its unit.Define the term specific conductance, mention its unit.Mention laws of crystallography, and explain the law of rational indices.					

- Explain the term absolute entropy. Define Weiss and Miller indices. e)
- **f**)

08

Q.3 Write short notes on any Two of the following.

- a) The specific conductance of N/50 solution of ZnSO₄ at 298 K is 0.02107 Ohm⁻¹ cm⁻¹. Calculate equivalent and molecular conductances of ZnSO₄ solution.
- **b)** State the law of partition and give its limitations.
- c) How is entropy change determined in fusion of solid and vaporization of liquid?

Q.4 Answer any Two of the following.

- a) Give an account of the process of extraction.
- b) Discuss entropy changes in reversible process.
- c) Define transport number of an ion. Describe the moving boundary method.

Q.5 Answer any One of the following.

- a) What is Hittorf's rule? Discuss the application of Kohlrausch's law.
- **b)** What is mean by space lattice of crystal? Describe Bragg's equation for interplaner distances of crystal.

80

Seat No.

B.Sc. (Semester - IV) (CBCS) Examination: Oct/Nov-2022 **COMPUTER SCIENCE (Paper – VII) Software Engineering**

Day & Date: Tuesday, 21-02-2023 Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Draw neat and labeled diagram wherever necessary.
- 4) Use of logarithmic table and calculator is allowed.

Q.1 Choose the correct alternatives from the options.

- In Systems Development Life Cycle, which phase comes after the analysis 1) phase?
 - a) Planning phase Coding phase

C)

C)

- b) Design phase
- d) Implementation phase
- 2) A feasibility study is used to determine the proposed systems.
 - **Resource requirements** a)
 - Costs and benefits b)
 - Availability of hardware and software C)
 - All of the above d)
- Spiral model is developed by _ 3)
 - b) Berry Bohem a) Roger Pressman
 - Victor Bisil d) Bev Little Wood C)
- 4) type of reports are required to be generated timely such as weekly, monthly, quarterly or yearly.
 - a) Future projections Internal outputs
- In software maintenance tackling the changes in the hardware and 5) software environment where the software works, is called .
 - Corrective a)
 - Adaptive C)
- 6) A physical DFD
 - a) Has no means of showing material flow
 - Can show the flow of material b)
 - Does not concern itself with material flow C)
 - Can show only stored material d)
- The smallest unit of data that provides for no further decomposition is 7)
 - Data element b) Data dictionary a)
 - C) Data base d) Data set
- is collection of data at its source means preparation of source 8) documents by applying manual checks.
 - a) Data Collection b) Recording Data
 - C) Report d) Data set



Set

- b) External outputs
 - d) Periodic outputs
- b) Perfective
- d) Preventive

		SLR-FZ-	109
Q.2	Ans a) b) c) d) e) f)	wer Any Four of the following: What are the characteristics of the software? What is DFD? What is meant by software prototyping? Define Data dictionary. Define software testing. What are the advantages of Prototype model?	08
Q.3	Writ a) b) c)	e short notes on any Two of the following. Software quality - Portability and Flexibility. Black box testing. Structured chart.	08
Q.4	Ans ^r a) b) c)	wer any Two of the following. Draw ERD of Library Management System. Compare Water fall Model and Spiral model. What is Maintenance? Explain the types of Software Maintenance.	08
Q.5	Ans [.] a)	wer any One of the following. Explain different fact finding techniques.	08

b) Explain 1NF, 2NF, 3NF of normalization with suitable example.

Sea	t						Sat	D
No.							Set	Г
	B.Sc. (Semester - IV) (CBCS) Examination: Oct/Nov - 2022							
		Apolyti		STRY (Pa	ape	r – VIII) Nania Chamiatry		
Dav		Alidiyu S. Wodposday, 22	02 2022	iusinai ili	ιοιί		lav Marko	· 40
Time	: 12:0	0 PM To 02:00 Pl	-02-2023 A			IV	10X. IVIAI KS	. 40
Instr	uctio	ns: 1) All questior 2) Figures to t 3) Draw neat 4) Use of loga (At. Wts.: H	s are com he right in and labele rithmic tab =T, C=12,	pulsory. dicate full n d diagram v ble and calc 0=16,N- !4	nark whe culat I,Na	s. rever necessary. or is allowed. =23, Cl = 35.5)		
Q.1	Cho	ose the correct a	Iternative	s from the	opt	ions.		08
	1)	As phenolphthal	ein indicat	or is colorle	ess i	n acidic medium, it is		
		a) Two			b)	One		
		c) Three			d)	Four		
	2)	Solochrome blac	:k is	_ indicator	-			
		a) Metallochro	mic		b)	Acid base		
	3)	C) Auto	reagent fo	r	u)	Nedox		
	3)	a) Aluminum	reagent 10	I	b)	Magnesium		
		c) Nickel			d)	Copper		
	4)	Fe(OH)₃ is a	precij	pitate.				
		a) Amorphous	i i i i i i i i i i i i i i i i i i i		b)	Crystalline		
	E)	C) Curdy	aathad ia .	upped for an	u)			
	5)	a) Sulphide	nethod is t		hcer b)	Silicates		
		c) Oxide			d)	Carbonate		
	6)	The method of p	urification	of a metal	by u	sing electrolysis is called	·	
		a) Poling	. .		b)	distillation		
	7)	c) nyorometai	urgy		a)	electrorenning		
	7)	a) 0 to 0 1	of carbon	in cast from	b)	25 to 500		
		c) 0.6 to 1.5			d)	0.1 to 0.6		
	8)	The critical temp	erature of	iron is		°C.		
		a) 725			b)	300		
		C) 230			a)	850		
Q.2	Ansv	wer Any Four of	the follow	ing:				08
	a)	Define the terms.			::\	Indiaator		
	b)	Define the terms			II)	Indicator		
	~,	i) Nucleation			ii)	Ignition		
	c)	What are the adv	antages of	f Haber's pi	roce	ess?		
	ወ) ወ)	Draw a neat labe	ed diagrai	m of L.D. pi process for f	roce the r	ss. manufacture of sulphuric	acid	

f) Give the characteristics of good precipitate.

Q.3 Write short notes on any Two of the following. 80 Physico-chemical principles of Haber's process a) Froth floatation process b) Heat treatments on steel C) Q.4 Answer any Two of the following. 08 Differentiate between Bessmer process & L.D. process a) Distinguish between calcination and roasting b) Give merits and demerits of organic precipitant C) Answer any One of the following. 08 Q.5 What is acid-base indicator? Define neutralization curve. Explain choice of a) indicator for titration between strong acid strong base with help of neutralization curve.

b) Explain the role of DMG and oxine in gravimetric analysis.

	Database Man	agement	System	
iy & Da ne: 03	ate: Wednesday, 22-02-2023 :00 PM To 05:00 PM		Max. Mark	ks: 40
structi	ons: 1) All questions are compulsor2) Figures to the right indicate	y. full marks		
1 Ch	oose the correct alternatives from	n the optior	ns.	08
1)	To list tables in a MySQL databa	se (command is used.	
	a) Display Lables	D) SI	how lables	
•	C) LIST TADIES	u) Si		
2)		ture of the w	vhole database for a group of	
	a) Physical	b) F	xternal	
	c) Conceptual	d) N	one of these	
3)	DML stands for	,		
-,	a) Data Manipulation Languag	e b) D	ata Manual Language	
	c) Data Menu Language	d) Da	ata Main Language	
4)	statement is used for up	dating existi	ng information in the table.	
	a) Insert	b) Al	lter Table	
	c) Delete	d) U	pdate	
5)	is the characteristics of t	ransactions		
	a) Atomicity	b) D	urability	
	c) isolation	(a) A	ii of the mentioned	
6)	In hierarchical model, data is org	anized into		
	c) tree like structure	d) pr	one of them	
7)	User which interacts with the sys	tom using d	latabase query language is	
')	called as	terri usiriy u	latabase query language is	
	a) Sophisticated user	b) N	aive user	
	c) Specialized user	d) A	pplication Programmer	
8)	SQL keyword is used to	retrieve a m	naximum value.	
-	a) Max	b) To	ор	
	c) Upper	d) N	one of these	
2 An	swer Any Four of the following:			08
a)	What is schema?			
b)	List numeric data types in MySQL			

- Write syntax of insert into command. C)
- Define DBMS? d)
- Write a different attributes of explicit cursor. e)
- State components of DBMS. f)

Set P

Seat No.

B.Sc. (Semester - IV) (CBCS) Examination: Oct/Nov-2022

Q.3	 Write short notes on any Two of the following. a) Transaction states. b) Write a note on codd's rules. c) Write a note on View. 	08
Q.4	 Answer any Two of the following. a) What is relational algebra? Explain select and project in details. b) What is concurrency control? What are the different problems of concurrency control? c) What is the use of primary key? How to use it 	08
Q.5	 Answer any One of the following. a) What is trigger? Explain types of trigger in details with example. b) What is join? Explain types of join in details. 	08

B.Sc. (Semester - IV) (CBCS) Examination: Oct/Nov - 2022 **PHYSICS** (Paper – VII) **Optics**

Day & Date: Thursday, 23-02-2023 Time: 12:00 PM To 02:00 PM

Seat

No.

Instructions: 1) All questions are compulsory.

- 2) Draw neat diagrams and give equations wherever necessary.
- 3) Figures to the right indicates full marks.
- 4) Neat diagrams must be drawn whenever necessary.

Q.1 Choose the correct alternatives from the options.

- The distance of an object and its image from the corresponding focal 1) points are 12 cm and 3 cm respectively for a thick lens in air, its focal length is
 - a) 4 b) 5 c) 6 d) 7
- In Michelson's interferometer, concentric circular fringes are obtained 2) when M_1 and M_2 are _____ to each other.
 - a) parallel b) perpendicular
 - c) inclined at 60° inclined at 45° d)

By Rayleigh's modified criterion, the condition for resolution is that the ratio 3) of the intensity at the saddle to the maximum intensity of either of the principal maxima of two wavelengths is

a) <u>8</u>	b) π^2
π^2	8
c) 4	d) π^2
$\overline{\pi^2}$	4

- 4) The substances which rotate the plane of vibration of polarized light towards the left side are known as
 - a) optically active laevo-rotatory b)
 - c) dextro rotatory laevo as well as dextro rotatory d)
- For an optical fibre to have grater information carrying capacity, the pulse 5) dispersion must be _____.

a)	very small	b)	very large
- \		-13	

- c) moderately large d) zero
- For a co-axial optical system, the initial and final media are water ($n_1 = 1.33$) 6) and air respectively. For a given object the lateral magnification is - 2.66, then is angular magnification.
 - a) 2 b) -0.5
 - c) 5.32 d) 1
- In the second order spectrum be the minimum number of lines in a 7) plane diffraction grating which has mean wavelength 5893 A⁰ and change in wavelength is $6 A^{0}$ b) 982
 - a) 491
 - c) 245 d) 100

Set

Max. Marks: 40

08

- 8) In double refraction doubly refracted rays are _____.
 - a) both are unpolarized
 - b) both are circularly polarized
 - c) both are plane polarized
 - d) Only ordinary ray is plane polarized

Q.2 Answer the following questions. (Any Four)

- a) Define plane of vibration and plane of polarization.
- **b)** Define Resolving power of an optical instrument. State Rayleigh's Criterion for resolution.
- c) What is Zone plate? How is it constructed?
- d) State the four points of superiority of Fay-Perot interferometer over Michelson's interferometer.
- e) For an optical image forming system, the refractive indices of the initial and final media are water ($n_1 = 1.33$) and air respectively. If the focal length in the image space is +10 cm, calculate the focal length in the object space.
- **f)** Compare Geometrical and Spectral Resolution (any two points)

Q.3 Answer any two of the following.

- a) Obtain the relation between the lateral, longitudinal and angular magnifications.
- b) Show that area of each half period zones are equal.
- c) State any eight advantages of Optical fibre.

Q.4 Answer any two of the following.

- a) Show that for a lens system, the distance between the principal points is equal to the distance between the nodal points. Also prove that the principal and nodal points coincide if the medium on both sides of the system is same.
- b) Explain the formation and working of Fibre- optic communication system.
- c) A plane diffraction grating has a width of 2.54 cm and grating element of 3.333×10⁻³ cm. Explain if D₁ and D₂ lines of sodium of wavelength 5890 A⁰ and 5896 A⁰ will be resolved by the grating in i) the first order, ii) the second order spectrum.

Q.5 Answer any ONE of the following.

- a) Explain the principle, construction and working of Nicol Prism. Explain how Nicol prism can be used as analyzer.
- **b)** With neat ray diagram explain the construction of Michelson's interferometer. When a thin film of glass ($\mu = 1.6$) is interposed in the path of one of the interfering beams of a Michelson's interferometer, a shift of 20 fringes of sodium light ($\lambda = 5893 \text{ A}^0$) is observed across the field of view. Calculate the thickness of the film.

08

08

Cast						
Seat No.		Se	et P			
	B.Sc. (Semester - IV) (CBCS) Examination: Oct/Nov-2022 BIO-CHEMISTRY (Paper – III) Nutrition and Metabolism					
Day & Time:	Date 03:00	e: Thursday, 23-02-2023 Max. Mar D PM To 05:00 PM	ks: 40			
Instru	 Instructions: 1) All questions are compulsory. 2) Draw neat diagrams and give equations wherever necessary. 3) Figures to the right indicates full marks. 					
Q.1	Choc 1)	ose the correct alternatives from the options.What is the net gain through the beta oxidation of palmitic acid?a) 131 ATPb) 130 ATPc) 129 ATPd) 132 ATP	80			
	2)	buffer system is a prominent buffer system of blood.a) Proteinb) Phosphatec) Haemoglobind) Bicarbonate				
	3)	Oxidative phosphorylation means production of ATP bya) Calvin cycleb) Respirationc) Glycolysisd) Glycogenolysis				
	4)	Biological value of protein (BV) refers to the percentage of absorbedretained by the body.a) Hydrogenb) Carbonc) Peptided) Nitrogen	_			
	5)	Body regulates acid base balance by maintaining its blood pHa) 9.4b) 8.4c) 6.4d) 7.4				
	6)	The electron transport chain and ATP synthesis system are situated on the	9			
		a) nuclear envelope b) Chromosomes c) inner mitochondrial membrane d) lysosomes				
	7)	BMR is elevated ina) under nutritionb) Starvationc) Hypothyroidismd) Hyperthyroidism				
	8)	During which condition, beta oxidation is stimulated?a) Well fed conditionsb) Starvationc) Bothd) None of the above				
Q.2	Ansv a) b) c) d) e) f)	wer the following questions. (Any Four) What are Sources of the atoms in the purine? What are disorders of acid-base balance? Which are the inhibitors of electron chain transfer? Define transamination and deamination. How blood pH is maintained in body? What do you mean by lipid metabolism?	08			

Seat 1

Q.3	Writ a) b) c)	te short note on any two of the following. What is BMR? Write factors affecting BMR and its significance. Write note on exergonic and endergonic reactions. Write note on ethanol fermentation.	08
Q.4	Answer any two of the following.		
	a)	What is oxidative phosphorylation? Write mechanism of oxidative phosphorylation	
	b)	Explain β -oxidation of palmitic acid.	
	c)	Write note on bicarbonate and phosphate blood buffer system in body.	
Q.5	Answer any ONE of the following.		
	a)	Write a note on biological value, essential and non-essential amino acids, nitrogen balance.	
	b)	Write note on TCA cycle and its energetic.	

08

B.Sc. (Semester - IV) (CBCS) Examination: Oct/Nov-2022 **PLANT PROTECTION (Paper – VII)** Introduction to weeds & non insect pests Day & Date: Thursday, 23-02-2023 Time: 03:00 PM To 05:00 PM Instructions: 1) All questions are compulsory. 2) Figures to the right indicate full marks. 3) Draw neat labelled diagrams and give equations wherever necessary.

Choose the correct alternatives from the options.

Seat

No.

Q.1

Weeds are to human being and animal. 1) Harmful Useful a) b) Superior d) None of these C) 2) Cyperus rotundus is . Xerophytic weed b) Aquatic weed a) C) Mesophytic weed d) Parasitic weed 3) is xerophytic weed plant. Typha sp. a) b) Cyperus sp. Argemone Mexicana Solanum sp. C) d) 4) Parthenium hysteroporous belongs to family Solanaceae a) Asteraceae b) Pappaveraceae d) Malvaceae C) Euphorbia hirta produce _____. 5) Steroids b) Flavonoids a) C) Sugars Milky latex d) Cynadon dectylon is a _____ weed plant. 6) Monocot a) Dicot b) Poisonous None of these C) d) 7) 2,4-D stands for 2,4- Dichlorophenoxy Acetic acid a) b) 2,4- Dichlorophenols Dichlorophenoxy acid C) 2,4- Dilhydroxy Acetic acid d) Effective time of weedicide spraying is 8) Afternoon Late morning a) b) C) Early morning d) Mid night Q.2 Answer the following questions. (Any Four) Give any four loss reasons, caused by weed growth. 1) 2) What is field sanitation? How the ploughing takes place? 3) How will you manage the attack of birds on grapevineyard? 4)

- Why the snails and slugs are non-beneficial? 5)
- Give the loss, caused by rats in storage and field. 6)

SLR-FZ-114



Max. Marks: 40

Q.3	Ans 1) 2) 3)	wer the following questions. (Any Two) Parasitic weeds Crop rotation Management of phytopathogenic nematodes.	08
Q.4	Ans 1) 2) 3)	wer the following questions. (Any Two) Give the properties, mode of action, formulation and use of Mira-71. Write in brief classification of weeds based on-ecology. What is mulching?	08
Q.5	Ans a) b)	wer the following questions. (Any One) Describe the gross morphology, reproduction, ecology, dispersal and management of weed Cynadon dactylon.	80
	0)	management of weed Argemone Mexicana.	

	•	PHYS	ICS (Paper-VIII)	
		Mo	dern Physics	
Day a Time	& Date : 12:00	e: Friday, 24-02-2023 DPM To 02:00 PM		Max. Marks: 40
Instru	uctions	 1) All questions are computed. 2) Draw neat diagrams a 3) Figures to the right ind 4) Use of logarithmic table (At. Wts.: H=1, 0=12, 0= 	lsory. nd give equations wherever neces icates full marks. e and calculator is allowed. 16, N= 14, Na =23, C1 = 35.5)	sary.
Q.1	Choo 1)	ose the correct alternatives The special theory of relativ a) Einstein c) Galileo	from the options. ity was developed by b) Newton d) Lorentz	08
	2)	The inertial frame of reference a) accelerated c) rotating	ce is also called as frame of b) unaccelerated d) steady	of reference.
	3)	The wavelength of matter w a) mass c) momentum	aves is independent of b) velocity d) charge	
	4)	De-Broglie wavelength λ is a) h/mv^2 c) mv^2h	given by b) h/mv d) mv/h	
	5)	L-shell corresponds to n = _ a) 1 c) 3	b) 2 d) 4	
	6)	Maximum number of electro a) n^2 c) $2n^2$	ons in the $n^{ ext{th}}$ shell is given by b) $2n$ d) n	<u> </u>
	7)	The magnitude of Compton a) 0.084 A° c) 0.0122 A°	wavelength is b) 0.0242 A° d) 0.022 A°	
	8)	In nuclear reactor, the chair a) Uncontrolled c) Controlled	reaction is b) Indefinite d) Absent	
Q.2	Ansv 1) 2) 3)	ver the following questions State and explain 'ether hyp Define inertial frame of refer State and explain De-Broglie	Any Four) othesis' ence. hypothesis.	08

- State Pauli's exclusion principle. What is Compton effect? 4)
- 5)
- What is nuclear fission? 6)

Set P

Seat No.

B.Sc. (Semester - IV) (CBCS) Examination: Oct/Nov-2022

Q.3	 Write short note on any two of the following. 1) Nuclear fission 2) Compton wavelength 3) Wave Packets 	08
Q.4	 Answer any two of the following. 1) Obtain an expression for wavelength of matter wave. 2) Describe the experimental verification of Compton effect. 3) Write note on neutron induced reactions. 	08
Q.5	 Answer any ONE of the following. a) Explain various quantum numbers associated with vector atom model. b) Derive the mass-energy relation. 	08

Seat No.					Set	Ρ
B.Sc. (Semester - IV) (CBCS) Examination: Oct/Nov- 2022 BIOCHEMISTRY (Paper - IV)						
Day & Time:	Mo Date: Friday, 24-02-2 03:00 PM To 05:00 P	lecular Biochemis 2023 M	try	& Diseases	Max. Marks	: 40
Instructions: 1) All questions are compulsory. 2) Figures to the right indicate full marks. 3) Neat diagram must be drawn whenever necessary.						
Q.1	Choose the correct a 1) Which of the fol a) urine c) breast milk	alternatives from the lowing is not a medium	op t n fo b) d)	t ions. r transfer of HIV? genital secretions blood		08
	 Full form of MG a) Man Gend c) Mouse Gend 	D is er Database nome Database	b) d)	Mutation Gene Data Management Gene	abase Database	
	3) is most a is most a β -phase c) λ -phase	commonly used vector	of b) d)	E. coil. δ –phase α –phase		
	 Aromatic hydrod a) alcohol c) juice 	carbon present in	b) d)	cause ling cancer. cigarette milk		
	 S1 nuclease is a a) single strai c) stable 	an endonuclease which nded	h is b) d)	specific for double stranded unstable	nucleic acid.	
	6) Insulin enzymea) liverc) pancreas	is formed in	b) d)	kidney small intestine		
	 7) To express euka a) cDNA Libra c) aDNA Libra 	aryotic genes in prokar ary ary	ryot b) d)	ic the library used is bDNA Library zDNA Library		
	8) In panc a) type 1 diab c) obesity	reatic cells producing in petes	nsu b) d)	lin are destroyed. type 2 diabetes type 3 diabetes		
Q.2	 Answer the following a) Write the symptom b) What is bioinform c) Which are the fa d) What are the me e) Write the type of f) What is reverse the famous of the symptom 	g questions. (Any fou oms of diabetes. natics? Write one exan ctors affecting enzyme tabolic effects of insuli tumor. transcriptase?	nple ac n?	e. tivity?		08
Q.3 Write short notes on any two of the following. 80 Write note on specific activity and turn over number. a) Write applications of bioinformatics. b) Explain agents causing cancer. C) Q.4 Answer any two of the following. 08 a) Write note on regulation of gene expression. **b)** Explain natural course of Aids. c) Write the structure of insulin and mechanism of action of insulin. Answer any one of the following. Q.5

- a) Explain significance of Km and V max. Write note on Lineweaver Burk plot.
- **b)** What is natural and acquired immunity? Explain clonal selection theory for formation of antibodies.

NO.							
	I	B.S	c. (Semest PL/ Inse	er - IV) (CBC ANT PROTEC ect Pests and	S) Exan CTION (I I Their N	nination: Oct/Nov-2 Paper - VIII) /lanagement	2022
Day 8 Time:	03:00	e: Fri D PN	day, 24-02-20 I To 05:00 PN)23 1		-	Max. Marks: 40
Instru	uction	is: 1 2 3) All question) Draw a well) All question	s are compulso diagram where carry equal ma	ry. ver neces rks.	ssary.	
Q.1	Choc 1)	Dse f Dev a) c)	he correct a velopmental s Gametogene Homogenise	Iternatives fror tage from birth t esis	n the opt to adult is b) d)	ions. called Metamorphosis Evolution	08
	2)	Car a) b) c) d)	bamates incl Fungicides, Insecticides Herbicides, i Insecticides,	ude herbicides and i only nsecticides and nematicides an	nsecticide nematici id rodenti	es des cides	
	3)	Roo a) c)	ker Sprayer i Knapsack Sj Gator Pump	s also called as orayer	b) d)	Hand sprayer Spray guns	
	4)	Cul a) c)	tural controls crop rotation resistant or t	of insects includ	de which b) s d)	of the following tillage methods all of the above	
	5)	The a) c)	use of legisl plant quaran Plant enclos	ative restriction tine ure	to control b) d)	pests is called: Plant law Plant protection	
	6)	a) c)	Scientific Chillo zonell Sitophilus or	c name of stem us yzae	borer. b) d)	Heliothis armigera Chrotogonus trachypt	nus
	7)	a) c)	legs and _ 3 pairs & 2 p 3 pairs & 3 p	wings pi vairs vairs	resent in i b) d)	nsect body. 2 pairs & 3 pairs 2 pairs & 2 pairs	
	8)	Inse a) c)	ect body divid 3 2	ed into	parts. b) d)	6 4	
Q.2	Ansv a) b) c) d) e)	ver t Meta Men Writa Writa Men	the following amorphosis. tion two name the classific any two che tion nature of	e of stored grain ation of insectic mical pest cont	n y Four) n insect po ides. rol. he pest m	est. nanagement.	08

Write the host plants of stem borer. f)

SLR-FZ-117

Seat No.

Set P

Q.3	Writ a) b) c)	te short note on any two of the following. Nature of damage of fruit borer. Control measures of trips of rose plant Repellents	08
Q.4	Ans a) b) c)	wer any two of the following. General characters of typical insect pest. Give an account on classification of insect pest. Write the principles of insect pest control.	08
Q.5	Ans a) b)	wer any ONE of the following. Describe in details about pulse beetle. Give an account on Woolly aphids of sugarcane.	08

		B.Sc. (Semester - IV) (CBCS) E STATISTICS (I Probability Dist	Exam Pape ribut	nination: Oct/Nov-2022 r – VII) ions - II	
Day a Time	& Date : 12:00	e: Saturday, 25-02-2023 0 PM To 02:00 PM		Max. Marks	: 40
Instr	uctior	ns: 1) All questions are compulsory.2) Figures to the right indicate full	marks		
Q.1	Choo 1)	Dise the correct alternatives from the lf $X \sim G(5, 1)$ then the p. d. f. of X is s with mean a) 0.2	e opti same b)	ons. as that of an exponential variate	08
	2)	c) I If $X \sim \beta_1(2,3)$ then E (X) = a) 0.4 c) 0.25	b) d)	0.04 0.15	
	3)	If X ~ U (4, 16) then Var (X) is a) 20 c) 10	 b) d)	12 8	
	4)	If X~N(60, 9) then the height of the n a) 51 c) 0	ormal b) d)	probability curve is highest at 60 69	
	5)	Moment generating function of the C a) $(1-2t)^{n/2}$ c) $(1-t)^{-n/2}$	hi-squ b) d)	are distribution is $(1-2t)^{-n/2}$ none of these	
	6)	Student's t distribution is given by a) G.W. Snedecor c) W.S. Gosset	b) d)	R.A. Fisher Karl Pearson	
	7)	If F ~ <i>F</i> (4 ,8) then mode of X is a) 0.5 c) 0.8	b) d)	0.4 4	
	8)	If X~ exp(θ) then a) mean = variance c) mean < variance	b) d)	mean = standard deviation none of these	
Q.2	Ansv 1) 2) 3) 4) 5) 6)	wer the following questions. (Any Formatting Area of the following questions.) (Any Formatting If $X \sim G(\alpha, \lambda)$ then what is the distribution Write m.g.f. of a chi square variate with Define beta distribution of 2 nd kind. Define an F variate with n ₁ , n ₂ d.f. Define exponential distribution. State relation between F and t variate	our) tion of th n d. s.	f CX, if C is a positive constant? f.	08

Seat

No.

SLR-FZ-118

Set P

Q.3	Ans 1) 2)	Find mean of gamma distribution with parameter (α , λ). If X is a r. v. with p.d.f. $f(x) = \theta e^{-\theta x}$; $x > 0$, $\theta > 0$ = 0; otherwise find the distribution of Y = θ X	08
	3)	Find mode of chi-square distribution with n d.f.	
Q.4	Ans 1)	wer any two of the following. If F~F(n ₁ , n ₂) distribution, then find the distribution of $\frac{1}{F}$	08
	2) 3)	Find median of normal distribution. If X ~ U (-3, 2) then find a) mean b) $P(X \le 2)$	
Q.5	Ans a) b)	wer any ONE of the following. Find mean and variance of beta distribution of first kind. State and prove relation between F and χ^2 distribution.	08

Seat						Set	Ρ	
B.Sc. (Semester - IV) (CBCS) Examination: Oct/Nov-2022 METEOROLOGY (Paper – III) Applied Climatology								
				iato	logy		40	
Day a	s Date 03:0	e: Saturday, 25-02 0 PM To 05:00 Pl	2-2023 M			Max. Marks	: 40	
Instr	Instructions: 1) All questions are compulsory.							
moti		2) Figures to 3) Draw neat 4) Use of loga	the right indicate full i and labeled diagram arithmic table and cal	mark whe culat	s. rever necessary. or is allowed.			
Q.1	Cho	ose the correct a	Iternatives from the	e opt	tions.		08	
	1)	In a hot dry envi	ronment excessive s	weat	ing causes	_·		
		a) Breathing		d)	denydration			
	2)	The best	nt island are formed d	u) uo ta	additional of hea	l from automobile		
	Z)	a) Hamlet		b)	rural		-	
		c) urban		d)	village			
	3)	The term 'foreca	st' was first applied i	n me	teorology by			
		a) Miller		b)	Fitzroy			
		c) Coriolis		d)	Irewartha			
	4)	The primary pur	pose of clothing is to	prot	ect man against _	and		
		a) humidity	siological compare	b)	temperature			
		c) wind		d)	weather			
	5)	The effective ter	nperature index belo	w	°C is conside	ered as		
		uncomfortable c	ooling.	b .)	47.4%			
		a) 16.1°C		d)	17.4°C 20°C			
	6)	The last WMO is	s beadquartered in	u)	20 0			
	0)	a) Washinton	D.C.	b)	 Geneva			
		c) Pune		d)	Melborne			
	7)	Statistical metho	od are used for	_ ra	nge forecasting of	weather.		
		a) short		b)	medium			
		c) long		a)	dally			
	8)	IS esser	itial for plant growth.	h)	temn			
		c) water		d)	fertilizer			
-	_	, _		,				
Q.2	Ans	wer Any Four of	the following:				08	
	a) b)	What is means b	yical response? v Pressure gradient?					
	c)	What is a local w	ind?					
	d)	Important of urba	n climate					

Г

Soat

Q.3	Writ a) b) c)	te short notes on any Two of the following. What are rotational forces? Human comfort. Effects of local wind.	08
Q.4	Ans a) b) c)	wer any Two of the following. Explain the importance of climatic studies in industrial development. State the importance of temperature in physiological response. Write the effect of urban climate on body comfort.	08
Q.5	Ans a) b)	wer any One of the following. Describe the importance of weather in transportation. Explain the method of weather forecasting.	08

Explain the method of weather forecasting.

Seat No.		Set I	כ				
	B.Sc. (Semester - IV) (CBCS) Examination: Oct/Nov-2022 GEO-CHEMISTRY (Paper – III) Principles of Geochemistry						
Day 8 Time:	k Date 03:0	e: Saturday, 25-02-2023 Max. Marks: 4 D PM To 05:00 PM	10				
Instru	 Instructions: 1) All questions are compulsory. 2) Figures to the right indicate full marks. 3) Draw neat and labeled diagram wherever necessary. 						
Q.1	Choo 1)	ose the correct alternatives from the options. 0 The example of aromatic compound is a) Naphthalene b) Ethane c) Butane d) Ethylene)8				
	2)	In Van't Hoff isotherm, when the reaction moves in backward direction. a) $\Delta G > 0$ b) $\Delta G < 0$ c) $\Delta G = 0$ d) ΔG is absent					
	3)	In conjugate acid-base pair, there is a difference of a) only one proton b) two protons c) no protons d) one proton and one -OH group					
	4)	Which of the following are the primary causes of water pollution?a) plantsb) human activitiesc) animalsd) none of these					
	5)	Lechatalier's principle is not affected ona) concentrationb) temperaturec) pressured) catalyst					
	6)	are the most abundant organic-rich sedimentary rock.a) Coalsb) aminesc) alcoholsd) aldehydes					
	7)	Full form of TDS isa) Tax Deducted at Sourceb) Total Dissolved Samplec) Total Diffused Solidd) Total Dissolved solid					
	8)	Chemical equilibrium is independent ofa) timeb) temperaturec) pressured) concentration					
Q.2	Ansv a) b) c) d) e) f)	ver Any Four of the following:(What is chemical equilibrium?(What are the reducing agents? Write example.(What are the types of water pollution?(What are acids and bases?(Write on origin of petroleum.(What is law of mass action?()8				

Page 1 of 2

Q.3 Write short notes on any Two of the following.

- a) Explain treatment on water pollutant by chemical oxygen demand (COD).
- **b)** Write note on organic matter in black shale.
- c) Write note on hydrolysis of Na₂CO₃.

Q.4 Answer any Two of the following.

- a) Write note on biological oxygen demand (BOD).
- **b)** Write note on organic reactions.
- c) Explain the effect of temperature on chemical equilibrium.

Q.5 Answer any One of the following.

- a) What are the geological uses of acids and bases? Explain estimation of ionic concentration.
- **b)** Explain Le chateliar's rule, stability, Van't Hoff isotherm equation.

08

80

6)	is the most common type of antibody found in blood circulation.						
	a)	lgA		b)	IgH		
	c)	ΙġΕ		d)	lgG		
7)	top	is produc	the process by w ce two identical D	hich a double-s NA molecules.	stranded DNA molecule is copied		
	a)	DNA	melting	b)	DNA anneling		
	C)	DNA	replication	d)	Opsonization		
8)	diff a) c)	erent Apoe Phos	e a group of enzy enzyme forms an enzyme sphoenzyme	rmes that cataly d catalytic effici b) d)	yze the same reaction but have iencies. Isoenzyme Ribozyme		
Ans	wer	the fo	llowing question	ns. (Any Four)		08	
1)	Writ	e biolo	ogical significance	e of lipids.			
2)	Wha	at is pr	rimary structure o	f protein.			
3)	Defi	ne po	lysaccharides.	-			
4)	Wha	at are	cofactor of enzym	ne.			
5)	Wha	at is D	NA melting and w	vhat is DNA ren	naturation?		
6)	Defi	ine imi	munoglobulin				

c) Enzyme d) Nucleosides

- 6) is the mo

 - a) IgA
 - c) IgE
- 7) is the pro
 - to produce two
 - a) DNA meltin
 - c) DNA replica
- 8) are a gro different enzyme
 - a) Apoenzyme
 - c) Phosphoen

- comprises adenine and guanine as nucleobases. a) pyrimidines b) Histones

- c) nucleic acids d) Acetvl
- 2) a) amino acids fatty acids b)
- are the organic compounds that combine to form proteins.

3) Figures to the right indicates full marks.

Choose the correct alternatives from the options.

3)

B.Sc. (Semester - IV) (CBCS) Examination: Oct/Nov-2022 **ZOOLOGY** (Paper – VII) **Fundamentals of Biochemistry**

2) Draw neat diagrams and equations wherever necessary.

Which of the following is not an example of glycocongugate ?

- - d) Purines c) apoenzyme
- 4) is a RNA molecules that convey genetic information from DNA to
 - the ribosome, where they specify the amino acid sequence of the protein. rRNA b)
 - a) mRNA c) tRNA d) Chaperons
- 5) can be defined as biological polymers that catalyze biochemical
 - reactions. a) DNA

Day & Date: Saturday, 25-02-2023 Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.

a) Glycoprotein

c) Steroid

Seat

No.

Q.1

Q.2

1)

- b) Immunoglobulin

b) Glycolipids

d) Peptidoglycan

SLR-FZ-121

Set

Max. Marks: 40

Q.3	 Write short note on any two of the following. 1) Define carbohydrates and add note on biological significance of carbohydrates. 2) Write general properties of amino acids. 3) Discuss on IgG type of immunoglobulin. 	08
Q.4	 Answer any two of the following. 1) Write on factors affecting enzyme actions. 2) Discuss in brief structure of B- DNA type. 3) Write note on structure of mRNA. 	08
Q.5	 Answer any one of the following. a) Describe in detail typical structure of antibody. b) Explain in detail enzyme inhibition. 	08

the s	the series by 2 month. Then pairs will be available for computing							
auto	autocorrelation.							
a)	25	b)	48					
c)	49	d)	50					
lf Xi a	are iidN(0,1) r.vs., then limiting di	strib	ution of $Z = $ is N(0,1).					
a)	$ar{X}$	b)	$\frac{\bar{X}}{\sqrt{n}}$					
C)	$\bar{X}\sqrt{n}$	d)	$\bar{X} + \sqrt{n}$					
For a	a continuous distribution Chebyso	heve	e's inequality can be stated as					
P[X	$-E(X) \ge C \le \frac{V(X)}{C^2}$ provided							
a)	$V(X) < \infty$	b)	$V(X) < C^2$					
C)	both (A) and (B)	d)	neither (A) nor (B)					

Seat No.

3)

8)

a)

C)

B.Sc. (Semester - IV) (CBCS) Examination: Oct/Nov-2022 **STATISTICS (Paper – VIII) Applied Statistics**

Day & Date: Monday, 27-02-2023 Time: 12:00 PM To 02:00 PM

Instructions: 1) All questions are compulsory. 2) Figures to the right indicate full marks.

Choose the correct alternatives from the options. Q.1

- Level of significance is the probability of 1)
 - Type I error a)
 - Not committing error C)

b) Type II error d) None of these

- 2) Type - II error is
 - Rejecting H_o when H_o is wrong a)
 - Rejecting H_o when H_o is true b)
 - Accepting H_o when H_o is wrong C)
 - Accepting H_o when H_o is true d)
 - The death rate obtained for a segment of a population is known as
 - Specific death rate
- The value of Gross Reproductive Rate (GRR) >1 is indicative of _____. 4)
 - increase in population a)

standardized rate

- population remains constant d) none of these C)
- Long term fluctuations in time series are called 5) variations.
 - b) cyclical seasonal a) C) trend d) irregular
- Suppose time series data are available for 50 months and suppose we lad 6) the serie autocorre
 - a) 25 c) 49
- 7) If Xi are a) *X*
 - c) $\overline{X}\sqrt{\eta}$

Set

Max. Marks: 40

SLR-FZ-122

08

b) reduction in population

- b) crude death rate
- d) vital index

Q.2 Attempt any four of the following

a) Define

i) Population

b) Define Null hypothesis.

- c) Define C. B. R.
- d) Define central limit theorem
- e) State Chebyscheve's inequality

Q.3 Attempt any two of the following.

- a) Describe the procedure to test for testing population mean $\mu = \mu_0$ based on t-distribution.
- **b)** A r.v. X is such that E(X) = 3 and $E(X^2) = 13$.
 - i) Find least value for P(|X-3| < 4)
 - ii) Determine lower bound for P(-2 < X < 8)
- c) Write a note on moving average method.

Q.4 Attempt any two of the following.

- a) Describe chi-square test of goodness of fit.
- **b)** Describe F test for testing equality of two population variances.
- c) Define Gross Reproduction Rate (GRR) and Net Reproductive Rate (NRR).

Q.5 Attempt any one of the following.

- a) Describe least square method for trend estimation.
- **b)** Describe the procedure for testing $H_0: \mu = \mu_0$ and $H_0: \mu_1 = \mu_2$ based on normal distribution.

08

SLR-FZ-122

08

08

08

ii) Sample

No. B.Sc. (Semester - IV) (CBCS) Examination: Oct/Nov-2022 **METEOROLOGY** (Paper – IV) **Meteorological Instruments** Day & Date: Monday, 27-02-2023 Time: 03:00 PM To 05:00 PM Instructions: 1) All questions are compulsory. 2) Figures to the right indicate full marks.

- 3) Draw neat diagrams and give equations wherever necessary.
- 4) Use of logarithmic table and calculator is allowed.

Q.1 **Multiple Choice Questions.**

Seat

- The float type; with automatic siphon, weighing gauges & tipping-bucket 1) gauges are types of _____.
 - a) hygrometers
 - thermometers C)
- 2) If the temperature on the Celsius scale is 20 °C the temperature in kelvin scale is
 - 293 K b) 294 K a)
 - C) 292 K d) 300 K

The lines of constant are called isobars. 3)

- temperature pressure b) a) d) humidity
- entropy C)

Atmospheric pressure is measured using a 4)

- Thermometer a)
 - C) float gauge
- A force due to brings air-mass in motion. 5) rate of change of force
 - a) Velocity gradient b)
 - pressure gradient d) rate of change of replacement C)
- Wind results from _____ heating of different parts of the Earth. 6)
 - a) over b) even
 - C) equal d) uneven
- 7) Which of the following instrument is used to measure relative humidity?
 - a) wet and dry bulb thermometer hair hygrometer b)
 - hygrograph d) all of these C)
- 8) Dry and wet bulb thermometer is used to measure humidity. relative
 - Absolute a) C)
 - b) absolute and relative d)
 - minimum maximum

SLR-FZ-123

Set

Max. Marks: 40

08

rain gauges

barometer

anemometer

b)

d)

- radiometers
- d)

- b)

Q.2 Answer any four of the following

- a) Draw neat diagram of ordinary rain gauge.
- **b)** Calculate the common temperature indicated by thermometers calibrated in Celsius scale and Fahrenheit scale.
- **c)** How atmospheric pressure is measured using Fortin's barometer?
- d) Two unknown wind velocities 40 km/hr and 60 km/hr are measured using a cup anemometer and the respective linear velocities of rotating caps are 25 m/s and 40m/s. Determine constants of the cup anemometer.
- e) With neat diagram explain wind vane.
- f) What is thermopile?

Q.3 Write short notes on any two of the following.

- a) With neat diagram explain construction and working of float gauge.
- **b)** Write a note on mercury thermometer.
- c) Calculate atmospheric pressure in mb if reading of Fortin's barometer is 27 inches.

(Given: density of Hg=13.6 g/cc)

Q.4 Answer any two of the following.

- a) Draw neat labelled diagram of Aneroid barometer and describe its construction and working.
- **b)** With neat diagram explain construction and working of Hooke's anemometer.
- c) With neat diagram explain construction and working of dry and wet bulb thermometers.

Q.5 Answer any one of the following.

- a) With neat diagram explain construction and working of automatic siphon gauge.
- **b)** With neat labelled diagram, describe maximum and minimum thermometer.

80

08

08

Fill in the blanks with correct answer from given options. The Eh - Ph diagrams were first proposed by a) Krumbien & Garrel b) Sloss & Garret c) Pettijohn d) None of the above b) Isotopes d) None of the above

The degree of hydration depends on the: 2)

- a) Size of the ion
- b) Intensity of the charge on its surface
- c) Shape of the ion
- d) Both a and b
- 3) The radioactive decay of unstable nuclides, which causes variation in the isotopic composition of the daughter products.
 - a) Stable isotope
 - c) Radiogenic isotopes
- 4) The swelling and shrinkage properties of soil are due to Hallovsite
 - a) Kaolinite b)
 - c) Montmorillonite None of these d)
- 5) Goldsmidth has classified clay mineral as
 - a) Resistates b) Hydrolysates
 - c) Oxidates d) Evaporates
- 6) The most stable form of manganese in the secondary environment is
 - a) Psilomelane
 - c) Hausmanite
- Soil pollution is caused by _____. 7)
 - a) Industrial Activity
 - c) Accidental Oil Spills
- Which of the following agents is responsible for turning the TajMahal 8) vellow?
 - a) Sulphur b) Chlorine
 - c) Sulphur dioxide d) Nitrogen dioxide

Answer the following questions. (Any Four) Q.2

- Define Pollution. a)
- What is hydrogen ion concentration in pure water at 25°C? b)
- C) What is mean by radiogenic isotopes?

GEO-CHEMISTRY (Paper – IV) **Chemistry of the Earth**

Day & Date: Monday, 27-02-2023 Time: 03:00 PM To 05:00 PM

Seat

No.

Q.1

1)

Instructions: 1) All questions are compulsory.

- 2) Draw neat diagrams and give equations wherever necessary.
- 3) Figures to the right indicates full marks.

B.Sc. (Semester - IV) (CBCS) Examination: Oct/Nov-2022

Set

Max. Marks: 40

08

08

- b) Pvrolusite
- d) Manganite

d) All of above

b) Agricultural Activities



- Which of the following radioactive isotopes has the longest half-life? e) Name the factors controlling the formation of soil. f) Q.3 Write short note on any two of the following. 08 Explain in brief the characteristic of Kaolinite clay mineral. a) Discuss in short Oxidation Reduction potential in sedimentation process. b) C) Write note on Geochemical cycle. 08 Q.4 Answer any two of the following. Explain the causes of soil pollution. a) Discuss the structural units of clay minerals with neat labeled diagram. b) Write the applications of radiogenic isotopes. C) Answer any ONE of the following. 08 Q.5 Define chemical weathering. Explain the different processes of chemical a) weathering.
 - b) Describe in detail the factors controlling the formation of soil.

List the air pollutants.

d)

Max. Marks: 40 Instructions: 1) All questions are compulsory. 2) Figures to the right indicates full marks. 3) Draw a well diagram wherever necessary. Fill in the blanks by choosing correct alternatives: Adrenal gland is located close to 1) organ. a) Trachea b) Liver d) Kidney c) Stomach 2) Fertilization step in IVF process take place in In Laboratory a) Fallopian tube b) c) Inside Cervix d) In Uterus 3) Development of mammary gland and formation of milk is the function of a) Oxytocin b) Growth Hormone c) Prolactin d) Progesterone 4) hormone is also called as 'pregnancy hormone'. a) Progesterone b) Estrogen c) Human Chorionic Gonadotrophin (hCG) d) Prolactin cycle involves regular appearance of menses due to the shedding 5) of the endometrial lining of the uterus. a) Estrous cycle b) Menstrual cycle c) Circadian cycle d) Lunar cycle _ type of muscles are line the gastrointestinal tract. 6) a) Cartilagenos Muscles b) Skeletal Muscle d) Cardiac Muscle c) Smooth Muscle 7) Islet of Langerhans are seen in the histology of organ. a) Testis b) Stomach c) Liver d) Pancreas Interstitial cell of Leydig are found in the histology of gland. 8) b) Testes a) Ovary c) Salivary d) Pancreas Q.2 Answer the following questions briefly. (Any Four)

- Write any two functions of blood. a)
- Write any two functions of pancreas. b)
- Differentiate between vasectomy and tubectomy. C)
- Define synapse and its function. d)
- Write on testosterone hormone and its one function. e)
- Define IVF and its one significance. f)

B.Sc. (Semester - IV) (CBCS) Examination: Oct/Nov-2022

ZOOLOGY (Paper – VIII)

Animal Physiology: Controlling and Coordinating Systems

Day & Date: Monday, 27-02-2023 Time: 03:00 PM To 05:00 PM

Seat

No.

Q.1

- 08

SLR-FZ-125



Q.3 Write note on any two of the following.

- a) Give an account on types of blood cells
- **b)** Write a brief account on histology of liver
- c) Write a note on ultrastructure of neuron

Q.4 Attempt the following.

- a) Write a detailed account on the ultra structure of skeletal muscle and molecular and chemical basis of muscle contraction.
- **b)** Explain in detail histology, hormones secreted and their functions of thyroid and parathyroid gland.

Q.5 Answer any one of the following.

- a) Describe ultrastructure of neuron and add a note on generation and transmission of action potential.
- b) Give a detailed account on pituitary gland and its hormones.

80

Seat No.				Set F	>			
		B.Sc. (Semester - IV) (CBCS) I	Exar	mination: Oct/Nov-2022				
	MATHEMATICS (Paper–VII)							
Day &	Date	: Tuesday, 28-02-2023	-qut	Max. Marks: 4	0			
Time:	Time: 12:00 PM To 02:00 PM							
Instru	ictio	s: 1) All questions are compulsory.2) Figures to the right indicate full	marl	KS.				
Q.1	Mult	ple choice questions (each 1 mark	x)	0	8			
	1)	a) $(y-c)(y-x-c) = 0$	b)	(y-c)(x-c) = 0				
		c) $(y-c)(y+x+c) = 0$	d)	(y+c)(y+x) = 0				
	2)	The solution of the differential equat	ion y	= px + f(p) is				
		a) $y = cx - f(c)$	b)	y = cx + f(x)				
	•	c) y = cx + f(c)	d) 1r (y = px + f(c&)				
	3)	One of the solution of the equation -	$\frac{dx}{z} = \frac{d}{z}$	$\frac{dz}{dz} = \frac{dz}{z^2(x+y)^2}$ is				
		a) $x - y = c_1$	b)	$x + y = c_1$				
		c) $x^2 + y^2 = c_1$	d)	$x^2 - y^2 = c_1$				
	4)	The differential equation of the form are function of x y z are called	Pdx eq	+ Qdy + Rdz = 0 where P, Q, R				
		a) Linear differential	b)	Homogeneous linear				
		c) Simultaneous	d)	Total differential				
	5)	The P.I. of the equation $x^2 \frac{d^2y}{dx^2} + y =$	= 3x ²	is				
		a) x^2	b)	x				
		C) $(\log x)^2$	d)	$\log x$				
	6)	One of the solution of the simultaneous dz	ous e	quations				
		$\frac{dx}{y-z} = \frac{dy}{z-x} = \frac{dz}{x-y}$ is equations						
		a) $xyz = c_1$	b)	$x + y + z = c_1$				
		c) $x^2yz = c_1$	d)	$x - y + z = c_1$				
	7)	The number of arbitrary constant in $d^2y = dy = 0$	the g	eneral solution of the differential				
		equation $\frac{dy}{dx^2} + P \frac{dy}{dx} + Qy = R$ is/are		- 				
		a) One	d)	Two				
	8)	If $y = a^x$ is known solution of C E or	u) f tha					
	0)	$\frac{d^2y}{d^2y} + P\frac{dy}{d^2} + Ov = R \text{ then}$						
		$a_{x^{2}}^{dx^{2}} = a_{x}^{dx} + a_{x}^{dx} = 0$	b)	1 + P - Q = 0				
		c) $1 - P + Q = 0$	d)	1 + P + Q = 0				

08

08

- Answer any Four of the following Q.2
 - Solve $P^2 + P 6 = 0$ a)
 - Solve (P-1)(y-Px) = Pb)
 - Solve $x^2 \frac{d^2y}{dx^2} + x \frac{dy}{dx} 4y = 0$ C)
 - **d)** Solve $\frac{dx}{x} = \frac{dy}{y} = \frac{dz}{z}$

Show that the given equation is integrable e) $(2x + y^2 + 2xz)dx + 2xydy + x^2dz = 0$

Solve $y = 2px + \tan^{-1}(p^2x)$ f)

Answer any Two of the following Q.3

- Solve $y + Px = P^2$ using solvable for y a)
- **b)** Solve $x^2 \frac{d^2y}{dx^2} + x \frac{dy}{dx} 4y = x^2$
- c) Solve $\frac{d^2y}{dx^2} \cot x \frac{dy}{dx} + \sin^2 xy = \cos x \cos^3 x$

Answer any Two of the following a) Solve $\frac{dx}{yz} = \frac{dy}{zx} = \frac{dz}{xy}$ Q.4

- Solve $2xdx + 2ydy + (x^2 + y^2 + e^z)dz = 0$ b)
- **c)** Solve $P = \tan(x \frac{P}{(1+P^2)})$

Q.5 Answer any one of the following

- Solve $x^3 \frac{d^3y}{dx^3} + 2x^2 \frac{d^2y}{dx^2} + 2y = 10(x + \frac{1}{x})$ a)
- Solve $x \frac{d^2y}{dx^2} 2(x+1)\frac{dy}{dx} + (x+2)y = (x-2)e^{2x}$ b)

08

08

Q.1	Cho	ose the correct alternatives fr	om the opt	tions.
	1)	Aerobic respiration is carried o	ut in prese	nce of
		c) SO_2	d)	O ₂
	2)	When CO ₂ concentration is vertice $$ takes place.	ry low and	O ₂ concentration is very high then
		c) C2 cycle	d)	C5 cycle
	3)	During respiration final oxidation a) Glycolysis c) TCA cycle	on of NADH b) d)	l occurs in Link reaction ETC
	4)	In TCA cycle Oxaloacetate cor a) Fumaric acid c) Malic acid	ndense with b) d)	n Acetyl Co-A to yield Succinic acid Citric acid
	5)	enzyme helps to fix CO a) PEPease c) Rubisco	O₂ in C3 cy b) d)	cle. Transaminase Carboxypeptidase
	6)	C3 cycle is also known as a) Krebcycle c) EMP pathway	 b) d)	Calvin cycle None of these
	7)	transport usually does a) symplastic c) both a & b	not require b) d)	e energy. apoplastic none of these
	8)	Mass flow hypothesis is also c a) food c) pressure	alled b) d)	flow hypothesis. ion salt

- - b) Define Short Day Plants. Give any two examples.
 - Define symplastic transport. C)
 - Enlist the different photosynthetic pigments. d)
 - e) Define vernalization.
 - What is sink? f)

Seat No.

B.Sc. (Semester - IV) (CBCS) Examination: Oct/Nov-2022 **BOTANY** (Paper – VII) **Plant Physiology**

Day & Date: Tuesday, 28-02-2023 Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks

SLR-FZ-127

Set

Max. Marks: 40

80

Ρ

Q.3	 Write short notes on any Two of the following. a) Explain role of phytochrome. b) Write a note on - Apoplastic transport. c) Write a note on - Mass flow hypothesis. 	08
Q.4	 Answer any Two of the following. a) Write a note on - Structure of Mitochondrion. b) Write a note on - Significance of photorespiration. c) Write a note on - Structure of Photosynthetic apparatus. 	08
Q.5	 Answer any One of the following. a) Explain in detail - Process of Glycolysis. b) Explain in detail - C3 cycle of photosynthesis. 	08

Seat No.	t		Set	Ρ
		B.Sc. (Semester - IV) (CBCS) Exam MATHEMATICS (Pap Abstract Algebra	ination: Oct/Nov-2022 per–VIII) a – I	
Day & Time	& Dat : 12:0	e: Wednesday, 01-03-2023 0 PM To 02:00 PM	Max. Marks	: 40
Instr	uctio	ns: 1) All questions are compulsory.2) Figures to the right indicate full marks	S.	
Q.1	Cho 1)	ose the correct alternative of the followingA one-one and onto mapping is known asa) Bijectionb)c) Surjectiond)	ng Injection None of these	80
	2)	The symbol Z(G) meansa) Semigroupb)c) Cyclic groupd)	Center of group None	
	3)	A cyclic group have at least genera a) Four b) c) Two d)	itor. Three One	
	4)	Every cyclic group isa) Reflexiveb)c) Non-abeliand)	Symmetric Abelian	
	5)	lsomorphism is a relation on the se a) Reflexive b) c) Transitive d)	t of all groups. Symmetric Equivalence	
	6)	If $f: G \to G'$ then the set $\{x \in G / f(x) = e_G \$ a) Subgroup b) c) Kernel of f d)	;} is known as Symmetric group Cyclic	
	7)	The set of all left or eight cosets with comp a) Normal group b) c) Semi group d)	oosition is known as Quotient group None of these	
	8)	Every group of order is cyclic.a) Primeb)c) Oddd)	Even None of these	
Q.2	Ans a) b) c) d) e) f)	wer any four of the following. Give the definition of group. Prepare a Cayley table for $G = \{1, i, j, k, \}$ w Define equivalence relation. Explain integral modulo n . Show that every subgroup of an abelian group.	rith multiplications. oup is normal subgroup	08

Q.3 Answer any two of the following.

- a) Show that a set $G = \{1, -1, i, -i\}$ of a complex number from a group under complex multiplication.
- **b)** Let p, q be two positive integers then gcd(p,q), lcm(p,q) = p q.
- c) Prove that every isomorphic image of cyclic group is cyclic.

Q.4 Answer any two of the following.

- a) Explain product of two permutation and inverse permutation.
- **b)** If $f: G \to G'$ be an onto group homeomorphism then G' is isomorphic to a quotient group G (*i.e.* $G' \cong G / kaif$)
- **c)** Prove that a group G is abelian if and only if $a^2b^2 = (ab)^2$ for all $a, b, \in G$

Q.5 Answer any one of the following.

a) Show that $GL(2, R) = \left\{ \begin{bmatrix} a & b \\ c & d \end{bmatrix} / a, b, c, d \in R \right\}$ be the set of two by two matrix

such that $\begin{vmatrix} a & b \\ c & d \end{vmatrix} \neq 0$ is a group under matrix multiplication.

b) State and prove Cayley theorem.

08

08

Seat No.	t		Set	Ρ
		B.Sc. (Semester - IV) (CBCS) Examination: Oct/N Botany (Paper – VIII) Embryology of Angiosperms	ov-2022	
Day & Time	& Dat : 03:0	e: Wednesday, 01-03-2023 00 PM To 05:00 PM	Max. Marks	: 40
Instr	uctio	 ns: 1) All questions are compulsory. 2) Figures to the right indicate full marks. 3) Draw neat and labeled diagram wherever necessary. 		
Q.1	Cho 1)	ose the correct alternatives from the options.Transfer of pollen to the stigma of another flower of the sama) autogamyb) allogamyc) xenogamyd) geitonogamy	ne plant is	08
	2)	In coconut plant, the fruit dispersal is due to a) epicarp b) fibrous mesocarp c) endocarp d) endosperm)	
	3)	Xanthium fruits are dispersed bya) windb) waterc) animald) explosive		
	4)	Fully matured normal type of monosporic embryo sac showsstructure.a) 7 celledb) 8 celledc) 4 celledd) 16 celled	S	
	5)	Entry of pollen tube through micropylar canal called a) chalazogamy b) misogamy c) porogamy d) all of these		
	6)	The development of embryo in <i>Capsella bursa-pastoris</i> a m type. a) crucifer b) asterad c) solenoid d) chenopodiad	ember of	
	7)	The polar nuclei and male gamete fuse to form a) secondary nucleus b) zygote c) primary endosperm nucleus d) all of these		
	8)	Function of tapetum isa) protectiveb) nutritivec) respiratoryd) all of these		
Q.2	Ans a) b) c) d)	wer Any Four of the following: Define flower as a modified shoot. Define cross pollination. What is endosperm? What is double fertilization?		08

e) Why fruits and seeds are dispersed?

Q.3	Wri a) b) c)	te short notes on any Two of the following. Mechanism in entomophily (<i>calotropis</i>) Nuclear endosperm Explosive seed dispersal mechanism	08
Q.4	Ans a) b) c)	swer any Two of the following. Describe the types of ovule. Describe the development of monosporic embryo sac. Explain in brief the wind dispersal of fruits and seeds.	08
Q.5	Ans a) b)	swer any One of the following. Give an account of microsporogenesis and write the entire development of male gametophyte. Describe the stepwise development of embryo in dicotyledons.	08

Seat	t					Set	Ρ
110.		B.Sc. (Semest	er - IV) (CBCS) GEOGRAPHY	Exar (Pap	nination: Oct/Nov-2022 per - VII)	2	
Day & Time	& Dat : 12:(te: Thursday, 02-0 00 PM To 02:00 PI	3-2023 M	eog	rapny Ma>	. Marks	: 40
Instr	uctio	ons: 1) All question 2) Figures to 1 3) Draw neat	ns are compulsory. the right indicate fu and labeled diagrar	ll marl n whe	ks. erever necessary.		
Q.1	Cho 1)	oose and write a c Economic Geog a) Cultural c) Political	correct from giver raphy is a branch o	n alte f b) d)	rnatives. Geography. Social Human		08
	2)	Agriculture is a) Primary c) Tertiary	type of econc	omic a b) d)	ctivity. Secondary Quaternary		
	3)	Agriculture Land a) 1726 c) 1926	l use model by Von	Thun b) d)	es has given in 1826 1996		
	4)	Legal practices a a) Primary c) Tertiary	are a types	of ec b) d)	onomic activities. Secondary quaternary		
	5)	Industrial locatio a) A. Wagner' c) Von Thune	n theory has given s s	by b) d)	A. Webers Carl Ritter		
	6)	Trade is a) Primary c) Tertiary	types of occupatio	n. b) d)	Secondary Quaternary		
	7)	The Special Eco on a) 1995	onomic Zone (SEZ)	policy	v in India first came into ince 2000	ption	
	8)	c) 2006 is a prima a) Acting c) Manufactur	ary types of econom	d) nic act b) d)	2015 tivities. Mining Transportation		
Q.2	Ans a) b) c) d) e) f)	wer any four of the Define the conce What is SEZ? Define the econo Give the definition What is commerce Define the conce	he following: pt of trade. mic activity. n of Economic Geo cial agriculture? pt of manufacturing	graph ı regic	y. ons.		08

Q.3	Writ a) b) c)	e short notes on any two of the following. Cotton Textile Forestry Tertiary Activities	08
Q.4	Ans a) b) c)	wer any two of the following. Industrial location theory by Alfred Weber. Explain the factors affecting on location of economic activity. Explain the Iron and Steel industry in India.	08
Q.5	Ans a) b)	wer any one of the following. Give the classification of economic activity. Explain the agriculture landuse model by Von Thunes.	08

Sect			
Seat No.		Set P)
		B.Sc. (Semester - IV) (CBCS) Examination: Oct/Nov-2022 ELECTRONICS (Paper - VII) Operational Amplifier and Applications	
Day & Time:	Date 12:00	e: Thursday, 02-03-2023 Max. Marks: 40) PM To 02:00 PM	C
Instru	ictior	 is: 1) All questions are compulsory. 2) Figures to the right indicate full marks. 3) Draw neat diagram and give equations wherever necessary. 4) Use of logarithmic table and calculator is allowed. 	
Q.1	Choo 1)	ose correct answer.08The differential amplifier can be used asa) voltage comparatorb) voltage subtractorc) voltage followerd) all of these	B
	2)	The slew rate of the IC 741 OpAmp is a) 0.5 V/ms b) 0.5 V/µs c) 5 V/ms d) 5 V/µs	
	3)	The OpAmp configuration offers gain less than one.a) invertingb) differentialc) non-invertingd) both a and b	
	4)	In case of zero crossing detector using OpAmp has reference voltage. a) +zero Volt b) zero volt c) -zero Volt d) All of these	
	5)	The voltage to current converter using OpAmp is amplifier.a) transresistanceb) bufferc) conductanced) transconductance	
	6)	In case of non-inverting amplifier input voltage is 2 mV, input resistance is 10 KOhm and feedback resistance is 20 KOhm, then out voltage is a) 6 V b) 6 mV c) 2 mV d) 2 V	
	7)	The configuration of OpAmp is used for voltage follower circuit.a) closed loop invertingb) open loop non-invertingc) open loop invertingd) closed loop non-inverting	
	8)	In case of basic differentiator circuit the capacitor is connected path.	
		 a) In reedback b) at the inverting c) at the non-inverting d) in designer chosen 	
Q.2	Ansv a) b)	ver Any Four of the following: Illustrate the four characteristics of ideal Operational Amplifier. Explain the need of differential amplifier.	B

- Define the OpAmp parameter Input bias current and input offset voltage. State any two non-linear application of OPAmp. In case of OpAmp, Ad is 24000 and Ac is 0.12, find the CMRR in dB. Draw the neat labelled symbol of OpAmp and IC741 pin configuration. c)
- d)
- e)
- f)

Q.3 Answer any Two of the following.

- a) Explain the need of closed configuration in OpAmp.
- **b)** Explain the current mirror bias.
- c) Explain the differentiator using OpAmp.

Q.4 Answer any Two of the following.

- a) Explain the triangular wave generator using OpAmp.
- **b)** Explain the slew rate of an OpAmp.
- c) Explain the basic comparator using operational amplifier.

Q.5 Answer any One of the following.

- a) State the various configurations of OpAmp. Derive the gain relation for the Inverting configuration.
- **b)** Explain the following
 - 1) OpAmp as adder
 - 2) Wine bridge oscillator using OpAmp.

80

80

Stratigraphy Day & Date: Thursday, 02-03-2023 Time: 03:00 PM To 05:00 PM Instructions: 1) All questions are compulsory. 2) Figures to the right indicate full marks. 3) Draw neat & well labeled diagram wherever necessary. Q.1 Multiple Choice Questions 1) A Stratigraphic Principle of Order of Superposition has been given by . a) James Hutton b) Guttenberg c) Nicholas Steno d) William Smith 2) Bhander formation belongs to _____. a) Vindhyan b) Dharwar c) Cuddapah d) Deccan Trap 3) Which of the following represent Pre-Cambrian formation? a) Vindhyan b) Dharwar c) Cuddapah d) All the above 4) Inter-trapean beds belong to _____. b) Vindhyan a) Dharwar c) Siwaliks d) Deccan Trap

5) Which is the following is smallest lithostratigraphic division?

- a) Group b) Super-group d) All the above c) Formation
- 6) Age of Delhi super group is _____.
 - a) Cambrian b) Precambrian c) Silurian d) Jurassic
- 7) Diamond deposits found in Panna region of System
 - a) Vindhvan b) Dharwar c) Cuddapah d) Deccan Trap
- 8) James Hutton has given Principle of a) Unconformity b) Discontinuity
 - c) Uniformitarianism d) Disconformity

B.Sc. (Semester - IV) (CBCS) Examination: Oct/Nov-2022 **GEOLOGY** (Paper–VII)

Seat

No.

SLR-FZ-133

Set

Max. Marks: 40

Q.2	Ans a) b) c) d) e) f)	wer any four of the following. Give the name of Era representing recent life? Give two names of periods of Mesozoic What are inter-trapen beds? Define Stratigraphy. What is Epocs? Define Index fossil.	08
Q.3	Wri [:] a) b) c)	te short notes on any two of the following. Classification of Cuddapah Lithology and Age of Dharwar Deccan Trap - Lithology and Distribution	08
Q.4	Ans a) b) c)	wer any two of the following. Explain Indo-Gangetic Plains of India. Classification of Delhi Economic importance of Dharwar	08
Q.5	Ans a) b)	wer any one of the following Describe lithology, distribution, life, age and economic importance of Cuddapah system. Define Correlation. Describe any two Physical methods of stratigraphic correlation.	08

Seat No.]			Set	Ρ
	I	B.Sc. (Semes	ter - IV) (CBCS) MICROBIOLOG	Exan Y (Pa	nination: Oct/Nov per - VII)	-2022	
-		Imr	nunology & Med	ical I	Nicrobiology		
Day & Time:	& Date : 03:00	e: Thursday, 02-() PM To 05:00 F	03-2023 PM			Max. Marks	: 40
Instru	uction	ns: 1) All question 2) Figures to	ons are compulsory. the right indicate ful	l mark	(S		
		3) Draw neat	and labeled diagrar	n whe	rever necessary.		
Q.1	Choc 1)	ose the correct Primary lympho	alternatives from the bid organ is	he op	tions.		08
	-	a) Spleen		b)	Bone marrow Paver's patches		
	2)	is a vira	al disease.	u)	r ayer s pateries		
	,	a) S. aureus		b)	Dengue		
	3)	Use of Anti-Sna	ake Venom (ASV) is	an ex	ample of imm	unitv.	
	-,	a) Artificially	active	b)	Naturally active		
	4)	c) Artificially Complement Fi	passive ixation test can be us	a) sed fo	r diagnosis of		
	-,	a) Bacteria		b)	Viruses		
	5)	c) Protozoa	v of an antigen depe	a) nds ur	All of these		
	-,	a) Foreignne	SS oizo	b)	Chemical complexity		
	6)	c) wolecular	size otide chains are pres	u) sent in	laG molecule		
	•,	a) 1		b)	2		
	7)	c) 3 antiboc	ly is present in secre	a) tions	4 and has valency four		
	• ,	a) IgG		b)	IgM		
	8)	C) IGA	n hypothesis was nu	a) t forth	IgD by		
	0)	a) Kohler and	d Milstein	b)	Burnet		
		c) Fenner		d)	Landsteiner		
Q.2	Ansv	ver Any Four of	f the following:				08
	a) b)	Phagocytic cell.					
	c) / d)	Agglutination rea	action. Ind Virulence.				
	e)	Collection of clir	nical samples.				
	T)	Spread of Deng	ue.				
Q.3	Write	e short notes or Structure of Anti	n any two of the fol	lowin	g:		08
	b)	Inflammation rea	action				
	C)	Germ tube test f	or Canalda albicans				

Page **1** of **2**

Q.4 Answer any Two of the following.

- a) Write in detail about primary and secondary immune response.
- **b)** Describe collection, handling and transportation of samples for microbiological testing.
- c) Describe mode of transmission and pathogenesis of Salmonella typhi.

Q.5 Answer any One of the following.

- a) Explain Complement fixation test.
- **b)** Draw and describe the structure of secondary lymphoid organs.

		S	SLR-FZ-1	35
Seat No.	:		Set	Ρ
		B.Sc. (Semester - IV) (CBCS) Examination: Oct/Nov GEOGRAPHY (Paper - VIII) Environmental Geography	-2022	
Day 8 Time:	& Dat : 12:0	te Friday, 03-03-2023 00 PM To 02:00 PM	Max. Marks	s: 40
Instru	uctio	 ons: 1) All questions are compulsory. 2) Figures to the right indicate full marks. 3) Draw neat diagram wherever necessary. 		
Q.1	Cho 1)	oose the correct alternatives from the options.The Nature of Environmental Geography isa) Changingb) Complexc) Elaboratingd) Interdisciplinary		08
	2)	The word of environment (Environ) has been derived from a) Greek b) Roman c) French d) Arabian	language	
	3)	Early human civilization is known as a) Marine civilization b) Mountain civilization c) River valley civilization d) Modern civilization		
	4)	The boreal forest biome, also called as a) Marine biome b) Desert biome c) Savana biome d) Taiga biome		
	5)	The term Ecosystem was firstly used by a) Tansley b) Wegner c) Anderson d) Huggett		
	6)	is a largest ecosystem on Earth. a) Desert b) Forest c) Grassland d) Oceans		
	7)	is a cause of desertification. a) Pollution b) Forestation c) Deforestation d) Drought		
	8)	is one of the following cause global warming. a) Carbon dioxide b) Oxygen c) Nitrogen d) Hydrogen		
Q.2	Ans a) b) c) d) e) f)	Swer Any Four of the following: Define the concept of Environment. What is Biome? Define the concept of Food web. What is Global Warming? Define the concept of Pollution. Define the concept of Ecosystem.		08
Q.3	 Write short notes on any two of the following. a) Acid rain b) Environmental program c) Climate change 	08		
-----	---	----		
Q.4	 Answer any Two of the following. a) Explain the Importance of Environmental Geography. b) Explain the causes of desertification. c) Explain in details of water pollution. 	08		
Q.5	 Answer any One of the following. a) Explain the Nature of Environmental Geography. b) Explain major ecosystem of the world. 	80		

		SLR-FZ-13	7
Seat No.	t	Set F	>
		B.Sc. (Semester - IV) (CBCS) Examination: Oct/Nov-2022	
		ELECTRONICS (Paper - VIII) Digital Techniques and Microprocessor	
Day ۵ Time	& Date : 12:0	e: Friday, 03-03-2023 Max. Marks: 4 0 PM To 02:00 PM	,0
Instr	uctio	 ns: 1) All questions are compulsory. 2) Figures to the right indicate full marks. 3) Draw neat and labeled diagram wherever necessary. 4) Use of log table and calculator is allowed. 	
Q.1	Cho	ose the correct alternatives from the options. 0	8
	1)	a) 32 KB b) 64 KB c) 16 KB d) 8 KB	
	2)	The resolution of DAC is depending ona) supply voltageb) digital inputsc) reference voltaged) analog output	
	3)	In 8085 processor interrupts has highest priority. a) RST 5.5 b) RST 7.5 c) RST 6.5 d) TRAP	
	4)	In linear address decoding unused address lines are used for decoding purpose. a) only one b) All	
	5)	c) none of these d) I hree memories are made by using MOSEET and capacitors	
	0)	a) SRAM b) DRAM c) EPROM d) PROM	
	6)	In 8085 processor the stack pointer is bit wide.	
		c) 8 d) 16	
	7)	LDA 2040 H is a byte instruction.	
		c) three d) four	
	8)	is a bidirectional bus driver IC. a) 74244 b) 74245	
		c) 74138 d) 74373	
Q.2	Ansv a) b)	wer Any Four of the following: Give the classification of semiconductor memory. Define Accuracy and Resolution of DAC.	8

- C)
- d)
- Write the role of ALE signal. Enlist conditional program control transfer group of instructions. Calculate analog voltage for 4-bit R-2R DAC if having digital inputs 1110 e) if 1 = 5 volt and 0 = 0 volt.
- State the role of program counter of 8085 processor. f)

Q.3 Write short notes on any two of the following.

- a) Explain generation of control signal <u>MEMR</u>, <u>MEME</u>, <u>IOR</u> and <u>IOW</u> with the help of decoder IC 74138.
- **b)** Draw the flag structure of 8085 and explain in brief the roll of each flag.
- c) Explain in brief the working of SAR type ADC.

Q.4 Answer any Two of the following.

- a) With suitable diagram explain in brief the working of the R-2R ladder network DAC.
- b) Define the terms.
 - 1) T State
 - 2) Machine cycle
 - 3) Fetch cycle
 - 4) Instruction cycle
 - State the functions of following pins
 - 1) IO/M
 - 2) WR
 - 3) <u>RD</u>

C)

4) SID

Q.5 Answer any One of the following.

- a) Draw the internal block diagram of 8085 processor and explain ALU, Accumulator, and General-Purpose Register array of 8085 processor.
- **b)** What is instruction? Classify instruction set according to the function of an instructions with suitable example of each functional group.

08

80

Seat No.			Set	Ρ				
	B.Sc. (Semester - IV) (CBCS) Examination: Oct/Nov-2022 GEOLOGY (Paper – VIII) Palaeontology							
Day & Time:	& Date 03:00	e: Friday, 03-03-2023 0 PM To 05:00 PM	Max. Marks	s: 40				
Instru	uctior	 ns: 1) All questions are compulsory. 2) Figures to the right indicate full marks. 3) Draw neat and labeled diagram wherever 	necessary.					
Q.1	Choc 1)	ose the correct alternatives from the options species is extinct. a) Productus	tella	08				
		c) Cardita d) Trilo	bites					
	2)	Mostly Fossils preserved in rock. a) Argillaceous b) Aren c) Rudaceous d) Volc	aceous					
	3)	The mode of preservation of fossil is a) Mould b) Cast	e i these					
	4)	 c) Carbonization <lic) carbonization<="" li=""> c) Carbonization c) Carbonization <lic) carbonization<="" li=""> c) Carbonization <lic) carbonization<="" li=""> <li< td=""><td>nalopoda</td><td></td></li<></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)></lic)>	nalopoda					
	5)	Most Mollusca are of Habitats. a) Marine b) Terre c) Freshwater	estrial f these					
	6)	Goniatite belongs to phylum a) Coelentera b) Arthu c) Mollusca d) Brac	opoda hiopoda					
	7)	Fossil Paradoxide belongs to a) Arthropods b) Mollu c) Gastropods d) all of	usca these					
	8)	Hemiaster belongs toa) Echinodermatab) Bracc) Cephalopodd) Gast	hiopod ropoda					
Q.2	Ansv a) b) c) d) e) f)	wer Any Four of the following: Define fossil. Preservation of fossil in cold climate. Difference between caste and mold. Geological period of Cephalopoda. Any two uses of fossils. Significance of Gondwana flora.		08				
Q.3	Write a) b) c)	e short notes on any two of the following. Morphology of Turritella Morphology of Terebratula Morphology of Pectene		08				

Q.4 Answer any Two of the following.

- a) Write evolutionary history of horse.
- b) Write conditions of fossilization.
- c) Morphology of Trinucleus.

Q.5 Answer any One of the following.

- a) Classification and morphology of Echinus and Micraster.
- b) Classification and morphology of Spirifer and Productus.

Seat No.						Set	Ρ
	B.Sc. (Semester - IV) (CBCS) Examination: Oct/Nov-2022 MICROBIOLOGY (Paper-VIII) Industrial Microbiology						
Day & Time:	& Date : 03:0	e: Friday, 03-03-2 0 PM To 05:00 P	2023 M			Max. Marks	: 40
Instru	uctio	ns: 1) All the que 2) Draw neat 3) Figures to 4) Use of loga (At wt, H=1	stions are compulse diagrams and give the right indicate fu arithmic table and c , C=12, O=16, N=1	ory. equati II mark alculat 4, Na=	ons wherever necessa s. or is allowed. =23, CI=35.5)	ary.	
Q.1	Mult	iple choice ques	tions	· ().			08
	1)	For aeration teria) Impellerc) Sparger	nentor is supplied v	with a d b) d)	Baffles coiling coils		
	2)	Example of dua	I fermentation produ	uction i	S		
		a) L- lysinec) Streptomyc	in	b) d)	Penicillin None of above		
	3)	Which of the foll	owing nitrogen sou	rce is i	used in penicillin ferme	entation	
		a) Molasses c) SWL		b) d)	Whey		
	4)	Which of the foll a) Rapid grow c) Non-toxicity	owing is Ideal Char th to humans	racteris b) d)	stics of Strain? Genetic stability All of these		
	5)	During the prese a) metabolism c) physiology	ervation of microbia stops changes	l cell c b) d)	ulture metabolism changes metabolism continue	S	
	6)	Capacity of Pilo	t plant tanks is	or s	lightly larger.		
		a) 25 to 100 gac) 1,000 to 20	allons 000 lit	b) d)	10 to 20 lit 50 to 100 lit		
	7)	During active pe a) 8 to 9 c) 4.4 to 4.8	enicillin production t	he pH b) d)	is maintained 6.4 to 6.8 3.5 to 4.5		
	8)	Which of the foll a) Downstrear c) Chromatogr	owing process is us n processing aphy	sed in b) d)	the recovery of the pro Upstream processing Treatment process	oduct? J	

Q.2	Ans a) b) c) d) e) f)	wer any four of the following. What is a batch fermentation? Impeller Define Inoculum Define screening What is distillation? Define Strain	08
Q.3	Writ a) b) c)	te short notes on any Two of the following. Difference between surface and submerged fermentation. Explain primary screening with 2 examples. Precipitation as a recovery process.	08
Q.4	Ans a) b) c)	wer any Two of the following Explain scale up of fermentation. Strain improvement by mutation Explain dual and multiple fermentation.	08
Q.5	Ans a) b)	wer any One of the following. Explain in detail preservation of industrially important microorganisms. Write an account on SCP	08

Seat No.

B.Sc. (Semester - V) (New) (CBCS) Examination: Oct/Nov-2022 **ENGLISH (Compulsory)** Literary Mindscapes - I

Day & Date: Friday, 27-01-2023 Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

Q.1 Choose the correct alternative from the given option.

- 1) What was Della's fear with her new haircut?
 - a) Jim wouldn't love her anymore
 - b) made her look like a nun
 - c) made her look ugly
 - d) She would look less fashionable
- 2) What was Phatik's deepest desire in the story 'The Home Coming'? b) to be a ring leader
 - a) to belong and be loved
 - c) to be a boats man
- 3) What makes the maidens song extraordinary?
 - a) it's musicality b) it's eternal nature
 - c) it's theme d) her voice
- 4) What does Queen Gulnar desire in the poem?
 - a) the Kings alteration b) more jewellary
 - c) a rival d) more clothes
- 5) What did the school master love above all?
 - a) discipline b) learning
 - c) debate d) sports
- The hunter killed the tiger. (change into passive voice) 6)
 - a) The tiger was killed by the hunter
 - b) The tiger was killed by someone
 - c) The hunter killed some tigers
 - d) The tiger killed the hunter
- 7) Her grandfather after a long illness.
 - a) passed out b) passed away
 - c) passes by d) passed by
- 8) She among all her classmates because of her intelligence and smartness.
 - a) stands away
- b) stand above d) stand by

c) stands out

d) to become a teacher

Max. Marks: 40

08

SLR-FZ-140



Set

Q.2 Answer any four of the following Questions.

- a) What did the couple in the story 'The Gift of Magi' decide to gift each other?
- b) Why did Phatik feel suffocated in the big city?
- c) What trouble did the poet have with the song in the poem 'The solitary reaper'?
- d) Why is the Queen unsatisfied in the poem 'The Queens Rival'?
- e) What is the significance of the two roads in the poem 'The Road Not Taken'?
- f) Describe the character of the village school master.

Q.3 Answer the following question. (Any one)

- a) You are the student Secretary of Cultural department, a differences arouse among the students of Group dance ones a minor issue of dance steps. What step will you initiate to resolve the issue and ensure that harmony prevails.
- **b)** What are the 21st Century Skills? Explain them in details.
- Q.4 As a native of Solapur, how will you solve the problem of deforestation (cutting down the trees) due to the construction of the National and State Highways.

12

Seat No.						Set	Ρ
	B.S	c. (S	emester Mathen	- V) (New) (CBCS PHYSICS (Speci natical Physics &	5) Ex al P a Sta	camination: Oct/Nov-2022 aper- IX) atistical Physics	
Day 8 Time:	Date 03:00	: Satu) PM	ırday, 28-0 <i>°</i> To 06:00 PI	1-2023 M		Max. Marks	: 80
Instru	iction	s: 1) 2) 3) 4)	All questior Figures to t Draw neat Use of loga	ns are compulsory. The right indicate full indicate full indicate full indicate full indicate full indicate full indicates and cal	mark quati culat	s. ons wherever necessary. or is allowed.	
Q.1	A)	Multi 1)	ple choice Three coor a) $(x, y, z$ c) (r, θ, z)	questions. dinates of spherical o c)	coord b) d)	linate system are (r, θ, Φ) (x, y, r)	10
		2)	The mome a) <i>hυ</i> c) <i>c/hυ</i>	ntum of a photon of f	reque b) d)	ency ^v is hv/c 2hv	
		3)	Electrons a a) F-D st c) M-B s	re the particles which atistics tatistics	n bel b) d)	ongs to B-E statistics None of these	
		4)	In orthogor are called _ a) Scale c) Scale	al curvilinear coordir coordinates coefficients	b) d)	system, the coefficient h1, h2, h3 Scale factors Scale	
		5)	For the dist a) $w = 0$ c) $\delta \log w$	tribution to be most p $v = 0$	roba b) d)	ble $\log w = 0$ $\log w = 1$	
		6)	According f molecules a) 2/3 NI c) 3/2 NI	to the kinetic theory c of an ideal gas at the KT KT	of gas abso b) d)	ses, the total energy U of N olute temperature T is 2/3 KT 3/2 KT	
		7)	With increa a) Decre b) remain c) Increa d) remain	ise in temperature of ases for all the wave ns constant for all the ise for all the wavelei ns zero	blac lengt way ngths	k body, the energy emission h velength	
		8)	Wien's law a) All wa c) longei	applies to velength ⁻ wavelength	b) d)	smaller wavelength all of these	
		9)	Photon hav a) positiv c) charge	ve charge ve eless	b) d)	negative none of these	

Seat No.

		 10) Energy of highest filled quantum state is a) Free energy b) Fermi energy c) Zero point energy d) Electron energy 	
	В)	 Fill in the blank/Definition/One sentence answer/ one word answer/ Give the name/'Predict the product etc. 1) Define priori probability. 2) Stokes theorem gives the relation between line integral with 3) Write Laplacian operator ∇² in orthogonal curvilinear co-ordinates. 4) What do you mean by an ensemble? 5) Rest mass of photon is 6) What are accessible microstates? 	06
Q.2	Solv a) b) c) d) e) f) g) h) i)	ve any eight of the following. Define Boson and Fermions. Define orthogonal curvilinear coordinate. Define canonical and micro canonical ensemble. Define R.M.S Velocity. Write basic postulates of Bose-Einstein statistics. Define microstates and macrostates. What is phase space? Define most probable distribution. What is Cartesian co-ordinates system?	16
	j)	What is Fermi energy?	
Q.3	j) A)	 What is Fermi energy? Attempt any two of the following. 1) State and prove Stoke's theorem. 2) Obtain an expression for divergence of vector field in orthogonal curvilinear coordinates System. 3) Explain electronic specific heat of metals. 	10
Q.3	j) A) B)	 What is Fermi energy? Attempt any two of the following. 1) State and prove Stoke's theorem. 2) Obtain an expression for divergence of vector field in orthogonal curvilinear coordinates System. 3) Explain electronic specific heat of metals. Write Short note/Solve. Obtain an expression for average speed of gas molecules. 	10 06
Q.3 Q.4	j) A) B) A)	 What is Fermi energy? Attempt any two of the following. State and prove Stoke's theorem. Obtain an expression for divergence of vector field in orthogonal curvilinear coordinates System. Explain electronic specific heat of metals. Write Short note/Solve. Obtain an expression for average speed of gas molecules. Attempt any two of the following. Derive Rayleigh-Jean's formula from Planck s radiation formula. Explain Green's first theorem. Deduce Wien's displacement law from Planck's radiation formula. 	10 06 08
Q.3 Q.4	j) A) B) A)	 What is Fermi energy? Attempt any two of the following. State and prove Stoke's theorem. Obtain an expression for divergence of vector field in orthogonal curvilinear coordinates System. Explain electronic specific heat of metals. Write Short note/Solve. Obtain an expression for average speed of gas molecules. Attempt any two of the following. Derive Rayleigh-Jean's formula from Planck s radiation formula. Explain Green's first theorem. Deduce Wien's displacement law from Planck's radiation formula. 	10 06 08 08
Q.3 Q.4 Q.5	j) A) B) A) B) Atte a) b)	 What is Fermi energy? Attempt any two of the following. 1) State and prove Stoke's theorem. 2) Obtain an expression for divergence of vector field in orthogonal curvilinear coordinates System. 3) Explain electronic specific heat of metals. Write Short note/Solve. Obtain an expression for average speed of gas molecules. Attempt any two of the following. 1) Derive Rayleigh-Jean's formula from Planck s radiation formula. 2) Explain Green's first theorem. 3) Deduce Wien's displacement law from Planck's radiation formula. Describe/Explain/Solve Derive Maxwell-Boltzmann distribution law. mpt any two of the following. Derive Planck's radiation formula in terms of wavelength of black body radiation. Obtain an expression for curl of a vector field in orthogonal curvilinear co- 	10 06 08 08 16

Seat No.

B.Sc. (Semester - V) (New) (CBCS) Examination: Oct/Nov-2022 **CHEMISTRY (Special Paper - IX) Physical Chemistry**

Dav & Date: Saturday, 28-01-2023 Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Draw neat and labeled diagram and give equations wherever necessary.
- 4) Use of logarithmic table and calculator is allowed.

Choose the correct alternative and write the sentences. Q.1 A)

- The equation, F = C P + 2, represent _ 1)
 - phase equation Gibb's phase rule a) b)
 - c) reduced phase rule d) all of these

The emf of Daniell cell is 1 volt at 25°C. Hence ∆G for its cell reaction 2) is _____.

a)	2 × 96500 J	b)	- 2 × 96500 J
C)	1 × 96500 J	d)	- 1 × 96500 J

The cell that converts electrical energy in to chemical energy is known 3) as .

- a) electrolytic cell b) voltaic cell
- c) galvanic cell d) all of these

In concentration cell, emf is produced due to decrease in 4) accompanying the cell reaction.

- a) enthalpy b) entropy
- c) free energy d) both (a) and (c)
- Electrode concentration cell can be prepared by using _ 5)
 - metal-metal ion electrode a) amalgam electrode b) both a and c
 - calomel electrode d) C)
- A packet of energy that available in a specific decrete amount is 6) known as _____.
 - a) internal energy b) quantum
 - both a and c external energy d) C)
- For a system ice = water the degree of freedom is . 7)
 - a) zero b) one
 - c) three d) two
- 8) A positive value for the emf of the cell indicates the cell reaction is
 - non-spontaneous b) reversible a)
 - spontaneous d) none of these C)
- For reaction that obeys Einstein law . 9)

a)	$\emptyset = 1$	b)	$\emptyset = 0$
C)	$\emptyset < 1$	d)	$\emptyset > 1$

Set

Max. Marks: 80

10) De Broglie equation is represented as _____

a)
$$\lambda = \frac{h}{mv}$$
 b) $E =$

c) $\Delta E = E_2 - E_1$ d) both (a) and (b)

B) Fill in the blanks from the following.

 Homogeneous mixture of two or more chemical components is known as ______ solution.

 \overline{mc}^2

- 2) Sodium amalgam electrode is represented as _____.
- 3) In concentration cells, emf is due to difference in _____.
- 4) An electrode at which oxidation occurs is called _____.
- 5) In photosynthesis _____ acts as a sensitizer.
- 6) $\Delta X. \Delta P \approx h$ is the mathematical expression of _____.

Q.2 Solve any eight of the following.

- a) What is Compton effect?
- **b)** Find the degree of freedom for the system, Four different gases enclosed in a cylinder.
- c) Represent the Daniell cell.
- d) Define oxidation and reduction.
- e) Define metal-metal ion electrode. Give its example.
- f) Give one application of EMF measurements.
- **g)** Define electrochemical series. What is the standard reduction potential of zinc electrode?
- h) State Lamberts and Beer's law.
- i) What is quantum yield?
- j) Define law of photochemical equivalence.

Q.3 A) Attempt any two of the following.

- 1) What are photochemical reactions? How do they differ from the dark reaction?
- 2) Write a note on reversible cell.
- 3) What is electrochemistry? What are electrolytic and voltaic cells?

B) Solve the problem.

Calculate the emf of the cell at 298K,

Pt | Cl₂ (g, 0.5atm) | HCl (aqs) | Cl₂ (g, 3atm) | Pt

State whether the reaction is spontaneous? Give reason.

Q.4 A) Attempt any two of the following.

- 1) Explain black body radiation.
- 2) Explain Pattinson's process of desilverisation of lead.
- 3) A substance absorbs 2 x 10^{16} quanta of radiation per second and 0.002 moles of it react in 20 minutes. Calculate quantum yield of this reaction. (N = 6.023×10^{23})
- B) Derive an expression for emf of an electrode concentration cell without
 08 transference.

Q.5 Attempt any two of the following.

- a) Write a brief note on Photoelectric effect.
- b) Discuss the application of phase rule to water system.
- c) Discuss in detail "Jablonski diagram".

16

06

16

10

08

Seat No.						Set	Ρ
	B.S	6c. (S	emester - V) (New) (CBCS BOTANY (Specia Plant Syste) Exa I Paj mati	amination: Oct/No per – IX) cs	ov-2022	
Day & Time:	Date 03:00	e: Sati D PM	rday, 28-01-2023 o 06:00 PM			Max. Marks	: 80
Instru	ctior	is: 1) 2) 3)	All questions are compulsory. Figures to the right indicate full r Draw neat and labeled diagram	narks where	ever necessary.		
Q.1	A)	Mult 1)	ble choice questions. A <i>nnona squamosa</i> belongs to fa a) Annonacea c) Malvaceae	amily b) d)	Rutaceae Poaceae		10
		2)	is a example of Rutacea a) <i>Citrus sinensis</i> c) <i>Mangifera indica</i>	ae fan b) d)	nily. Cocos nucifera Zea mays		
		3)	Bentham and Hooker's system o a) Phylogenetic c) Artificial	of clas b) d)	ssification of angiospe Natural None of the above	rm is	
		4)	type of inflorescence is a) Spadix c) Verticillaster	found b) d)	in family Lamiaceae. Hypanthodium Spike		
		5)	Gynobasic style is seen in a) Bignoniaceae c) Lamiaceae	far b) d)	nily. Poaceae Rubiaceae		
		6)	Sir J. C. Bose Botanical Garden a) Delhi c) Calcutta	is loc b) d)	ated at Kolhapur Pune		
		7)	The elongation of internode betv a) Anthophore c) Gynophore	veen b) d)	corolla and stamen is Androphore Carpophore	called	
		8)	Vonoadelphous stamens are fo a) Cotton c) Mango	und ir b) d)	n flower. Rose Mustard		
		9)	Example of tuberous root is a) Sweet potato c) Carrot	b) d)	Tomato <i>Pothos</i>		
		10)	Allium cepa(Onion) is t a) Tuber c) Rhizome	ype o b) d)	f stem. Corn Bulb		

Set P

SLR-FZ-143

Page **1** of **2**

	B)	 Fill in the blanks from the following. 1) The flower having calyx, corolla, androecium, and gynoecium is called as flower. 2) The coloured sepal is called as sepal. 3) In hypogynous flower the ovary is 4) Male reproductive organ of flower is 5) The entire inflorescence is enclosed by a large bract called 6) Permanent calyx is called as calyx. 	06
Q.2	Solv a) b) c) d) e) f) g) h) i) j)	 e any eight of the following. Give the special types of inflorescence with example. Sketch and label papilionaceous corolla and give example. Which are the types of aestivations? Define fruits. Give types of stamens with example. Explain the essential whorls of flower. What is parthenocarpic fruit? Mention the types of polypetalous forms of corolla. Give types of roots with example. 	16
Q.3	A)	 Attempt any two of the following. What is herbarium? Describe various steps involved in herbarium preparation. Give definition of inflorescence and describe racemose types of inflorescence with suitable example. Explain in brief about the Lead Botanical Garden Shivaji University, Kolhapur. 	10
	B)	Sketch label and describe the typical structure of flower.	06
Q.4	A)	 Attempt any two of the following. 1) Describe the principals of ICBN. 2) What is Placentation? Describe its types. 3) Give economic importance of family Annonaceae. 	08
	B)	Describe the types of modifications in stem.	08
Q.5	Atte a) b)	mpt any two of the following. What is aggregate fruit? Describe its types with suitable example. Give the merits and demerits of Benthum and Hooker's system of classification.	16
	C)	Give distinguishing characteristics of family Rutaceae with economic	

B) Fill in the blanks from the following

Q

importance.

Set | B.Sc. (Semester - V) (New) (CBCS) Examination: Oct/Nov-2022 **ZOOLOGY** (Special Paper – IX) **Molecular Biology** Max. Marks: 80

b) Carbon

RNA polymerase

b)

Dav & Date: Saturday, 28-01-2023 Time: 03:00 PM To 06:00 PM

C)

C)

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

- 3) Draw neat diagrams and wherever necessary.
- 4) Use of calculator is allowed.

Fill in the blanks by choosing correct alternatives given below. Q.1 A)

- Following ______ element is not found in nitrogenous base. 1)
 - Nitrogen a)
 - Phoshorous Hydrogen d)

The nature of DNA replication in eukaryotes is 2)

- Conservative Non conservative a) b)
- C) Semi conservative d) Cyanobacteria

The enzyme responsible for transcription is _____ 3)

- a) DNA polymerase
 - Reverse transcriptase d) Ligase
- 4) Following may be attached with adenine base in RNA.
 - Guanine a) b) Cytosine
 - C) Uracil Thymine d)
- 5) is not a cloning vector.
 - Plasmids a) b) Cosmids
 - BAC d) Introns C)
- 6) Histone protein is present in
 - Ribosome b) Replisome a)
 - Nucleosome Spliceosome d) C)

Hybridoma technology is used to synthesize 7)

- a) Insuline b) Growth hormone C)
 - Monoclonal antibodies d) Interferons
- Genetically engineered human insulin is called 8)
 - Humuline Haematin a) b) C)
 - Aniline d) Haematoxylene
- Which of the following bond is not related to nucleic acid? 9)
 - Ester bond H-bond b)
 - Glycosidic bond d) Peptide bond
- Following is required as inducer for the expression of Lac 10) operon.
 - a) Glucose Lactose C)

a)

C)

- b) Galactose
- d) Lactose and Galactose

10

Seat No.

	B)	 Write one sentence answer. 1) Write location of DNA and RNA in a cell. 2) Give name of nitrogenous bases. 3) What is operon concept? 4) Define hybridoma. 5) Define transcription. 6) What is SOS? 	06
Q.2	Solv a) b) c) d) e) f) g) h) i) j)	Pe any eight of the following. Draw a figure of Helix model of DNA. Types of RNA. Functions of DNA. What is DNA replication? Define translation. Significance of RNA. What is Splicing? Gene mapping. Application of R-DNA in medicine. Recombinant DNA technology.	16
Q.3	A)	 Attempt any two of the following. 1) Write an salient features of DNA. 2) Write an salient features of RNA. 3) Give an account on significance of polyacrilation. 	10
	B)	Write Short note. Difference between prokaryotic and eukaryotic translation.	06
Q.4	A)	 Attempt any two of the following. 1) Describe properties of genetic code. 2) Explain role of RNA polymerase. 3) Describe mechanism of capping. 	08
	B)	Describe /Explain miRNA and siRNA	08
Q.5	Atte a) b)	mpt any two of the following. Describe mechanism of transcription in prokaryotes. Give an account on principles of transcriptional regulation with example of lac operon.	16

c) Describe the mechanism of R-DNA.

Seat No.						Set	Ρ
	B.So	c. (S	emester MA	- V) (New) (CBCS THEMATICS (Sp Algebra) Exa ecial a-ll	amination: Oct/Nov-2022 Paper- IX)	
Day & Time:	Date: 03:00	Satu PM	urday, 28-0 <i>°</i> To 06:00 PI	1-2023 M		Max. Marks	: 80
Instru	ctions	s: 1) 2)	All questior Figures to f	ns are compulsory. the right indicate full r	narks		
Q.1	A) (Choc 1)	ose the cor The charac a) 7	rect alternative of th the ring Z_3	he foll × Z_4 = b)	owing.	10
	2	2)	c) 6 The maxim a) 2	al ideal M in Z_{12} are _	d) b)	5	
	2	3)	c) 3 The vector	space Maus has dime	d) ension	4	
	·		a) 3 c) 12		b) d)	4 7	
	4	4)	The vector $V_1, V_2, V_3 \dots V_n$ in a vector space V are said independent if $\sum_{i=1}^n aiv_i = 0$ implies			pace V are said to be Linearly $S_{}$	
	_		c) All a	i = 0 $i \neq 0$	d)	None of these $a_1 \neq 0$	
	5	5)	A linear tra a) One c) One	nsformation $T: V \rightarrow V$ - one and into - one and onto	b) d)	ersible then <i>T</i> is Many one into Many on to	
	e	6)	$T: \mathbb{R}^2 \to \mathbb{R}^2$	be given by $T(x, y) =$	= (3 <i>x</i>	+ 4y, $x - 5y$) then $[T]_{\beta}^{\gamma}$	
			a) $\begin{bmatrix} 3\\1\\c \end{bmatrix}$	4 5 1 5	b) d)	$\begin{bmatrix} 3 & 4 \\ 1 & -5 \end{bmatrix}$ $\begin{bmatrix} 3 & 1 \\ 5 & 4 \end{bmatrix}$	
	7	7)	Let $T: \cup \rightarrow V$ is called a) Range	be homomorphism the formula $\overline{\mathbf{g}}$ of T	hem tl b)	The set defined by $\{ u \in v/T(u) = 0_v \}$ Kernel of <i>T</i>	}
	8	3)	c) Subs	space of T product space the no (m, w)	d) orm is	None of these defined by	
			(a) $ v $ (c) $ v $	$= (v, v)$ $= (v, v)^{2}$	d)	$\ v\ = \sqrt{(v, v)}$ $\ v\ = v$	
	ę	€)	Which strue a) (<i>R</i> , - c) (<i>E</i> , -	cture is not a field? +,·) +,·)	b) d)	$(C, +, \cdot)$ $(Q, +, \cdot)$	

10)	The span	{ (0,1,0)	$(0,0,1)\}$	contains	all points in	
-----	----------	-----------	-------------	----------	---------------	--

- XY plane b) YZ plane a) XZ plane C)
 - None of these d)

Fill in the blanks from the following. B)

- $T: \mathbb{R}^3 \to \mathbb{R}^2$ is linear transformation defined by $T(a_1, a_2, a_3) =$ 1) $(a_1 - a_2, a_3)$ then R(T) =If $u = (-1, 1, 2) \in R^3$ than $\frac{u}{\|x\|} =$ ______
- 2)
- 3) In a ring if $a^2 = a \forall a \in R$ then 'a' is called element. Г10 O -81

4) Determine trace of
$$\begin{bmatrix} 2 & -4 & 3 \\ -5 & 7 & 6 \end{bmatrix}$$

- Let $T: \mathbb{R}^2 \to \mathbb{R}^3$ be linear transformation given by 5) $T(X_1, X_2, X_3) = (X_1 + X_2 + X_3, X_1 - 2X_2, 2X_2 - X_3)$ Then T(1, 1, 2) =
- The dimension of vector space of complex number C' over filed of 6) complex number is _____.

Q.2 Solve any Eight of the following.

- Prove that if $(a + b)^2 = a^2 + 2ab + b^2$ for all a, b in a ring R iff R is a) commutative
- Define ring with zero divisor and integral domain. b)
- If x, y, z are vector in vector space V such that x + z = y + z then show that C) x = y (cancellation law)
- Determine whether first vector can be written as linear combination of other d) two vectors (3,4,1)(1,-2,1)(-2,-1,1)
- Show that $\beta = \{ (2,5)(1,1) \}$ is basis of $V = R^2$ e)
- Let V be inner product space over f then for all $X \in V$ and $C \in f$ show that f) || Cx || = |C| ||x||
- Let $\{V_1, V_2, V_3, \dots, V_k\}$ be an orthogonal set in V and let $a_1, a_2, a_3 \dots a_k$ be g)

scalars prove that

$$\left\|\sum_{i=1}^{k} ai \, Vi\right\|^{2} = \sum_{i=1}^{k} |ai|^{2} ||Vi||^{2}$$

- h) If x = (2, 1 + i) and y = (2 - i, 2) then compute $\langle x, y \rangle$
- Show that mapping T is non linear $T: V_3 \rightarrow V_1$ defined by i) $T(x_1, x_2, x_3) = x_1^2, x_2^2, x_3^2$
- Let $T: \mathbb{R}^3 \to \mathbb{R}^3$ be liner transformation defined by T $(a_1, a_2, a_3) = (a_1, a_2, 0)$ j) find N(T) and R(T).

A) Attempt any Two of the following. Q.3

- Show that intersection of two ideals of R is ideal of R1)
- Show that $||x + y||^2 + ||x y||^2 = 2||x||^2 + 2||y||^2 \forall x, y \in R$ 2)
- If $T: R_2 \rightarrow R_2$ is linear transformation T(1,0) = (1,4), T(1,1) = (2,5)3) What is T(2,3)
- **B)** Prove that the set { (1,0,0,-1)(0,1,0,-1)(0,0,0,1) } is linearly independent

A) Attempt any Two of the following. Q.4

- If $T: V_3 \rightarrow V_3$ is liner transformation defined by 1) T(x, y, z) = (3x, x - y, 2x + y + z) find T^{-1}
- Let W_1 and W_2 be subspace of vector V then show that $W_1 + W_2$ is 2) also subspace.
- Prove that every finite integral domain is field. 3)

16

06

06

Page 2 of 3

B) State and prove Cauchy schwarz inequality and also show that $||x + y|| \le ||x|| + ||y||$

Q.5 Attempt any Two of the following.

- a) Let *V* and *W* be vector space and let $T: V \to W$ be linear if *V* is finite dimensional then show that nullity $(T) + rank(T) = \dim(V)$
- **b)** Show that the set of members of $a + b\sqrt{2}$ with *a*, *b* as rational number is a field
- c) Let x = (2, 1 + i, i) and y = (2 i, 2, 1 + 2i) be vector in C^3 compute $\langle x, y \rangle$, ||x||, ||y|| and ||x + y|| Then verify Cauchy schwarz inequality and Triangle inequality.

Seat No.						Set	Ρ
	В.	Sc. (Semester · S	- V) (New) (CBC TATISTICS (Spe Statistical Inf	S) Exa ecial Pa ference	mination: Oct/Nov-2022 aper- IX) e – I	
Day & Time:	Dat 03:0	e: Sat 00 PM	urday, 28-01 To 06:00 PM	-2023 1		Max. Marks	: 80
Instru	ictio	ns: 1) 2) 3) 4)	All questions Figures to th Draw neat la Use of log ta	s are compulsory. e right indicate full r belled diagrams wh ble and calculators	marks. ierever i is allow	necessary. ed.	
Q.1	A)	Choo 1)	ose the corre Consistency a) small s c) any siz	ect alternative / is property associa amples ze samples	ated with b) d)	n large samples None of these	10
		2)	lf expected be a) unbias c) consist	value of an estimato estimator. ed tent	or is equ b) d)	uals to a parameter, it is said to biased sufficient	
		3)	Mean squar a) Bias + c) Bias ² +	red error of an estim Var(T) - Var(T) ²	nator T c b) d)	of θ is {Bias + Var(T)}² Bias² + Var(T)	
		4)	The estimat a) unbias c) sufficie	or sample mean for ed ent	popula [.] b) d)	tion mean is consistent All of these	
		5)	For a rando θ; MLE of θ a) Mediar c) Geome	m sample of size n) is n etric Mean	from Po b) d)	isson distribution with parameter Mode Mean	
		6)	Let T be an a) $g(\theta) =$ c) $g(\theta) =$	unbiased estimator = $3 \theta + 1$ = $2\theta^2 + 5\theta$	of θ, the b) d)	en g(T) be surely unbiased for $g(\theta) = e^{\theta}$ $g(\theta) = \theta^{\frac{1}{2}}$	
		7)	Let $X = 5$ be estimator of a) 0.5 c) 0	e an observation fro p is	b) b) d)	, p). then maximum likelihood 1 None of these	
		8)	Pitman-Koo a) unbias c) sufficie	pman form is used ed ent	to obtaiı b) d)	n statistics. efficient none of these	
		9)	A sufficient a) mean	statistics for θ of U(0, θ) is b)	median	

SLR-FZ-146 Г

Seat N

c) max $(X_1, X_2,...,X_n)$ d) $min(X_1, X_2,...,X_n)$

- 10) For which of the following distribution moment estimators does not exist?
 - a) Laplace
 - c) Exponential
- b) Lognormal d) Cauchy

Q.1 B) Fill in the blank

- 1) A statistics T is said to be sufficient for parameter θ , if the conditional distribution of (X_1, X_2, \dots, X_n) given T = t is
- 2) Likelihood function is function of only.
- 3) Based on random sample of size n from U(0, θ), the moment estimator of θ is
- 4) Maximum likelihood estimator if exists, is function of statistic.
- 5) The equality in Cramer- Rao inequality for lower bound of variance exists if
- 6) If $(X_1, X_2, ..., X_n)$ be random sample of size n from $f(x, \theta)$ then $I_{X_1,X_2,\ldots,X_n}(\theta) = \underline{\qquad} I_X(\theta)$

Solve any eight of the following. Q.2

- Define an estimator and give example of an unbiased estimator. a)
- Define Mean Squared Error(MSE) of an estimator T. What is the relationship b) between MSE and Var(T), when T is an unbiased estimator?
- Define sufficient statistics. Is \overline{X} is regarded as a sufficient statistics for μ , C) based on random sample of size n from $N(\mu, \sigma^2)$?
- d) What do you mean by consistent estimator? Is it unique, if exists?
- e) State Neyman-Factorization theorem.
- Define minimum variance unbiased estimator (MVUE). **f**)
- Give an example which supports the statement 'MLE need not be unique'. g)
- h) Define Fisher information function.
- Explain the key difference between statistic and an estimator. i)
- Define unbiased estimator. Is X_1 unbiased for μ , based on random sample of j) size n from $N(\mu, \sigma^2)$?

Attempt any two of the following. Q.3 A)

- 1) Find moment estimator of θ if $f(x) = \begin{cases} (1-\theta)\theta^x & ; x = 0,1,2,3,... \\ 0 & ; otherwise \end{cases}$
- 2) Write a note on method of minimum chi-square for estimating unknown parameters of distribution.
- 3) Obtain maximum likelihood and moment estimators of θ , based on a random sample of size n form exponential distribution with parameter θ .
- B) Show that, sample mean is sufficient estimator of λ of a Poisson distribution 06

A) Attempt any two of the following. Q.4

- 1) Prove that, if T is unbiased estimator of θ , then $\phi(T)$ is an unbiased estimator of $\phi(\theta)$, provided that $\phi(.)$ is linear function.
- 2) Let X₁, X₂ be a random sample of size 2 from $N(\mu, \sigma^2)$ distribution. Consider two estimators $T_1 = \frac{X_1 + X_2}{2}$ and $T_2 = \frac{2X_1 + 4X_2}{6}$. Are T_1 and T_2 unbiased estimators of population mean? Find the efficiency of T_2 with respect to T_1 .
- 3) State and prove sufficient condition for consistency of an estimator.

06

16

10

16

B) Prove that a biased estimator is consistent if its bias and variance both tend to zero as the sample size tends to infinity.

Q.5 Attempt any two of the following.

- a) State and Prove Cramer-Rao inequality.
- b) Let X_1, X_2, \dots, X_n be a random sample of size n from $G(\alpha, \lambda)$ distribution with pdf

$$f(x; \alpha, \lambda) = \frac{\alpha^{\lambda}}{\lambda} e^{-\alpha x} x^{\lambda - 1}; \quad x \ge 0, \alpha > 0, \lambda > 0$$

0 ; otherwise

Obtain sufficient statistic

i) for α when λ is known

ii) for λ when α is known

iii) When both α & λ are unknown

c) Let X₁, X₂,X_n be a random sample of size n form Exponential distribution with pdf

$$f(x;\theta) = \begin{cases} \theta e^{-\theta x} x^{\lambda-1}; & x \ge 0, \theta > 0\\ 0 & ; & otherwise \end{cases}$$

Obtain

- i) MLE of θ , and show that it is function of sufficient statistic.
- ii) Fisher information function in MLE estimator.

Set

Max. Marks: 80

10

Seat No.

B.Sc. (Semester - V) (New) (CBCS) Examination: Oct/Nov-2022 GEOLOGY (Special Paper – IX) Economic Geology

Day & Date: Saturday, 28-01-2023 Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.

- 2) Draw neat labelled diagrams wherever necessary.
- 3) Figures to the right indicate full marks.

Q.1 A) Fill in the blanks by choosing correct alternatives given below.

- 1) Metasomatic replacement deposits are characterised by
 - a) Preservation of rock structure
 - b) Presence of pseudo morphs of replacing minerals after the replaced one
 - c) Absence of Crusification
 - d) All the above

2) Which is the most common ore of lead?

- a) Sphalerite b) Galena
- c) Chromite d) Bauxite

3) The process of oxidation and supergene enrichment takes place _____.

- a) On surfaceb) At shallow depthc) At greater depthd) In atmosphere
- Hydrothermal replacement deposits are mainly produced in _____ rocks.
 - a) basalt b) carbonate
 - c) granite d) none of these
- 5) Which of the following rock types would most likely be the best oil reservoir?
 - a) Granite b) Shale
 - c) Sandstone d) Salt
- 6) Which of the following has control on formation of laterite?
 - a) Climate b) Parent rock
 - c) Lithology d) All of the above
- 7) Greenstone belts of Precambrian terrain are good for searching
 - a) Cu b) Au
 - c) Fe d) Sn
- 8) Diamond is an example of _____ magmatic deposits.
 - a) disseminated b) segregated
 - c) injected d) none of these
- 9) Mechanical concentration can occur only if the valuable minerals have:
 - a) high specific gravity
 - b) chemical resistance to weathering
 - c) durability (toughness and hardness)
 - d) All of the above

16

SLR-FZ-147

- 10) Fossil fuels are derived from which of the following sources?
 - Organic matter trapped in sedimentary rock a)
 - b) Inorganic matter trapped in metamorphic rock
 - Organic matter trapped inigneous rock C)
 - Organic matter on the crust surface d)

B) Answer the following.

- Where is the Singhbhum copper belt located in India? 1)
- What is the name for the surficial indicator of the hidden ore deposit? 2)
- What is contact metasomatism'? 3)
- "The hydrothermal deposits are epigenetic ore deposit", True / False 4)
- Chromite is mostly of which origin? 5)
- What are sublimation deposits? 6)

Q.2 Answer the following questions. (Any Eight)

- Name the mineral constitutents of coal. a)
- What is reservoir rock? b)
- Give two examples of magmatic segregation ore deposits. C)
- d) Name any two processes of ore formation of syngenetic deposits.
- Name the types of cavity filling hydrothermal ore deposits. e)
- Write the condition of formation of residual deposits. f)
- Name the ore minerals of Manganese. g)
- Define the term ore deposit. h)
- Write sequentially the zones of formation of supergene enrichment i) deposits.
- Define the term Tenor of ores. j)

Q.3 A) Answer the following questions. (Any Two) 1) Explain the process of formation of Residual deposits with suitable example. 2) Discuss the classification of coals with its chemical constituents. Describe the occurrences and distribution of Iron ore deposits. 3) Write short note on Contact metasomatic ore deposits. 06 B) Answer the following questions. (Any Two) 08 Q.4 A) Discuss the geological occurrence and distribution of gold deposits in 1)

- India.
- 2) Define Gossan. Write a brief note on Supergene Sulphide enrichment with neat labelled diagram.
- Write note on Sublimation with suitable example. 3)
- Explain in brief the Magmatic ore deposits and its types with suitable Indian 08 B) examples.

Q.5 Answer the following questions. (Any Two)

- Explain the process of formation of Natural gas and its reservoir rocks. a)
- Discuss in detail the conditions for formation of hydrothermal deposits with b) suitable examples.
- C) Describe the origin, occurrence and distribution of coal.

06

16

Set

Max. Marks: 80

Seat No.

B.Sc. (Semester - V) (New) (CBCS) Examination: Oct/Nov-2022 MICROBIOLOGY (Special Paper – IX) Virology

Day & Date: Saturday, 28-01-2023 Time: 03:00 PM To 06:00 PM

Instructions:	1) All	questions	are	compulsory.
---------------	--------	-----------	-----	-------------

- 2) Figures to the right indicate full marks.
- 3) Draw neat and labeled diagrams wherever necessary.
- 4) Use of log tables and calculators are allowed.

Q.1 A) Fill in the blanks by choosing correct alternatives given below.

- One step Growth experiment was discovered by . 1) b) Crick
 - Watson a)

a)

- Ellis & Delbruck d) Leaderberg C)
- Migration of cancerous cell from the site of origin to the other parts of 2) the body is called as .
 - a) Tumor b) Metastasis
 - Necrosis c) d) Apoptosis
- 3) is a DNA oncogenic virus.
 - Epstein Bar virus Rous sarcoma virus b)
 - c) Lukemia Virus d) Influenza virus

The bacteriophage capable of establishing lysogenic relationship 4) with their host cells are called phages.

- a) Lvtic Temperate b)
- c) Prions d) Virions
- All DNA viruses are placed in type of family of viral classification. 5) b) Deoxyviridae a) Riboviridae
 - c) Phycoviridae d) Viroviridae
- The multiplication of influenza virus occurs in 6)
 - Cytoplasm b) Ribosome a) C)
 - Nucleus d) Mitochondria

The time of infection by the phage to the host cell until the 7) accumulation of intracellular progeny of virus is known as

- a) Latent period **Burst period** b)
- c) Eclipse period d)
- Bacteriophages are readily counted by the process of _____. 8)
 - a) Tissue culture b) Plaque assay c) ELISA
 - d) Acid titration

_____ is a cancer that originated in lymphatic tissue. 9)

- Lymphoma a) Sarcoma C)
- b) Leukemia d) Carcinoma
- Burst size

10

Ρ

		 10) An icosahedral capsid consists of capsomers. a) Hexagonal b) Pentagonal c) Triangular d) Both a and b 	
	B)	Define the following.1) Capsid2) Viroids3) Prions4) Burst period5) Defective immunity6) Lytic phage	06
Q.2	Solv a) b) c) d) e) f) g) h) i)	What is envelope? What is the hypothesis of cancer? What is prophage? What is role of CI, CII and CIII protein? What is oncogenesis? What is somatic mutation? Symptoms of plant viral diseases. Enlist DNA oncogenic viruses. What is complex symmetry? One step growth experiment.	16
Q.3	A)	 Attempt any two of the following. 1) Give a detailed account on properties of cancer cell. 2) Describe in detail replication of adenovirus. 3) Describe in brief prevention and control of plant viral disease. 	10
	B)	Discuss in detail the concept of Lysogeny of λ phage.	06
Q.4	A)	 Attempt any two of the following. 1) Give a detailed account on TMV virus. 2) Give a brief account on structure and properties of virus. 3) Discuss in brief structure and replication of influenza virus. 	80
	B)	What is cancer? Discuss in detail types of cancer.	80
Q.5	Atte a) b) c)	mpt any two of the following. Describe in detail viral classification on the basis of LHT system. Describe in detail lytic cycle of T ₄ bacteriophage. Give a detailed account on isolation, cultivation and enumeration of	16

viruses.

Set

Seat	
No.	

B.Sc. (Semester - V) (New) (CBCS) Examination: Oct/Nov-2022 **ELECTRONICS (Special Paper – IX) Linear Integrated Circuits and Applications**

Day & Date: Saturday, 28-01-2023 Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

3) Draw neat and labeled diagram wherever necessary.

4) Use of log tables and calculators are allowed.

Choose the correct alternative and rewrite the sentence. A) Q.1

- If the control voltage of a VCO decreases, then its output frequency 1)
 - is a) decreases
- b) increases
- none of these c) remain same d)
- process is used for growing a single crystal silicon structure 2) upon an original silicon substrate.
 - a) Oxidation Lithography b) c) Epitaxial
 - Ion Implantation d)
- 3) An antilog amplifier has a _____ in series with the input.
 - a) inductor a resistor b) c) a capacitor d) diode or BJT
- In the low pass filter at exact high cut off frequency the roll of rate 4)

15 _			
a)	20 dB	b)	3 dB

- c) 40 dB d) 60 dB
- In IC regulators is used for providing the more current to the 5) load.
 - a) series pass transistor reference amplifier b)
 - c) error amplifier protection circuits d)

The PLL in normal condition operates 6)

- a) in a capture mode in a lock range mode b)
 - c) in a filter mode in a free running mode d)
- In basic circuit of _____ the thermal shutdown and current limiting is 7) included.
 - a) IC LM 317 b) IC µA 741 IC LF 398
 - c) IC NE 555 d)

The second low pass filter the number of RC combinations are 8)

- a) four three b) c) two d) one
- In an active clipper circuit, the clipping level is decided by the _____. 9)
 - a) input voltage c) output voltage
 - supply voltage b)
 - reference voltage d)

Max. Marks: 80

06

SLR-FZ-149

10

06

08

16

- 10) In the IC _____ is made by using transistor structure.
 - a) capacitor b) diode d) FET
 - c) resistor

B) Define the following.

- Integrated Circuit 1)
- Log Amplifier 2)
- 3) Roll of Rate
- 4) Load regulation
- 5) VCO
- Phase Lock Loop 6)

Q.2 Solve any eight of the following.

- State advantages of Integrated circuits over discrete circuits. a)
- Draw the circuit diagram of active clamper circuit. b)
- State the advantages of active filters over passive filter. C)
- Draw the circuit diagram of voltage regulator using IC 7815. d)
- State the application of PLL. e)
- Calculate the value of IC resistance having sheet resistance of 400 Ω / sg. f) and has aspect ratio L:W=10:1.
- Calculate cut off frequency of second order low pass filter if $R_1 = R_2 = 1 \text{ K} \Omega$ g) and $C_1 = C_2 = 0.1 \mu F$.
- Draw the diagram of log amplifier. h)
- Define cut off and center frequency of the filter. i)
- Define drop out voltage and ripple rejection of regulator. j)

Q.3 A) Attempt any two of the following.

- With suitable diagram explain the working of precision full rectifier. 1)
- Explain the fabrication process of resistor in IC. 2)
- Explain Butterworth second order high pass filter. 3)
- Explain working principal of Phase lock loop. B)

Q.4 A) Attempt any two of the following.

- 1) Explain the working of series Op-Amp regulator.
- Explain PLL as a FM demodulator. 2)
- Explain working of active peak detector. 3)
- What is voltage regulator? Draw the functional block diagram of IC voltage 08 B) regulator and explain function of each block.

Q.5 Attempt any two of the following.

- Explain working V to F converter by using IC LM 331. a)
- Give the classification of filter and explain narrow band pass filter. b)
- Explain with neat diagram fabrication of NPN transistor in IC. C)

Seat No.						Set	Ρ		
	B.Sc. (Semester - V) (New) (CBCS) Examination: Oct/Nov-2022 COMPUTER SCIENCE (Special Paper - IX) Visual Programming Using C#								
Day & Time:	Date 03:0	e: Sa 0 PM	urday, 28-01-2 To 06:00 PM	2023	•	Max. Mark	s: 80		
Instru	ictior	1s: 1 2) All questions () Figures to the	are compulsory. e right indicate full r	narks				
Q.1	A)	Cho 1)	ose the correct By default Price a) Normal c) Above nor	ct alternatives fro prity of thread is mal	m the b) d)	e options. Highest Below normal	10		
		2)	 a) Java Virtu b) Common c) Common d) Common 	I equivalent of al Machine Language Runtime Language Specifica Type system	ation				
		3)	Inheritance is a) Associativ c) Commutat	in nature. e tive	b) d)	Transitive Iterative			
		4)	C# does not si a) Abstractio c) Multiple in	upport n heritance	b) d)	Polymorphism Inheritance			
		5)	Two method w a) Overloadin c) Duplexing	rith same name but ng	t diffei b) d)	rent parametersis known as Multiplexing Loading	-		
		6)	Every class dir a) System c) Drawing	rectly or indirectly e	extenc b) d)	ls the class. Object Console			
		7)	Abstract class a) Abstract n c) Both a and	contains nethod d b	 b) d)	Non abstract method None of these			
		8)	The default sc a) Private c) Protected	ope for the membe	ers of a b) d)	an interface is Public Internal			
		9)	The Point at w a) Default po c) Calling po	hich an exception i int int	is thro b) d)	wn is called Invoking point Throw Point			
		10)	Thea created for Us a) Web form c) Application	are the graphical us ser interaction. n Form	ser int b) d)	erface (GUI) components Window Form None of these			

16

10

06

08

16

- B) Fill in the Blanks.
 - 1) _____ are intended to be common libraries that any other application can use.
 - 2) _____ parameter are used to pass result back to the calling method and it does not create new storage location.
 - 3) Virtual method defined in _____ class is inherited by it's derived class.
 - 4) _____ statement is to ensure that the necessary cleanup of Object in Exception handling.
 - 5) An anonymous method is one way to create an _____ block of code.
 - 6) The Binary Reader and Writer class allows you to read and write data Types to an underlying stream in a compact binary format.

Q.2 Answer the followings (Any Eight):

- a) Define Garbage Collection.
- **b)** Define Read Only Field.
- c) What is function overriding?
- d) Define delegate.
- e) What is the namespace?
- f) What is Assembly?
- g) Define Event.
- h) Define CTS.
- i) Define Enumeration.
- j) Define Polymorphism.

Q.3 A) Answer the followings (Any Two):

- 1) What is abstract class and abstract method? Write a program for Abstract class and abstract method.
- 2) Explain Thread Life Cycle.
- 3) Write a program for file which can write data into file and read data from file.
- **B)** Write short note on common Language Runtime.

Q.4 A) Answer the followings (Any Two):

- 1) What is sealed class? Write a program for sealed class.
- 2) Write a program for multicast delegate.
- 3) What is property? Write a program for property.
- **B)** Explain Exception Handling. Write a program for multiple catch block. **08**

Q.5 Answer the following (Any Two).

- a) How to implement interface? Explain derived interface with program.
- **b)** Explain List Box control. Design a form having 2 List Box control which Perform following operation.
 - 1) Add one element from List Box 1 to List Box 2.
 - 2) Add all element from List Box 1 to List Box 2.
- c) What is File Stream? Explain Stream Reader and Stream Writer with example.

	0)	seven groups	u)	louiteen groups
2)	Rec a) c)	iprocal of reciprocal lattice is square lattice reciprocal lattice	5 b) d)	direct lattice inverse lattice
3)	The a) b) c) d)	electrical conductivity of the independent of electron de independent of proton dens depend upon proton densit dependent on electron den	meta nsity sity y sity	l is
l)	In in and a) c)	Itrinsic semiconductor the nu number of holes V.B. is unequal large	imber b) d)	of conduction electron in C.B. exactly equal none of the a, b, c
5)	, Diar a) c)	nagnetic material has negative infinity	, ma b) d)	gnetic susceptibility. positive zero
5)	The para a) c)	temperature above which a amagnetic material is called Curie point transition point	ferror b) d)	nagnetic material behaves like a Neel point cooling point
7)	Sup a) c)	erconductor is also called as bad conductor perfect conductor	s a b) d)	hole conductor semiconductor
3)	The a) b) c) d)	normal conductor become s its resistance becomes zer its conductivity becomes zer it melts its resistance become high	superc o ero	conductor when
))	Mag a) c)	gnitude of reciprocal lattice ve d _{hki} 1/*d _{hki}	ector i b) d)	s equal to 1/d _{hki} d² _{hki}

Q.1 A) Select correct alternative from the following.

2) Figures to the right indicate full marks.

Bravais lattice in three dimensions is classified in _____. 1)

3) Use of logarithmic table and calculator is allowed.

- a) three groups b) five groups 2
 - seven arouns ýP fourteen arouns

B.Sc. (Semester - V) (New) (CBCS) Examination: Oct/Nov-2022 **PHYSICS (Special Paper - X) Solid State Physics**

4) Neat diagrams must be draw and give equations wherever necessary.

2

- 3
- 4
- 5

- 7
- 8
- 9

SLR-FZ-151

Set

Max. Marks: 80

Ρ

10

Seat No.

Day & Date: Monday, 30-01-2023

Instructions: 1) All questions are compulsory.

Time: 03:00 PM To 06:00 PM

		 10) In intrinsic semiconductor the position of fermi energy level is a) In the conduction band b) in the valence band c) exactly at centre of forbidden energy gap d) above the forbidden energy gap 	-				
	B)	 Give the correct answer and rewrite the following. 1) Who invented X-ray? 2) In simple cubic crystal structure total number of lattice points per unit cell is 3) First superconductor was invented at temperature. 4) What is the general relation of magnetic susceptibility? 5) The relation of Fermi energy (E_f) = 6) In which class of solid material conduction band is completely empty?)6				
Q.2	Ans a) b) c) d) e) f) g) h) i)	What is mean by packing fraction in crystallography? Draw the neat diagram of BCC structure. What is Bragg's law of x-ray diffraction? Define reciprocal lattice. What is forbidden energy gap? Write any two properties of ferromagnetic materials. What are the types of ferrites? What are the types of ferrites? What are the types of superconductor?					
Q.3	A)	 Answer any two of the following Explain Miller indices. How they are determined? Show that every reciprocal lattice vector is normal to the lattice plane of the crystal lattice. Define Fermi energy and derive its expression at absolute zero temperature. 	10				
	B)	Write a short note on hysteresis.	D6				
Q.4	A)	Answer any two of the following(1) Explain FCC crystal structure.(2) Write note on Hall-effect.3) Distinguish between insulator, metal and semiconductors.	38				
	B)	Discuss Sommerfeld's model of metal and hence derive an expression for (energy of free electron in the metal.	08				
Q.5	Ans a)	Yer any two of the following What are the types of crystal structure? Explain hexagonal close packed structure.	16				
	b)	What is superconductor? Explain the effect of magnetic field on superconductor.					
	c)	Give the classification of magnetic materials. State their properties.					

						SLR-FZ-1	52
Seat No.						Set	Ρ
	B.S	c. (S	emester (- V) (New) (CBC CHEMISTRY (Spo Inorganic C	S) cia cia	Examination: Oct/Nov-2022 Il Paper – X) mistry	
Day 8 Time: Instru	Date 03:00 Ictior	e: Moi 0 PM 1s: 1) 2) 3) 4)	nday, 30-0 To 06:00 All questio Figures to Draw nea Use of log	01-2023 PM ons are compulsory. o the right indicate fu at labelled diagrams g table and calculato	II ma whei rs is	Max. Marks arks. rever necessary. allowed.	s: 80
Q.1	A)	Choo 1)	ose the co 4s orbital	orrect alternatives f	rom	the options.	10
		.,	a) a_1 g c) t_2 g		b) d)	t ₁ u eg	
		2)	In any ch a) addir b) chan c) incre d) decre	emical reaction, the ng product molecules ging the size of the o asing the concentrat easing the temperatu	rate s to t conta ions ire	of the reaction can be increased by he reaction mixture ainer of the reactants	
		3)	Uranium- a) fertile c) man-	238 is a e nuclear fuel made element	b) d)	transuranic element non-radioactive element	
		4)	Sodium p a) Mg ²⁻ c) Ca ²⁺	oump transports +	b) d)	on into the cell. K ⁺ Na ⁺	
		5)	Catalyst r a) lower b) incre c) neith d) none	reduces the rate of c r activation energy ase activation energ er lower activation en of these	hem y nerg	ical because y nor increase activation energy	
		6)	In plants, a) K c) Ca	carboxylase involve	d b) d)	metal. Zn Fe	
		7)	Ferritin is a) trans c) prote	port iron in chain	b) d)	store iron transport O ₂	

8) In octahedral complexes each t₂g electrons is destabilized by

a)	-6 Dq	b)	-4 Dq
α)	0 0 9	σ)	1 0 9

c)
$$+6 Dq$$
 d) $+4 Dq$

- 9) $[Fe(CN)6]^{3-}$ is ______ spin complex.
 - a) high b) moderate
 - c) low d) intermediate
- **10)** In structure determination of PCI₅, the isotope used is _____.
 - a) ³⁶N b) ³⁶P
 - c) ³⁶C d) ³⁶CI
- Fill in the blank/Definition/One sentence answer/ One word answer/ 06 Give the name/Predict the product etc.
 - The crystal field theory considers the metal-ligand bond to be a _____ bond.
 - 2) Identify the correct relation between Δo and Δt , where Δo denotes crystal field splitting in octahedral complexes and Δt denotes crystal field splitting in tetrahedral complexes.
 - 3) Name the moderator used in the nuclear reactor.
 - 4) Which isotope of Uranium has the capacity to sustain the chain reaction?
 - 5) What is the function of the hemoglobin?
 - 6) What is mean by homogeneous catalysis?

Q.2 Answer the followings (Any Eight):

- 1) Define the crystal field splitting.
- 2) What is exothermic nuclear reactions?
- 3) What is function of Calcium in our body?
- 4) What is auto-catalyst give one example?
- 5) Draw the shapes of d orbitals.
- 6) Draw the structure of porphyrin.
- 7) What is role of tetra ethyl lead in the internal combustion engine?
- 8) What is indirect fertilizers?
- 9) What is applications of crystal field splitting?
- 10) What is artificial transmutation?

Q.3 A) Answer the followings (Any two):

- 1) Distinguish between CFT and MOT.
- 2) Write a note boiling water reactor.
- 3) Write a note of sodium pump.

B) Short note/Solve

Explain formation of octahedral complex of crystal field splitting of d orbitals.

10

Q.4	A)	 Answer the followings (Any two): 1) Difference between Hemoglobin and Myoglobin. 2) What is characteristics of catalytic reaction? 3) Define fertilizer and explain brief quality of the ideal fertilizer. 	08
	B)	Describe/Explain/Solve Explain the structure and working of myoglobin.	08
Q.5	Ans a) b)	wer the following (Any Two). Discuss the adsorption theory of the catalyst. With the help of MO diagram, explain the formation and characteristics	16

of $[Ni(NH_3)_6]^{2+}$. **c)** Write a note on radio-isotopes as tracers.
Instructions: 1) All guestions are compulsory. 2) Figures to the right indicate full marks. 3) Draw neat labelled diagrams wherever necessary. Rewrite the following question by choosing correct alternative. The movement of a gene from one linkage group of another is b) Translocation d) Crossing over In a monohybrid cross between two heterozygous individuals, percentage of pure homozygous individuals obtained in F1 generation b) 50% 100% d) 75% b) d) None

will be a) 25 % 75% C)

3) A haemophilic man marries a normal homozygous women. What are the chances that their son will be haemophiliac?

b)

- 100% a)
- C) 50%

Traits which show continous variation are 4) Quantitative traits

- Qualitative traits a) Phenotypic variation C)
- d) In which of the following male is not heterogametic?
- 5) Grasshopper Drosophila a) b)
 - Birds d) Man C)
- In corolla length of Nicotiana longiflora, polygenic inheritance was 6) studied by __
 - Joseph Kolreuter E.M. East a) b)
 - c) Francis Galton d) Nilsson-Ehle
- The F2 dihybirid ratio 9 : 3 : 4 is explained on the basis of 7)
 - Epistatic gene a)
- Supplementary gene b)

Complementary gene interaction

Somaclonal variation

- c) Allelic interaction d)
- Which of the following is not true for cytoplasmic inheritance? 8)
 - Reciprocal cross is always different a) Unequal contribution from male and female gametes b)
 - Do not show segregation of traits C)
 - d) It follows Mendelian pattern of inheritance
- Which of the following is X- linked recessive disorder? 9)
 - Colour blindness Sickle cell anemia a) b) PTC testing Albinism C)
 - d)

SLR-FZ-153

B.Sc. (Semester - V) (New) (CBCS) Examination: Oct/Nov-2022

Max. Marks: 80

Set

Genetics

BOTANY (Special Paper - X)

Day & Date: Monday, 30-01-2023
Time: 03:00 PM To 6:00 PM

called a)

C)

Inversion

Duplication

Q.1

A)

1)

2)



		10)	 Mendel's Law of independent assortment holds good for genes situated on the a) non-homologous chromosomes b) homologous chromosomes c) extra nuclear genetic element d) same chromosome 	
	B)	Ansv 1) 2) 3) 4) 5) 6)	wer the following questions in single sentence. Define back cross. What is cytoplasmic inheritance? Define linkage. What are holandric genes? What is pure line? Define epistasis.	06
Q.2	Solv a) b) c) d) e) f) g) h) i)	Ve any What Enlis Give What Give Enlis What Give What	<pre>/ Eight of the following. t are multiple alleles? t any two characters selected by Mendel. any two examples of maternal inheritance. t is continuous variation? t is cytoplasmic male sterility? significance of crossing over. t the methods of sex determination. t is recombination frequency? the significance of test cross. t is complete linkage?</pre>	16
Q.3	a)	Atter 1) E 2) E 3) E	npt any Two of the following. Explain the epistatic interaction with suitable example. Explain the concept of crossing over. Explain the inheritance of Haemophilia disease in man.	10
	b)	Write	a note on Hardy Weinberg Law.	06
Q.4	a)	Atter 1) E 2) E 3) E	npt any Two of the following. Explain the complementary gene interaction with suitable example. Explain the inheritance of Colour blindness. Explain the concept of linkage map.	08
	b)	Expla	ain the bridges theory of sex determination.	08
Q.5	Atte a) b)	mpt a Expla Expla	ain the coupling and repulsion hypothesis with suitable diagram. ain the Mendels law of segregation with suitable example.	16

c) Explain the inheritance of genes in chloroplast.

Day Time	& Date : 03:00	e: Mon 0 PM ⁻	ıday, 30-01-2023 To 06:00 PM		Max. Marl	ks: 80
Instr	uctior	ns: 1) 2) 3) 4)	All questions are compulsory) Draw neat labelled diagrams) Figures to right indicate full I) Use of log table and calculat	/. s whereve Varks. tors is allo	r necessary. wed.	
Q.1	A)	Multi 1)	iple choice question. is the father of Gene a) Mendel	etics. b)	Gregon	10
		2)	 Hereditary unit is known as a) Genes c) Allele 	d) b) d)	Chromosomes None	
		3)	The linked genes which are separated by crossing over a) Incomplete gene c) Interaction of gene	middle lo is called a b) d)	cated in chromosomes & are is Complete gene None of these	
		4)	The phenomenon of phenot genes & not by a right domin a) Gene Interaction c) Test Cross	ypic expre nant or re b) d)	ession of characters by confirme cessive gene is called as Allele None	d
		5)	Scientist noticed of comb type in fouls. a) John Cotto c) Kuru	a very inte b) d)	eresting result during inheritance Gardener None of these	;
		6)	Gene is inherited from parer this is called a) Units of Heredity c) Supplementary Gene	nts to the b) d)	offsprings has phenotypic expres Non allelic None of these	ssion
		7)	The phenomenon of inherita same Chromosomes togeth a) Linkage c) Multiple alleles	ance of tw erly called b) d)	o or more genes are located on as Crossing over None	
		8)	Scientist done the stu a) Bateson and Punnel c) T.H. Morgon	udy on linl b) d)	kage. Sulton and Bovery None	
		9)	When two or more characte governed by two or more ge a) Complete gene	rs are inhe nes calleo b)	erited together which are d as Incomplete gene	

Seat No.

B.Sc. (Semester - V) (New) (CBCS) Examination: Oct/Nov-2022 ZOOLOGY (Special Paper-X) Principles of Genetics

Day 8 Time:

SLR-FZ-154

Set

Ρ

- c) Interaction of gene
 - d) None of these
- Page 1 of 2

- 0

		 Belling's copy choice theory is the theory of a) Crossing over b) Mutation c) Synapsis d) None 	
Q.1	B)	 Fill in the blanks/ definition / One sentence answer / One word answer / Give the name / Predict product etc. 1) basic unit of heredity. 2) introduced the theory of inheritance. 3) is the process by which the DNA is copied in cell. 4) Cell makes RNA copies. 5) is a set of rules defining code of DNA. 6) Small single celled organism. 	06
Q.2	Solv a) b) c) d) e) f) g) h) i)	ve any Eight of the following: Incomplete Dominance Crossing Over Linkage Transports in Bacteria Transformation Sex determination Mutation Down's Syndrome Klinefelter's Syndrome Turners Syndrome	16
Q.3	a)	 Attempt any Two of the following: 1) Describe laws of Mendalian Inheritance. 2) Mechanism of Crossing Over 3) Molecular basis of mutation in relation to UV. 	10
	b)	Short Note/ Solve. Transduction with example.	06
Q.4	a)	 Attempt any Two of the following: 1) Extra chromosomal inheritance with example 2) Chromosomal mechanisms of sex determination 3) Polygenic Inheritance 	08
	b)	 Describe/ Explain /Solve. 1) Type of chromosomal abbreviation 2) Type of Gene Mutation 3) Cytological basis of Crossing Over 	08
Q.5	Atte a) b)	empt any Two of the following. Describe in detail Gene Interactions. Write in detail supplementary gene with example. Explain in details Chromosomal Mapping	16

c) Explain in details Chromosomal Mapping.

	В.	Sc. (Seme	ester - V) (I MATHE	New) (CB MATICS (Complex	CS) E> Specia Analy	amination: C al Paper- X) ⁄sis	Oct/Nov-2022
Day Time	& Dat : 03:0	te: Mo 00 PN	onday, 1 To 06	30-01-2023 0:00 PM		-		Max. Marks: 80
Instr	uctio	o ns: 1 2) All qu ?) Figur	uestions are res to the rig	compulsory ht indicates	full mar	ks.	
Q.1	A)	Cho 1)	oose th The r a)	the correct all the residue of the $\frac{3}{16i}$	Iternative for the function (z	br each $\frac{1}{2+1)^3}$ at b)	of the following z = i is $\frac{3i}{16}$ 3i	ıg. 10
		2)	c) The v	$-\frac{16i}{16i}$ value of $\int_{0}^{2\pi}$	$\frac{\mathrm{d}\theta}{\mathrm{a} + \mathrm{b}\mathrm{cos}\theta}, \mathrm{a}$	d) > b > 0	— <u>16</u>) is	
			a) c)	$\frac{\pi}{\sqrt{a^2 - b^2}}$ $\frac{2\pi}{\sqrt{b^2 - a^2}}$		b) d)	$\frac{2\pi}{\sqrt{a^2 - b^2}} \\ \frac{3\pi}{\sqrt{a^2 - b^2}}$	
		3)	The r a) c)	residue of $\frac{1}{\sin \frac{1}{\sqrt{2}}}$	$\frac{1}{2z-\cos z}$ at $z =$	= π/4 is b) d)	$\frac{\sqrt{2}}{\frac{1}{2}}$	
		4)	lf c is a) c)	s circle z – a πi -2πi	= r then	$\int_{c} \frac{dz}{(z-a)}$ b) d)) is 3π <i>i</i> 2π <i>i</i>	
		5)	Whic for a)	h of the follo z < ∞? sinz	wing functio	ons doe: b)	s represent the s	series $\sum_{n=0}^{\infty} \frac{z^n}{n!}$
		6)	c) The r a) c)	e ^z number of iso 1 3	olated singu	d) Iar poin b) d)	log(1 + z) ts of $f(z) = \frac{z+z^2}{z^2(z^2)}$ 4	⁺³ ² +2) İS

Seat No.

SLR-FZ-155

Set P

7)
$$\int_{L} |dz|$$
 where L is any rectifiable are joining the points z=a, z=b is

equal to _____.

b-aa) C) |b-a|

- b) arc length L d) 0
- 8) An analytic function with constant modulus is _____.
 - may be variable or constant a)
 - b) constant
 - C) variable
 - d) modulus

Any function of x and y possessing continuous partial derivatives of 9) the first and second order is called a harmonic function if it satisfies.

- Laplace's equation Euler's equation a) b) Lagrange's equation
- d) Cauchy's equation C)

If f (z) = u + iv is analytic function in a finite region and $u = x^3 - 3xy^2$, 10)

then v is _____. a) $3x^2y^2 - y^3 + c$ b) $3x^2y - y^2 + c$ c) $3x^2y + y^3 + c$ d) $3x^2y - y^3 + c$

B) Fill in the blanks.

If L is any rectifiable are joining the points z=a, z=b then 1) is equal to _____.

- $\int \bar{z} dz$ If c is straight line from (1,0) to (1,1) then the value of integral 2)
- is If $\overline{f(z)} = u + iv$ be an analytic function of z = x + iy then the families of 3) curves u=constant, v=constant are _____ to each other.
- Then function $w = |z|^2$ is continuous everywhere but nowhere 4) differentiable except at the _
- If $\lim_{z \to a} (z a)f(z) = A$ and if \overline{c} is the are $\theta_1 \le \theta \le \theta_2$ of the circle |z a| = r5) then $\lim_{z \to z} \int f(z) dz =$

$$r \to 0 \int_{c} c$$

6) If
$$f(z) = \frac{1}{(z-1)(z-2)(z-3)}$$
. residue of $f(z)$ at $z = 1$ is _____.

Q.2 Answer the following questions. (Any Eight)

What kind of singularity has the function $f(z) = \frac{1}{\cos(1/z)}$ at z = 0. a)

b) Show that when
$$0 < |z| < 4$$
 then $\frac{1}{4z - z^2} = \sum_{n=0}^{\infty} \frac{z^{n-1}}{4^{n+1}}$

- c) Expand $\frac{1}{z(z^2-3z+2)}$ for the region, 1 < |z| < 2
- d) Find residue of cosecZ

e) Find residue of
$$\frac{Z^3}{(z-1)^4(z-2)(z-3)}$$
 at $z = 2,3$

f) Evaluate
$$\int_{c} \frac{e^{z}}{z(z-1)^{2}} dz$$
 where c is circle $|z| = 2$.

06

 $\int z \, dz$

10

08

- g) Evaluate $\int_{c} \frac{z-3}{z^2+2z+5} dz$ where c is circle |z| = 1.
- h) If f(z) and g(z) are analytic function in a domain D then prove that $\frac{d}{dz}(f(z).g(z)) = f(z)\frac{d}{dz}g(z) + g(z)\frac{d}{dz}f(z)$
- i) If $f(z) = e^z$. show that Cauchy-Riemann equations are satisfied.
- j) Show that a harmonic function satisfies the formal differential equation $\frac{\partial^2 u}{\partial z \cdots \partial z} = 0$

Q.3 A) Answer the following questions. (Any Two)

- 1) Show that $\int_{0}^{n} \frac{d\theta}{(a+\cos\theta)^{2}} = \frac{\pi a}{(a^{2}-1)^{3/2}}, a > 1$ 2) Evaluate $\int_{0,1)}^{(2,5)} (3x+y)dx + (2y-x)dy \text{ along the curve}$ a) $y = x^{2} + 1$ b) The straight line (0,1) to (0,5) and then from (0,5) to (2,5) 3) If f(z) = u + iv is an analytic function of z = x + iy and $u - v = \frac{e^{y} - \cos x + \sin x}{\cosh y - \cos x}$ find f(z.)
- **B)** Prove that the polar form of Cauchy's Riemann equations $\frac{\partial u}{\partial r} = \frac{1}{r} \frac{\partial v}{\partial \theta}$ and $\frac{\partial u}{\partial \theta} = -r \frac{\partial v}{\partial r}$ where $r = \sqrt{x^2 + y^2}$, $\theta = \tan^{-1}(\frac{y}{x})$
- Q.4 A) Answer the following questions. (Any Two) 1) $\int_{|f|} f(z) = \frac{x^{3}(1+i)-y^{3}(1-i)}{x^{2}+y^{2}}, \quad (x, y) \neq (0,0)$ $= 0 \qquad (x, y) = (0,0)$ Prove that C.R. equation satisfy at the origin.
 - 2) Prove that the function $\sin(c(z + \frac{1}{z}) \operatorname{can} be expanded in the series of type <math>\sum_{n=0}^{\infty} a_n z^n + \sum_{n=1}^{\infty} b_n z^{-n}$ in which the coefficient z^n and z^{-n} are $\frac{1}{2\pi} \int_{0}^{2\pi} \sin(2\cos\theta) \cosh\theta$ 3) If c is an are $\theta_1 \le \theta \le \theta_2$ of the circle |z| = R and if $\lim_{R \to \infty} zf(z)dz = A$

then prove that
$$\lim_{R \to \infty} \int_{c} f(z) dz = i (\theta_2 - \theta_1) A$$

B) State and prove Cauchy's fundamental theorem.

Q.5 Answer the following questions. (Any Two)

- a) State and prove Cauchy's Residue theorem.
- **b)** Prove that necessary and sufficient condition that w = f(z) = u + iv be regular in region R is that C.R. evations $u_x = v_y$ and $u_y = -v_x$ are sufficient in R where it is supposed that D is partial derivative continuous in R.

- **c)** Obtain the expression for $\frac{(z-2)(z+2)}{(z+1)(z+4)}$ which are valid when
 - 1) |z| < 1
 - 2) 1 < |z| < 4
 - 3) 0 < |z+1| < 3

						SLR-F2	Z-1	56
Seat No.						S	et	Ρ
	B.S	c. (S	emeste	r - V) (New) (STATISTICS Probabil	(CBCS) 6 (Spec ity Dist	Examination: Oct/Nov-202 ial Paper- X) ributions	22	
Day 8 Time:	a Dat 03:0	e: Mo 00 PM	onday, 30- I To 06:00	01-2023 PM		Max. M	arks	s: 80
Instru	ıctio	ns: 1 2 3 4) All quest) Draw ne) Figures) Use of lo	tions are comp eat diagrams ar to the right indi ogarithmic table	ulsory. Id give ec cate full r e and calo	quations wherever necessary. narks. culator is allowed.		
Q.1	A)	Cho 1)	ose the c If X~B (1 a) q p c) 1	orrect alterna , p) r. v. suppos	tives fro i e it is trui b) d)	m the options. ncated at X = 0 then E(X) is q 0	<u> </u>	10
		2)	If X follow below 0 t a) 0 c) less	ws truncated no then $P(0 < X < the states of the theory $	ormal dist 100) is = b) d)	ribution truncated above 100 and 	Ł	
		3)	Let X be I a) e(e - c) e	LN (0, 1)r. v. the - 1)	en Var (lo b) d)	e(e + 1) 1		
		4)	For X ~ lo a) $e^{\mu - \sigma^2}$ c) e^{μ}	og normal (μ, σ ² ²	²) then m b) d)	edian of X is $e^{\mu+\sigma^2}$		
		5)	For Cauc a) raw c) both	chy distribution a and b	r b) d)	noments of all orders do not exis central a or b	st.	
		6)	For Lapla a) $\beta_1 =$	ace distribution $0, \beta_1 = 6$	b)	$\beta_1 = 0, \beta_1 = 3$		
			c) $\beta_1 >$	0, β ₁ > 6	d)	$\beta_1 < 0, \beta_1 = 3$		
		7)	If (X, Y) ~ given Y = a) norm	- BN (μ ₁ , μ _{2,} σ ₁ ² , σ = y isd nal	σ², ϱ) thei listributioi b)	n the conditional distribution of X n. bivariate normal		

c) lognormal d) Cauchy

- 8) If X ~ C (2,3), Y ~ C (3,2) then X + Y is _____.
 a) C (0,1)
 b) C (5,5)
 c) C (-1,1)
 d) N (0,1)
- **9)** If X follows Logistic (μ, σ) then its c.d.f. is given by,
 - a) $\frac{1}{1 + e^{-((x-\mu)/\sigma)}}$ b) $\frac{1}{1 + e^{((x-\mu)/\sigma)}}$ c) Both a and b d) None of these
- **10)** If X follows Pareto (α, β) then mean is given by
 - a) $\frac{\alpha\beta}{\alpha-1}$; $\alpha > 1$ b) $\frac{\alpha\beta}{1-\alpha}$; $\alpha \neq 1$ c) $\frac{\alpha\beta}{\alpha-2}$; $\alpha > 2$ d) $\frac{\alpha\beta}{2-\alpha}$; $\alpha \neq 2$

Q.1 B) Answer the following.

- 1) Define Pareto distribution with parameters (α, β)
- 2) Write the p.m.f. of truncated binomial distribution, truncated at X = 0.
- 3) If X ~ lognormal (μ , σ^2) write the expression for E(X).
- 4) If $(X, Y) \sim BN(\mu_1, \mu_2, \sigma_1^2, \sigma_2^2, \varrho)$ write the pdf of (X Y).
- 5) State the additive property of Cauchy distribution.
- 6) Define Laplace distribution with parameters (μ, λ) .

Q.2 Answer the following. (Any Eight):

- 1) If a binomial r.v. is truncated at X = 0 then write down its p.m.f.
- **2)** State relationship between Laplace distribution and exponential distribution.
- **3)** For Laplace (μ, λ) distribution state mean & variance.
- 4) If X is a standard Cauchy variate then state the distribution of X^2
- 5) State the relationship between Cauchy and Uniform distribution.
- 6) If X is a non-negative r.v. such that Y = log(X) is N(0,1) then write the pdf of X.
- 7) Define power series distribution.
- 8) Let (X, Y) is BN($\mu_1, \mu_2, \sigma_1^2, \sigma_2^2, \varrho$) then state mean & variance of distribution of (X | Y = x).
- 9) Write the joint p.d.f. of bivariate normal distribution.
- **10)** Define Pareto distribution with parameters (α, β)

Q.3 A) Answer the following. (Any Two):

- 1) Obtain the m.g.f. of Laplace (μ, λ) distribution.
- 2) If $X \sim \text{lognormal} (0, 1)$ find mean and mode.
- 3) If $X \sim P(\lambda)$, truncated at X = 0 find mean and variance.

16

06

B)	If $f(x, y) = K e^{-\frac{1}{2}(x^2+y^2)}$; $-\infty < x, y < \infty$ find the value of K and E(X), V(X).	06
A)	 Answer the following. (Any Two): 1) Define logistic distribution with parameters (μ, σ) and find its mean. 2) Show that binomial distribution is a particular case of power series distribution. 3) Find the distribution of ratio of two independent standard normal variates. 	08
B)	Fid mean & variance of Weibull distribution with parameters (α , β).	08
Ans a) b) c)	wer the following (Any Two). Let X be a Logistic random variable with parameters (μ , σ), obtain C.D.F. and mean of X. If X, Y are i.i.d exponential r.v.s. with parameter θ then find the distribution of (X – Y) If (X, Y) is BN (μ_1 , μ_2 , σ_1^2 , σ_2^2 , ϱ) then find the distribution of aX + bY + c	16
	B) A) B) Ansv a) b) c)	 B) If f(x,y) = K e^{-1/2 (x²+y²)}; -∞ < x, y < ∞ find the value of K and E(X), V(X). A) Answer the following. (Any Two): Define logistic distribution with parameters (μ, σ) and find its mean. Show that binomial distribution is a particular case of power series distribution. Find the distribution of ratio of two independent standard normal variates. B) Fid mean & variance of Weibull distribution with parameters (α, β). Answer the following (Any Two). a) Let X be a Logistic random variable with parameters (μ, σ), obtain C.D.F. and mean of X. b) If X, Y are i.i.d exponential r.v.s. with parameter θ then find the distribution of (X - Y) c) If (X, Y) is BN (μ₁, μ₂ σ₁², σ₂², ρ) then find the distribution of aX + bY + c

If (X, Y) is BN $(\mu_1, \mu_2, \sigma_1^2, \sigma_2^2, \varrho)$ then where a,b and c are real numbers.

Seat No.

B.Sc. (Semester - V) (New) (CBCS) Examination: Oct/Nov-2022 GEOLOGY (Special Paper – X) Hydrogeology

Day & Date: Monday, 30-01-2023 Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Draw neat diagrams wherever necessary.

Q.1 Rewrite the sentence by filling the blanks with the correct answer 10 A) from the given options. Infiltration in sedimentary terrain is _____ than igneous rock terrain. 1) b) greater a) lesser d) very poor C) poor Rate of infiltration is _____ in igneous rocks in tectonically disturbed 2) area than its undisturbed equivalent & sandstone terrains. better poor a) b) c) very poor d) very good Though it is a plain ground sedimentary terrain, the scope of infiltration 3) decreases in _____ climatic regions like Siberia. a) hot b) tropical equatorial c) cold d) 4) Limestone is aquifer for its primary porosity. a) very good b) good c) bad d) ideal Topmost zone in vertical distribution of groundwater is zone. 5) a) capillary b) root c) saturation d) aeration Shear zones in rocks are _____ porosity features. 6) effective a) secondary b) c) primary d) bad 7) Aquifers in Basaltic terrain are mainly of type. idealized unconfined a) b) C) bad d) confined Localities Unhere & Tatapani is famous for 8) contact springs a) hot springs b) depression springs d) seepage areas C) Plants adds water in water cycle by _____ & _____. 9) a) Evaporation, Transpiration b) Transpiration, Sublimation c) Transpiration, Guttation d) Guttation, Evaporation

Max. Marks: 80

Set F

		 After precipitation, water flowing on ground surface is called as a) Flow b) Flood c) Surface runoff d) River 						
	B)	 Answer the following 1) Define transpiration? 2) Define porosity. 3) Define piezometric surface. 4) Define surface runoff. 5) Define spring. 6) Define seepage. 	06					
Q.2	Writ	te answers to any eight of the following.	16					
	a)	What is magmatic water?						
	b)	What is connate water?						
	d)	What is Aquifer?						
	e)	What is Transmissivity?						
	f)	What is an artificial levee?						
	g)	What is a water table?						
	h)	What is aquifuge?						
	I) i)	What is a pasin?						
])							
Q.3	A)	 Attempt any Two of the following. 1) Describe the porosity of sedimentary rocks & its deciding factors. 2) Explain the Utilization of Groundwater. 3) Describe types of groundwater basin. 	10					
	B)	Describe Hydrological Cycle. Draw sketch.	06					
Q.4	A)	 Attempt any Two of the following. 1) Describe the depression spring. 2) Describe the contact spring. 3) Describe the factors controlling infiltration. 	08					
	B)	Role of vegetation and rock type in groundwater recharge process.	08					
Q.5	Atte a)	empt any Two of the following. Explain how to identify textural features & the structural influence on an area using imagery wrt to groupdwater	16					
	b)	Describe the vertical distribution of aroundwater						
	~, _)	Evaloin the hot enringe 8 its significance. Draw sketch of cover						

c) Explain the hot springs & its significance. Draw sketch of geyser.

Seat	
No.	

B.Sc. (Semester - V) (New) (CBCS) Examination: Oct/Nov-2022 MICROBIOLOGY (Special Paper – X) **Agricultural Microbiology**

Day & Date: Monday, 30-01-2023 Time: 03:00 PM To 6:00 PM

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

Rewrite the following sentences by selecting correct answer from the Q.1 A) 10 given alternative.

- Smallest particle in soil is called as 1)
 - sand silt a) b) C) clay d) gravel
- is a polymer of glucose linked together by β 1-4 linkage. 2)
- Starch Lignin b) a) Cellulose C) d) Hemicellulose 3) organisms are responsible for mobilization of PO4 in soil.
 - VAM fungi PSM a) b)
 - Desulfovibrio Nitrosomonas C) d)

enzyme acts only on native cellulose molecule. 4)

- C_x cellulose a) C₁ cellulase C)
- β 1-4 glucanase b) d) glycosidase

Biological reduction of molecular N₂ to ammonia is called . 5)

- a) ammonification b) nitrification denitrification C)
 - N₂ fixation d)

of the following is capable of oxidizing sulfur to sulfates. 6)

- Thiobacillus thiooxidans b) Rhodomicrobium a)
- Desulfotomaculum Rhodospirillum d) C)

7) The uppermost soil horizon containing only organic matter is .

- А b) В a) С d) 0 C)
- 8) *Erwinia carotovora* is the causative agent of disease.
 - Citrus canker a)
 - whip smut of sugar cane b)
 - Soft rot of potato C)
 - bacterial blight d)
- _ is the assimilable form of sulphur. 9)

a)	S	b)	SO4
C)	H ₂ S	d)	SO ₂

is the most persistent pesticide found in nature. 10)

a)	Malathion	b)	DDT
a)	Darathian	, P	

Parathion d) 2, 4 –D C)

Set

Max. Marks: 80

	B) Answer the following questions.				
		1)	Name the enzyme responsible for N2 fixation.		
		2)	is the causative agent of oily spot of pomegranate.		
		3)	Earthworms are used for production of compost.		
		4)́	Give an example of detrimental association.		
		5)	Name the product produced by ammonification.		
		6)	Name the most dominant group of microorganisms in soil.		
Q.2	Solv	/e anv	/ Eight of the following.	16	
	a)	Defin	e Phosphate solubilization.		
	b)	Give	structure of hemicellulose		
	c)	Defin			
	d)	Defin	e Nitrate reduction		
	(۵	Defin	ne nersistent nesticide		
	C) f)	Defin	ne Ammensalism		
	и) а)	Nam	e two nitrogen fixing bacteria		
	9) h)	Defin	e highesticides		
	i)	Defin	a Green manure		
	'' i)	Defin	ne soil ecosystem		
])	Denn			
Q.3	A)	Atter	npt any Two of the following.	10	
	,	1)	Farm Yard Manure		
		2)	Biological nitrogen fixation		
		3)́	Physical properties of soil		
	B)	Give	an account of 'Carbon cycle'.	06	
• •	• •			••	
Q.4	A)	Atter	mpt any I wo of the following.	80	
		1)	Discuss about causative agent symptoms and control of 'Soft rot of		
		0)	polalo . Fundaio Mutualiana and common caliana		
		2) 2)	Explain Mutualism and commensalism.		
		3)	Lignin degradation		
	B)	Give	an account of Types of microorganisms in soil.	08	
Q.5	Atte	mpt a	iny Two of the following.	16	
	a)	Give	structure of cellulose and give an account of biochemistry of cellulose	-	
	,	deara	adation.		
	b)	Give	an account of applications of biotechnology in agriculture.		

c) Explain production and significance of Vermicompost.

	•					
Seat No.					Se	t P
	B.Sc. (S	Semester EL Fເ	- V) (New) (CBCS ECTRONICS (Spe undamentals of M) Exa ecial licro	amination: Oct/Nov-2022 Paper – X) controller	
Day & [Time: 0	Date: Mor 3:00 PM	nday, 30-01 To 6:00 PM	-2023		Max. Mar	[.] ks: 80
Instruc	tions: 1) 2) 3) 4)	All question Figures to Draw neat Use of log	ns are compulsory. the right indicate full r labelled diagrams wh table and calculator is	narks ereve s allow	r necessary. ved.	
Q.1 A	A) Seleo 1)	ct the correct The microc a) 4 by c) 4 Kb	ect alternative. controller 8051 has te yte	b) d)	of internal RAM. 128 byte 64 Kbyte	10
	2)	The bit size a) 8 c) 32	e of stack pointer in 80	051 m b) d)	icrocontroller is Bit. 16 64	
	3)	The PSW i a) data c) flag	s the of 8051 register register	micro b) d)	ocontroller. interrupt register Timer register	
	4)	The DIV A, B. a) A c) A an	_ register is used to s d B	b) d)	emainder after the execution of B R0	
	5)	In case of a belongs to a) MOV c) MOV	3051 microcontroller v immediate addressing / A, F5H / A, 3AH	which g mod b) d)	of the following instruction le? MOV A, #06H MOV A, @R1	
	6)	The register a) R1 a c) R0 a	ers are norma ind R2 ind R1	lly use b) d)	ed for indirect addressing mode R0 and R2 R0 and R7	! <u>.</u>
	7)	The 8051 r purpose. a) 8 c) 32	nicrocontroller has	b) d)	I/O port pins for interfacing 16 40	
	8)	LJMP instr Byte addre a) 64K c) 256	uction can be used to ss space of the 8051.	call s b) d)	ubroutines located within 2K 128	-
	9)	Mode 2 of mode. a) 16-b c) 8-bit	Timer 0 or Timer 1 of it auto reload	b) d)	microcontroller is 16-bit auto reload 8-bit	

10) To mask lower nibble of a byte, it should be logically AND with number

a)	F0H	b)	FEH
c)	EFH	d)	0FH

B) State true or False.

- 1) The microprocessor is one of the most important components of a digital computer and actually acts as a brain of a computer system.
- 2) The 8051 microcontroller has five interrupts and out of these 1 external interrupts, 2 timer interrupts and 2 serial port interrupts.
- 3) The synonym of ALE is Address Light Enable.
- 4) The 8051 microcontroller has two 8 bit timers/counters called T0 and T1.
- 5) Register PCON controls processor power down, sleep modes and serial data baud rate.
- 6) The Data Pointer, DPTR, is a special 16 bit register used to address the external code or external data memory.

Q.2 Solve any Eight of the following.

- a) State salient features of 8051 microcontroller.
- b) Mention the names of any four SFRs.
- c) Draw RESET circuit for 8051 microcontroller.
- d) Give the role of \overline{EA} pin in 8051.
- e) Explain AND and OR instructions with suitable examples.
- f) Illustrate, with suitable example, the instruction MUL AB.
- g) Explain the concept of subroutine.
- h) Describe register addressing mode.
- i) Mention any four instructions of Branch control group.
- j) Give modes of serial data communication.

Q.3 A) Attempt any Two of the following.

- 1) Describe pin configuration of microcontroller 8051.
- 2) Give the comparison between microprocessor and microcontroller
- 3) Write a note on interrupts in 8051.
- **B)** Explain organization of on chip memory of microcontroller 8051.

Q.4 A) Attempt any Two of the following.

- 1) Draw the block diagram of 8051 and explain functions of the block in brief.
- 2) Explain PSW and stack pointer of 8051 microcontroller.
- 3) Write an Assembly Language Program to generate a square wave of 5 KHz on port pin P1.3 Use Timer-1 in Mode-2 and assume crystal frequency of 12 MHz.
- B) Give the classification of instruction set of 8051. With suitable examples 08 explain each group in brief.

Q.5 Attempt any Two of the following.

- a) Write the Assembly Language Program to
 - 1) Toggle the bits of port 1 and 2.
 - 2) separate the nibbles of hex number 45H and store it at memory.
- **b)** Write an Assembly Language Program to.
 - 1) to mask LSB and MSB of the byte
 - 2) Program for Logical XORing of two nos. stored at 6050 & 6051.
- c) What do you mean by serial communication facility of 8051 microcontroller? With suitable assembly language program, explain serial transmission.

06

16

10

06

08

Seat <u>No.</u>						Set	Ρ
	B.S	c. (Seme C	ster - V) (New OMPUTER S() (CBCS) CIENCE (Core Jay	Exa Spe ⁄a	amination: Oct/Nov-2022 cial Paper- X)	
Day & Time:	Date: 03:00	Monday, 3 PM To 06:	0-01-2023 00 PM			Max. Marks:	: 80
Instru	ictions	s: 1) All que 2) Figures	estions are comp s to the right indi	oulsory. cate full ma	rks.		
Q.1	A) (Choose co 1) Packa a) c c) s	rrect alternative ge is collection c lasses sub-packages	es. of	b) d)	Interfaces all of these	10
	:	2) The ex are ca a) c c) נ	xceptions that an lled hecked iser defined	e checked a	, at coi b) d)	mpile time by the Java compiler unchecked none of these	
		3) a) s c) e	keyword is used super extends	d to extend	the c b) d)	lass final implements	
	4	4) a) ja c) ja	Package contai ava.util ava.lang	n all the col	lectio b) d)	on classes. java.io all of these	
	Į	5) a) J c) J	is used to find a VM IDB	ind fix a bu	g in ja b) d)	ava. JDK JRE	
	(6) InaJa a) e c) b	ava thread can b extending class both a and b	e created _	b) d)	implementing interface none of these	
	7	7) a) s c) s	Method is used leep() suspend()	to suspend	a th b) d)	read. terminate() stop()	
	8	8) Which other? a) F c) C	layout used to a lowLayout GridLayout	arrange the	comp b) d)	oonents in a line one after the BorderLayout GridBackLayout	
	ę	9) AWT s a) F	stands for Abstra alse	ict Window	Tooll b)	kit. True	
		10) a) u c) c	is not a feature ise of pointer object oriented	of a Java.	b) d)	dynamic architecture natural	

06

16

10

06

Fill in the Blanks. B)

- 1) JVM stands for 2)
 - _____Keyword is used to prevent method overriding.
- Componentin AWT that can contain another components like 3) buttons, labels etc?
- 4)
- In Java default priority of thread is _____. ____keyword is used to call base. class constructor in derived class. 5)
- Keyword is used to implement interface in the class. 6)

Q.2 Answer the followings (Any Eight)

- a) What is use of super keyword?
- b) Write a note on JCheckBox.
- c) Write a note on ArrayList.
- d) Write a note Thread priorities.
- e) Define abstract class.
- f) What is Event?
- g) Define constructor.
- h) List out advantages of collection.
- i) Use of final keyword.
- j) JVM

A) Answer the followings. (Any two) Q.3

- 1) What is exception? How to handle exception in java?
 - 2) Explain the features of java.
 - 3) Write a program to demonstrate that use of 'super' keyword.

What is method overriding? Explain. Q.3 B)

Q.4	A)	 Answer the following. (Any Two) 1) What is interface? Explain with example. 2) List out Difference AWT and swing. 3) Explain file reader and file writer. 	08
Q.4	B)	Write a program for constructor overloading.	08
Q.5	Ans	swer the following. (Any Two)	16

a) What is Inheritance? Explain types of Inheritance.

- b) Explain thread life cycle.
- c) Explain data types in Java.

Seat	
No.	

B.Sc. (Semester - V) (New) (CBCS) Examination: Oct/Nov-2022 **PHYSICS (Special Paper - XI) Classical Mechanics**

Day & Date: Tuesday, 31-01-2023 Time: 03:00 PM To 6:00 PM

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

3) Use of logarithmic table and calculator is allowed.

4) Draw neat labelled diagrams wherever necessary.

A) Q.1 Choose correct alternative.

If T and T_o are time of flight of projectile in resistive medium and non-1) resistive medium respectively then the correct relation between T and T₀ is

a)	$T < T_{\circ}$	b)	$T > T_{\circ}$
C)	$T = T_{\circ}$	d)	T # T₀

2)	For a conservative force, $\vec{F} = _$	

a)	$\overrightarrow{\nabla}V$	b)	$\overrightarrow{\nabla} \times V$
c)	$-\overrightarrow{\nabla}V$	d)	$\vec{\nabla}^2 V$

A rocket works on the principle of conservation of . 3)

- linear momentum a) b) mass C)
 - d) energy angular momentum
- 4) The Lagrange's equations of motion for a system are equivalent to equations of motion.
 - Newton's Laplace's b) a)
 - Poisson's d) Maxwell's C)

The river deviation occurs to the of river flow in the northern 5) hemisphere and to the _____ of flow in the southern hemisphere.

- left, right left, left a) b) right, left C) right, right d)

If a body is dropped from a height of 100 m from rest at latitude ϕ = 6) 45°, it will be deflected by about towards east.

- b) 15.5 cm 15.5 m a)
- 1.55 m C) d) 1.55 cm

The extremizing curve of Brachistochrone problem is a _____. 7)

- Catenary Circle b)
- Cycloid Straight line C) d)

The Hamilton's principle is an example of . 8)

- Force Lagrange's multiplier a) b) C)
 - Stationary point Variational principle d)

9) The total energy of a system of coupled pendulums is

only kinetic a)

a)

- only potential b)
- partly kinetic and partly potential C)
- kinetic energy is always half of potential energy d)

Max. Marks: 80

Set

- **10)** The moment of inertia is a tensor of a rank
 - One b) Two
 - Three d) Four

c) Three **B) Fill in the blanks**.

a)

- 1) If the constraints are independent of time, then they are called _____ constraints.
- The centrifugal acceleration has the maximum value at the _____ on earth's surface.
- 3) y = ax + b, where b = constant is equation of _
- 4) In case of coupled system of two simple pendulums, the frequency of antisymmetric mode is _____ than that of symmetric mode.
- 5) A plane of oscillation of Focault's pendulums turns through an angle equal to _____.
- 6) if $I_{xx} = I_{yy}$ and $I_{zz} = 0$ then the body is called _____.

Q.2 Solve any Eight of the following.

- a) What are symmetric and antisymmetric mode of oscillations?
- **b)** State the expressions for two frequencies, $(\omega_1 \text{ and } \omega_2)$ of coupled oscillatory system.
- c) Define constraints and give one example.
- d) State Hamilton's principle.
- e) What are pseudo forces?
- f) A stone is released from a helicopter at a height of 500 m. Calculate time required for a stone to fall on the terrace of 304 m high building (g= 9.8 m/s²).
- **g)** Determine the number of degrees of freedom of four particles moving freely in a plane.
- h) What is concept of centre of mass?
- i) State Euler's theorem.
- **j)** Two masses 10 kg and 5 kg are connected to Atwood's machine. Calculate the acceleration produced in Atwood's machine.

Q.3 A) Attempt any Two of the following.

- 1) State and prove the conservation theorems of linear momentum and angular momentum of a particle.
- 2) Define normal coordinates and hence derive expressions for symmetric and antisymmetric mode of simple harmonic oscillator.
- 3) Set up the Lagrangian for Atwood's machine.

B)	Write a note on effect of Coriolis force on nature.
----	---

Q.4 A) Attempt any Two of the following.

- 1) Show that the shortest distance between any two points in a plane is along a straight line passing through them.
- 2) Show that angular acceleration of a particle is the same in fixed and rotating coordinate system.
- 3) Obtain an expression for energy of coupled oscillator in normal coordinate form.
- **B)** Derive Euler's equation of motion of a rigid body.

16

06

10

06

16

Q.5 Attempt any Two of the following.

- a) State D'Alembert's principle. Obtain Lagrange's equation from D'Alembert's principle.
- **b)** Derive expressions for time of flight and range of flight of a projectile moving in resistive medium.
- c) Deduce Lagrange's equation from Hamilton's principle.

Seat No.			Set	Ρ
	B.Sc. (Semester - V) (New) (CBCS) Examination: O CHEMISTRY (Special Paper - XI) Organic Chemistry	ct/Nov-2022	
Day & I Time: 0	Date: Tu)3:00 PM	esday, 31-01-2023 To 6:00 PM	Max. Marks	3: 80
Instruc	tions: 1 2 3 4	All questions are compulsory. Figures to the right indicate full marks. Use of log table and calculators is allowed. Draw neat labelled diagrams wherever necessary.		
Q.1 #	A) Mul 1)	iple choice question. In carbon dioxide, fundamental modes of vibrations an a) 3 b) 4 c) 6 d) 9	re	10
	2)	Halo ester and Zn is used in reaction.a) MPV reductionb) Reformatskyc) Wittigd) Stobbe conder	sation	
	3)	The process of converting compound into itscalled as enolisation.a) hydroxylb) phenolicc) alcoholicd) carbonyl	enol form is	
	4)	In mass spectrum, intensity assigned to base peak is a) 100% b) 0% c) 50% d) 90%		
	5)	The product obtained in wittig reaction isa) alkeneb) aldehydec) alcohold) alkane		
	6)	Ethyl Acetoacetate is a of acetoacetic acid.a) methyl esterb) ethyl esterc) propyl esterd) diester		
	7)	In Oppenaur oxidationconvert to ketones.a)primary alcoholb)b)secondary alcoholc)tertiary alcohold)c)secondary aminimized	phol ne	
	8)	The ions which are produced by bond cleavages in the called asa)Parent ionb)rearrangementc)fragment ionsd)complex ions	e parent ion is ions	
	9)	$\begin{tabular}{lllllllllllllllllllllllllllllllllll$		
	10)	The ions which are produced from the decomposition source and ion collector is known as a) doubly charged ions b) isotope ions	between ion	

ſ

c) molecular ions d) metastable ions

		 Write the product formed when benzamide reacts with NaOBr. What is meant by (M + 1) peak in mass spectroscopy? What is a chemical shift?
Q.2	Solv a) b) c) d) e) f) g) h)	any Eight of the following. /rite note on finger print region. /hat are metastable ions? /rite reactions involved in conversion of acetophenone to β -methyl nnamic acid. /rite two applications of mass spectroscopy. /hat are isotope ions? /rite the preparation of anthranilic acid from phthalic anhydride. /rite one synthetic application for MPV reduction. tate nitrogen rule. /rite statement with one example of Reformatsky reaction.
Q.3	A)	 ttempt any Two of the following. What are Ylides? Explain Wittig reaction with mechanism. Explain syn addition and anti-addition with respect to bromination of 2-butene. Explain magnetic and non-magnetic nuclei.
	В)	 xplain the term spin-spin coupling. How many signals are expected from? isobutane 1, 2 dichloroethane Propane ethanol
Q.4	A)	 ttempt any Two of the following. Explain bending or deformation vibrations in covalent bonds. Explain keto-enol tautomerism with ethylacetoacetate. Write note on conformation and stability of methyl cyclohaxane.
	B)	xplain conformations and stability of cyclohexane with energy profile agram.
Q.5	Atte a)	p t any Two of the following. xplain NMR instrument with diagram. Write note on shielding and
	L.)	connenting.

- Explain the mechanism for claisen condensation for EAA. How will you prepare b) methyl ethyl aceto acetate and butanoic acid from ethylacetoacetate?
- Explain double beam spectrophotometer with diagram. Explain Hook's law. C)

B) Write One sentence answer.

- Write basic principle involved in mass spectroscopy. 1)
- What is reactive methylene group? 2)
- What is selection rule? 3)

Q.2

- Q.:
 - 06

Q.4

16

80

80



16

10

06

Soat						[
No.						Set	Ρ
	B.Sc. (S	Semester	- V) (New) (CBCS BOTANY (Specia Molecular B) Exa I Paj Siolog	amination: Oct/No per - XI) gy	ov-2022	
Day & [Time: 0	Date: Tue 3:00 PM	esday, 31-0 <i>°</i> To 06:00 P	I-2023 M			Max. Marks	: 80
Instruc	tions: 1) 2) 3) 4)	All question Figures to Use of loga Draw neat	ns are compulsory. the right indicate full r arithmic table and cald diagrams and give ec	narks culato juatio	r is allowed. n wherever necessary	<i>.</i>	
Q.1 A	A) Rew 1)	rite the sen Operon hy a) Gilbo c) Griff	tence by using correct pothesis is put forth by ert and Muller ith	ect al y b) d)	ternative. Hershey and Chase Jacob and Monod		10
	2)	In prokaryc a) 70 S c) 90 S	otes type of ril	boson b) d)	nes are found. 80 S 50 S		
	3)	When the F factor is re a) sigm c) alph	RNA polymerase reco leased and transcripti la a	gnize ion pr b) d)	s the promoter region oceeds. gamma beta	,	
	4)	The DNA s strand. a) pron c) temp	trand which is used ir noter blate	b) d)	synthesis is called _ coding TATA		
	5)	In lac oper enzyme. a) Perr c) Beta	on, lac-A gene is resp nease i galactosidase	onsib b) d)	le for synthesis of Transacetylase Amylase		
	6)	In lac oper a) Indu c) Rep	on, i gene is responsil cer ressor	ole foi b) d)	r synthesis of Promoter Inhibitor	protein.	
	7)	Nucleic aci carbon sug a) 6 c) 8	d is polymer or biomo ars and phosphate gr	olecule oups b) d)	e which is made up of 5 9		
	8)	Nucleotide a) Pent c) Nitro	s are monomers made tose Sugar ogen base	e up c b) d)	of components Phosphate groups all of these	S.	
	9)	a) DNA c) Helio	known as Kornberg's A Polymerase-I case	enzyn b) d)	ne. Amylase Peptidase		

		 10) Ribosomes arc not present in a) Chloroplast b) Mitochondria c) Cytoplasm d) Nucleus 	
	B)	 Answer the following questions. 1) Griffith used bacterium in his experiments. 2) Friedrich Miescher isolated nuclein from cells. 3) Eukaryotes have type of ribosomes. 4) Replication of DNA is semiconservative. True or False? 5) Process of RNA formation from DNA is called 6) Lac operon was discovered in which bacterium? 	06
Q.2	Sol ^y a) b) c) d) e) f) g) h) i)	ve any Eight of the following. What are nucleic acids? Give examples. Enlist different types of DNA and RNA. What is replication of DNA? Sketch and label any type of RNA. Name any two enzymes involved in replication. Name any two enzymes involved in transcription. What is essential for transcription? What is essential for translation? What are steps involved in transcription? What are the chemical components of DNA?	16
Q.3	A)	 Attempt any Two of the following. 1) Describe the Griffith's experiment. 2) Give salient features of DNA double helix. 3) Describe principles of transcriptional regulation. 	10
	B)	Write a note on organization of DNA in prokaryotes.	06
Q.4	A)	 Attempt any Two of the following. 1) Sketch and label - Watson and Crick model of DNA. 2) Write a note on Kornberg's discovery of DNA synthesis. 3) Give different transcription factors and describe their roles. 	08
	B)	Explain regulation of lactose metabolism in <i>E. coli.</i>	08
Q.5	Atte a) b)	Provide a start in the start of the following. Write a note on - transcription in prokaryotes. Describe the stars involved in protein synthesis	16

b) Describe the steps involved in protein synthesis.c) With neat labelled diagram explain replication of DNA in prokaryotes.

Instr	uctio	ns: 1) 2) 3) 4)	All qu Figur) Use () Draw	estions are compulsory. es to the right indicate full of logarithmic table and cal neat labelled diagrams wh	marks culato nereve	s. er is allowed. er necessary.
Q.1	A)	Mult 1)	i ple cl The p regula a) c)	hoice question. bineal gland secretes the he ate biological rhythms. Dopamine LTH	ormor b) d)	ne which helps to Melatonin Glucagon
		2)	The c horm a) c)	condition associated with th one in adults is known as _ Gigantism Acromegaly	b) d)	et of hypersecretion of growth Dwarfism Goitre
		3)	of the a) c)	is the primary target of t hypothalamus. Liver and adipose tissue Anterior pituitary	b) d)	easing and inhibiting hormones Gonads Bone marrow
		4)	The h a) c)	ormone made by the posto FSH ACTH	erior p b) d)	ituitary is LH ADH
		5)	ICSH a) c)	in male acts on Cells of Leydig Spermatids	b) d)	Sertoli cell Spermatogonia
		6)	Milk s a) c)	secretion is stimulated by _ oxytocin LH	b) d)	_ hormone. progesterone prolactin
		7)	Chem a) b) c) d)	nically hormones are biogenic amines only proteins, steroids and bio proteins only steroids only	 genic	amines
		8)	a) c)	is a secondary messen(Ca²⁺ Na⁺	ger. b) d)	Mg ²⁺ K ⁺
		9)	Horm	one receptors are		

B.Sc. (Semester - V) (New) (CBCS) Examination: Oct/Nov-2022 ZOÓLOGÝ (Special Paper - XI)

Endocrinology Day & Date: Tuesday, 31-01-2023

Time: 03:00 PM To 06:00 PM

Seat

No.

(

- glycolipids a)
 - polysaccharides C)

SLR-FZ-164

Set Ρ

Max. Marks: 80

- Human Placental Lactogen (hPL) _____.a) promotes mammary gland growth in preparation for lactation
 - b) prepares the placenta for delivery
 - ensures the lining of the uterus stays intact during the pregnancy C)
 - maintains the corpus luteum during pregnancy d)

	B)	Fill in the blanks/Definition/One sentence answer/One word answer Give the name/Predict the product ete.	06
		 hormone is responsible for maintenance of pregnancy. hormone secreted by pituitary gland responsible for skin 	
		 a) Hormone is responsible for relaxation of pelvic ligament during birth of child. 	
		4) Cushing's syndrome in hyperpituitarism is due to excess secretion of hormone.	
		 5) Acidophil cells of anterior pituitary gland secrete hormones. 6) Testosterone is type of hormone. 	
Q.2	Sol ^y a) b)	ve any Eight of the following. CRH Structure of placenta	16
	c) d)	Structure of hypothalamus Hormones of posterior pituitary	
	e) f)	GPCR Neurohormones	
	g) h)	Structure of Testis Pineal gland	
	i) j)	Disorders of ovary GnRH	
Q.3	A)	 Attempt any Two of the following. 1) Explain types of hormone receptors. 2) Explain brief function of epiphysis. 3) Hormonal regulation of testis. 	10
	B)	Describe hypothalmo-hypophysial portal system.	06
Q.4	A)	 Attempt any Two of the following. 1) Explain the functions of placenta. 2) Describe the classification of hormones. 3) Explain Molecular mediators in hormonal action. 	08
	B)	Explain hormones of adenohypophysis.	08
Q.5	Atte	empt any Two of the following.	16
	a) b)	Disorders of pituitary gland. Explain in detail hormone action at cellular level.	
	c)́	Explain regulation of neuroendocrine glands.	

Seat No.					Set	Ρ	
	B.Sc. (Semester - V) (New) (CBCS) Examination: Oct/Nov-2022 MATHEMATICS (Special Paper XI) Poal Analysis						
Day & Time:	Date: Tue 03:00 PM	esday, 31-01-2 To 06:00 PM	2023		Max. Marks	s: 80	
Instru	ctions: 1) 2)	All questions Figures to the	are compulsory. e right indicate full m	arks.			
Q.1	A) Fill i 1)	n the blanks f If $f: A → B$ an a) Range c) Range	by choosing corrected f is one-one then of f of f^{-1}	t alte the do b) d)	rnatives given below. Somain of f^{-1} is co-domain of f domain of f	10	
	2)	Which of the a) $f(x) =$ c) $f(x) =$	following is one-one e^x , $(-\infty < x < \infty)$ e^{x^2} , $(-\infty < x < \infty)$	funct b) d)	ion? $f(x) = x^2, (-\infty < x < \infty)$ All of these		
	3)	If $f: R \to R$ su	ch that $f(x) = \frac{x-2}{x+3}$ th	en f-	$x^{-1}(x) = $		
		a) $\frac{x+3}{x-2}$		b)	$\frac{x+1}{x-1}$		
		c) $\frac{3x+2}{1-x}$		d)	$\frac{x+3}{x+1}$		
	4)	If A and B area) $(A \cap B)$ c) $(A \cap B)$	subset of \mathbb{R} then $A' \subseteq A' \cap B'$ $A' = A' \cap B'$	b) d)	$(A \cap B)' \supseteq A' \cap B'$ $(A \cap B)' = A' \cup B'$		
	5)	$\lim_{n \to \infty} \left(\frac{n}{n+2}\right) = -$ a) 1 c) ∞	·	b) d)	0 $\frac{1}{2}$		
	6)	For the sequer a sub-sequer a) $7, -4, 1$	ence 1, - 4, 7, -10, 13 nce? .3, -10,	3, b)	² which of the following is not 1,7,13,		
	7)	 c) -4, -1 The sequence a) converting c) oscillation 	0, -16, e $\left\{1, -\frac{1}{2}, \frac{1}{3}, -\frac{1}{4}, \frac{1}{5}, \dots \right\}$ gent cory	d) }is b) d)	all of these divergent strictly increasing		
	8)	The series a) conver c) diverge	$\sum_{\substack{n=1\\gent}}^{\infty} \frac{1+n}{1+3^n} \text{ is } \underline{\qquad}$	 b) d)	oscillates all of these		

9) The series $\sum_{n=2}^{\infty} \frac{1}{n(\log n)^P}$ converges if _____ a) P > 1 b) P < 1

c)
$$P = 1$$
 d) $P = 0$

10) I) If
$$\Sigma a_n$$
 converges absolutely the Σa_n is convergent.

- II) If Σa_n is convergent then Σa_n converges absolutely.
- a) I) is true and II) is false b) I) is false and II) is true
 - Both I) and II) is true d) Both I) and II) is false

c) Both I) B) Fill in the blanks.

- 1) If $f: A \to B$ and $X \subset A$ Define $g: X \to A$ by $g(x) = f(x) \forall x \in X$ then g is called _____.
- 2) A set A is countable, if A is equivalent to the set of _____
- 3) A sequence is a function from ______ to the set of real number.
- 4) Consider the sequence $\{-1, 1, -2, 1, -3, 1, -4, 1, \dots \}$ then $\lim_{n \to \infty} \sup$ of this sequence is _____.
- 5) If Σa_n is convergent series then $\lim_{n \to \infty} a_n =$ _____.
- 6) If Σa_n is absolutely convergent series and $\{b_n\}$ is bounded sequence then $\Sigma a_n b_n$ is _____.

Q.2 Attempt any Eight of the following.

- a) If the function $f(x) = \log x$ for $x \in (0, \infty)$. If A = [0,1] and B = [1,3] find $f^{-1}(A)$ and $f^{-1}(A \cup B)$
- **b)** Prove that the set $\{1,4,9,16,25,\ldots..\}$ is countable.
- c) Define, Difference and symmetric difference of two sets.
- d) If $\lim_{n \to \infty} s_n = L$ and $\lim_{n \to \infty} t_n = M$ then prove that $\lim_{n \to \infty} (s_n t_n) = L M$
- e) Show that the limit of the sequences $s_n = \{(-1)^n\}_{n=1}^{\infty}$ does not exist.
- f) Define bounded sequence and gives one example.
- g) Define limit superior and limit inferior of sequence.
- **h**) Discuss the convergence of the series $\sum \frac{n+2}{10^{10}(n+3)}$
- i) Define alternating series with example.
- j) State comparison test of series.

Q.3 A) Attempt any Two of the following.

- 1) Define countable set and prove that, if A and B are countable sets then $A \times B$ is also countable.
- 2) Prove that a sequence $\{s_n\}_{n=1}^{\infty}$ of real numbers is convergent iff it is Cauchy sequence.
- 3) If $\sum_{n=1}^{\infty} a_n$ is divergent series of positive numbers then prove that

there is a sequence $\{E_n\}_{n=1}^{\infty}$ of positive number which converges

to zero but
$$\sum_{n=1}^{\infty} E_n a_n$$
 Diverges.

B) If $f: A \to B$ and $X \subset A, Y \subset B$ then show that $f(X \cup Y) = f(X) \cup f(Y)$ **06**

06

16

Q.4 A) Attempt any Two of the following.

- 1) If A and B are subset of s then prove that $(A \cup B)' = A' \cap B'$
- 2) Prove that every convergent sequence converges to unique limit.
- 3) Prove that the series $\sum (-1)^n [\sqrt{n^2 + 1} n]$ is conditionally convergent,
- **B)** For any $a, b, \in \mathbb{R}$ Prove that $||a| |b|| \le |a b|$, hence prove that if $\{s_n\}_{n=1}^{\infty}$ **08** converges to *L* then $\{|s_n|\}$ converges to |L|.

Q.5 Attempt any Two of the following.

a)

16

Prove that if A_1, A_2, A_3, \dots are countable sets the $\bigcup_{n=1}^{n=1} A_n$

is countable

hence show that the set of all rational number is countable.

- **b)** Prove that every bounded sequence of real number has a convergent subsequence.
- c) State and prove Ratio test for the absolute convergence of series and hence test the convergence of the series $\sum \frac{n^n}{n!}$ is convergent.

B.Sc. (Semester - V) (New) (CBCS) Examination: Oct/Nov-2022 **STATISTICS (Special Paper - XI) Sampling Techniques** Max. Marks: 80 Day & Date: Tuesday, 31-01-2023 Time: 03:00 PM To 06:00 PM Instructions: 1) All questions are compulsorv. 2) Figures to the right indicate full marks. 3) Use of log table and calculators is allowed. Choose the correct alternative. The discrepancy between estimate and population parameter is known as: _____. human error b) sampling error a) non- sampling error d) none of these C) Which of the following is the advantage of systematic sampling? Easy selection of sample a) Economical b) Spread of sample over the whole population C) d) All the above

The total number of possible samples of size n, drawn from 3) population size N by SRSWOR is _____.

a)	n	b) N	
C)	NCn	d) <i>N</i> ⁿ	

4) In stratified random sampling with Neyman's optimum allocation the size of the sample from ith stratum is

a)	$ni = nP_i$	b)	$ni = \frac{n}{n}$
c)	$ni = np_i s_i$	d)	None of these

- Sampling frame is a term used for _____ 5)
 - a list of random numbers a)
 - b) a list of voters
 - a list of sampling units of a population C)
 - d) none of the above

6) In which of the following situations cluster sampling is appropriate?

- When the units are situated far apart a)
- When sampling frame is not available b)
- When all the elementary units are not easily identifiable C)
- All of the above d)

a)

- Under proportional allocation the size of the sample from each 7) stratum depends on
 - Total sample size b) Size of the stratum
 - Population size All of the above C) d)

SLR-FZ-166

Set

Seat No.

Q.1

A)

1)

2)

- 8) There are more chances of non-sampling errors than sampling errors in case of
 - Studies of large samples b) Complete enumeration a) All of the above d)
 - Inefficient investigators C)
- 9) Systematic sampling means
 - Selection of n contiguous units a)
 - b) Selection of n units situated at equal distances
 - Selection of n largest units C)
 - Selection of n middle units in a sequence d)
- 10) In presence of linear trend _____ method is more efficient.
 - a)

- b) Systematic
- d) SRSWR

06

16

10

06

08

- Stratified
 - SRSWOR C)

B) Define the following.

- Sampling unit 1)
- 2) Sampling frame
- Random sampling 3)
- 4) Non-random sampling
- 5) Non-sampling error
- Sampling error 6)

Solve any Eight of the following. Q.2

- Define census method. a)
- b) Give any two real life situations where census method is not preferable over sampling.
- State characteristics of a good questionnaire. C)
- d) Give a real life situation where stratification can be used.
- What is meant by proportional allocation? e)
- State the objectives of a sample survey. f)
- Give a real life situation where cluster sampling is used. g)
- State the advantages of sampling method over census method. h)
- Distinguish between random sampling and non-random sampling. i)
- Give a real life situation where Ratio method is appropriate. j)

Q.3 A) Attempt any Two of the following.

- Find under what condition ratio estimate is more efficient than SRS. 1)
- 2) Explain sampling for proportion. Obtain its unbiased estimator for population proportion.
- Explain regression estimators of population mean and population 3) total.
- B) Write a short note on systematic sampling.

Q.4 A) Attempt any Two of the following.

- Show that ratio estimator is a biased estimator. Obtain an expression 1) for the bias in estimator.
- Describe stratified random sampling procedure and state unbiased 2) estimator of population total.
- 3) Describe, in brief, the cluster sampling.
- B) Describe the idea of two-stage and multi-stage sampling in detail **08**

Q.5 Attempt any two of the following.

- a) With usual notations prove that Neyman's allocation has better precision than proportional allocation. Also prove that proportional allocation has better precision than simple random sample.
- **b)** For stratified sampling, obtain unbiased estimator of population mean. Also obtain standard error of the estimator.
- c) Discuss in detail about the determination of the sample size.

SLR-FZ-1	67
----------	----

Set

Ρ

10

Seat	
No.	

B.Sc. (Semester - V) (New) (CBCS) Examination: Oct/Nov-2022 **GEOLOGY** (Special Paper - XI) Applied Geology – Engineering Geology

Day & Date: Tuesday, 31-01-2023 Time: 03:00 PM To 06:00 PM

Max. Marks: 80

Instructions:1) All questions are compulsory.

2) Figures to the right indicate in full marks.

Fill in the blanks. Q.1 A)

- Preparation of geological map is done in the stage of the civil 1) engineering project.
 - planning stage a)
- post construction stage b)
- C) design stage
- construction stage d)
- Which of the following test can detect presence of subsurface 2) unconformity?
 - Photogeological interpretation a)
 - seismic b)
 - drill core C)

C)

- d) magnetic survey
- 3) Electrical resistivity method is based on measurement of
 - Specific resistance a) b) Voltage C)
 - Potential drop d) Current
- Which type of compressive strength is taken as the most important 4) index property of stones?
 - a) Confined b) Drained
 - Undrained Unconfined d)
- According to engineering classification rocks, rocks with compressive 5) strength 1120 - 2240 kg/cm³ are classified as
 - medium strength type and class C a)
 - b) medium strength type and class B
 - C) high strength type and class B
 - high strength type and class C d)
- 6) Moderately altered / weathered rocks occur in grade of soil.

a)		b)	IV
C)	V	d)	VI

- Which type of mass movement occurs on gentle slope whose angle 7) between 2^0 and 5^0 ?
 - Creep Rapid flowage a) b)
 - Sliding Toppling C) d)
- The type of dam that requires an impermeable membrane is: 8)
 - Rock-fill dam a) Concrete dam b)
 - Earth dam d) Masonry dam C)

16

SLR-FZ-167

- A tunnel passing through core of syncline and align parallel to fold 9) axis is site.
 - Favourable a)

C)

- unfavourable b) Both a) and b) cannot say d)
- Two types of embarkment dams are: 10)
 - Weirs and bandhara b) arch and buttress a)
 - C) Earth fill and rock fill d) gravity and arc

B) Answer the following questions in one sentence.

- In which stage of the civil engineering project, geophysical surveys 1) are carried out?
- What is the purpose of Auger drilling method? 2)
- 3) Which rock material can be used as a roofing material?
- Siliceous sandstone has more porosity than calcareous sandstone. 4) True/false.
- What is alluvial soil? 5)
- Which type of dam usually has a triangular profile and can resist the 6) forces by its own weight?

Q.2 Answer the following questions. (Any Eight)

- Name three major types in classification of mass movement. a)
- What are the particle sizes of aeolian soil? b)
- What is overburden in civil engineering? C)
- What is crown of tunnel? d)
- What are heel and toe of the dam? e)

Q.5 Answer the following questions. (Any Two)

- f) Name the types of dams.
- What are lahars? g)
- Define rock mechanics. h)
- Give mathematical expression of uniaxial compressive strength. i)
- i) What are three types of aerial photographs?

Q.3	A)	 Answer the following questions. (Any Two) 1) What is sliding? 2) What are utilities of dams? 3) Write a note on tensile strength. 	10
	B)	Write a short note on feasibility / design stage of site investigations.	06
Q.4	A)	 Answer the following questions. (Any Two) 1) Describe in brief hydraulic and traffic tunnels. 2) Classification of soils depending upon grades of weathering. 3) What are methods of sub-soil exploration? 	08
	B)	Explain role of gravity in mass movement.	08

What is shear strength? Explain it with appropriate figure. a) b) Describe various concrete dams.

Describe various geological structures which may cause landslide event. C)

06
			SLR-FZ-168
Seat No.			Set P
B.Sc	c. (S	emester - V) (New) ((MICROBIOLOG Imr	CBCS) Examination: Oct/Nov- 2022 GY (Special Paper- XI) munology
Day & Date Time: 03:0	e: Tu 0 PM	esday, 31-01-2023 1 To 06:00 PM	Max. Marks: 80
Instructio	n s: 1 2 3 4) All questions are compu 2) Draw neat labeled diagr 3) Figures to the right indic 4) Use of log table and cal	ulsory. rams wherever necessary. cate full marks. lculators is allowed.
Q.1 A)	Mul 1)	tiple choice question. The type of reag a) lgG c) lgM	10 genic antibody involved in type I hypersensitivity. b) IgE d) IgD
	2)	Immune complex is requ pathway. a) Classical c) Lectin	uired for activation of complement b) Alternative d) All of the above
	3)	is the graft betwee to same species. a) Isograft c) Allograft	en genetically different individuals belonging b) Autograft d) None of these
	4)	The antibody pro a) IgG c) IgM	roduced in primary immune response. b) IgE d) IgA
	5)	MHC II can bind to a) CD₄⁺ c) CD₃+	b) CD₀⁺ d) All of the above
	6)	The auto antibodies pro	duced against vitamin B ₁₂ receptor called as
		a) SLE c) Pernicious anemia	b) Anemia d) myshenia gravis
	7)	The antigen present in the	he blood is filtered and eliminated by
		a) lymph node c) Thymus	b) Spleend) bone marrow

		8)	Serum sickness is example ofhypersensitivity.a) Type Ib) Type IIc) Type IIId) Type IV	
		9)	Blood group is called universal blood acceptor.a) Ab) Bc) ABd) O	
		10)	Image: Image of the second systemImage of the second systema) Bb) Tc) Macrophaged) Neutrophils	
	B)	Defi 1) 2) 3) 4) 5) 6)	ne the following. Define complement. Define allograft. Define blood transfusion. Define Autoimmunity. Define allergen. Define secondary immune response.	06
Q.2	Solv 1) 2) 3) 4) 5) 6) 7) 8) 9) 10)	e any Wha Wha Wha T lyn Wha Rh b Seru Wha Defir	r eight of the followings. t is humoral immunity? t are the biological effects of complement? t is phagocytosis? t is hemolytic anemia? nphocyte. t is Xenograft? lood grouping. m sickness. t is MALT? he cell mediated immunity.	16
Q.3	A)	Atte 1) 2) 3)	mpt any two of the following. Describe in detail mechanism of graft rejection. Discuss in brief ABO blood grouping. Discuss in brief classical complement pathway.	10
	B)	Defir	ne monoclonal antibody. Discuss in brief hybridoma technology.	06
Q.4	A)	Atter 1) 2) 3)	mpt any two of the following Give a detailed account on alternate pathway of complement. Give a brief account on structure of thymus. Discuss in brief applications of monoclonal antibody.	08
	B)	Disc	uss in detail delayed type of hypersensitivity.	08

- Q.5 Attempt any two of the following.a) Describe in detail structure and role of MHC I and MHC II.
 - b)
 - Describe in detail immediate type of hypersensitivity. Give a detailed account on organ specific autoimmunity. C)

					SLR-FZ-	169
Seat No.					Set	P
	B.Sc. (Semester - ELE	V) (New) (CBCS CTRONICS (Sp Sensors and Ti	6) Exa ecial ranso	amination: Oct/Nov-2022 Paper - XI) Jucers	
Day & Time:	Date: Tu 03:00 PM	esday, 31-01 I To 6:00 PM	-2023		Max. Mark	(s: 80
Instru	1 (1000) 12 13 14 10 10 10 10 10 10 10 10 10 10 10 10 10) All question) Figures to t) Use of log t) Draw neat l	s are compulsory. he right indicate full able and calculators abelled diagrams wh	marks is allo nereve	s. owed. er necessary.	
Q.1	A) Mult 1)	tiple choice The deviation a) Sens c) Error	question. on of the true value f itivity	rom th b) d)	ne desired value is Resolution Expected value	10
	2)	A measure a) resol c) preci	of consistency of me ution sion	easure b) d)	ement is accuracy error	
	3)	The sensitiv a) 10 m c) 10 m	rity of IC LM35 temp V/° F V/° C	eratur b) d)	e transducer is 10 mV/° K 10 μV/° C	
	4)	Strain gaug a) Active c) Inver	e is transdu e ter	cer. b) d)	Passive All of these	
	5)	What will ha a) Decre c) incre	appen to resistance, eases ases	if leng b) d)	of conductor is increased? no change Doubles	
	6)	PIR stands a) Pass c) Pulse	for ive infrared sensor e infrared Sensor	b) d)	Position infrared sensor all of these	
	7)	The principl a) Self i c) Reluc	e of operation of an nductance ctance	LVDT b) d)	is based on variation of Mutual inductance Conductance	
	8)	In capacitive of plates is a) Incre c) both	e transducers the ca ased a and b	b) d)	nce is increased if the spacing decreased none of these	
	9)	RVDT stand a) Rotar b) Resis c) Regis d) Rotar	ds for Ty Variable differenti stor Variable differen ster variable differen Ty vague difference f	al tran Itial tra tial tra transd	isducer ansducer insducer ucer	
	10)	LPG is pressure. a) Solid	at normal ambie	ent ten	perature and atmospheric	

c) Liquid d) solid-liquid

		 2) Enlist the temperature transducers. 3) Define accuracy of measurement system. 4) Define sensitivity of measurement system. 5) Give the two names of Active Transducer. 6) Draw the symbol of Phototransistor. 	
Q.2	Solv a) b) c) d) e) f) g) h) i)	 What is need of system calibration? What is the basic needs of measurement? What is actuator? Give one example. What is LDR? Give the difference between Active and Passive sensors. Give the principle of operation of capacitive transducers. Draw diagram of optocoupler. Draw the diagram of Resistive Position transducer. Give the principle of operation of Inductive Transducer. Give basic difference between Sensors and Transducer. 	16
Q.3	A)	 Attempt any Two of the following. 1) Explain the construction and working of Electromagnetic Relay. 2) Give brief account of static and dynamic characteristics of instrument. 3) Write a note on capacitor microphone. 	10
	B)	Write a note onpiezoelectric transducer.	06
Q.4	A)	 Attempt any Two of the following. 1) Explain the PIR sensor. 2) Write a note on Potentiometer. 3) Write a note RTD. 	08
	B)	Explain the Hall effect transducer.	08
Q.5	Atte a) b) c)	mpt any Two of the following. Explain working of LVDT with neat diagram. Draw the block diagram of measurement system and explain in brief. Explain Thermocouple in brief.	16

Give one sentence answer. 1) What is Passive transducer?

B)

SLR-FZ-169

sday, 31-0 To 06:00 I	орогали у с 01-2023 РМ	,	Max. M
All questic Figures to Draw nea	ons are compulsory. I the right indicate full r I labelled diagrams wh	narks. ereve	r necessary.
ple choic	e question.		
a) Pro c) Pro	ogram Control Block	b) d)	Program Central Block Process Central Block
For DEAD	DLOCK DETECTION		Graph is used in Single
a) Res c) Wa	Resource Type. source Allocation iit-For-a	b) d)	Variant None
is	the mechanism that b	rings a	a page into memory only whe
a) Ov	l. erlavs	b)	Fragmentation
c) Dei	mand Paging	d)	Segmentation
S(cheduler select which p	proces	ses should be brought into th
ready que	eue.		-
a) Rea	al-term	b) d)	Long-term
		u)	Short term
a) Noi	n-Pre-Emptive schedul	ing	
b) Pre	e-Emptive scheduling	0	
c) Fas	st scheduling		
d) Pa			
Loading o	of different routines at E	EXECL	JTION TIME is known as
a) Dyı	namic Linking	b)	swapping
c) Dyr	namic Loading	d)	Dynamic Routine
A page fa	ult rate is high in	_ paę	ge replacement algorithm.
a) SJI	=	b)	FIFO
C) LR		u)	
A Directed	a edge from $Rj \rightarrow Pi$ in	RAG	Is called as <u>Edge</u> .
c) Cla	ucsi iim	d)	Wait
ie	a process synchroniz	-, ation t	ool operates on two atomic

Seat No.

B.Sc. (Semester - V) (New) (CBCS) Examination: Oct/Nov-2022 **COMPUTER SCIENCE (Special Paper - XI) Operating System**

Day & Date: Tuesda Time: 03:00 PM To

Instructions: 1) All

- 2) Fig
- 3) Dra

Q.1 A) **Multiple**

- 1) PC
 - a)
 - C)
- Fo 2) Ins
 - a)
 - C)
- 3) n it is r
- 4) ne rea
 - a)
 - C)
- Prie 5)
 - a)
 - b)
 - C)
 - d)

6) Loa

- a)
- Αp 7)
 - a)
 - C)
- 8) ΑC a)
- 9) a process synchronization tool operates on two atomic operations. Socket a)

 - Writer C)
- Reader b)
- Semaphore d)

larks: 80

Ρ

10

SLR-FZ-170

Set

06

16

10) Paging suffers from External fragmentation. TRUE FALSE a) b)

Define the following terms. B)

- 1) Process.
- **Co-operating Processes** 2)
- Throughput 3)
- 4) Page fault
- Boot block 5)
- Virtual Machine 6)

Q.2 Solve any Eight of the following.

- Define Context Switching with its Drawback. a)
- List TWO differences between process and program. b)
- C) Define Thrashing.
- List out any FOUR usage of Operating System. d)
- Define Internal and External Fragmentation. e)
- What is CPU Bound Process? f)
- Define Logical Address Space. g)
- State the purpose of Overlays. h)
- i) Define Race Condition.
- j) What is Compaction?

Q.3 A) Attempt any Two of the following.

- Explain OS Structure with Diagram. 1)
- Write Note on Swapping. 2)
- Consider Following System Snapshot, 3)

<u> </u>					
Process	P1	P2	P3	P4	P5
Arrival Time	0	1	2	3	4
CPU Burst	5	9	7	2	4

Prepare Gantt chart and calculate Average Waiting and Average Turnaround Time using, RR Scheduling Algorithm with Time Slice= 2 m/s

B) Explain Process States with Process Life Cycle Diagram.

Q.4 A) Attempt any Two of the following.

- 1) Write a note on RAG.
- 2) State any FOUR file types.
- Explain TWO LEVEL Directory Structure in brief. 3)
- 08 Calculate Number of Page Fault Rate for following Reference String with B) Frame Size = 3 using,
 - 1) **FIFO**
 - 2) Optimal

LRU 3)

Reference String \rightarrow 5,0,2,1,0,3,0,2,4,3,0,3,2,1,3,0,1,5.

10

06

Q.5 Attempt any Two of the following.

- a) Explain Contiguous File Allocation Method.
- b) Define Schedulers and explain all 3 types of schedulers.
- c) <u>Consider following system</u> scenario,

MAX						
	R1	R2	R3	R4		
P1	0	0	1	2		
P2	1	7	5	0		
P3	2	3	5	6		
P4	0	6	5	2		
P5	0	6	5	6		

ALLOCATION						
	R1	R2	R3	R4		
P1	0	0	1	2		
P2	1	0	0	0		
P3	1	3	5	4		
P4	0	6	3	2		
P5	0	0	1	4		

AVAILABLE						
R1	R2	R3	R4			
1	5	2	0			

Solve by using Bankers Algorithms and find out,

- 1) Contents of NEED Matrix.
- 2) Is System is in safe state?
- 3) If Process P2 arrives with request (0 4 2 0) then can it granted Or NOT.

Seat							Set	Ρ
NO.					_			-
	B.S	5c. (S	Semester	- V) (New) (CBCS) PHYSICS (Specia Nuclear Ph) Exa I Pap ysic	amination: O per - XII) s	ct/Nov-2022	
Day & Time:	Date 03:00	e: Wee D PM	dnesday, 01 To 06:00 Pl	-02-2023 M			Max. Marks	: 80
Instru	ctior	ns: 1) 2) 3) 4)	All question Figures to f Neat diagra Use of log	ns are compulsory. the right indicate full n am must be drawn wh table and calculator is	narks ereve allow	er necessary. ved.		
Q.1	A)	Seleo 1)	ct the correct The radius mass numb a) squa c) cube	ect alternative: of nucleus is directly per. are root	propo b) d)	rtional to cube root square	_ of atomic	10
		2)	The value of a) M + c) M -	of packing fraction is F A/A A/A	b) d)	$\frac{A/M}{A/M} + A$		
		3)	In exothern a) posit c) zero	nic nuclear reactions t tive	he Q b) d)	value should be negative infinity	e	
		4)	In stripping a) Isom c) isoto	reaction product and ners opes	targe b) d)	t nuclei are isobars monomers	<u> </u>	
		5)	An accelera a) Sync c) Beta	ator in which two dees chrocyclotron tron	s are (b) d)	used is called Cyclotron Synchrotron		
		6)	In cyclotror revolution. a) Incre c) cons	n time for semicircular eases stant	path b) d)	of ion is decreases zero	_for every	
		7)	The substa particles st a) Phos c) emit	nce which emits flash rikes on it is called sphor ter	of lig b) d)	ht when high er collector absorber	nergetic charge	
		8)	GM counte a) Emis b) visua c) mea d) Piez	r works on the princip ssion of light alization of track suring discharge curre o-electric effect	le of _ ent du	ie to ionization		
		9)	β - particles a) position c) prote	are trons ons	b) d)	electrons neutrons		

		10)	Hydrons meansa) intermediateb) bulkyc) heavyd) light in weight	
	B)	Fill i 1) 2) 3) 4) 5) 6)	in the blanks from the following. In nuclear reaction the bombarding particle is called The betatron accelerates lons. The time at which GM tube unable to count pulse is called Neutrino has charge. Antiparticle of electron is Neutron was discovered by	06
Q.2	Solv a) b) c) d) e) f) g) h) i) j)	ve any Defin What Expla Defin What State Defin Give What	y Eight of the following. The Mass defect. It is pickup reaction? ain Endothermic reaction. The threshold energy of nuclear reaction. It is accelerator? The principle of scintillation counter. The recovery time of GM counter. The α -disintegration energy. Two properties of Photons. It is Electromagnetic Interaction?	16
Q.3	A)	Atter	mpt any Two of the following.	10
		1) 2) 3)	Obtain equation for Q-value of nuclear reaction and explain types of nuclear reactions. Show that $Q\alpha = E\alpha[1 + M_{\alpha}/M_{Y}]$ Explain the classification of elementary particles in brief.	
	B)	1) 2) 3) Expla	Obtain equation for Q-value of nuclear reaction and explain types of nuclear reactions. Show that $Q\alpha = E\alpha[1 + M_{\alpha}/M_{Y}]$ Explain the classification of elementary particles in brief. ain liquid drop model of nucleus.	06
Q.4	B) A)	 1) 2) 3) Expla Atter 1) 2) 3) 	Obtain equation for Q-value of nuclear reaction and explain types of nuclear reactions. Show that $Q\alpha = E\alpha[1 + M_{\alpha}/M_{Y}]$ Explain the classification of elementary particles in brief. ain liquid drop model of nucleus. mpt any Two of the following. Explain electrical quadrupole moment. Obtain betatron condition and explain the construction and working of betatron. Explain properties of elementary particles.	06 08
Q.4	B) A) B)	 1) 2) 3) Explation Atter 1) 2) 3) Explation Explation 	Obtain equation for Q-value of nuclear reaction and explain types of nuclear reactions. Show that $Q\alpha = E\alpha[1 + M_{\alpha}/M_{Y}]$ Explain the classification of elementary particles in brief. ain liquid drop model of nucleus. mpt any Two of the following. Explain electrical quadrupole moment. Obtain betatron condition and explain the construction and working of betatron. Explain properties of elementary particles. ain construction and working of cyclotron. What are the limitations of other othe	06 08 08

Seat	
No.	

B.Sc. (Semester - V) (New) (CBCS) Examination: Oct/Nov-2022 CHEMISTRY (Special Paper - XII) Analytical and Industrial Physical Chemistry

Day & Date: Wednesday, 01-02-2023 Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory. 2) Figures to the right indicate full marks.

- 3) Use of log table and calculator is allowed.
- 4) Draw neat labelled diagrams wherever necessary.

Q.1 A) Choose the correct alternatives for the following.

- 1) In the colorimetric measurements, the light passing through the thin gold layer falls upon the selenium surface _____ are released.
 - a) ions b) electrons
 - c) protons d) atoms
- In colorimetric measurements, the best filter is that which gives transmission.

a)	maximum	b)	minimum
2	1000/	d)	nono of th

c) 100% d) none of these

For standardization of potentiometer, a standard cell having voltage is generally used.

	•		
a) 1	.180 V	b)	1.108 V

- c) 1.018 V d) 2.018 V
- **4)** Which of the following method gives exact end point in potentiometric titrations?
 - a) classical b) first derivative
 - c) second derivative d) none of these

5) In a conductance cell, the two electrodes are 0.5 m apart and have a area of cross section 1m², then its cell constant is _____.

- a) $5 m^{-1}$ c) $50 m^{-1}$ b) $0.05 m^{-1}$ d) $0.5 m^{-1}$
- 6) The conductivity water is obtained by _____ of distilled water with alkaline KM_nO_4
 - a) cooling b) freezing
 - c) redistillation d) filteration
- 7) Picking means cleaning of articles by the action of _____.
 - a) base b) acid
 - c) water d) all of these
- 8) In nickel plating _____% nickel anodes are generally used.
 - a) 99 b) 100 c) 50 d) 1
- 9) The material most commonly used in making prism, in flame photometry is _____.
 - a) Glass b) Quartz c) Mica d) Ebonite



Max. Marks: 80

Set

06

16

10

08

10)	Whe radia	n temperature of ation	f flame increases	, the intensity of emitted	ł
	a)	increases	b)	decreases	

- c) remains same
- d) become zero
- c) Ternams same

B) Fill in the blanks.

- 1) Reciprocal of resistance is known as _____
- 2) In simple flame photometers, the monochromator is _____.
- 3) The logarithm of opacity is known as _____
- 4) The titrations in which end points are determined by emf measurements are called ______ titrations.
- 5) In chromium plating _____ is used as anode.
- 6) For the determination of cell constant ______ electrolyte is used.

Q.2 Solve any Eight of the following.

- a) Define the term
 - 1) Opacity
 - 2) Transmittance
- **b)** State Lambert's law.
- c) Give the advantages of glass electrode.
- d) Give the advantages of quinhydrone electrode.
- e) Draw labelled circuit diagram of Wheatstone bridge.
- f) Why direct current source cannot be used in conductance measurements?
- g) Explain the term electroforming.
- h) Mention the electroplating equipment's.
- i) Draw the block diagram of flame photometer.
- j) What are advantages of Laminar Flow burner?

Q.3 A) Attempt any Two of the following.

- Discuss the different types of conductivity cells used in conductance measurements.
- 2) Describe the sulphuric acid method in anodising.
- 3) Describe analytical methods for locating end points of potentiometric titrations.
- B) What are the applications of flame photometry in qualitative? 06

Q.4 A) Attempt any Two of the following.

- 1) Describe the construction and working of single cell photoelectric colorimeter.
- 2) Discuss the basic principles of electroplating.
- 3) State and explain Beer's law.
- B) Describe various components of flame photometer. Give advantages of08Flame Photometer.

Q.5 Attempt any Two of the following.

- 16
- a) Describe in detail the electroplating of nickel. Give its applications.
- b) Explain the conductometric titration between strong acid and strong base. Give the advantages of conductometric titrations.
- c) Explain the potentiometric acid-base titrations.

Seat Set No. B.Sc. (Semester - V) (New) (CBCS) Examination: Oct/Nov-2022 **BOTANY (Special Paper – XII) Plant Breeding** Day & Date: Wednesday, 01-02-2023 Max. Marks: 80 Time: 03:00 PM To 06:00 PM **Instructions:** 1) All questions are compulsory. 2) Draw neat labeled diagrams wherever necessary. 3) Figures to the right indicate full marks. 4) Use of log tables and calculators is allowed. Q.1 Choose the correct alternatives from the options. 10 A) A cross between F1 generation and recessive parent is known as 1) Monohybrid cross b) Back cross a) Dihybrid cross d) Mass selection C) 2) Male sterility in plants is associated with a) Pollen failure b) Leaf failure c) stem failure d) Root failure Intellectual Property Rights (IPR) protects the use of information and 3) ideas that are of a) Social value b) Ethical value c) Moral value d) Commercial value of the following is not ionizing radiations. 4) a) UV rays b) X rays c) Cosmic rays d) Alpha rays Method of selection in plants showing vegetative propogation is 5) a) Clonal selection b) Pure line selection c) Pedigree selection d) Mass selection 6) Emasculation is concerned with a) Hybridization b) Clonal selection c) Mass selection d) Pureline selection 7) The mutation produced by the activity of man is called a) Induced mutation b) spontaneous mutation C) Gene mutation d) Micromutation

SLR-FZ-174

		8)	On the basis of causes of mutation, X-rays causing mutation is an example of a) Spontaneous mutation b) Induced mutation c) Mutation d) Breeding	
		9)	is the main aim of plant breeder. a) To grow taller and taller plants b) To grow only fruit c) To grow only seeds d) To increase the yield of grain and fruit per acre of land 	
		10)	The factors or agents that causes mutation are called asa) Mutagensb) Mutationc) Mutantd) Gene mutation	
Q.1	B)	Ansv 1) 2) 3) 4) 5) 6)	wer in one Sentences. Enlist the methods for self pollinated crops. What is clone? Define Mutation. Define Emasculation. Enlist method of crop improvement. Define plant breeding.	06
Q.2	Solv 1) 2) 3) 4) 5) 6) 7) 8) 9) 10)	e eigh Defin What Enlis Write Defin What Write What What	ht of the following. he hybridization. t is copyright? t the methods of emasculation. e advantages of pureline selection. he plant introduction. t is aim of plant breeding? e the types of mutation. t is the intellectual property rights? t is recipient parent? e merits of bulk method.	16
Q.3	A)	Atter 1) 2) 3)	mpt any two of the followings. Describe trademark with example. Describe role of mutation in plant breeding. Describe any two old world centres of origin.	10
	B)	Write Obje	e Shorts note on ctives of plant breeding.	06
Q.4	A)	Atter 1) 2) 3)	mpt any two of the followings. Describe types of property with example. Describe role of polyploidy. Write a brief description of various national crop breeding institute.	08

	B)	Describe procedure and advantages of Clonal Selection Method.	08
Q.5	Atte	mpt any two of the followings.	16
	a)	Describe the procedure of hybridization.	
	b)	Describe the main forms of intellectual property rights with example.	
	•		

c) Describe role of biotechnology in crop improvement.

Seat No.							Set	Ρ
	В.\$	Sc. (S	Semester	- V) (New) (CBCS) BOTANY (Special Economic Be	Exai Pape otan	mination: Oct/No er - XII) v	v-2022	
Day & Time:	Date 03:0	e: We 0 PM	dnesday, 01 To 06:00 Pl	-02-2023 VI			Max. Marks	: 80
Instru	ctio	n s: 1) 2) 3) 4)	All question Figures to Use of loga Draw neat	ns are compulsory. the right indicate full ma arithmic table and calcu diagrams and give equ	arks. Jator Jation	is allowed. wherever necessary		
Q.1	A)	Mult 1)	i ple Choice Pigeon pea a) <i>Med</i> c) <i>Arac</i>	Questions. is the common name icago sativa his hypogaea	of b) d)	Cajanus cajan Cicer arietinum		10
		2)	Lucerne is a) <i>Med</i> c) <i>Arac</i>	the common name of _ icago sativa his hypogaea	b) d)	 Cajanus cajan Cicer arietinum		
		3)	The maxim a) 50 c) 30	um length of lint is	n b) d)	nm. 40 10		
		4)	The scienti a) Coco c) With	fic name of coconut is _. os nucifera ania somnifera	b) d)	<u>.</u> <i>Gossypium hirsutur</i> None of these	n	
		5)	Groundnut a) semi c) non	oil is oil. drying drying	b) d)	drying essential		
		6)	The origin (a) Sout c) Peru	of soybean plant is h Eastern Asia	b) d)	West Indies India		
		7)	S <i>yzygium a</i> a) Myrt c) Eupł	a <i>romaticum</i> belongs to aceae norbiaceae	the fa b) d)	amily Acanthaceae Solanaceae		
		8)	The leaves a) vasion c) deox	of <i>Adbatoda zeylanica</i> cinine xyvasicine	a conta b) d)	ain the alkaloids vasicinone all the above	<u> </u>	
		9)	Rubia cord a) seec c) micro	<i>ifolia</i> is propagated by l opropagation	b) d)	 cuttings all the above		
		10)	The turmer a) antib c) antic	ic is used as viotic liabetic	b) d)	anti-inflammatory all the above		

Give the one sentence answer of the following B) 1) Write one use of Coir. 2) Give the scientific name of Sesbania. Write one use of Emblica officinales. 3) Write one use of Soyabean. 4) Give the scientific name of Kutch. 5) Write scientific name of Rubber. 6) Q.2 Solve any Eight of the following. 16 What is legume? a) Write two uses of Red Gram. b) C) Define plant fibres. d) Give the Scientific name and one use of Soyabean. Give the two uses of Coir. e) f) What is drug? Explain the two use of Withania somnifera. g) Write two morphological character of Syzigium aromaticum. h) What is Dyes? i) Write two uses of Termeric. j) Q.3 A) Attempt any Two of the following. 10 Explain the Botanical name, source and economic importance of Kutch. 1) Give the Botanical name, morphology and importance of Neem. 2) Describe the properties of rubber studied by you. 3) Write short notes any two of the following. 06 B) 1) Write the morphology and source of Hevea brasilensis. 2) Plant dyes Heena. 3) Explain the source and uses of Emblica officinales. Q.4 A) Attempt any Two of the following. 08 1) Explain the morphology, source and uses of Adhatoda zeylanica. 2) Describe the Morphology, source and uses of Tinospora cardifolia. 3) Write botanical name, source and economic importance of Groundnut. 08 B) Attempt any one of the following. 1) Explain the botanical name, morphology, source and economic importance of Cotton. Describe the botanical name, morphology, source and economic 2) importance of Lucerne. Q.5 Attempt any Two of the following. 16 Explain the botanical name, morphology, source and economic importance a) of Chick pea. Describe the plant dyes Oak and Teak studied by you. b) Write in details drug Zingiber officinales. C)

SLR-FZ-175

No. B.Sc. (Semester - V) (New) (CBCS) Examination: Oct/Nov-2022 **ZOOLOGY (Special Paper - XII)** Wildlife Conservation & Management

Day & Date: Wednesday, 01-02-2023 Time: 03:00 PM To 06:00 PM

Seat

Instructions: 1) All questions are compulsory.

- 2) Draw neat labeled diagrams wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Use of calculators is allowed.

Q.1 A) **Multiple Choice Questions.**

- refers to the animal species that are not domesticated. 1)
 - a) Wildlife

- b) Biodiversity d) Animal husbandory
- c) Sacred groove
- 2) The careful maintenance and upkeep of a natural resource to prevent it from disappearing is called
 - a) Biodiversity b) Conservation
 - c) Ecosystem d) Ecology
- Urbanization, illegal logging, agriculture, subsistence farming, soil 3) erosion are important causes of
 - a) Resources depletion
 - b) Resources conservation d) Mortality
 - c) Biodiversity conservation Mountains, hills, valleys, lakes, oceans, rivers, cities, dams, and
- 4) roads are examples of
 - b) Chromatography a) Demography
 - c) Topography d) Geography
- is a method of measuring biological parameters from a 5) distance.
 - a) Biometry b) Biotelemetry
 - c) Indices d) Census
- 6) is a system that creates, manages, analyzes, and maps all types of data.
 - a) GIS b) GIB
 - c) GPS d) ZSI

Max. Marks: 80

10

Set

SLR-FZ-176

Ρ

- Responsible travel to natural areas that conserve the environment. 7) sustains the well-being of the local people, and involves interpretation and education is called a) Ecotourism b) Ecosystem c) Ecotone d) Emmigration 8) is state, period, or place of isolation in which people or animals that have arrived from elsewhere or been exposed to infectious or contagious disease are placed. a) Quarantine b) Elimination c) Separation d) Gathering 9) Tadoba national park is located in b) U.P a) M.S c) M.P d) U.S. 10) In CITES, E stands for _____. a) Ecosystem b) Ecology c) Endangered d) Environment B) Answer in one Sentences. 06 Define conservation ethics. 1) Write names of physical parameters of wild life. 2) Pug marks. 3) Define climax. 4) Biotelemetry. 5) Examples of protected areas. 6) Q.2 Answer the followings (Any Eight): 16 What is the positive values wildlife? 1) What are the basic requirements of wild life? 2) Significance of remote sensing. 3) What are the different types of wildlife conservation? 4) What are the steps of succession? 5) What type of animals are ungulates? 6) What is the difference between the Shannon and Simpson index? 7) What is the difference between national park and sanctuary? 8) What is meant by community reserve? 9) 10) State role of CITES. Q.3 A) Answer the followings (Any two): 10 Causes of wildlife depletion. 1) Applications of biostatistics in biodiversity estimation. 2)
 - 3) GIB reserve and its management.

B) Short note

Tiger conservation.

	SLR-FZ-176
Answer the followings (Any two):	08
1) Explain negative values of wildlife.	
2) Ecotourism	
3) Give an account on sanctuary.	
Describe/Explain Describe national parks in India.	08

Q.5 Answer the following (Any Two). a) Describe in detail wildlife protection act-1972. b) Explain care of injured and diseased animal. c) Describe the international CITES 1973.

Q.4 A)

B)

Set

Ρ

Seat	
No.	

B.Sc. (Semester - V) (New) (CBCS) Examination: Oct/Nov-2022 MATHEMATICS (Special Paper - XII) Partial Differential Equations

Day & Date: Wednesday, 01-02-2023 Time: 03:00 PM To 06:00 PM

Max. Marks: 80

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.



8) The particular integral of $\frac{1}{D-mD'}f(x,y)$ is _____. a) $\int f(x,c+mx)dx$ b) $\int f(y,c-mx)dx$ c) $\int f(x,c-mx)dx$ d) $\int f(y,c+my)dy$ 9) The P.I. of $r + s = 6t = y \cos x$ is _____. a) $\sin x - y \cos x$ b) $\sin y - y \cos x$ c) $\sin x - x \cos x$ d) $\cos x - y \sin x$

10) The auxiliary equation of
$$r - 2s + t = \sin(2x + 3y)$$
 is

- a) $m^2 2m + 1 = \sin(2x + 3y)$
- b) $m^2 + 2m + 1 = \sin(2x + 3y)$
- c) $(m-1)^2 = 0$
- d) $(m+1)^2 = 0$

B) Fill in the blanks.

06

16

- When the number of arbitrary constant is equal to the number of independent variables then by eliminating arbitrary constant we get ______ partial differential equation of order _____.
- 2) The quasi-linear partial differential equation of order one is called as ______equation.
- 3) The integral which does not contains an arbitrary constant is called ______ integrals.
- The standard form II of non-linear partial differential equation of order one is _____.
- 5) If $a \neq 0$, then the general solution of the equation (bD aD' C)Z = 0 is _____.
- 6) If m_1, m_2, \dots, m_n be *n* distinct roots or auxiliary equation of linear homogeneous partial differential equation then the C.F. is _____.

Q.2 Attempt any eight of the following.

- a) Form the partial differential equation by eliminating *h* and *k* from the equation $(x h)^2 + (y k)^2 + Z^2 = \lambda^2$
- **b)** Solve $y^2 p + x^2 q = x^2 y^2 z^2$
- **c)** Show that the differential equations $p = x^2 ay$, $q = y^2 ax$ are compatible.
- d) Find complete integral of $q = 3p^2$
- e) Define the term singular solution.
- f) Explain the method of solving standard form I of non-linear partial differential equation of order one.
- **g)** Find singular integral of the equation $z = px + qy + \log(pq)$
- h) Solve $(D^2 D'^2 + D D')z = e^{2x+3y}$
- i) Solve $(D^3 4D^2D' + 4DD'^2)z = 0$
- **j)** Solve r + t + 2s = 0

Q.3 A) Attempt any Two of the following.

- 1) Derive the partial differential equation by eliminating arbitrary function ϕ from the equation $\phi(u, v) = 0$ where *u* and *v* are functions of *x*, *y*, *z*.
- 2) Find complete and singular integral of $4(1 + z^3) = 9z^4pq$
- 3) Solve $(D^3 6D^2D' + 11DD'^2 6D'^3)z = e^{5x+6y}$
- **B)** Explain the Langrange's method of solving Pp + Qq = R where P, Q, R are functions of x, y, z and hence solve $p \tan x + q \tan y = \tan z$.

Q.4 A) Attempt any Two of the following.

- 1) Solve (y z)p + (z x)9 = x y
- 2) Explain method of solving equation of the form f(p,q) = 0.
- 3) If F(D,D') be homogeneous function of D and D' of degree n then prove that $\frac{1}{F(D,D')}\phi^{(n)}(ax+by) = \frac{1}{F(a,b)}\phi(ax+by)$ provided $F(a,b) \neq 0, \phi^{(n)}$ being n^{th} derivative of ϕ w.r.t ax + by.
- **B)** Explain Charpit's method of solving partial differential equation f(x, y, z, p, q) = 0 where *p* and *q* are independent variables and $p = \frac{\partial z}{\partial x}, q = \frac{\partial z}{\partial y}$ and hence solve $p^2 y^3 q = y^2 x^2$

Q.5 Attempt any Two of the following.

- a) Find the integral surface of the partial differential equation (x - y)p + (y - x - z)q = z through the circle z = 1, $x^2 + y^2 = 1$.
- **b)** Explain the method of solving the equation of the form $f_1(x, p) = f_2(y, q)$ and hence find the complete integral of $p - 3x^2 = q^2 - y$
- c) Show that the solution of $(D - mD')^2 z = 0$ is $z = \phi_1(y + mx) + x\phi_2(y + mx)\phi$ and hence solve $(D - D')^2 Z = \tan(y + x)$

80

08

		SLR-FZ-178
Seat No.		Set P
	B.Sc	(Semester - V) (New) (CBCS) Examination: Oct/Nov-2022 MATHEMATICS (Special Paper - XII) Mathematical Analysis
Day & Time:	Date: \ 03:00 F	ednesday, 01-02-2023 Max. Marks: 80 // To 6:00 PM
Instru	ctions	 All questions are compulsory. Figures to the right indicate full marks.
Q.1	A) Fi 1)))	in the blanks by choosing correct alternatives given below. 10 Consider the function $f(x) = \frac{ x }{x}$ then $\lim_{x \to 0^+} f(x) = 1$ $\lim_{x \to 0^-} f(x) = -1$
	111	a) All I), II) are true b) Both I) and II) are false c) only III) is true d) I) and II) are true
	2)	The function $y = 2 - 3x $ is a) Continuous $\forall x \in \mathbb{R}$ & differentiable $\forall x \in \mathbb{R}$ b) Continuous $\forall x \in \mathbb{R}$ & differentiable $\forall x \in \mathbb{R}$ except $x = \frac{3}{2}$ c) Continuous $\forall x \in \mathbb{R}$ & differentiable $\forall x \in \mathbb{R}$ except $x = \frac{2}{3}$ d) Continuous $\forall x \in \mathbb{R}$ except at $x = 3$ and differentiable $\forall x \in \mathbb{R}$
	3)	If the function $f(x)$ and $g(x)$ are continuous everywhere and f(1) = 2, f(3) = -4, f(4) = 8, g(0) = 4, g(3) = -6, g(7) = 0 then $\lim_{x \to 3} (f + g)(x) = $ a) -10 b) -6 c) -4 d) 10
	4)	In which of the following interval the function $f(x) = x^2 - 2x$ is strictly increasing? a) $\begin{bmatrix} 1, \infty \end{pmatrix}$ b) $(1, \infty)$ c) $(0, \infty)$ d) $(-\infty, 1)$
	5)	The value of 'C' in Rolle's theorem for the function $f(x) = \cos \frac{x}{2}$ on
		[π , 3π] is a) 0 b) $\frac{\pi}{2}$ c) $\frac{3\pi}{2}$ d) 2π
	6)	2I)Rolle's theorem is applicable to $f(x) = \tan x$ on $\left[\frac{\pi}{4}, \frac{5\pi}{4}\right]$ II)A function f is not necessarily continuous on $[a, b]$ to satisfy L.M.V.T.a)Both I), II) are trueb)Both I), II) are false

c) I) is true, II) is false d) II) is true, I) is false

- A function f is derivable on a closed interval [a, b] and f'(a), f'(b) are 7) of opposite signs then there exist at least one point c between aand b such that
- f'(c) < 0a) f'(c) > 0b) d) f'(c) = constantf'(c) = 0C) The series $\sum_{n=1}^{\infty} 2^n \cdot z^{n!}$ converges to _____. a) 1 b) 0 c) ∞ d) $\frac{1}{2}$ 8) For how many real value of *n* the equation $a^{2n^2+2} = 1$ has a solution? 9) a) 1 b) 0 2 C) d) 4 If $f(x) = \frac{1}{x} - \frac{1}{x+1}$ then what is the value of $f(1) + f(2) + f(3) + \dots + f(10)$? a) $\frac{9}{10}$ b) $\frac{10}{11}$ 10) $\frac{12}{13}$ 11 C) d) 06 Fill in the blanks. For given $\in > 0$ there exist $\delta > 0$ such that $|f(x_1) - f(x_2)| < \in$ 1) whenever $0 < |x_1 - x_2| < \delta$, then function *f* is called ______ function. 2) A function *f* is said to have discontinuity of the first kind at x = c if . By addition theorem E(x). E(-x)= 3) A function f(x) is differentiable in [a, b] if 4) If f and g are bounded variation function then $V(f \pm g, a, b) =$ 5) 6) The Maclaurin's infinite expansion of $\log x$ is . 16 Solve any Eight of the following. Find the right hand limit and left hand limit of $f(x) = \begin{cases} \frac{|x-4|}{x-4} & x \neq 4 \\ 0 & x = 4 \end{cases}$ Prove that $\sin x$ is uniformly continuous on $[0, \infty)$ If f and g are continuous functions on domain D then prove that f + g is also continuous on D. Define increasing and decreasing functions. Verify the function $f(x) = x^2 + 2x$ over [-2,0] satisfies the criteria in Rolle's theorem. Discuss the derivability of the function $f(x) = \begin{cases} x & if \\ 1 & if \end{cases}$ $0 \le x < 1$ $x \ge 1$ Define the term function of bounded variation for vector valued function. Show that monotonic function is a function of bounded variation. Define generalized power function a^x and show that $a^x a^y = a^{x+y}$ Prove that $\lim_{x \to 0} x \cdot \sin \frac{1}{x} = 0$ Attempt any Two of the following. 10 Q.3 A) Investigate the continuity of the function 1) $f(x) = \begin{cases} \frac{e^{\frac{1}{x}} - e^{\frac{-1}{x}}}{e^{\frac{1}{x} + e^{-1}/x}}, & x \neq 0 \\ 0 & x = 0 \end{cases} \text{ at } x = 0$

B)

a)

b)

C)

d)

e)

f)

g)

h)

i)

j)

Q.2

- State and prove Jordon's theorem. 2)
- 3) Obtain the power series expansion of log(1 + x)
- State and prove Couchy's mean value theorem. B)

Q.4 A) Attempt any Two of the following.

- Let $f: [0,2] \to \mathbb{R}$ be differentiable with f(0) = 0, f(1) = 2 and f(2) = 1, 1) then prove that there exist $c \in [0,2]$ such that $f'(c) = \frac{1}{2}$.
- Prove that a function which is derivable at a point is necessarily 2) continuous at that point.
- Prove that the product of two functions of bounded variation is also of 3) bounded variation.

B) If
$$\lim_{x \to a} f(x) = L$$
, $\lim_{x \to a} fg(x) = M$ then prove that $\lim_{x \to a} (f, g)(x) = L$. *M* and $\lim_{x \to a} \left(\frac{f}{g}\right)(x) = \frac{L}{M}$ provided $M \neq 0$

Q.5 Attempt any Two of the following.

a)

- 1)
- Show that the function $f(x) = \frac{1}{x}$ is not uniformly continuous Determine all the values of c which satisfies the conclusion of mean 2) value theorem for the function $f(x) = x^3 + 3x^2 - x$ on [-1,2]
- Assuming f'' to be continuous on [a, b] show that b) $f(c) - f(a)\frac{b-c}{b-a} - \frac{c-a}{b-a}f(b) = \frac{1}{2}(c-a)(c-b)f''(\xi)$ where c and ξ both lie in [a, b].
- State and prove Taylor's theorem remainder after n terms. C)

Seat No.

B.Sc. (Semester - V) (New) (CBCS) Examination: Oct/Nov-2022 **STATISTICS (Special Paper - XII) Operations Research**

Day & Date: Wednesday, 01-02-2023 Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

3) Use of simple or scientific calculator is allowed.

4) Draw neat labelled diagrams wherever necessary.

Q.1 A) Select most correct alternative.

Graphical method is applicable for solving a LPP which has only 1) b) 3 variables

b)

- a) 2 variables C)
 - not more than 3variables d) none of these
- If a solution of a LPP also satisfies non negative restriction then it is 2) called as feasible solution
 - infeasible solution a) C)
 - optimum solution
- d) none of these
- Which of the following method is a method of obtaining initial basic 3) feasible solution to Transportation Problem?
 - Hungarian a) Simplex C)
- b) North-West
- d) Newton Raphson

None of these

- 4) The procedure for solving the sequencing problem is known as S.M. Johnson's algorithm
 - S.M. John's algorithm b) a) C) d)
 - S.M. Johny's algorithm
- Monte Carlo is 5)

C)

- a technique for modeling b) a book a)
- a technique for simulation a company brand C) d)

6) A type of decision making environment is

- certainty uncertainty a) b) C)
 - risk d) all of these
- In linear programming problem, most popular non-graphical procedure is 7) classified as
 - a) linear procedure
- non-graphical procedure b)
- graphical procedure simplex method d)
- A decision alternative in decision making problem is also known as 8)
 - Strategy States of nature b) a)
 - payoff d) none of these C)

The feasible region of a L.P.P. has three corner points (x_1, x_2) : P(0,0), 9) Q(1,1), and R(1,0) on the graph. Optimal solution for maximization problem with the objective function $z = 2x_1 - 2x_2$ is

- $(x_1 = 1, x_2 = 0)$ a) C)
 - $(x_1 = 0, x_2 = 0)$ b) $(x_1 = 1, x_2 = 1)$ d) both b and c

Set

Max. Marks: 80

- 10

		10)	Minir	nize Z =			
			a) c)	-Maximize (Z) Maximize (-Z)	b) d)	-Maximize (-Z) None of these	
	B)	Fill i	n the	blanks.			06
	,	1)	The I	method used for solvin	g an assigr	nment problem is	
		2)	MOD probl	I method is a method o em.	of obtaining	optimum solution of	
		3)	İf a fe is cal	easible solution of a LF led as	PP optimize	s the objective function then it	
		4)	ln se have	quencing problem the a job to process is kno	time during own as	which a machine does not	
		5)	A giv is no	en transportation prob t equal to the total dem	lem is said nand.	to be if the total supply	
		6)	The or alterr	consequence resulting native and a state of na	from a spe ature is a _	cific combination of a decision	
Q.2	Solv a) b) c) d) e)	ve any Wher Defin Defin What Defin	Eigh n a ba le a su le an A t is an le tota	t of the following. sic feasible solution of irplus variable. Assignment Problem. opportunity loss in a d I elapsed time in a seq	a L.P.P. is ecision ma juencing pr	said to be degenerate? king problem? oblem?	16
	f) g)	State Soluti	e a Li the n ion of	PP. ecessary and sufficien a transportation proble	t condition	for the existence of feasible	
	h) i) j)	Give What Defin	the m t is a s ie bas	athematical form of an equencing problem? ic feasible solution of a	assignmer	nt problem.	
Q.3	A)	Atter 1) 2)	mpt an Write Write with	Two of the following the definition and projection the procedure of conv 4 machines into a sequ	ng. perties of ra verting a se uencing pro	andom numbers. quencing problem of n jobs blem of n jobs with 2 machines.	10
	B)	3) Write	Expla the s	teps involved in the pro	aking. ocedure of	Monte Carlo simulation.	06
~ 4	_, •)	A 11					00
Q.4	A)	Atter 1)	Write	the dual of the following	ng. ng L.P.P. :		00
		2)	Maxi subje and What	$\begin{array}{ll} mize & z_x = 3x_1 + 5\\ ext \text{ to} & \vdots\\ 2x_1 + 3x_2 \leq 8 & 2x_2\\ x_1, x_2, x_3 \geq 0.\\ t \text{ is decision making un} \end{array}$	$5x_2 + 4x_3$ $x_2 + 5x_3 \le 1$ oder uncerta	$0 \qquad 3x_1 + 2x_2 + 4x_2 \le 15$	
		3)	Expla Bern	ain the procedure of ge oulli distribution.	enerating ra	ndom observations from	
	B)	Find	the IB	FS of the following LPI Maximize $z = -2x_1$ subject to: $3x_1 + x_2 = 3$ $4x_1$ and $x_1, x_2 \ge 0$	$P: -2x_2$ $x_1 + 3x_2 \ge 0$	$6 \qquad x_1 + 2x_2 \le 4$	08

16

Q.5 Attempt any Two of the following.

Find the optimal sequence in performing the following five jobs on two a) machines in the order M₁M₂. Processing times (in hours) are given in the following table:

Job	1	2	3	4	5	6	7
Machine M ₁	3	12	15	6	10	11	9
Machine M ₂	8	10	10	6	12	1	3

Also find minimum total elapsed time and idle times for all machines.

b) Find initial basic feasible solution to the following transportation problem using Matrix Minima method:

•	D1	D2	D3	D4	D5	Availability
O1	9	12	9	6	9	5
O2	7	3	7	7	5	4
O3	6	5	9	11	3	2
O4	6	8	11	2	2	9
Requirement	4	4	6	2	4	-

C) Suggest the best strategy using the EMV criteria for the following decision making problem:

Payoff (Profits) Table				
Stratogios	States of nature			
Strategies	S ₁	S ₂	S ₃	S4
D ₁	20	15	12	-3
D2	15	8	-7	10
D3	5	-10	15	12
P(Si)	0.4	0.3	0.2	0.1

ff (Drafita) Tabl

Seat	
No.	

B.Sc. (Semester - V) (New) (CBCS) Examination: Oct/Nov-2022 STATISTICS (Special Paper - XII) Regression Analysis

Day & Date: Wednesday, 01-02-2023 Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Draw neat labeled diagrams wherever necessary.
- 4) Use of log table and calculator is allowed.

Q.1 Choose the correct alternatives from the options.

- 1) In simple linear regression model $Y = \beta_0 + \beta_1 X + \varepsilon$, *X* and *Y* are respectively _____.
 - a) response variable and regressor variable
 - b) response variable and predictor variable
 - c) predictor variable and response variable
 - d) slope and intercept
- The sum of residuals in any regression model that contains an intercept is always _____.
 - a) zero b) One
 - c) non-zero d) Positive
- **3)** In a simple linear model, $Y = \beta_0 + \beta_1 X + \varepsilon$, if we change regressor variable by 1 unit, how much response variable will change?
 - a) by 1 b) no change
 - c) by β_0 d) by β_1
- 4) The difference between the actual *Y* value and the predicted *Y* value found using a regression model is called the _____.
 - a) scatter plot b) Residual
 - c) slope d) Outlier

5) The coefficient of determination (R²) is the square of correlation coefficient between (where *Y* is response) _____.

- a) *Y* and hat matrix b) *Y* and its predicted value
- c) Regressors d) none of these
- 6) Backward elimination process begins with the assumption that _____.
 - a) no regressors are in the model
 - b) some regressors are in the model
 - c) all regressors are in the model
 - d) None of these
- **7)** Suppose the R^2 value of a regression of *Y* on *X* is 0.64. Which of the following is necessary true?
 - a) Correlation coefficient between *X* and *Y* 0.8
 - b) Correlation coefficient between X and Y 0.8
 - c) Correlation coefficient between *X* and *Y* 0
 - d) Correlation coefficient between X and Y is either -0.8 or 08



- 8) Logistic regression model is an appropriate model when response variable is distributed as _____.
 - Poisson b) Binomial
 - c) Normal d) Gamma
- 9) Logistic regression is used when we want to predict ____
 - a) a dichotomous variable from continuous or dichotomous variables
 - b) a continuous from dichotomous variables
 - c) any categorical variable from several other categorical variables
 - d) a continuous variable from dichotomous or continuous variables
- 10) In a binary logistic regression ____
 - a) the dependent variable is continuous
 - b) the dependent variable is divided into two equal subcategories
 - c) the dependent variable consists of two categories
 - d) there is no dependent variable

B) Fill in the blanks.

a)

- 1) In a simple linear regression model, the distribution of error term is assumed to be _____.
- **2)** The transformation $ln\left(\frac{\pi(x)}{1-\pi(x)}\right)$ is called _____.
- 3) In the regression equation, $Y = 21 3X + \varepsilon$, the slope is _____.
- 4) If in the model $Y = \beta_0 + \beta_1 X + \varepsilon, \varepsilon \sim N(0, \sigma^2)$ then covariance between \overline{Y} and $\hat{\beta}_1$ is _____.
- 5) In simple linear model, to test hypothesis about intercept parameter _____test is used.
- 6) In multiple linear regression model, variance of least estimator of β is

Q.2 Answer the following questions. (Any Eight)

- a) Explain studentized residual and briefly mention its uses.
- **b)** State the assumptions of error terms in a simple linear regression model.
- c) Define hat matrix H. State properties of H.
- d) Define coefficient of determination R².
- e) Explain the term variable selection in linear regression.
- f) Obtain the confidence interval for β_1 in simple linear regression model.
- **g)** With usual notations, show that $Cov(\hat{Y}, e) = 0$.
- **h)** With usual notations, show that (I H)X = 0.
- i) Define dichotomous independent variable with illustration.
- j) Discuss the logit transformation in the context of logistic regression model.

Q.3 A) Answer the following questions. (Any Two)

- 1) Describe the ANOVA approach to test the significance of regression in a simple linear regression model.
- 2) Define residual vector in regression analysis. Obtain its mean and Variance.
- 3) What is the logistic regression model? Give a real life situation when this model is appropriate.
- B) Explain the residual plot. Outline the procedure of construction of normal probability plot.
 06

16

10

Q.4 A) Answer the following questions. (Any Two)

- 1) In multiple linear regression model $Y = X\beta + \varepsilon$, show that $\hat{\beta} = \beta + (X'X)^{-1}X'\varepsilon$.
- 2) Describe forward selection method for variable selection and state its limitations.
- 3) Describe the Pearson's chi-square test for goodness of fit of a logistic model.
- **B)** In usual notations, prove that.
 - 1) Var $(\hat{Y}) = \sigma^2 H$
 - 2) Var $(\hat{\beta}) = (X'X)^{-1}\sigma^2$

Q.5 Answer the following questions. (Any Two)

- a) Explain the concept of simple linear regression with illustration. Derive least squares estimators of the regression coefficients in the model.
- **b)** Describe a multiple linear regression model. Stating the assumptions, obtain the mean and variance of least squares estimator (LSE) $\hat{\beta}$ of β
- c) Derive the maximum likelihood estimators of parameters of a logistic regression model with one covariate.

80

08

Page	1	of	2

Seat	
No.	

1)

B.Sc. (Semester - V) (New) (CBCS) Examination: Oct/Nov-2022 **GEOLOGY** (Special Paper – XII)

Applied Geology – Prospecting and Mining Geology

Day & Date: Wednesday, 01-02-2023 Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.

- 2) Draw neat labelled diagrams wherever necessary.
- 3) Figures to right indicate full marks.
- 4) Use of log table and calculators is allowed.

Q.1 A) Fill in the blanks by choosing correct alternatives given below.

- Which of the following geological criteria is used for placer deposits?
 - Structural criteria Magmagene criteria b) a)
 - C) Climatic criteria d) All of the above
- In Wenner configuration the electrodes are: 2)
 - a) Equally spaced
 - Unequally spaced b)
 - Space between current electrodes is more than the potential C) electrodes
 - None of these. d)
- 3) Which of the following are major environmental issues involved in mining?
 - Air pollution a) Soil degradation
- b) Water pollution d) All of the above
- sampling which best suited to bedded, banded and vein type of 4) deposits.
 - a) Grab

C)

C)

C)

C)

- Channel b) Chip d) None of the above
- 5) A series of measurements of resistivity are made by increasing the electrode spacing about a fixed point.
 - Resistivity traversing a) b) Lateral exploration
 - Vertical exploration Electrical trenching d)
- In geophysical investigation, artificial signals are introduced into the 6) earth and subsequently recorded after being modified by the earth materials.
 - Gravity method a) b) Magnetic method
 - Seismic method Self potential method d) C)
- The amount of a particular element present in the parent rock not 7) affected by dispersion or migration is known as:
 - a) Anomaly b) Threshold
 - Background value d) None of these C)
- Which of the following geological criteria is used for coal deposits? 8)
 - Lithological facies a)
- Structural facies b)
- Stratigraphic facies All of the above d)

Set

Max. Marks: 80

				-			
		9)	In the curve-matching technique if $\rho 1 > \rho 2 > \rho 3$, the curve type is: a) 'Q' type b) 'H' type c) 'A' type d) 'K' type				
		10)	Torsion balance surveys are conducted for: a) Gravity prospecting b) Electrical prospecting c) Magnetic prospecting d) Seismic prospecting				
	B)	Ansv 1) 2) 3) 4) 5) 6)	wer the following. Explain stratigraphic criteria in one sentence. What do you mean by anomaly? The openings in the mine, which serve as a means of entry is known as. Define Sample. What is Geoid? What is true resistivity?	06			
Q.2	Ans a) b) c) d) e) f) g) h) i)	wer th Defin Name What Name Give Write Give Write Defin	he following questions. (Any Eight) 16 ne prospecting. ie two geological criteria for prospecting gold deposits. ie two geological criteria for prospecting gold deposits. ie two geological criteria for prospecting gold deposits. ie any two types of Underground Mining. ie two methods of electrical survey. ie two methods of placer mining. ie any two correction data of magnetic method. ie any two environmental effects of mining. ie two sampling methods. ie two sampling methods. ie two sampling methods.				
Q.3	A)	Ansv 1) 2) 3)	wer the following questions. (Any Two) Describe any three criteria of geological prospecting. Discuss the reduction of data for magnetic method. Explain in note on Acid mine drainage.	10			
	B)	Write	e a short note on Geochemical exploration.	06			
Q.4	A)	Ansv 1) 2) 3)	 wer the following questions. (Any Two) Discuss in brief the any four types of surface mining. Define sampling, Explain in short the any two geological sampling methods. Write the field procedure of seismic method with neat labelled diagram. 	08			
	B)	Expla	ain the geophysical methods used for groundwater exploration.	08			
Q.5	Ans a) b) c)	wer th Desc Expla	he following questions. (Any Two) cribe the impact of mining on water resources. ain the field procedure, interpretation and application of gravity method. uss the geological criterias used for coal prospecting	16			

Discuss the geological criterias used for coal prospecting. c)

Set Ρ B.Sc. (Semester - V) (New) (CBCS) Examination: Oct/Nov-2022 **MICROBIOLOGY** (Special Paper – XII) **Industrial Microbiology** Day & Date: Wednesday, 01-02-2023 Max. Marks: 80 Time: 03:00 PM To 06:00 PM **Instructions:** 1) All questions are compulsory. 2) Draw neat labeled diagrams wherever necessary. 3) Figures to the right indicate full marks. 4) Use of log table and calculators is allowed. Rewrite the following sentences by selecting correct answer from 10 Q.1 A) given alternatives. The waste product of sugar industry is 1)

- a) Molasses b) Whey c) SWL d) CSL Example of soft cheese is _____. 2) b) Swiss a) Collage c) Cheddar d) Roquefort 3) is not used for toxicity testing. a) Rabbit b) Monkey d) Cat c) Mice Bruce Ames test is used for testing. 4) b) Allergy a) Sterility c) Toxicity d) Carcinogenicity Insulin produced by rDNA technology is used for treating . 5) a) Blood pressure b) AIDS c) Cancer d) Diabetes is used for streptomycin production. 6)
- a) E. coli b) B. subtilis c) Streptomyces griseus d) Penicillium Addition of hops during beer production gives to beer. 7) a) Bitterness b) Aroma c) Flavor d) Color The buffer used in fermentation media is 8) a) NaOH b) HCI c) Calcium carbonate d) NaCl

SLR-FZ-182

Seat No.

		 Cloning organism used for production of rDNA product is a) Vibrio b) Bacillus c) E. coli d) Pseudomonas 				
		0) Red table wine mostly contains% of alcohol. a) 50-60 b) 1-2 c) 10-14 d) 20-40				
	B)	Vrite proper definition of the following.06)Precursor)Synthetic media)Black strap molasses)Distillation)Sterility)Food Spoilage				
Q.2	Solv 1) 2) 3) 4) 5) 6) 7) 8) 9) 10)	any Eight of the following.16ypes of wine spoilage ntifoaming agent Whey What is solvent extraction? ist organisms used in idli production ypes of wines ruit and vegetable spoilage Organisms in curd production locculation ogurt				
Q.3	A)	Attempt any Two of the following.10)Explain food as a substrate.)Spoilage of milk.)Write a note on recovery of fermentation product by chromatography.				
	B) Write short note.Write in detail fermentation of cheese.					
Q.4	A)	Attempt any Two of the following.08)Pyrogenicity testing.)Food infection by Salmonella.)Post fermentation soilage of wine.				
	B)	escribe idli and bread fermentation. 08				
Q.5	Ansv a) b) c)	Swer the following (Any Two). Explain vitamin B12 fermentation. Explain the principles and methods of food preservation. Beer fermentation.				
				SLR-FZ-184		
--------------------------	--	---	------------------------------	--	--	--
Seat No.				Set P		
B.Sc	c. (Semest E	ter - V) (New) (CBC ELECTRONICS (Sp Electronics Cor	S) E ecia mm	Examination: Oct/Nov-2022 al Paper – XII) nunication		
Day & Date Time: 03:0	Day & Date: Wednesday, 01-02-2023 Max. Marks: 8 Time: 03:00 PM To 06:00 PM Max. Marks: 8					
Instructio	ns: 1) All qu 2) Draw 3) Figur 4) Use c	estions are compulsory neat labeled diagrams es to the right indicate f of log table and calculate	/. whe full m or is	erever necessary. narks. s allowed.		
Q.1 A)	Select the 1) a) Sa c) W	correct alternatives fr communication is dup atellite /ireless	om plex	the Following.10communication system.b) Telephoned) Television		
	2) In am power a) 1/ c) 1/	plitude modulation powe - /3 /6	er in	b) 2/3 b) 4/3		
	3) Virtua a) M c) Le	I height of an ionospher ore than ess than	ric la b) d)	ayer is actually penetrates. Same as height None		
	 4) The b a) 4. c) 10 	and width of TV signal f 5 MHz) MHz	for 6 b) d)	625-line scanning is 5.5 MHz 3 MHz		
	5) In tele achiev a) ar c) sp	phone communication i ved bycircuit. mplifier peech	impe b) d)	edance matching of all process is hybrid ringer		
	6) Most (a) ch c) re	commonly noise is intro nannel cceiver	duce b) d)	ed in transmitter destination		
	7) a) R c) P	_ is an example of bala ing modulator hase modulator	ance b) d)	ed modulator. Frequency modulator All of these		
	8) One c a) R c) fo	f the following is non re hombic Ided dipole	sona	ant antenna b) end fire array d) broad side array		

Page **1** of **3**

- 9) A super heterodyne receiver with IF of 450 KHz is tuned to signal of 1200 KHz, the image frequency is _____.
 - a) 750 KHz b) 2100 KHz
 - c) 1650 KHz d) 450 KHz
- 10) _____ tone indicates that telephone exchange is ready to accept the dialing.
 - a) Busy b) Ring
 - c) Dial d) All

B) Answer in one sentence.

- 1) Define Electronic communication system.
- 2) Define modulation index in A.M. Give its formulae.
- 3) Define radio wave propagation.
- 4) What is super heterodyne principle?
- 5) What is the role of blanking and synch signal?
- 6) Define noise. List its types.

Q.2 Solve any eight of the following.

- 1) In electronic communication system signal power is 2 watt and noise power is 4 watt calculate signal to noise power in percentage.
- 2) Define skip distance. Give its formulae.
- 3) A 100 MHz carrier is FM modulated by 5 KHz sine wave. If resulting FM signal has frequency deviation of 50 KHz, then calculate modulation index?
- 4) What is radio receiver? What are its types?
- 5) List different tones used in telephone communication.
- 6) What are the types of electronic communication system?
- 7) Give any two differentiating points between AM and FM.
- 8) Draw labeled diagram of Yagi antenna.
- 9) What is audio and video signal?
- 10) List the value-added services used in telephone communication?

Q.3 A) Attempt any two of the following: 10 Explain Electronic communication system with neat block diagram. 1) Explain any five receiver characteristics of Radio receiver. 2) Derive formulae for power distribution in case of AM. 3) What is demodulation? Explain Ratio detector as FM discriminator. 06 B) Q.4 A) 80 Attempt any two of the following: Explain ground wave radio propagation. 1)

- 2) Explain DTMF dialing system used in telephone communication.
- 3) Explain simplex and duplex communication system.
- B) Explain Frequency modulation with derivation of output voltage of FM
 08 modulated wave.

- Q.5 Attempt any two of the following:a) Explain Monochrome TV receiver with necessary block diagram.
 - Explain Dish antenna in detail. b)
 - Explain telephone communication with necessary block diagram. C)

Seat Set No. B.Sc. (Semester - V) (New) (CBCS) Examination: Oct/Nov-2022 **COMPUTER SCIENCE (Special Paper – XII)** Python Day & Date: Wednesday, 01-02-2023 Max. Marks: 80 Time: 03:00 PM To 06:00 PM **Instructions:** 1) All questions are compulsory. 2) Draw neat labeled diagrams wherever necessary. 3) Figures to the right indicate full marks. 4) Use of log table and calculators is allowed.

Multiple Choice Questions. Q.1 A)

- In python block of code can be defined using Key. 1)
 - a) curly braces b) round braces
 - c) square braces d) Indentation
- The name of local variables start with an underscore character are 2) used
 - a) to identify the variable
 - b) to indicate a private variable of a class
 - c) to indicate special variable
 - d) to indicate the public variable of a class
- What is the output of the following code? 3) x=10

type (x)

- a) <class 'tuple'> b) <class 'int'>
- c) Type error d) Value Error
- What is the output of the following code? 4) all([5>8, 6>3, 3>1])
 - a) True b) False
 - c) 011 d) Error
- In function, type of arguments doesn't requires to maintain 5) position of arguments.
 - a) Default b) Required
 - d) Variable Length c) Keyword
- To reverse the following list, command is used. 6)
 - $1^{st} = [10, 11, 12, 13, 14, 15]$
 - a) 1st[-1:] b) 1st[-1::] c) 1st[:-1] d) 1st[::-1]

SLR-FZ-185

Ρ

- What is the output of the following code? 7) "ba"+"na"*2
 - b) bana2 a) banana
 - c) ba2na d) error

The is correct way to call base class constructor. 8)

- a) base.init() b) base(). init ()
- c) super.init() d) super()._init_()
- The _____ method is used to read entire file. 9)
 - a) read() b) readline()
 - c) readlines() d) seek()

10) The Lambda functions are used along with _____ built-in functions.

- a) any() b) insert() d) map()
- c) discard()

B) Fill in the Blanks.

- _____ model is used to find patterns. 1)
- The first parameter for every class method is 2)
- The function is used to select random element from the 3) given sequence.
- The _____ function is used to add new attribute in class. 4)
- The exception is raised when a function gets argument of 5) correct type but improper value.
- MRO stands for . 6)

Q.2 Answer the followings. (Any Eight):

- 1) What is a nested dictionary? Give example.
- Write down the difference between set and frozen set. 2)
- Write down different string formatter with example. 3)
- What is docstring? 4)
- What are use of type and id function? 5)
- What is use of assert statement? Give example. 6)
- Create any module and use it. 7)
- What is Anonymous functions? How to create Anonymous functions? 8)
- How to create a constructor and destructor in python? Give example. 9)
- **10)** List all file properties with example.

Q.3 Answer the followings (Any two): A)

- 1) Create a binary file with 1000 random numbers. Also, write code for reading that file.
- What is an abstract class? Explain with an example. 2)
- Write a regular expression for the password, email, pin code 3) number, and URL validation.
- B) Why MRO is used? Explain MRO with an example.

06

16

06

Q.4	A)	 Answer the followings (Any two): 1) Differentiate list and tuples. Explain any four methods of tuples. 2) Explain regular expression's compile method with an example. 3) What are operations with the set? Explain with an example. 	80		
	B)	What is exception handling? Explain how to create user define exceptions with the creation of any two user-defined exceptions.			
Q.5	Ans a) b) c)	wer the following (Any Two). What is inheritance? Explain all types of inheritance with example. What are variable-length arguments? Explain all types with example. What is operator overloading? Explain operator overloading and overload any two comparison operators.	16		

Set

Max. Marks: 80

Seat No.

B.Sc. (Semester - V) (New) (CBCS) Examination: Oct/Nov-2022 **Certificate Course in testing and Repairs of Electric Appliances** (Special Paper-XI)

Day & Date: Friday, 24-03-2023 Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

3) Use of logarithmic table and calculator is allowed.

4) Draw neat labelled diagrams wherever necessary.

Q.1 A) Multiple choice questions.

- For safety purpose 1)
 - switch is connected on neutral while fuse is connected on live a) wire.
 - switch is connected on live wire and fuse is connected on b) neutral.
 - both switch and fuse are connected on neutral wire. C)
 - both switch and fuse are connected on live wire. d)
- 2) supply is used in domestic installation. a)
 - Single phase Double phase b)
 - Three phase d) D.C. C)
- A resistor having resistance of 100 ohm carries a current of 10 3) amperes. How much will be power P=
 - a) 10000 watt b) 1000 watt C)
 - 10 watt d) 100000 volt

4) Standard frequency of commercial a. c. in India is Hz.

110 a) 230 b) C) 60 d) 50

wiring is mainly done in workshops. 5)

- Metal conduit Concealed a) b)
 - PVC conduit lead sheathed or CTS d) C)

6) A multimeter is used to measure

a)

C)

- current b) voltage
- All of these resistance d)

An electric doorbell works on the principle of working of 7)

- Electromagnetism a) static electricity b) electromotive force
- C) magnetomotive force d)
- 8) Which of the following is not an electric fan?
 - Cabin fan Ceiling fan a) b)
 - Exhaust fan d) weird fan C)
- Which of the following equipment requires choke and starter to start 9) it?
 - incandescent lamp a)
 - electric bell C)
- b) electric iron
- fluorescent tube d)

16

10) Which of the following is unit of capacitor?

a)	Henry	b)	hertz

- c) Farad d) ohm
- Fill in the blank/Definition/One sentence answer/ One word answer/ 06
 Give the name/Predict the product etc.
 - 1) A 5-ohm resistance has potential difference of 10 volts across it. The heat produced in 2 seconds will be _____ joule.
 - 2) Two resistances; 45 ohm and 15 ohms are connected in series; their resultant resistance is ______ ohm.
 - A 200 ohm resistance is carrying current of 0.5 A. the p. d. across it will be _____ volt.
 - By oersted experiments it is proved that a current carrying conductor produces ______ field around it.
 - 5) Mention any two electrical quantities which has same unit?
 - 6) Name the electrical quantity which is measured in hertz.

Q.2 Solve any Eight of the following.

- What is Earthing of a electrical circuit?
- a) What is Earthing of ab) What is a fuse wire?
- c) When a fuse melts and why?
- d) What are different types of earthing?
- e) A consumer uses two electric bulbs, each of 50 watt, for 5 hours daily. Calculate the units of electricity consumed in two months, assuming that a month is of 30 days.
- f) Discuss ohms law.

Q.3

- g) Distinguish between alternating current and direct current.
- **h)** Explain how resultant of two resistances connected in parallel is determined?
- i) Describe working principle of an electric motor.
- j) Distinguish between exhaust fan and cabin fan.

A)	Attempt any Two of the following.					
,	1)	Mention any four Electrical safety precautions and explain its meaning.				
	2) 3)	With neat circuit diagram discuss working of electric tube. With neat diagram explain construction and working of electric fan				
B)	Ave of v	Average value of voltage measured is 30.3 volt. Calculate maximum value of voltage and R.M. S. value of voltage.				

Q.4 A) Attempt any Two of the following.

- 1) With neat circuit diagram explain working of electric door bell.
- 2) With neat diagram explain construction and working of electric stove.
- 3) With neat diagram explain construction and working of electric toaster.
- B) Explain joules heating effect of electric current. Illustrate it with suitable 08 example.

Q.5 Attempt any Two of the following.

- a) Distinguish between fluorescent tube and incandescent lamp.
- **b)** Explain working of starter of fluorescent tube.
- c) Discuss how a table fan is opened for repairs and how are different parts inspected for repairs.

16

Seat No.			Set P
Thin Day & Time:	B.S Filn Date 03:00	5c. (S n De e: Frid D PM	Semester - V) (New) (CBCS) Examination: Oct/Nov-2022 position and Characterization Techniques (Special paper-XI) ay, 24-03-2023 Max. Marks: 80 To 06:00 PM
Instru	ctior	ns: 1) 2) 3) 4)	All questions are compulsory. Figures to the right indicate full marks. Use of log table and calculator is allowed. Draw neat labelled diagrams wherever necessary.
Q.1	A)	Multi 1)	ple choice questions.10Thin film is dimensional material structure with one degree confinement.b) 1a) 0b) 1c) 2d) 3
		2)	Thin film deposition techniques are classified into types.a) 2b) 3c) 4d) 5
		3)	 Chemical solution deposition method is also called as method. a) chemical bath deposition b) chemical solid deposition c) sol-gel d) chemical vapor deposition
		4)	Generally epitaxial films are grown on substrate. a) amorphous b) single crystal c) polycrystalline d) flexible plastic
		5)	In SILAR method, thin film formation involves the phenomenon during deposition. a) adsorption b) reaction c) both a and b d) only a
		6)	Thin film semiconductor possesstemperature coefficient.a) positiveb) zeroc) negatived) All of the above
		7)	The gravimetric method is used to determine value of the thinfilm.a) contact angleb) transmissionc) absorptiond) thickness
		8)	SI unit of resistance isa) wattsb) ohmsc) voltsd) amps
		9)	Scanning electron microscopy help us to see the of a sample.a) moleculeb) atomsc) insided) surface texture

16

10

08

10) Minimum interplanar spacing required for Bragg's diffraction is _____.

a)	λ	b)	$\lambda/4$
C)	$\lambda/2$	d)	2λ

- Fill in the blank/Definition/One sentence answer/ One word answer/ 06
 Give the name/Predict the product etc.
 - 1) Which one is standard and most commonly used method for the measurement of electrical resistivity of very high resistivity samples like thin films?
 - 2) For measurement in SEM, samples should be electrically _____.
 - 3) Give the full form of JCPDS.
 - 4) Nanomaterials are synthesized by assembling the atoms/molecules together is called _____ approach.
 - 5) What is the effect of temperature on the energy band gap?
 - 6) What is meant by ternary thin films?

Q.2 Attempt any Eight of the following.

- a) What is thin film deposition?
- **b**) Write down the disadvantages of chemical methods for thin film preparation.
- c) Draw a schematic labelled diagram of spray pyrolysis unit.
- d) What are the requirements for thin film deposition by silar method?
- e) Why we do annealing of thin films?
- f) What are the materials used for transparent conductive glass substrates?
- **g)** Write down the Young's equation for contact angle with their usual meaning.
- h) What products have thin films in various sectors?
- i) Write down the general parameters of thin film preparation by chemical methods.

Q.3 A) Attempt any Two of the following.

- 1) Explain the properties of thin films.
- 2) Explain CBD method for thin film deposition.
- 3) Write a short note on top-down and bottom-up approaches.
- B) If the wavelength incident on a crystal at a 38.30 angle has a wavelength of 1.54 Å. What is the distance between two layers?

Q.4 A) Attempt any Two of the following.

- 1) Explain the material properties that are suitable for photovoltaic application.
- 2) Explain the importance of substrate cleaning in thin film preparation and describe the procedure for it.
- 3) What do you mean by energy band gap? Explain difference between direct and indirect band gap?
- B) For BCC iron, compute 1) the interplanar spacing, and 2) the diffraction angle for the (220) set of planes. The lattice parameter for iron is 0.2866 nm assuming that monochromatic radiation having a wavelength of 0.1790 nm is used, with order of reflection 1.

Q.5 Attempt any Two of the following.

- **a)** Explain sol-gel technique for thin film preparation.
- **b)** Explain an experimental procedure for finding the XRD patterns. What information does the XRD pattern of a crystal provide?
- c) What is the principle of SEM? Explain construction and working of SEM.

Set

Max. Marks: 80

Ρ

Seat	
No.	

B.Sc. (Semester - V) (New) (CBCS) Examination: Oct/Nov-2022 Scientific Research Substrate Cleaning Paper Writing and Publications (Special Paper-XI)

Day & Date: Friday, 24-03-2023 Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.

		2) 3) 4)) Draw neat labelled diagrams) Figures to right indicate full m) Use of log table and calculate	wherev arks. ors is all	er necessary. owed .
Q.1	A)	Mult 1)	tiple choice questions. Every research action has a c as a) Purpose of research c) Result of research	quest of b) d)	knowledge which is known Object of research None of the above
		2)	Microsoft Excel 2019 has colu a) 13684 c) 18634	umn lim b) d)	it of 16384 84163
		3)	In the initial process of reseau reviewed and preferably arrau a) Alphabetically c) Randomly	rch stud nged b) d)	y, literature collected is Chronologically None of these
		4)	In Microsoft Excel Workbook <u>a)</u> Ctrl+C c) Esc	can be b) d)	closed using keyboard shortcut Ctrl+W Ctrl+F
		5)	 Bibliography is: a) At the end of the study at b) Anywhere in the study c) Beginning of the study d) Not necessary to be inclu 	rranged	in alphabetical order
		6)	 One of the useful skills for a r a) The ability to understand b) The ability to write an effec c) Both a and b d) None of the above 	esearch the res ective re	ner is: earch esearch report
		7)	Scaling the X and Y axis of g a) Easy c) Challenging	raphs pl b) d)	otted in Origin software is Difficult Impossible
		8)	APA Style, MLA Style, Chicag famously known as a) Citation Manuals c) Abbreviation Manuals	go Manı b) d)	ual, Blue Book, OSCOLA are Directories Handbooks

- 10
- h is known
- irch ove

ected is

- /board shortcut

16

10

80

- Ethical Neutrality is a feature of 9)
 - Scientific method a) Deduction b)
 - c) Observation Experience d)
- 10) The Origin software is specifically a software. Table formatting
 - a) Photo editing
 - c) Report formatting Plotting graph and analysis d)
- Fill in the blank/Definition/One sentence answer/ One word answer/ 06 B) Give the name/Predict the product etc.

b)

- The graph can be copied from Origin and added in the MS word 1) using
- is the first step of Research process. 2)
- Population Census is an example of type of research. 3)
- is a quality of Good Researcher. 4)
- In MS Excel, the content of the cell is shown in 5)
- Origin can produce graphs. 6)

Q.2 Solve any Eight of the following.

- What is citation index? a)
- What is peer review process for journals? Why it is used? b)
- What is Scopus? C)
- d) What is scientific writing?
- What is the need of scientific words in scientific writing? e)
- How do you prepare index for technical reports? **f**)
- List the types of charts in MS Excel software. g)
- In which software do you prepare presentations? What are slides in h) presentation?
- What is the advantage of origin over MS Excel? i)
- Name two software's for plotting graph. j)

Q.3 A) Attempt any Two of the following.

- 1) Explain the steps followed to prepare technical reports.
- 2) If you need to add a table in your scientific report, how do you add the table? Write necessary steps to add the table in the report.
- 3) Explain the procedure for peer review of journals for publishing a research paper.
- B) Write Short note on scientific writing. Give few examples using scientific 06 words.

Q.4 A) Attempt any Two of the following.

- 1) Consider any one electronic device such as pn-junction diode/Zener diode/Transistor and write a technical writing on it.
- 2) Plot the graph of students result analysis in 1st class, 2nd class, Distinction etc. (Consider 15 students in the class)
- 3) What are the contents of the research paper? Briefly explain each one.
- What is the first step to start research? Explain how one can publish the 08 B) research article in any journal?

Q.5 Attempt any Two of the following.

- a) With an example describe how the power point presentation of ten slides can be prepared for a scientific writing? Specifically how the first and last slide of the presentation should be prepared?
- **b)** Explain the steps followed to plot graph using origin. Use minimum 15 rows and 2 columns.
- c) A class of 10 students scored some marks in six subjects. Using MS Excel worksheet list the subject and marks obtained by the students in the given subjects. Use formulae to find total marks, percentage of marks of the class.

Seat No.

B.Sc. (Semester - V) (New) (CBCS) Examination: Oct/Nov-2022 Medical Physics (Special Paper-XI)

Day & Date: Friday, 24-03-2023 Time: 03:00 PM To 06:00 PM

1)

Instructions: 1) Q. No. 1 and 2 are compulsory.

2) Attempt any three questions from Q. No. 3 to Q. No. 7. 3) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative.

a)

C)

a)

- What is the full form of LASER?
 - Light Absorbent and Stimulated Emission of Radiations a)
 - b) Light Absorbing Solar Energy Resource
 - Light Amplification of Stimulated Emission of Radiations C)
 - Light Amplification of Singular Emission of Radiations d)
- 2) Dental X-Ray is also known as
 - Orthopedics Orthopentology b)
 - Orthopantomography Orthology d)
- What properties of sound wave acts like the principle of ultrasound? 3)
 - Reflection and Refraction Reflection only b) a)
 - C) Refraction only d) Propagation
- When an abdominal ultrasound is done, why is it advised to have a 4) full bladder?
 - To have a good acoustic window a)
 - To increase the water content b)
 - C) To lower impedance
 - To allow for better propagation of wave d)
- 5) Which of the following number system is known as bas-10 system?
 - Binary Number System b) Hexadecimal Number System **Decimal Number System**
 - Octal Number System C) d)
- Which two number form the binary number system? 6)
 - 0 and 2 1 and 2 a) b)
 - 0 and 1 1 and 3 C) d)
- 7) In how many generations a computer can be classified?
 - 3 4 a) b) C) 5 d) 6
- What is the difference between soft and hard X-rays? 8)
 - Velocity Intensity a) b)
 - Frequency C) d) Polarization
- 9) In a normal X-Ray machine, X-ray are produced by
 - bombardment of cathode rays on a radioactive material a)
 - nuclear fission b)
 - nuclear fusion C)
 - super heating of an element d)

Max. Marks: 80

Set

Ρ

		10)	For not a) c)	which of these for an adult? Cranium Arms	areas can the	e ultra b) d)	asound be taken for an infant bu Chest Legs	ıt
	B)	Fill in Give 1) 2) 3) 4) 5) 6)	the i Lase calle Wha The Flan a) b) Opti a) b) T ₁ ir a) b)	blank/Definition name/Predict t er energy is use ed? at does MRI Sta Geiger Muller of ne emission def True False c fibers are use True False ncreases with m True False	on/One sente he product/V ed to break up and for? counter uses tector is a typ ed in endosco hagnetic field.	ence Vrite o kidn poten e of r py.	answer/ One word answer/ true/false ey or gallstones in process itial difference of adiation detector	06
Q.2	Ans a) b) c) d)	wer ti Expla What What Discu	wer the following. Explain the term electromagnetic wave and Doppler Shift. What are the feathers of advantages of PET and X-Ray? What is electrocardiogram and magnetic resonance? Discuss visible and IR radiations.					
Q.3	Ans a) b)	wer the following. Explain the application of Laser in medical field. Describe ultrasonic waves from piezoelectric materials.					16	
Q.4	Ans a) b)	wer tl Write What	ne fo shor are t	llowing. It notes on sonc the type of optic	ography. cal radiation?	Expla	ain any one of them.	16
Q.5	Ans a) b)	wer tl Desc Expla	ne fo ribe a ain th	llowing. about GM tube e function of CF	and its workir PU.	ng wit	h the help of diagram	16
Q.6	Ans a) b)	wer tl Desc Expla	ne fo ribe t ain th	llowing. the x-ray tube a e five type of lu	nd its working mineense.	g with	the help of diagram.	16
Q.7	Ans a) b)	wer tl Desc What	ne fo ribe d t do y	llowing. contact CT Sca you mean by me	n and its worl edical diagnos	king. stic ai	nd therapeutic radiation?	16

			SLR-FZ-190
Seat No.			Set P
	В.	Sc. (S	Semester - V) (New) (CBCS) Examination: Oct/Nov-2022 Energy Resources (Special Paper-XI)
Day & Time:	Dat 03:0	e: Fric)0 PM	lay, 24-03-2023 Max. Marks: 80 To 06:00 PM
Instru	ictio	ns: 1) 2) 3)	All questions are compulsory. Figures to the right indicate full marks. Draw neat labelled diagrams wherever necessary.
Q.1	A)	Multi 1)	ple choice questions.10The non-renewable energy resources area) Not pollution-freeb) Not environment friendlyc) Cost is highd) All of the above
		2)	Photovoltaic energy is the conversion of sunlight into:a) Chemical energyb) Biogasc) Electricityd) Geothermal energy
		3)	Horizontal axis and vertical axis are the types of:a) Nuclear reactorb) Wind millsc) Biogas reactord) Solar cell
		4)	Biomass can be converted toa) methane gasb) ethanolc) biodieseld) all of the above
		5)	The difference, in temperature between the core of the planet and itssurface, is known asa) geothermal coefficientb) geothermal gradientc) geothermal constantd) none of the above
		6)	Greenhouse effect is due to release ofgas in atmosphere.a)Carbon monoxideb)Carbon dioxidec)Nitrogend)Hydrogen
		7)	Biogas is used as fuel fora) Heating waterb) Producing electricityc) Cooking foodd) Both a and c
		8)	In thermal power plants the fuel used is a) Coal b) Oil c) Gas d) All
		9)	In solar cooker mirrors are used to focus sunlight.a) Convexb) Biconcavec) Planed) Concave
		10)	 Biogas is a mixture of a) Methane and Hydrogen b) Methane and Helium c) Methane and Carbon dioxide d) Methane and Nitrogen

	В)	 Fill in the blank/Definition/One sentence answer/ One word answer/ Give the name/Predict the product etc. 1) What is clarity index? 2) Define solar constant. 3) What is solar collector? 4) Comments "Sun is thermonuclear fusion reactor". 5) Define fermentation. 6) Define diffuse radiation. 	06
Q.2	Solv a) b) c) d) e) f) g) h) i) j)	ve any eight of the following. List out the applications of solar energy. What is electrolyte cell? What is solar cell? What are the uses of solar cell? Give classification of solar collector. State various applications of wind energy. What is OTEC technology? What is biogas and its disadvantages of using as a fuel? Define FF and efficiency of solar cell. What are the constituents of biogas? What is wind farm?	16
Q.3	A)	 Attempt any two of the following. 1) State the advantage and disadvantages of geothermal energy. 2) Differentiate between renewable and non-renewable energy resources. 3) Give brief description on type of wind turbines. 	10
	B)	Short note/solve Calculate the fill factor and efficiency of a solar call with dimension 10 cm X 10 cm is illuminated at standard test condition. The cell has the following external parameter: Voc=0.8 V, Isc= 3A, Vmp=0.7 V and Imp=2.5 A.	06
Q.4	A)	 Attempt any two of the following. 1) Explain the construction and working of biogas plant. 2) Draw a neat diagram of box type solar cooker. 3) List out any four alternative energy resources and state its importance. 	08
	B)	Describe/Explain/solve Draw the line diagram and explain the working of hybrid OTEC cycle.	80
Q.5	Atte a) b)	mpt any two of the following. Explain the principle of solar photovoltaic power generation. Explain the production of biodiesel with a neat flowchart.	16

c) Differentiate between 'horizontal axis turbines' and 'vertical axis turbines.

	D.1	5C. (Sem	Geoinformatics (Sr)⊏)eci	al paper-XI)	
Day & Time	& Dat : 03:0	e: Fri 0 PN	day, 2 I To 0	24-03-2023 5:00 PM		Max. Marks:	40
Instr	uctio	ns: 1 2) All q) Figu	uestions are compulsory. Ires to the right indicate full	mark	S.	
Q.1	A)	Fill i 1)	n the Whic wave a) b) c) d)	blanks. h of the following indicates es? Shorter wavelength - high Longer wavelength - less f Shorter wavelength - less Longer wavelength - high	the c frequ frequ frequ	orrect set of combination in radio lency ency lency ency	05
		2)	Outc a) c)	rop of limestone in vector fo Point Polygon	ormat b) d)	can be represented by Line All of these	
		3)	In fal a) c)	se colour composite (FCC) Blue Green	imag b) d)	le healthy vegetation appears: Red Orange	
		4)	Solaı a) c)	our falls in which zone of UT 43W 43E	⁻ M? b) d)	43S 43N	
		5)	A con from of a) c)	nical shaped feature with ce the surrounding area in the anticlinal hill volcanic cone with crater	ntral aeria b) d)	depression and which stand out al photographs suggest presence Dome None of the above	
	B)	Ans ⁻ 1) 2) 3)	wer tl Wha Wha Wha	he following questions in at are three basic elements at is diffuse reflection? at band combination occurs	one of ve in F(sentence. ctor data? CC?	03
Q.2	Ans a) b) c) d) e)	wer a How How Give Wha Wha	ver any Four of the following.08How do you recognise shallow and deep water in aerial photographs?08How dyke is represented in the aerial photograph?08Give examples of spatial and non-spatial data.08What is difference between Nadir and Principal point?08What is the colour of water bodies in IR colour image?08				
Q.3	A)	Atte 1) 2)	mpt a What What	iny One of the following. is Atmospheric window? are various scales of aerial	phot	ographs?	05
	B)	Expl	ain ar	ny one type of resolution of	digita	Il imagery.	03

Seat No.

R Sc n: Oct/Nov 2022 10 v ~ ~ W/ (CBCC) 4 . 4! -

SLR-FZ-191

Set Ρ

Q.4 Attempt any Two of the following.

- a) What are various errors in flying?
- b) Describe various platforms of remote sensing
- c) What is spectral reflectance curve?

Q.5 Attempt any One of the following.

- a) Describe in brief various elements of photointerpretation.
- b) Describe classification of aerial photograph based on camera axis.
- c) Describe basic components of remote sensing.

08

Seat No.						Set	Ρ
	В.	Sc. (Semester	- V) (New) (CI LINUX (Spe	BCS) Exa	amination: Oct/Nov-2022 per-XI)	
Day 8 Time:	& Dat 03:0	e: Fri 00 PN	day, 24-03-2 I To 06:00 P	:023 M	•	, Max. Marks	3: 80
Instru	uctio	ns: 1 2 3 4) All question) Figures to) Draw neat) Use of loga	ns are compulson the right indicate and labeled diag arithmic table and	ry. full marks ram where d calculato	s. ever necessary. or is allowed.	
Q.1	A)	Mul 1)	tiple choice Which of th	questions. ne following symb	ools repres	sent redirection?	10
			a) -		b)	<	
			C) &		d)	1	
		2)	The statem	ient z='expr 5 / 2	' would sto	ore which of the following values	
			a) 0		b)	1	
			c) 2		d)	5	
		3)	Which of th a Linux sys	ne following com	mand is us	sed to access an SMB share on	
			a) NFS		b) d)	smbclient	
		4)	Which is th	e correct way to	use the ni	ce command?	
		,	a) nice 5 c) nice -	i class d class	b) d)	nice +5 class none of these	
		5)	What is the	e full path for grul	b's configu	iration file?	
		,	a) /boot/	grub/lsof.conf	b)	/boot/grub/menu.lst	
			c) /etc/g	rub/grub.conf	d)	/etc/grub/grub.txt	
		6)	Which can	be used to find a	a file emp.	sh under the current directory or	
			a) find .	-print emp.sh	b)	find emp.sh	
			c) find .	emp.sh	d)	none of these	
		7)	Which com host?	imand used to pr	int the rou	te packets trace to a network	
			a) netsta	nt raaa	b)	route	
		0)	C) TOULE		u)		
		8)	which can a file?	be used to show	the conte	ent of a zip file without extracting	
			a) unzip	-t	b)	unzip –d	
			c) unzip	-Z	d)	unzip –x	
		9)	Which sym	bol is used to se	parate mo	re than one command in the	
			command	ine?	h)	#	
			c) :		d)	 ,	

06

16

10

08

08

16

10)	You need to change some settings on your Apache server. Which is
	the best tool to use for logging in remotely?

- b)
- ssh a) rsh C) rlogin d) telnet

B) Fill in the blanks.

- system variable is used to store the PID of the current shell. 1)
- 2) Case statement ends with
- The location for subdirectories for local programs and executable for 3) user and administrative commands is in _____ directories.
- 4) "?" Wild character is used for matching ______ character.
- When you in the vi editor, by default you are in mode. 5)
- is used to replace a single character in "vi" editor. 6)

Q.2 Solve any Eight of the following.

Define File permission? a)

What is Linux and why is it so popular? b)

- List the name of different Shells available in Linux. C)
- What is shell script? d)
- What is chown command with example? e)
- f) Define Inode Block.
- What are positional parameters? g)
- How do we move jobs to background and foreground? h)
- i) Define we command.
- What are the network / communication commands? j)

Q.3 A) Attempt any Two of the following.

- 1) How to create archive file in Linux with example?
- 2) Explain different boot loaders.
- 3) What is the syntax for different types of loops available in shell scripting with example?
- Write a shell script to check entered number is Armstrong or not. 06 B)

Q.4 A) Attempt any Two of the following.

- 1) How files are internally organized in Linux file system? Explain it briefly.
- 2) What is a shell? How does it work with the kernel & user?
- What is the difference between hard and soft links? 3)

Write a menu driven shell Script B)

- 1) Copy a file
- Remove a file 2)
- 3) Move a directories
- Cut fields 1,3,5 from bca file 4)
- To remove repeated data from bcom file. 5)

Q.5 Attempt any Two of the following.

- Explain Input modein detail. a)
- Describe the use of filter. Explain sort filter command in detail. b)
- Explain sed command in detail with example. C)

Seat No.		Set P)
	B.Sc. (Semester - V) (New) (CBCS) Examination: Oct/Nov-2022 MS-EXCEL (Special paper-XI)	
Day & Time: (Date: Fri)3:00 PM	day, 24-03-2023 Max. Marks: 80 To 06:00 PM	0
Instruc	tions : 1 2 3 4	All questions are compulsory.) Figures to the right indicate full marks.) Draw neat labelled diagrams wherever necessary.) Use of log table and calculators is allowed.	
Q.1 A	A) Choi 1)	ce the correct alternative.10Excel is a program that is used to prepare aa)a)Slide presentationb)Spreadsheetc)Text documentd)Database	0
	2)	Which of the following identifies a cell in Excel?a) Addressb) Formulac) Named) Label	
	3)	Which term is used to join the selected cells in one cell?a) Filterb) Wrapc) Pivotd) Merge	
	4)	A formula in Excel always begins with an a) Equal sign b) Colon c) Comma d) Space	
	5)	The result is a value either TRUE or FALSE.a) Logicalb) Arithmeticc) Algorithmd) Logarithm	
	6)	is a powerful tool used to create and format spreadsheets?a) Adobe Photoshop CSb) Mozilla Firefoxc) Microsoft Office Power Pointd) Microsoft Office Excel	
	7)	Workbook is a collection ofa) Worksheetb) Page set-upc) Buttonsd) Diagrams	
	8)	is the intersection of a row with a column.a) Cellb) Rowc) Columnd) All of these	
	9)	To displays the Find and Replace dialog box, with the Find tab selected press a) Alt + F b) Tab + F c) Esc + F d) Ctrl + F	
	10)	Pre- defined and built in formulas in Excel are known asa) Auto sheetsb) Chartsc) Functionsd) Tables	

06

16

10

06

08

08

16

B) Fill in the blanks.

- 1) Press _____ to save the active file with its current file name, location, and file format
- 2) _____ are equations that perform calculations on values in your worksheet.
- 3) _____ function is used to add the values in the function argument.
- 4) Press _____ to undo in MS-EXCEL.
- 5) _____ of the worksheet appears vertically and are identified by letters at the top of the worksheet window.
- 6) Press ______ to select all rows and columns in the worksheet.

Q.2 Solve any eight of the following.

- a) What do you mean by cells in an Excel sheet?
- b) Explain what is a spreadsheet?
- c) What are charts in MS-Excel?
- d) Write the function for calculating p.m.f. of Poisson distribution with $\lambda = 2$.
- e) Which function is used to calculate mean of numbers?
- f) Which function is used to calculate sum of numbers?
- g) Which function is used to generate random numbers?
- $\dot{\mathbf{h}}$ Write the name of file formats that are used to save a MS-EXCEL file.
- i) How can you add cells, rows or columns in Excel?
- j) What is the use of the IF function in Excel?

Q.3 A) Attempt any two of the following.

- 1) Explain MS Excel in brief.
- 2) How do you find averages in MS-excel?
- 3) How will you write the formula for the following? Multiply the value in cell A1 by 10, add 5 in the result, and divide it by 2.
- **B)** Write short notes on 'Data' tab in Excel.

Q.4 A) Attempt any two of the following.

- 1) What is the order of operations used when evaluating formulas in Excel?
- 2) What is difference between a function and a formula in Excel?
- 3) How can you draw a 20 random numbers from 0 to 1?
- B) Explain different charts in MS-Excel.

Q.5 Attempt any two of the following.

- a) Explain the SUM and SUMIF functions with examples
- **b)** What are the different types of COUNTIF functions in Excel?
- c) Explain RAND and RANDBETWEEN functions with examples.

Seat No.		Set F	>					
	B.S	c. (Semester - VI) (New) (CBCS) Examination: Oct/Nov-2022 ENGLISH (Compulsory) Literary Mindscapes – I						
Day & Time:	Day & Date: Tuesday, 28-03-2023 Max. Marks: 40 Time: 03:00 PM To 05:00 PM							
Instru	uctio	s: 1) All questions are compulsory.2) Figures to the right indicate full marks.						
Q.1	Rew 1)	ite the following sentences by choosing the correct alternative.0In the story 'Growing up' the name of Robert's dog isa) Sportb) Sortc) Shortd) Snore	8					
	2)	Aksionov's wife see in her dream about him thata) he lost his hairb) his hair had become greyc) he became illd) he got arrested						
	3)	In the poem "Sita" children are listening to the story. a) two b) three c) four d) five						
	4)	Who is the painter of the duchess's portrait?a) Aphra Pandolfb) Fra Pangolc) Aphra Behnd) Fra Pandolf						
	5)	In the poem "Ode to Beauty" are read or heard by us.a) Plays and classical musicb) Novels and songsc) Lovely talesd) Poetry and western music						
	6)	In the poem "Life" springs again like elastic. a) Tragedy b) Family c) Hope d) Death						
	7)	He went to his office to look for his lost keys. (Choose the correct adverb) a) Back b) Backside c) Back in d) Back up						
	8)	The helping verb always comes after the in indirect form.a) Objectb) Complementc) Subjectd) Adverbial						
Q.2	Write a) b) c) d) e) f)	answer in short. (Any Four)1Why did Robert Quick not ask for the children's affection?Why did Aksionov leave the inn early?Why was the forest so dark and dense in the poem "Sita"?Describe the personality of the Duchess.Describe John Keat's philosophy of Beauty.What did Charlotte Bronte say about life in the poem "Life"?	2					

10

Q.3

Answer the following questions. (Any One)a) What is an Information Literacy? Explain the benefits of Information Literacy?

OR

- Write a note on Leadership skill with its characteristics. b)
- Q.4 What is Environment consciousness skill? Mention habits for environment 10 conservation.

Seat No.

B.Sc. (Semester - VI) (New) (CBCS) Examination: Oct/Nov-2022 **PHYSICS (Paper- XIV)** Electrodynamics

Day & Date: Monday, 27-03-2023 Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Draw neat labelled diagrams wherever necessary.
- 4) Use of log tables and calculator is allowed.

Q.1 Multiple choice questions. A)

- Which of the following statement is wrong? 1)
 - a) charged particle at rest in an electric field experience force due to the field.
 - b) A moving charged particle in an electric field experience force due to the field.
 - c) A charged particle at rest in the magnetic field experience force due to the field.
 - d) A moving charged particle in the magnetic field experience force due to the field.

A uniform electric field is applied along positive Y direction. A moving 2) charged particle enters the electric field along positive X direction. If x is the distance travelled by the particle in X direction, then the particle's deflection along Y direction (y) is proportional to

- **x**² a) x b) c) x³ **X**⁴ d)
- Generation of motional emf is the principle of 3)
 - a) battery b) generator
 - c) photovoltaic cell voltaic cell d)
- According to Lenz's law, the induced e.m. f. the rate of charge 4) of magnetic flux.
 - a) does not oppose b) opposes
 - c) increases d) decreases
- Mathematical formulation of empirical laws in electricity and 5) magnetism are known as
 - a) Maxwell's equations b) Faraday's equations

of different magnitude

- c) Lorentz's equations Laplace's equations d)
- 6) In vacuum, polarization and magnetization are present
 - a) absent b)
 - c) of variable magnitude d)
- In electromagnetic fields _____ is conserved. 7)
 - a) total energy
 - b) total momentum
 - c) both energy and momentum
 - d) neither energy nor momentum

Max. Marks: 80

Set

- The nature of electromagnetic waves is _____. 8)
 - a) Longitudinal
 - b) Stationary
 - c) Transverse
 - d) Neither transverse nor longitudinal
- 9) A light ray travelling from denser (glass) to rarer medium (air) at an angle of incidence more than critical angle for the pair of media, suffers
 - a) scattering c) Diffraction
- interference b)
 - d) Total internal reflection
- 10) Static charge can _____.
 - a) radiate not radiate b) c) nothing can be said
 - radiate at some condition d)
- B) Fill in the blank/Definition/One sentence answer/ One word answer/ 06 Give the name/Predict the product etc.
 - The trajectory of a charged particle in mutually perpendicular crossed 1) electric and magnetic fields is
 - Both Self-inductance and mutual inductance are measured in the 2) unit
 - 3) The statement 'magnetic free poles do not exist.' is justified by Maxwell's equation
 - The cross product $\vec{E} \times \vec{H}$ gives _____ vector. 4)
 - The sum of reflection and transmission coefficients, R+T =____ 5)
 - Total power radiated by electric dipole is proportional to power 6) of frequency.

Q.2 Solve any Eight of the following.

- Write Gauss law in differential form and give meaning of each term. a)
- Explain in brief electromotive force. b)
- State Biot-Savart's law. C)
- State Poynting's theorem. d)
- e) Define skin depth.
- Define reflection coefficient of electromagnetic wave. f)
- If refractive index of glass and air are respectively 1.5 and 1. Calculate the g) value of Transmission coefficient (T) of the glass-air interface.
- Light emitted by the sun travels with speed of $3 \times 10^8 m/s$ and reaches the h) earth. Distance between sun and earth is $150 \times 10^9 m$. Calculate retarded time (t_r) if current time (t) is 6 A.M.
- What is retarded potential? i)
- With neat diagram explain an electric dipole. j)

Q.3 A) Attempt any Two of the following.

- Discuss the motion of a charged particle in constant, uniform electric 1) field.
- 2) Explain Faraday's law of electromagnetic induction.
- Write a note on Biot-Savart's law. 3)
- B) For sea water; $\sigma = 4.2 \ mho/m$ at a frequency of 50 kHz. Calculate the skin 06 depth. Given: permeability of medium; $\mu = \mu_0 = 4\pi \times 10^{-7} H/m$.

10

Q.4 A) Attempt any Two of the following.

- Considering Maxwell's equations in vacuum, find out wave equations for electric and magnetic fields. Obtain expression for velocity of EM waves in vacuum.
- 2) Obtain the boundary condition for electromagnetic field vectors $\vec{D}, \vec{E}, \vec{B}$ and \vec{H} at the interface of two media.
- 3) What is radiation reaction? Deduce an expression for radiation reaction force for an electric dipole.
- B) State Maxwell's equations for vacuum and explain the physical significance
 08 of each equation.

Q.5 Attempt any Two of the following.

- a) Explain the motion of charged particle in crossed, uniform and constant Electric (\vec{E}) and Magnetic (\vec{B}) fields.
- **b)** What is transformer? Obtain the relation $\frac{\varepsilon_2}{\varepsilon_1} = \frac{N_2}{N_1}$
- c) Write a note on total internal reflection. Calculate value of critical angle for the pair of media having refractive indices 1.414 and 1.

08

Instr	uctio	o ns: 1) 2 3 4) All) Fig) Dra) Uso	questions are compulsory. ures to the right indicate full r aw neat labeled diagrams whe e of log table and calculators	nark ereve is al	s. er necessary. lowed.				
Q.1	A)	Fill i give 1)	Fill in the blanks by choosing most correct alternative among thosegiven below and rewrite the sentences.1)Vibrational spectra of diatomic molecule observed in region.a)Visibleb)Near infraredc)Microwaved)X-ray							
		2)	As is _ a) c)	wave length of radiation is in increases remains same	crea b) d)	sed, the energy of that radiation decreases none of these				
		3)	The a) c)	e solution of lower vapour pre Higher temperature Higher vapour pressure	ssur b) d)	e will boil at Lower temperature None of these				
		4)	The in i a) c)	e liquid mixture which boil at o ts composition is called zeotropic boiling	cons _ miz b) d)	tant temperature without change xture. fractional azeotropic				
		5)	At a) c)	constant pressure dG = vdP - S – S	sdT b) d)	, then $\left(\frac{dG}{dT}\right)_{P} = $ V - p				
		6)	Wc a) c)	ork function A is defined as A = E + TS A = E - TS	b) d)					
		7)	The equ a) c)	e variation of melting point of uation. Clapeyron – Clausius Kirchhof's	solic b) d)	I with pressure is given by Arrhenius Gibb's				
		8)	In a a) c)	a reaction, $2A + B \rightarrow C + D$, $\frac{2}{3}$	the r b) d)	nolecularity of the reaction is 0 1	-·			

An increase in temperature, temperature coefficient of reaction _____.

The reaction having smaller energy of activation are _____.

b) decreases

b) Slow

d) none of these

d) Both (a) & (b)

B.Sc. (Semester - VI) (New) (CBCS) Examination: Oct/Nov-2022 **CHEMISTRY (Special Paper - XIII)**

Day & Date: Monday, 27-03-2023 Time: 03:00 PM To 06:00 PM

9)

10)

a) increases

a) Fast

c) Steady

c) remains constant

Seat

No.

Physical Chemistry

SLR-FZ-196

Max. Marks: 80

Ρ Set

06

16

- Fill in the blanks:
 1) Reactions which proceeds in a series of successive stages initiated by suitable primary processes are called as ____.
- 2) The selection rule for rotational spectra is _____.
- The term fugacity has the dimension of _____.
- 4) At equilibrium free energy change is _____
- 5) The temperature at which the total vapour pressure of solution becomes equal to atmospheric pressure is known as _____.
- 6) The distance between two nearest troughs or crests is known as _____.

Q.2 Solve any Eight of the following.

1) State Raoult's law.

B)

- 2) Define critical solution temperature.
- 3) What is mean by Rayleigh scattering?
- 4) Define the terms fugacity and activity.
- 5) Give the applications of rotational spectra.
- 6) Define opposing and parallel reactions.
- 7) Mention the applications of Clausius Clapeyron equation.
- 8) Show that half life period of third order reaction is inversely proportional to the square of the initial concentration of reactants.
- 9) Define : a) frequency b) wave number
- 10) For a third order reaction, when $\frac{1}{(a-x)^2}$ are plotted against time t, draw the

nature of graph and find its slope.

Q.3 A) Attempt any Two of the following:

- 1) Discuss the fractional distillation of solutions of liquids in liquids with minimum boiling point.
- 2) Write a note an chain reactions.
- 3) Derive Gibbs Helmholtz equation.
- **B)** Calculate the reduced mass and moment of inertia of CO, if the bond length **06** is 1.134 A⁰ and atomic masses are C = 12 and O = 15.995. *Given* : $N = 6.024 \times 10^{23}$

Q.4 A) Attempt any Two of the following:

- 1) Distinguish ideal and non ideal solutions.
- 2) Draw the Vibrational energy level diagram. Explain Vibrational spetra indetail.
- 3) What is Arrhenius equation? How it is used to determine the value of energy of activation?
- B) The equilibrium constant Kp for a reaction at 373K is 0.06 and at 403K, it is 0.5953. Calculate the enthalpy change. (Given = 8.314 JK⁻¹mole⁻¹)

Q.5 Attempt any Two of the following:

- a) Derive Clapeyron Clausius equation.
- **b)** Describe mutual solubility of partially miscible liquids with maximum critical solution temperature.
- c) Derive the rate equation of third order reaction. Give any two examples.

16

08

	В.	Sc. (Semester - VI) (New) (CBCS) Examination: BOTANY (Special Paper - XIII) Plant Pathology	: Oct/Nov-2022
Day Time	& Dat e: 03:0	te: Mo 00 PM	onday, 27-03-2023 1 TO 06:00 PM	Max. Marks: 80
Inst	ructio	o ns: 1 2 3 4) All questions are compulsory. ?) Figures to the right indicate full marks. 3) Draw neat labeled diagram wherever necessary. 4) Use of log tables and calculators are allowed. 	
Q.1	A)	Mul 1)	Itiple choice questions. Little leaf of Brinjal is caused by a) Bacterial b) Mycoplasma c) Viruses d) Fungi	10
		2)	Late blight of potato is caused by a) <i>Albugo Candida</i> b) <i>Melamspor</i> c) <i>Phytophthora infestans</i> d) <i>Puccinia re</i>	a line condite
		3)	Tikka disease is related to crop. a) Sugar cane b) Rice c) Ground nut d) Jowar	
		4)	Red rot of sugarcane is caused by a) Colletotrichum falcatum b) Plasmopara c) Streptomyces griseus d) Piricularia o	a viticola oryzae
		5)	Example of cultural practice isa) Soil fumigationb) Seed treatmc) Crop rotationd) Foliar applied	nent cation
		6)	following is not true regarding Chlorosis. a) Yellowing of leaves b) Death of plant tissues c) Non-formation of chlorophyll d) Destruction of chlorophyll 	
		7)	 of the following is not related to Necrosis. a) Curling of leaves b) Death of tissues c) A common symptom of fungal diseases d) Discolouration of leaves 	
		8)	The study deals with viruses is known as a) Bacteriology b) Mycology c) Phycology d) Virology	
		9)	 The Bordeaux mixture was first time used for the c a) Downy mildew of grapes b) Powdery mildew of cucurbits c) Citrus canker d) Grain smut of Jowar 	ontrol of

Seat No.

SLR-FZ-197

Set P

06

16

10

06

08

16

- a) Obligate parasites
- c) Obligate saprophytes
- b) Facultative parasitesd) Facultative saprophyte
- d) Facultative saprophytes.

B) One sentence answer.

- 1) Define host.
- 2) Give the name of any two fungal diseases.
- 3) Give the name of two viral diseases.
- 4) Define parasite.
- 5) What is symptoms
- 6) What is Aerobiology

Q.2 Solve any Eight of the following.

- a) Write symptoms of tikka disease of ground nut.
- b) Cultural control of plant disease.
- c) Biological control plant diseases.
- d) Write causal organisms of Powdery mildew of Mango and White rust of crucifer.
- e) Write control measures for Citrus canker.
- f) What is seed pathology? Give the examples of seed pathogen.
- g) What is seed certification?
- h) Explain the role of aerobiology in disease forecasting.
- i) Write symptoms of Bacterial blight of pomegranate.
- j) Write symptoms on Powdery mildew of Mango.

Q.3 A) Attempt any Two of the following.

- 1) Describe the classification of plant diseases based on symptoms, spread and severity of infection.
- 2) Describe Red rot of sugarcane with respect to causal organism, symptoms and control measures.
- 3) Describe Yellow vein mosaic of Bhendi with respect to causal organism, symptoms and control measures.

B) Write importance of plant diseases.

Q.4 A) Attempt any Two of the following.

- Give an account of Late blight of potato with respect to causal organism, symptoms and control measures.
- 2) What is rust? Explain the brown rust of wheat with respect to causal organism, symptoms and control measures.
- 3) Explain scope and importance of aerobiology.
- B) What is seed treatment? Explain the different methods used in seed 08 treatment.

Q.5 Attempt any Two of the following.

- a) Explain Grain smut of Jowar with respect to causal organism, symptoms and control measures.
- b) Define following terms: 1) Pathogen 2) Pathogenicity 3) Pathogenesis
 4) Incubation period 5) Hypersensitivity 6) Infection 7) Immunity 8) Resistance.
- c) Explain Wilt of Pigeon pea with respect to causal organism, symptoms and control measures.

Seat No.						Set	Ρ	
	B.Sc. (Semester - VI) (New) (CBCS) Examination: Oct/Nov - 2022 ZOOLOGY (Special Paper – XIII) Animal Physiology: Life Sustaining Systems							
Day & Time:	Date 03:0	e: Mor 0 PM	nday, 2 To 06:	27-03-2023 00 PM		Max. Marks	: 80	
Instru	ction	ns: 1) 2) 3)	All que Draw Figure	estions are compulsory neat labelled diagrams wh es to right indicate full ma	nereve rks.	er necessary.		
Q.1	A)	Fill ii 1)	n the b The rh a) c)	blanks by choosing corre hythmic contraction and re Heat valve Heart attack	ect alt laxatic b) d)	ernatives given below. on of heart is known as Heart beat Heart burn	10	
		2)	The co a) c)	olour of Human blood is re Haemoglobin Chlorocrorin	d due b) d)	to the respiratory pigment Haemocyanin Pinnaglobin		
		3)	enviro a) c)	is defined as gaseous exonment. Digestion Excretion	chang b) d)	e between the organism and circulation Respiration		
		4)	The b a) c)	reakdown of complex food Digestion Circulation	into s b) d)	simpler form is called Respiration Excretion		
		5)	The a a) c)	nimals excreting ammonia Ureotelic Hydrotelic	are c b) d)	alled Uricotelic Amonotelic		
		6)	ABO s a) c)	system of blood grouping v Carl Linnneous Karl Max	vas di b) d)	scovered by Carl Landsteiner Carl Lewis		
		7)	a) c)	is the major organ to proc Heart Bone	duce r b) d)	iew RBC. Brain Lung		
		8)	In myo a) c)	ogenic heart beat originate Muscle Nerve	es in th b) d)	ne Bone Blood		
		9)	Stress a) b) c) d)	s management is about lea How to avoid the pressure How to develop skills that when we are subjected to Both a and b None	arning es of I would the p	ife d enhance our body's adjustment ressures of life		
		10)	Major a)	stress hormone is Adrenaline	b)	Glucagon		

c) Epinephrine d) Cortisol

	B)	 Fill in the blank/Definition/One sentence answer/ One word answer/ Give the Name/Predict the product etc. 1) blood group is the Universal acceptor. 2) Define: Pulmonary respiration. 3) What is gastric digestion? 4) Name the instrument used to measure electrical impulse of heart. 5) Name the instrument used to treat the patients with acute renal failure. 6) What is the end product of protein digestion? 	06
Q.2	Ans a) b) c) d) e) f) g) h) i)	wer any Eight of the following What is blood pressure? How is it measured? What is Tidal Volume? What are respiratory pigments? Name any 2 What is micturation? Name the hormones which control the gastrointestinal tract. Name 2 bile salts. Give the different types WBC in blood. Write the function of kidney. What is Tachycardia? Name any 2 enzymes of pancreas.	16
Q.3	A)	 Attempt any Two of the following. 1) Describe origin and conduction of heart beat. 2) Internal respiration 3) Structure of Nephron 	10
	B)	Short note/Solve Describe functions of blood.	06
Q.4	A)	 Attempt any Two of the following. 1) Describe cardiac cycle 2) Chloride shift 3) Functions of pancreas 	08
	B)	Describe/Explain/Solve Explain Yoga and stress.	08
Q.5	Atte a) b)	mpt any Two of the following. Describe the process of blood clotting. Explain the process of intestinal digestion.	16

c) Describe the process of urine formation.

No.								Set	Ρ
	в.	Sc. ((Semes	ster - MAT	VI) (New HEMATI N	v) (CBC: CS (Spe letric Sp	S) Exa ecial F baces	amination: Oct/Nov-2022 Paper – XIII)	
Day & Time:	• Dat 03:0	e: M)0 PI	onday, 2 M To 06:	27-03-2 00 PN	2023 1	-		Max. Mark	s: 80
Instru	ictio	ns:	1) All que 2) Figure	estion es to th	s are com ne right inc	pulsory. dicate full	marks		
Q.1	A)	Ch (1)	oose the Which c a)	e correction f the f $\left(\frac{1}{\sqrt{n}}\right)_{n=1}^{\infty}$	ect alterna following s	ative for a sequence	each o is elen b)	of the following. Thent of l^2 space? $\left\{\frac{1}{n}\right\}$	10
			c) E	Both a) and b)		d)	Neither a) nor b)	
		2)	If $f: J \rightarrow$ increasi	\mathbb{R} when the second	ere J $\subseteq \mathbb{R}$, and only if.	if <i>f</i> is no	n decre	easing on J then f is strictly	
			a) <i>f</i> c) f	f is inv f is on	vertible e - one		b) d)	<i>f</i> is onto <i>f</i> is both one - one and onto	
		3)	If <i>f</i> is m a)]	$\lim_{z \to c^{-}} f(x)$	ne functio (x) exist	n on (<i>a, b</i>) and i b)	f $c \in (a, b)$ then $\lim_{n \to c^+} f(x)$ exist	
			c) N	Veithe	r a) nor b)		d)	Both a) and b)	
		4)	Which c	of the f	following is	s not cont	inuous	function of R'	
			a) <i>f</i>	f(x) =	$\frac{\sin x}{x}$		b)	$g(x) = \frac{1+x^3}{1+x}$	
			c) <i>f</i>	f(x) =	x		d)	$f(x) = x^n$	
		5)	Let M = incorrec	= [0,1] ct?	with abso	lute value	metric	then which of the following is	
			a)	$3\left[\frac{1}{4},\frac{1}{4}\right]$	$\int = \left(0, \frac{1}{2}\right)$		b)	$B\left[\frac{1}{4}, \frac{1}{2}\right] = \left(0, \frac{3}{4}\right)$	
			c) <i>E</i>	$3\left[\frac{1}{2},\frac{1}{2}\right]$] = (0,1)		d)	$B\left[\frac{1}{2},\frac{1}{4}\right] = \left(\frac{1}{4},\frac{3}{4}\right)$	
		6)	Which c a) 7 b) 7 c) 7 d) 7	of the f The inf The un The inf The un	following is tersection tion of infir tersection tion of infir	s correct s of infinite nite numb of infinite nite numb	statem numbe er of cl numbe er of o	ent? er of open set is open set losed set is closed set er of closed set is closed set pen sets need not be open set	
		7)	If A and a) A c) A	<i>B</i> are 4 × <i>B</i> i 4 × <i>B</i> i	e closed su s open su s open su	ubsets of bset of ℝ bset of ℝ	ℝ, ther b) ²d)	$A \times B$ is closed subset of \mathbb{R} $A \times B$ is closed subset of \mathbb{R}^2	

- 8) I) The interval $(0,\infty)$ is bounded subset of \mathbb{R}'
 - II) The interval $(0,\infty)$ is bounded subset of \mathcal{R}_d Only II is correct
 - Only I is correct a) b)
 - d) Both I & II are incorrect Both I & II are correct C)

SLR-FZ-199 Set P

Seat

- 9) Which of the following is incorrect statement?
 - If $f(x) = x^2$, $(-1 \le x \le 1)$ then *f* attains maximum value at a) x = 1 and x = -1
 - If $f(x) = x^3$, $(-\infty < x < \infty)$ then *f* attains maximum and b) minimum value
 - If $f(x) = x^2$, $x \in [0,2]$ be real valued function then f attains C) minimum value at the point x = 0
 - d) All of these

A metric space \mathbb{R}^1 is not compact because 10)

- It is complete but not totally bounded a)
- It is totally bounded but not complete b)
- It is neither totally bounded nor complete C)
- All of these d)

Attempt the following questions. B)

- 1) Define the norm for the sequence in ℓ^2 space.
- Define Cauchy sequence in metric space. 2)
- Define Homeomorphism. 3)
- Define limit point of subset of metric space. 4)
- State finite intersection property. 5)
- Define ∈-dense subset of metric space. 6)

Q.2 Attempt any eight of the following.

- Show that $\varrho: \mathbb{R} \times \mathbb{R} \to \mathbb{R}$ defined by $\varrho(x, y) = |x y|$ is metric on \mathbb{R} . 1)
- Let (M, ρ) be a metric space then show that every convergent sequence of 2) points in *M* converges to unique limit.
- Prove that the usual metric for \mathbb{R}^2 and the metric σ defined by 3) $\sigma(P,Q) = |x_1 - x_2| + |y_1 - y_2|$ where $P(x_1, y_1), Q(x_2, y_2) \in \mathbb{R}^2$ are equivalent.
- Prove that if *f* is continuous at $a \in \mathbb{R}'$ then |f| is also continuous at $a \in \mathbb{R}'$ 4)
- 5) If R_d is discrete metric space then find B[a, 1] and B[a, 2] for any $a \in R_d$
- 6) In any metric space (M, ϱ) show that the sets M and ϕ are closed sets.
- 7) Show that the closed subset of complete metric space is complete.
- If $f(x) = \frac{1}{1+x}$, $(-\infty < x < \infty)$, then prove that f attains maximum value but 8) does not attain a minimum value.
- If $u = \{u_n\} \in \ell^2$ and let $T_u = \left\{\frac{u_n}{2}\right\}_{n=1}^{\infty}$ then show that *T* is contraction of ℓ^2 . 9)
- 10) Define Heine - Borel property in a metric space.

Q.3 A)

- Attempt any two of the following. 1) Let $x = \{x_n\}_{n=1}^{\infty}$ and $y = \{y_n\}_{n=1}^{\infty}$ are in ℓ^2 and $\varrho(x, y) = ||x y||_2$ then show that (ℓ^2, s) is metric space.
- Prove that if F_1 and F_2 are closed in metric space M then $F_1 \cup F_2$ is 2) also closed in M.
- 3) If the metric space *M* has Heine - Borel property then prove that *M* is compact.
- State and prove Schwarz inequality in ℓ^2 space. B)

06

10

16
Q.4 A) Attempt any two of the following.

1) Let (M, ϱ) be a metric space and $a \in M$. If f and g are real valued function such that $\lim_{x \to a} f(x) = L$ and $\lim_{x \to a} g(x) = N$ then prove that

$$\lim_{x \to a} (f(x) + g(x)) = L + N \text{ and } \lim_{x \to a} (f(x) \cdot g(x)) = L \cdot N$$

- 2) Prove that the characteristics function of rational number is not continuous in \mathbb{R}^\prime
- 3) If *f* is a continuous function from the compact metric space M_1 in to the metric space M_2 then prove that the range $f(M_1)$ is also compact.
- B) State and prove fixed point theorem.

Q.5 Answer the following questions. (Any two)

1) Define metric space and prove that the set \mathbb{R}^n is metric space with metric

defined as $\varrho(x, y) = \left[\sum_{1=1}^{n} (x_i - y_i)^2\right]^{\frac{1}{2}}$ where $x = (x_1, x_2, ..., x_n), y = (y_1, y_2, ..., y_n) \in \mathbb{R}^n$

- **2)** Define open set and prove that if G_1 and G_2 are open in metric space *M* then $G_1 \cap G_2$ is also open. Also prove or disprove that arbitrary intersection of open set is open.
- **3)** Let (M, ϱ) be a metric space prove that a subset *A* of *M* is totally bounded if and only if every sequence of points in *A* contains a Cauchy subsequence.

08

		(-		STATISTICS (Statistica	Special P al Inferen	aper-XIII) ce–II		
Day Time	& Da [:] :: 03:(te: Mo 00 PM	nday, To 06	27-03-2023 6:00 PM		Max. Marks:	: 80	
Instr	ructio	ons: 1) 2) 3) 4)	All qu Figure Draw Use c	estions are compulse to the right indicate neat labelled diagram f log tables and calcu	ory. e full marks. ms whereve ılator is allo	r necessary. wed.		
Q.1	A)	Cho 1)	o se th Leve a) c)	e correct alternative I of significance is the Type I error Both (a) and (b)	e probability b) d)	of Type II error Cannot be determined	10	
		2)	Critic a) c)	al region provides us Acceptance No decision	the criteria b) d)	for of the null hypothesis Rejection None of these		
		3)	In a r of the a) c)	random variable X ha e following is a simple $\mu = 0$ $\mu > 0$	s $N(\mu, \sigma^2)$ hypothesis b) d)	where σ^2 is known, Then which $\mu < 0$ $\mu \neq 0$		
		4)	The (a) c)	choice of one tailed o Null hypothesis Both a) and b)	r two tailed b) d)	test depends on Alternative hypothesis None of these		
		5)	Pivot parai a) b) c) d)	al quantity used for c meter σ^2 in case of N Chi square distribution t distribution with $n d$ Chi square distribution F distribution.	onstructing $I(\mu, \sigma^2)$ dis on with $(n - f)$ on with $n df$	confidence interval for tribution (μ is known) follows. 1) df		
		6)	In SF a) b) c) d)	 In SPRT, decision about the hypothesis is taken a) After each successive observation b) After a fixed number of observations c) At least after five observations d) When the experiment is over. 				
		7)	Ordir a) c)	nary sign test Utilizes Poisson distribution Normal distribution	b) d)	Binomial distribution None of the above		
		8)	lf the poss a) c)	re are 10 symbols of ible number of runs is 8 10	two types o b) d)	f equal in number, the maximum 9 None of the above		
		9)	Neyn a)	nan – Pearson lemma Confidence interval	a provides. b)	Most powerful test		

d)

None of the above

c) Goodness of fit test

B.Sc. (Semester - VI) (New) (CBCS) Examination: Oct/Nov-2022

Seat

SLR-FZ-200

Set

Ρ

Page 1 of 3

No.

Page **2** of **3**

- 10) Randomness of a sequence through run test is decided by comparing the observed number of runs with
 - a) Z value
- b) T valued) None of the above
- c) Two critical values

B) Solve the following

- 1) LRT for equality of two population variances of normal distribution reduces to _____ test.
- 2) Range of likelihood ration test statistic is _
- 3) State True or False: if the length of confidence interval is zero, it gives point estimate.
- 4) Find 95% confidence interval for μ if random sample of size 64, is drawn from N (μ , 4) with sample mean = 3.
- 5) Hypothesis which specifies the population distribution is known as
- 6) Define "run" of nonparametric tests.

Q.2 Solve any eight of the following.

- a) Explain the term "Pivotal quantity".
- b) Define simple and composite hypothesis.
- c) Define probabilities of type I and Type II errors.
- d) Explain the use of Likelihood Ratio Test (LRT).
- e) What are the assumptions of non parametric tests?
- f) What are the critical values of SPRT tests?
- g) What is the test statistics for Wilcoxon's signed-Rank test?
- h) Define most powerful test.
- i) Define best critical region.
- j) How Kolmogorov Smirnov test is compared with chi-square test?

Q.3 A) Solve any two of the following.

- 1) Obtain 100 (1α) % confidence interval for the population mean μ , when random sample of size *n* is drawn from $N(\mu, \sigma^2)$ when σ^2 is unknown.
- 2) Based on a random sample of size *n* from $f(x, \theta) = \theta x^{\theta^{-1}} \theta < x < 1$ show that the best critical region (BCR) for testing H₀: $\theta = 1$ against

$$H_1: \theta = 2$$
 is $\prod_{i=1}^n x_i \ge 0$

3) Explain Mann – Whitney U test

B) A sample of size one from exponential distribution is drawn to test the hypothesis H₀: $\theta = 2$ against H₁: $\theta = 1$. The hypothesis H₀ is rejected if the observed value is greater than or equal to one. Find the probabilities of Type - I and Type - II errors.

Q.4 A) Solve any two of the following

- 1) Let $X_1, X_2 \sim N(\mu, 1) X_1, X_2$ are independent. Define $T = \sqrt{2} \left(\frac{X_1 + X_2}{2} \mu \right)$ is T a pivotal quantity.
- 2) Explain in short the sign test for paired sample.
- 3) Let X be a Bernoulli Variate with pmf $P(x, \theta) = \theta^x (1 \theta)^x, x = 0$ construct SPRT of strength (α, β) for testing $H_0: \theta = \theta_0$ against $H_1: \theta = \theta_1, (\theta_1 > \theta_0)$.
- **B)** Describe $100(1 \alpha)\%$ confidence interval for population proportion.

80

08

16

06

Q.5 Solve any two of the following

- a) State and prove Neyman Pearson lemma.
- **b)** Show that the likelihood ratio test leads to t-test for testing H_0 : $\mu = \mu_0$ against H_1 : $\mu \neq \mu_0$ ($0 < \sigma^2 < \infty$) in case of N (μ , σ^2) distribution where μ_0 is specified
- **c)** Based on a random sample of size *n* from $p(x, \lambda) = \frac{e^{-\lambda}\lambda^x}{x!} x = 0,1,2...$ show that the most powerful critical region of size not exceeding α for testing $H_0: \lambda = \lambda_0$ against $H_1: \lambda = \lambda_1$ is of the form $\bar{x} \leq A_{\alpha}$ if $\lambda_0 > \lambda_1$ and $\bar{x} > B_{\alpha}$ if $\lambda_0 < \lambda_1$

	-						
Seat No.						Set	Ρ
	B.S	c. (S	emester - VI) (GEOL Photog	New) (CBCS) .OGY (Specia geology & Re	Exa I Pa mote	mination: Oct/Nov - 2022 per - XIII) e Sensing	
Day & Time:	Date 03:0	e: Mor 0 PM	iday, 27-03-2023 To 06:00 PM			Max. Marks: 8	80
Instru	ctior	18: 1) 2) 3)	All questions are Draw neat labell Figures to right i	compulsory ed diagrams wh ndicate full mark	ereve s.	r necessary.	
Q.1	A)	Fill i 1)	the blanks by The shape of a p a) Rectangula c) Triangle	choosing corre bixel of an image r	e ct alt e can b) d)	e rnatives given below. only be: Circular Square	10
		2)	An image that sh a) Finer resolu b) Coarser res c) Moderate re d) None of the	nows finer details ution solution esolution e above	s is sa	aid to be of:	
		3)	Sand along river a) Black c) moderate	bank show	b) d)	one in the aerial photograph. Light Bright	
		4)	A unique reflecta as a) spectral sig c) spatial sign	ance pattern of in nature ature	ndivid b) d)	lual object on the earth is called optical sign signature	
		5)	In GIS vector for a) point c) polygon	mat, outcrop of	granit b) d)	e gneiss is represented by line all of these	
		6)	Which one of the imagery? a) spatial c) temporal	e following is NC	b) d)	ype of resolution of satellite spectral non-spatial	
		7)	a) Active c) Proximity	oduce its own e	nergy b) d)	source. Passive Ultrasonic	
		8)	The study of the using the aerial p a) Photointerp c) Photo resol	characters of th photograph is retation ution	e geo b) d)	ological features on earth surface Photogrammetry Photo reading	
		9)	Imaginary lines of 180 equally space a) Equatorial I c) Longitude	drawn parallel to ced section from ines	merie north b) d)	dian and divide the earth into to south are known as Prime meridian Latitudes	

		 10) The marks present at the centre of boarders of aerial photograph is known as marks. a) Fiducial b) Alluvial c) Triangular d) Principal 				
	B)	 Answer the following questions in one sentence. What is the scale of large-scale aerial photograph? List out any three types of information printed on aerial photograph. Which EMR has longest wavelength and smallest frequencies? What is the format of satellite imageries when used for GIS analysis? What processes includes pre-processing of digital images? What is IRS? 	06			
Q.2	Ans a) b) c) d) e) f) g) h) i)	swer any Eight of the following What is platform and its types? How many bands does LANDSAT ETM+ has? Give their spatial resolutions. What is spectral signature? How do you recognize sandstone from the aerial photographs? What is photogrammetry? What is mosaicking of aerial photographs? Why water appears black in IR or near IR region? What is pattern in aerial photographs? What are Indian Remote Sensing satellite series?				
Q.3	A)	 Attempt any Two of the following. 1) Describe simple pocket stereoscope. 2) What are the factors affecting aerial photography? 3) What are types of passive sensors? 	10			
	B)	Describe various information printed on the aerial photographs.	06			
Q.4	A)	 Attempt any Two of the following. 1) Describe vector data model. 2) Describe multispectral sensors. 3) Explain atmospheric windows. 	80			
	B)	Describe components of GIS.	80			
Q.5	Atte a) b)	mpt any Two of the following. Explain various errors in flying. Describe image preprocessing.	16			

c) Describe various resolutions in satellite images.

Seat	
No.	

B.Sc. (Semester - VI) (New) (CBCS) Examination: Oct/Nov-2022 MICROBIOLOGY (Special Paper-XIII) Microbial Genetics

Rewrite the following sentences by selecting correct answers from

Day & Date: Monday, 27-03-2023 Time: 03:00 PM To 06:00 PM

Q.1

A)

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Draw neat labelled diagrams wherever necessary.

given alternatives. dye is used for visualising DNA in electrophoresis. 1) Methylene blue Ethidium b) a) c) Giemsa's statin d) ZNCF Semiconservative mode of DNA replication was firstly shown by _____. 2) a) Watson and Crick b) Griffith c) Meselson and Stahl Wilkinson d) 3) of Transcription is the work of sigma factor. a) Initiation Elongation b) c) Fragmentation d) Termination is an example of homology and similarity tool. 4) a) PROSPECT RASMOL b) **BLAST** c) EMBROSS d) Circular DNA without any helical coiling is called 5) DNA. a) Relaxed Supercoiled b) d) Nonhelixed c) Uncoiled The computational methodology that tries to identify the best matching 6) between two molecules, a ligand and receptor are known as molecular a) Checking b) Docking d) Matching c) Fitting 7) Gel electrophoresis separates nucleic acid molecules based on their a) Charge b) Chemical nature c) Molecular weight d) Size of the molecules RNA dependent DNA polymerase enzyme is also known as . 8) a) Reverse transcriptase **RNA** primase b) c) DNA primase d) **DNA** synthatase types of deoxynucleoside triphosphates are used in Sanger 9) sequencing. 3 a) 2 b) 5 c) 4 d)

Max. Marks: 80

10

Set F

		 10) is responsible for switching on and off the lac operon. a) Lactose b) Glucose c) Galactose d) Beta Galactosidase 					
	B)	 Fill in the blank. Folded fiber model of chromosome was proposed by in 1965. Observable characters of organisms are called Electrophoresis technique was developed by Alec Jeffrey developed technique. enzyme separates the two strands of DNA during replication. The process of formation of RNA from DNA is known as 	06				
Q.2	Solv a) b) c) d) e) f) g) h) i) j)	 In which year Human Genome Project was started? What is meaning of Leading strand in DNA replication? What is meaning of Blotting in molecular biology technique? Define Auxotrophs. Give the two examples of restriction endonucleases. What is data mining? What is full form of EMBL. What is function of DNA ligase enzyme? What is function of O gene in Lac Operon? . How DNA can be useful tool in the forensic applications? 					
Q.3	A)	 Attempt any two of the following. 1) Write note on Protein Data Bank. 2) Write note on Post transcriptional modifications. 3) Describe in detail Lac Operon. 	10				
	B)	Give in detail applications of Genetic engineering.	06				
Q.4	A)	 Attempt any two of the following 1) Describe in brief Electrophoresis of DNA. 2) Describe in detail Cis-Trans test. 3) Give the concept and applications of Protein Engineering. 	08				
	B)	Describe in detail structural organisation of E.coli chromosome.	08				
Q.5	 Attempt any two of the following. a) Discuss in detail major bioinformatics resources on Internet and their applications. 						
	b)	Describe in detail Tools and Techniques of Genetic Engineering.					

c) Describe in brief DNA sequencing and Fingerprinting.

Seat No.								Set	Ρ
	B.S	c. (S	emes	ter - VI) (I ELECTF	New) (CBCS CONIC (Spec Power Elec	6) Exa cial P ctroni	mination: Oct/No aper – XIII) cs	ov - 2022	
Day 8 Time:	& Dat 03:0	e: Moi 0 PM	nday, 1 To 06	27-03-2023 :00 PM				Max. Marks	: 80
Instru	uctio	ns: 1) 2) 3) 4)	All qu Draw Figur Use c	lestions are neat labelle es to the rig of log table a	compulsory. d diagram wh ht indicate full and calculator	enever marks is allow	necessary ved.		
Q.1	A)	Fill i 1)	n the a) c)	blanks by c is used to Circuit bre Equalizing	choosing corr protect SCR f aker circuit	r ect alt rom hig b) d)	ernatives given bel gh dv/dt. Fuse Snubber circuit	ow.	10
		2)	Reve a) c)	rse recovery storage ch PIV	y current depe arge	nds on b) d)	Temperature forward current		
		3)	In coi a) c)	ntrolled recti forced line	ifier cor	mmutat b) d)	ion is used. load all of these		
		4)	The b a) c)	ouried gate i GTO SCR	s fabricated in	b) d)	SIT PUT		
		5)	a) c)	is program Gate volta Anode volt	nmable param ge tage	eter in b) d)	PUT. Load current Cathode voltage		
		6)	a) c)	_ circuits are UPS SMPS	e operated wit	h highe b) d)	er frequency. Inverters None of these		
		7)	In SC a) c)	R based se Class B Class A	ries inverter _	c b) d)	ommutation is used. Class C Class F		
		8)	lf the powe a) c)	firing angle r delivered t very less less	of the controll to the load is _	ed rect b) d)	ifier is small then the more all of these	average	
		9)	In SI ⁻ a) b) c) d)	F the curren both major only minor only major none of the	t will flows due rity and minorit ity charge can ity charge can ese	e to ty char riers riers	ge carriers		
		10)	The c a) c)	levice that e GTO IGBT	exhibits negativ	ve resis b) d)	stance property like L SIT PUT	JJT is	

	B)	 Answer the following questions in one sentence. 1) Define batching current. 2) Define reverse recovery time of power diode. 3) Define the function of drift layer of power devices. 4) Define threshold voltage of power MOSFET. 5) Define commutation of the SCR. 6) Define holding current. 	06
Q.2	Ans a)	wer any Eight of the following State the concept of $\frac{dv}{dt}$ triggering	16
	b) c) d) e) f) g) h) i)	State effect of reverser recovery time of power diode. State different triggering methods of SCR. Give the principle of phase control. Explain the need of heat sink in case of power devices. State the advantages and disadvantages of SCR. Give the classification of the Inverters. Define firing angle and conduction angle of SCR. Draw constructional diagram of Power MOSFET. Draw the circuit diagram of Class D commutation technique.	
Q.3	A)	 Attempt any Two of the following. 1) With suitable constructional diagram explain working of SIT. 2) With suitable waveforms explain action of single phase full wave controlled rectifier with resistive load. 3) With suitable circuit diagram explain working of flasher circuit using SCR. 	10
	B)	Explain the action SCR firing by using UJT.	06
Q.4	A)	 Attempt any Two of the following. 1) With suitable circuit diagram explain action of emergency lighting system by using SCR. 2) Explain working principle of transistorized inverter circuit. 3) With suitable diagram give the switching characteristics of Power MOSFET. 	08
	B)	With suitable constructional diagram explain turn on and turn off process of GTO.	08
Q.5	Atte a) b) c)	Explain working of Class C commutation of SCR with suitable waveforms. With suitable constructional diagram explain working principle of IGBT. With suitable waveforms explain the action of single phase half wave controlled rectifier with inductive load and state the significance of free	16

wheel diode.

SLR-FZ-204 Seat Set Ρ No. B.Sc. (Semester - VI) (New) (CBCS) Examination: Oct/Nov-2022 **COMPUTER SCIENCE (Paper- XIV)** Web Technology Max. Marks: 80 2) Figures to the right indicate full marks. 3) Draw neat labelled diagrams wherever necessary. 4) Use of log table or calculator is allowed. Multiple choice questions. 10 The are stores small amount of data in the form of text file 1) on client machine. a) Session b) Cookies d) Hidden field c) Application The process in which a web page sends data to the another page 2) on the server is called as b) PostBack a) AutoPostBack c) CrossPagePosting d) IsPostBack By default authentication type of ASP.Net is . 3) a) Passport b) Form c) Windows d) File A Control does not have the Click and Command events. 4) a) Hyperlink b) Link Button c) Image Button d) Command Button The control has a in-built support for Sort, Filter and 5) paging the Data. a) DataList b) Repeater c) FormView d) DataGrid The _____ method executes the command and returns the 6) number of rows that were affected.

- b) ExecuteScaler a) ExecuteNonQuery
- c) ExecuteReader d) ExecuteQuery
- The _____ property o Tree View control is used to show 7) checkboxes for nodes.

 - a) DisplayCheckBoxesb) ShowCheckBoxesc) AssignCheckBoxesd) CheckBoxes

Day & Date: Monday, 27-03-2023

Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.

Q.1 A)

		8)	The property of Compare Validator control is used to compare with constant value.a) ConstantToCompareb) ControlToComparec) ValueToCompared) ConstantValueToCompare				
		9)	The method removes all rows from all tables in the DataSet: a) Clear () b) Del () c) Delete () d) Remove ()				
		10)	Timer control has event. a) Timer_Time b) Timer_Tick c) Timer_Click d) Timer_Execute				
	B)	Fill i 1) 2) 3)	Fill in the Blanks. I) By default value for is valid property is 2) Every Ajax control must be included in control. 3) Every ASP.Net website contains number of Global.asax				
		4) 5) 6)	Every master page has directive. The ImageMap control has hotspots. The import directive has only attribute.				
Q.2	Ans ⁵ 1) 2) 3) 4) 5) 6) 7) 8) 9) 10)	wer ti Wha Wha appli Wha Wha Wha Give Wha	he followings (Any Eight): t is a connection string? t is IsPostback? Give example. t is Namespace? List at least 4 namespaces used in a database ication. t is the use of custom validator control? t is timer control? Give example. t are the types of ASP.Net tracing? Explain each in one line. t is the use of themes? Explain how to create it. t are the different types of lists used in ASP.Net? the regular expression for validating pin code number and email id. t are different events available in Global.asax file?	16			
Q.3	A)	Ans ¹ 1) 2) 3)	wer the followings (Any two): What are nested master pages? Explain event ordering in master pages. What is site navigation? Explain the SiteMap file and SiteMapPath control with example. What is Ajax? Explain the Server-side and client-side architecture of Ajax.	10			
	B)	Wha Expl	t is the use of \ App_GlobalResources and \App_Local Resources? ain with an example.	06			

Q.4 A) Answer the followings (Any two):

- 1) Design a web page that demonstrates at least 10 advertisements using AdRotator control.
- 2) What are the advantages and disadvantages of client-side and server-side validations? Explain Validation summary control and IsValid property with an example.
- 3) Design a web page that displays 10 friends' birthdays in the calendar control.
- B) Design a web page that inserts, selects, and updates records.

Q.5 Answer the following (Any Two).

- a) What is directives used in ASP.Net? Explain each directive in detail.
- **b)** What is the state management technique? Explain server side state management with example.
- c) What is Authentication & Authorization? Explain role management in details.

08

80

В.	Sc. (Se	mester - VI) (New) (CE PHYSICS (Material	BCS) Examination: Oct/Nov-2022 Paper – XV) s Science	
Day & D Time: 03	ate: Moi 3:00 PM	nday, 06-02-2023 To 06:00 PM	Max. Marks	: 8
Instruct	ions: 1) 2) 3) 4)	All questions are compulso Figures to the right indicate Neat diagrams must be dra Use of log table or calculat	ory. e full marks. awn wherever necessary. tor is allowed.	
Q.1 A) Cho 1)	ose the correct alternative The reciprocal of conductive a) resistivity c) dielectric strength	es from the options. vity is b) capacity d) inductivity	1
	2)	Applied force per unit cros a) strain c) creep	s-sectional area of a body is called b) stress d) ductility	-
	3)	polymer is prepared a) PVC c) Starch	d by condensation polymerization. b) Nylon 66 d) Teflon	
	4)	Bakelite is obtained by rea a) Phenol c) ethane	iction of formaldehyde with b) styrene d) urea	
	5)	Thermal conductivity of cea) greater than metalc) infinity	ramics is b) zero d) less than metal	
	6)	Ceramics normally exhibit a) sort c) brittle	nature. b) hard d) elastic	
	7)	The combination of two or properties from constituent a) Polymer c) composite	more materials which have different t materials are called b) crystalline d) amorphous	

Seat No.

SLR-FZ-205

Set Ρ

30

- The strength of composite is 8)
 - a) low b) high
 - d) infinite c) zero

When grain size reduces to nanoscale, then the material becomes 9)

a) soft

- b) elastic
- c) plastic d) stronger and harder

10) Sol-Gel is _____ method of synthesis of nanomaterials.

- b) Hybrid
 - a) Physical c) Chemical
- d) Electrical

B) Fill in the Blanks.

06

16

10

- Time dependent permanent deformation is called _____ 1) Polymers are long chain organic macromolecules having 2)
- as a common element in their structure. The materials which finds application in the field of medicine are 3) called
- The tanning operations on skin of animal produces . 4)
- technique is used to determine the crystal structure of 5) material.
- 1 nanometer = meter. 6)

Q.2 Answer the followings. (Any Eight)

- Define the terms (i) hardness (ii) fatigue 1)
- Calculate the conductivity of copper having resistivity $18 \times 10^{-9} \Omega cm$. 2)
- What is degree of polymerization? 3)
- Define polymerization mechanism. 4)
- Give any two examples of ceramics. 5)
- Write any two applications of composite materials. 6)
- What is biomechanism? 7)
- Give any two examples of biomaterials. 8)
- Explain the term deposition. 9)
- **10)** Give two Properties of nanomaterials.

Q.3 Answer the followings (Any two): A)

- Explain classification of materials in detail. 1)
- What is homo-polymer and co-polymer? Give three applications 2) of polymers.
- Explain Co-precipitation method of nanomaterial synthesis. 3)
- What is ceramics? Explain Rock Salt (NaCI) structure with suitable 06 B) diagram.

Q.4	A)	Answer the followings (Any two):				
		1) Explain electric and magnetic properties of materials.				
		2) Give four applications of polymers.				
		 Describe Chemical vapour deposition method of synthesis of nanomaterials. 				
	B)	Give four properties and four applications of biomaterials.				
Q.5	Answer the following (Any Two).					
	a)	Explain steps of ceramic processing. Give properties and applications of ceramics.				
	b)	Explain fiber-reinforced composites. Give five properties of composites.				

c) What is Bottom-up and Top-down approaches. Explain chemical vapors deposition method of synthesis.

SLR-FZ-206 Set

B.Sc. (Semester - VI) (New) (CBCS) Examination: Oct/Nov - 2022 **CHEMISTRY (Special Paper- XIV) Inorganic Chemistry**

Day & Date: Monday, 06-02-2023 Time: 03:00 PM To 06:00 PM

1)

9)

Seat

No.

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Neat diagrams must be drawn wherever necessary.
- 4) Use of log table or calculator is allowed.

Q.1 A) Choose the correct alternatives from the options.

- All lanthanides show a common and stable oxidation state.
 - a) +1 b) +2 c) +3 d) +4

2) is the most suitable method to prepare transuranic elements.

- a) Accelerated projectile bombardment
- b) Heavy ion bombardment
- c) Neutron bombardment
- d) Proton bombardment

Bonding in metal is properly explained by _____ theory. 3)

- a) Valence bond b) Molecular orbital (band)
- c) Crystal field d) Ligand field
- Electrical conductivity of metal with rise in temperature. 4) a) Decreases
 - b) Increases
 - c) remains same d) first decreases then increases
- Borazine is isoelectronic with 5)
 - a) pyridine b) diborane
 - c) benzene d) borax

is electron deficient molecule. 6)

- a) C_2H_6 b) B_2H_6
- c) C_6H_6 d) $B_3N_3H_6$
- is essential for corrosion. 7)

c) square planer

- a) solid b) gas
- d) water c) liquid
- Metal becomes passive because a layer is produced on its 8) surface.
 - a) Hard b) Soft c) Protective d) Non-transparent

 - Nickel carbonyl has _____ structure. a) Tetrahedral
 - b) Octahedral
 - d) trigonal bipyramidal

Max. Marks: 80

Ρ

06

16

10)	Methyl	lithium contains	sb	ond.
-----	--------	------------------	----	------

- a) (4C-1e) b) (4C-2e)
- c) (4C-3e) d) (4C-4e)

Q.1 B) Give the definitions of the following.

- 1) Transuranic elements
- 2) Semiconductors
- 3) Metallic bond
- 4) Noble gases
- 5) Passivity
- 6) Organometallic compounds

Q.2 Answer the followings (Any Eight):

- 1) Name the Cerium and Yttrium group minerals.
- 2) What are lanthanides and actinides? Why are they called f block elements?
- 3) Explain why YBa₂Cu₃O₇ is called as 123 superconductor.
- 4) Give applications of semiconductors (any four).
- 5) Distinguish between Diborane and Ethane.
- 6) XeF₂ is a linear molecule. Why?
- 7) Mention the factors affecting corrosion.
- 8) What are passivators? Give the different types of passivators.
- 9) What are carbonyls? Give their classification with suitable example.
- 10) What is type of hybridization in Fe(CO)₅.

Q.3 A) Answer the followings (Any two): 10 Explain ion exchange method for separation of lanthanides. 1) Give the structure of P₄O₁₀ 2) 3) Explain oxide film theory of passivity. How the solids are classified as conductors, semiconductors and 06 B) insulators on the basis of band theory. Q.4 A) Answer the followings (Any two): 08 Give the synthesis and structure of dimethyl beryllium. 1)

- 2) Mention general methods of preparation of transuranic elements. Explain heavy ion bombardment method.
- 3) Explain the bulk separation method of lanthanides.
- B) What is corrosion? Explain it with electrochemical theory. Mention the methods of protection of metals from corrosion.

Q.5 Answer the following (Any Two).

- a) Give the names, symbols, atomic numbers and electronic configuration of Lanthanons.
- b) What are types of semiconductors? Explain n-type and p-type semiconductors.
- c) Discuss in detail the structure of diborane.

No.						Set	۲
	B.Sc. (S	Seme	ester - VI) (New) (CBCS) BOTANY (Special I Plant Biotech	Exar Paper nolog	nination: Oct/No [·] – XIV) IV	ov-2022	
Day & Time	& Date: Mo : 03:00 PM	nday To 6	, 06-02-2023 :00 PM	-	-	Max. Marks	3: 80
Instru	uctions: 1) 2) 3) 4)) All q) Figu) Use) Drav	uestions are compulsory. Ires to the right indicate full m of logarithmic table and calcu w neat labelled diagrams whe	arks. ulator is rever r	s allowed. necessary.		
Q.1	Fill in the 1)	blan Sou	thern blotting technique used	for det	es given below.		16
		a) c)	Protoplast	(d	Cells		
	2)	Prim a) c)	ner is Gene Complementary sequence	b) d)	Chromosome RNA		
	3)	a) c)	among the following is ha Anther Callus	iploid c b) d)	culture. Meristem Protoplast		
	4)	a) c)	called as molecular glue. Polymerase Ligase	b) d)	Endonuclease None		
	5)	a) c)	method is used for gene t Microinjection Agrobacterium mediated	transfo b) d)	rmation in plants. electroporation cobalt chloride		
	6)	a) c)	used for detection of DNA Ehidium bromide Agarose	A in ele b) d)	ctrophoresis. Tris HCL Both b & c		
	7)	a) c)	is thermostable enzyme. Endonuclease Phosphotase	b) d)	Taq polymerase None		
	8)	a) c)	is complementary sequer TACCGTTAC TAACATGTA	nce of / b) d)	ATTGTACAT. TAATGACAC CATTGACC		
	9)	a) c)	application of pcr. Amplification of DNA Quantification	b) d)	Detection of DNA Hybridization		
	10)	a) b)	enzyme used to cut the D Restriction endonucleases ty Restriction endonucleases ty	NA at ype II ype III	site of recognition.		

- c) Restriction endonucleases type I
- d) None

Seat

Set P

- 11) Vectors are isolated from _____.
 - Bacteria b) Cytoplasm a)
 - Plants C) Genome d)
- 12) antibiotic resistant sites are present on vector.

Amphicylin a)

Both a & b All antibiotics C) d)

b)

Tetracyclin

Indirect propagation

Multiplication

- temperature of denaturation step. 13)
 - 4° 95° a) b) C) 100°
 - 70° d)
- Cosmid shows presence of _____ site.
 - a) COS Site b) TDNA site
 - DNA site C) d) None
- media used in Tissue culture. 15)
 - MS media PDA a) b)
 - Nutrient Agar Specialized C) d)

In tissue culture the plants produce without callus formation is called 16) as

b)

d)

- Direct propagation a)
- Both a & b C)

Q.2 Answer any four of the following.

- Define R-DNA Technology. a)
- b) Write a note on PBR 322.
- Applications of anther culture. C)
- Somatic hybridization. d)
- Restriction endonucleases. e)
- Applications of Recombinenet DNA technology. f)
- Denaturation step in PCR. g)
- Function of ligase. h)
- Define callus. i)
- What is DNA library? i)

Q.3 A) Write short notes on any two of following. 12 1) What are the properties of good vector & describe Agro bacterium as vector? 2) Give the process of golden rice. 3) Describe role of enzymes involved in R-DNA Technology. Write short notes on. 04 B) Describe the process of northern blotting.

Q.4 Answer any two of the following.

- Write a note on Southern bloating. a)
- b) Role of Biotechnology in agriculture.
- Describe methods of gene transformation. C)

Answer any two of the following. Q.5

- Describe in detail the process of PCR. a)
- Describe process of protoplast isolation. b)
- Describe the process of micropropagation along with its types. C)

16

16

Sea	t						Set	. [П
No.							5 et		Γ
E	3.Sc.	(Se	mester - Z	VI) (New) (CBC 2OOLOGY (Spec Evolutionar	S) E ;ial 'y E	Exar Pap Biol	mination: Oct/Nov - 20 per- XIV) ogy	22	
Day a Time	& Dat : 03:0	e: Mo 0 PM	nday, 06- To 06:00	02-2023 PM			Max. Ma	ŕks	s: 80
Instr	uctio	ns: 1) 2 3) All quest) Draw ne) Figures	ions are compulsory at labeled diagrams to the right indicate t	/. whe full n	ereve nark	er necessary. s.		
Q.1	A)	Cho 1)	ose the c The force a) Varia c) Extin	orrect alternatives that initiates evolut ation ction	fror ion i	n the is b) d)	e options. Mutation Adaptation		10
		2)	The earli a) Cam c) Quat	est geological time p brian ernary	peric	od an b) d)	nong the following is Jurassic Permian		
		3)	Observate evolution a) Anda c) Gala	ion of species on aman pogos	b) d)	isla Nice Fier	nd inspired Darwin's theory obar o	of	
		4)	a) Seyn c) Lobe	as considered as a r nouria fish	niss b) d)	ing li Arc Per	nk between reptiles and bird heopteryx ipatus	ls.	
		5)	On the O a) Char c) Char	rigin of Species was les Babbage les Darwin	s wri b) d)	tten De Lan	by Vries narck		
		6)	During ev many mil a) 2000 c) 4000	volution, the first cell lion years?	lular b) d)	form 300 500	n of life appeared before how 0 0	V	
		7)	The stud a) Foss c) Geol	y of fossils is ology ogy	 b) d)	Pal Zoc	eontology ogeology		
		8)	The conr a) Aust c) Hom	necting link ancestor ralopithecus o erectus	of h	uma b) d)	ins and ape is Homo habilis Homosapiens		
		9)	Chief age a) muta c) acqu	ent of evolution tion ired characters		b) d)	natural selection sexual reproduction		

10)	Golden age of reptiles
-----	------------------------

- a) coenozoic era
- b) Proterozoic era d) Psychozoic era c) Mesozoic era

Q.1	B)	 All in the blank/Definition/One sentence answer/ One word answer/ Give the name/Predict the product etc. 1) Gene pool 2) Mutation 3) Variation 4) Evolution 5) Migration 6) Extinction 	06
Q.2	Ansv 1) 2) 3) 4) 5) 6) 7) 8) 9) 10)	wer the followings (Any Eight): Homosapiens Chemogeny Molecular evolution Natural selection Cline Species Isolation RNA world Genetic drift Mass extinction	16
Q.3	A)	 Answer the followings (Any two): 1) Evolution of eukaryotes 2) Adaptive radiation 3) Give sources of variations 	10
	B)	Write Short note on Darwinism.	06
Q.4	A)	 Answer the followings (Any two): 1) Lamarckism 2) Types of fossils 3) Organic evolution 	80
	B)	Describe and derive equation for Hardy Weinberg law.	80
Q.5	Ansv a) b) c)	wer the following (Any Two). Describe Neo-Darwinism. Explain geological time scale with reference to eras. Explain different modes of speciation.	16

	В.\$	Sc. (\$	Semester - VI) (New) (CB Mathematics (Sp Numerical	CS) Exa ecial P Analy:	amination: Oct/Nov-2022 aper- XIV) sis	
Day Time	& Date : 03:0	e: Mo 0 PM	onday, 06-02-2023 To 06:00 PM	-	Max. Marks:	80
Instr	uctio	ns: 1) 2) 3)	All questions are compulsory. Figures to the right indicate ful Use the scientific calculators a	l marks. re allowe	ed.	
Q.1	A)	Cho	oose the correct alternative fo	or each o	of the following.	10
		1)	Find $\nabla^2 y_8 = ___$ a) $y_8 + 2y_7 + y_6$	b)	$y_8 - 2y_7 + y_6$	
			c) $y_{10} - 2y_9 + y_8$	d)	$y_{10} + 2y_9 + y_8$	
		2)	$If \Delta^2(ab^{cx}) = \underline{\qquad}$	L	$(1 A)^2 \downarrow CY$	
			a) $a(b^c - 1)^2 b^{cx}$ c) $a(b^c + 1)^2 b^{cx}$	d)	$a(b-1)^{c} b^{cx}$	
			c) $u(b^2 + 1)^2 b^{22}$	u)	$u(b-1)^{*}b^{**}$	
		3)	If $\left(E^{1/2} + E^{-1/2}\right) \left(1 + \Delta\right)^{1/2} =$			
			a) $\Delta + 1$ c) $\Delta - 2$	b) d)	$\Delta - 1$ $\Lambda + 2$	
		4)	() <u>Γ</u> If Λ∇ =	ч)		
		.,	a) δ	b)	μ	
			c) δ^2	d)	μ^2	
		5)	The solution of $y_{n+2} - 4y_n =$	0 such tl	hat $y_0 = 0, y_1 = 2$ is	
			a) $y_n = (2)^n - (-2)^n$	D)	$y_n = (2)^n + (-2)^n$	
		6)	c) $y_n = (2)^n - (-2)^n$	a) 5	$y_n = (2)^n + (-2)^n$	
		6)	The particular integral of u_{n+2} 4^n	$2 - 5u_{n+2}$	$\begin{array}{c} _{1}+6u_{n}=4^{n} \\ 4^{n} \end{array}$	
			a) $-\frac{1}{2}$	b)	$\frac{1}{2}$	
			n^4	d)	n^4	
			$\frac{1}{2}$	u)	2	
		7)	If $y_{x+2} y_x = y_{x+1}^2$ put $\frac{y_{x+1}}{y_x} = 0$	U_x then U	$J_x = $	
			a) $U_x = c_1 (-2)^x$	b)	$U_x = c_1 \ (2)^x$	
			c) $U_x = c_1 (1)^x$	d)	$U_x = c_1 \ (-1)^x$	
		8)	Gauss backward interpolation	n formula	a is used interpolate value of y	
			a) $0 < P < 1$	b)	$0 < P < \alpha$	
			c) $-1 < P < 0$	d)	$-\alpha < P < 0$	

SLR-FZ-209

Set P

- Interpolation is the technique of estimate the values of a function for 9) any_
 - a) Intermediate value of function
 - b) Intermediate value of variable
 - c) Intermediate value of constant
 - d) Both (a) and (b)
- 10) In Trapezoidal rule, the function y = f(x) is take to be
 - a) Straight line b) Ettipes Circe
 - c) Parabola d)

B) Fill in the blank of the following.

- 1) The solution of $6y_{n+2} + 5y_n 6y_n = 0$ is _____
- 2) Using forward differences, the formula for $f'(\alpha) =$
- 3) Gauss forward interpolation formula is used to interpolate value of y for
- 4) $\Delta^{\dot{r}} y_k$ in terms of backward differences _____.
- 5) If $f(x) = 3x^3 2x^2 + 1$, then $\Delta^3 f(x) =$ _____.
- 6) The value of $E^{-1}\nabla =$ ____ in difference

Q.2 Solve any Eight of the following.

- Using Newton's forward interpolation formula find $\frac{dy}{dx}$ a)
- b) Find cos(1.74) from the following table.

<i>x</i> :	1.7	1.74	1.78	1.82	1.86
$\sin x$:	0.9916	0.9857	0.9781	0.9691	0.9584

- Prove that $\Delta = E \nabla = \nabla E$ C)
- d) Prove that $\Delta(n_{c_{r+1}}) = n_{c_r}$
- Find the missing y_x values from the first difference provided e)

y_x :	0	-	-	I	-	-
Δy_x :	0	1	2	4	7	11

- With usual notation prove that $E = e^{hD}$ **f**)
- Solve $y_{n+1} 2y_n \cos \alpha + y_{n-1} = 0$ g)
- Solve $u_{n+2} 4u_{n+1} + 4u_n = 2^n$ h)
- Find the polynomial f(x) by using Lagrange's formula i)

<i>x</i> :	0	1	2	5
f(x):	2	3	12	147

Find the difference table for the following data j)

Marks :	30-40	40-50	50-60	60-70	70-80
No. of students :	31	42	51	35	31

Q.3 A) Attempt any two of the following

- Find the difference equation corresponding to the family of curves 1) $v = ax + bx^2$
- 2) Find the cubic polynomial which takes the following values

<i>x</i> :	0	1	2	3		
f(x): 1 2 1 10						

Hence find the value f(4)

Evaluate (i) $\Delta^2(\frac{5x+2}{x^2+5x+6})$ (ii) prove that $\Delta^3 y_2 = \nabla^3 y_5$ 3)

10

Page 2 of 3

16

State and prove Simpson's one third rule, and hence evaluate B)

take h = 0.25

Q.4 A) Attempt any two of the following

- Prove that usual notation $\mu = \frac{2+\Delta}{2\sqrt{1+\Delta}} = \sqrt{1 + \frac{1}{4}\sigma^2}$ 1)
- For what values of *x*, *y* is minimum for the following table 2)

x	c:	3	4	5	6	7	8
J	/:	0.205	0.240	0.259	0.262	0.250	0.224
			-				

3) Solve
$$y_{n+2} - 4y_n = n^2 + n - 1$$

B) State and prove Newton's forward interpolation formula.

Attempt any two of the following. Q.5

a) Evaluate
$$\int_{0}^{1} \frac{d_x}{1+x^2}$$
 using

- 1)
- Trapezoidal rule taking $h = \frac{1}{4}$ Simpson's $\left(\frac{1}{3}\right)^{rd}$ rule taking $h = \frac{1}{4}$ 2) 3) Simpson's $\left(\frac{3}{8}\right)^{th}$ rule taking $h = \frac{1}{6}$
- b) Solve

1)
$$y_{x+2}^2 - 3y_{x+1}y_x + 2y_x^2 = 0$$

2)
$$y_{n+2} - 2\cos\alpha \cdot y_{n+1} + y_n = \cos\alpha n$$

State and prove Lagrange's interpolation formula. C) 1)

2) A curve pass through the points (0,18,), (1,10), (3,-18) and (6,90)find the slope of the curve at x = 2

06 $\int \frac{1}{1+x^3} d_x$

SLR-FZ-209

08

08

	В.	Sc. (Sem	ester - VI) (New) (C STATISTICS (S Probabi	BCS) Ex Special P lity Thec	amination: Oct/Nov-2022 Paper-XIV) ory	
Day Time	& Da e: 03:	ate: Mo 00 PN	onday /I To 0	, 06-02-2023 6:00 PM		Max. Marks:	80
Inst	ructio	ons: 1 2 3 4) All c 2) Figu 3) Dra 4) Use	uestions are compulsor ures to the right indicate w neat labelled diagram of log table and calcula	ry. full marks is whereve ators is allo	s. er necessary. owed.	
Q.1	A)	Sele 1)	ect the A se a)	e most correct alternat equence $\{X_n\}$ is said to $\lim_{x \to \infty} P[X_n - X] = 0$	t ive. converge i b)	n quadratic mean to X if $\lim_{x \to \infty} P[X_n - X]^2 = 0$	10
			C)	$\lim_{x \to \infty} E X_n - X ^2 = 0$	d)	None of these	
		2)	A st a) c)	ate i is absorbing state i Pii = 1 both a and b	if b) d)	Pij = 0, for all $j \neq i$ neither a nor b	
		3)	lf a the a) c)	random sample of size r distribution of first order $\beta_2(1,n)$ U(0,1)	n is drawn statistic is b) d)	from U(0,1) distribution then s identical to $\beta_1(1,n)$ None of these	
		4)	In M ther a)	$I/M/1: \infty$ / FIFO model, e are <i>n</i> customers in the ϱ^n	if ϱ is traff e system is b)	fic intensity, probability that s $1-\varrho^n$	
		5)	c) Whi a) c)	$\varrho^{\mu}(1-\varrho)$ ch of the following is an sample median sample mode	d) order stat b) d)	<i>ϱ</i> (1 − <i>ϱ</i>) tistic? sample mean both a & b	
		6)	In a a)	Markov chain state <i>j</i> is Pji ⁽ⁿ⁾ > 0, n \ge 1	said to be	e accessible from state <i>i</i> if) $\operatorname{Pij}^{(n)} > 0, n \ge 1$	
		7)	c) A st a) c)	Pij ⁽ⁱⁱ⁾ = 0, n ≥ 1 ate <i>i</i> is said to be transit 1 0	a ent if ultim b) d)) Pıj = 0 ate return to it has probability) < 1) Either a or c	
		8)	A qı rela a)	ueue length will be finite tion $\lambda = 0.75 \ \mu$	if arrival r	rate λ and service rate μ have) $\lambda > \mu$	
		9)	c) Cor a) b) c)	$\lambda = 0.50 \ \mu$ avergence in quadratic n convergence in probation convergence in distribu- convergence in normality	d) nean impli oility ution I distributio) λ#μ es on	

Seat No.

- Set Ρ

(

- ormal distributio
- d) none of these

- While deriving the pdf of k^{th} order statistic we use concept of _____. 10)
 - multinomial distribution uniform distribution b)
 - both a and b C)
- d) neither a nor b

Attempt the following. B)

a)

- State the p.d.f. of nth order statistic. 1)
- Define convergence of a sequence of random variables in probability. 2)
- Define transition probability matrix. 3)
- In M/M/1 : ∞ /FIFO model if arrival rate is λ & service rate is μ , what 4) is the probability that the server is idle?
- Define stochastic process. 5)
- Define convergence of sequence of random variables in guadratic 6) mean to a random variable.

Q.2 Solve any eight of the following.

- If λ (arrival rate) = 12 per hour and μ (service rate) 15 per hour in M/M/1 a) model then find average length of queue of the system.
- It is known that customers arrive at a rate of 10 per hour and service rate is b) 12 customers per hour, then according to M/M/1 model, find the expected waiting time of customer in the queue.
- For a Markov chain $\{Xn, n \ge 0\}$, $P^0 = (0.5 \ 0.5)$ and C)

$$P = \begin{bmatrix} 0 & 1 \\ 1 & 2/3 \\ 3/4 & 1/4 \end{bmatrix}$$

 $P = {0 \ 1} \begin{bmatrix} 1/3 & 2/3 \\ 3/4 & 1/4 \end{bmatrix}$ Obtain P(X₂ = 0 | X₀ = 0)

- **Define Markov Chain?** d)
- Let X_1, X_2, \dots, X_n be a random sample from U(0,2). Find the p.d.f of e) minimum (X_1, X_2, \dots, X_n) .
- In usual notation write down the joint p.d.f. of (Yr, Ys), (r < s)f)
- State weak law of large numbers for i.i.d. random variables. g)
- Define convergence of a sequence of random variables in distribution. h)
- Define communicative states. i)
- State the conditions for existence of W.L.L.N. i)

Q.3 A) Attempt any two of the following.

1) Let {Xk} be a sequence of i.i.d. random variables with mean μ and finite variance σ^2 .

Let $S_n = X_1 + X_2 + \ldots + X_n$. Test whether W.L.L.N. holds good for this sequence.

- 2) Let $Y_1 < Y_2 < Y_3 < Y_4 < Y_5$ be a order statistic with respect to a random sample of size 5 from $exp(\theta)$ distribution. Find the distribution of sample median.
- What do you mean by 3)
 - balking i)
 - ii) reneging
 - iii) jockeying with respect to queuing process.

06

16

08

16

B) Consider the Markov chain with three states {1,2,3}, that has the following transition matrix. **06**

 $\mathbf{P} = \begin{bmatrix} \frac{1}{2} & \frac{1}{4} & \frac{1}{4} \\ \frac{1}{3} & 0 & \frac{2}{3} \\ \frac{1}{2} & \frac{1}{2} & 0 \end{bmatrix}$

If we know $P(X_1 = 1) = P(X_1 = 2) = 1/4$, find $P(X_1 = 3, X_2 = 2, X_3 = 1)$.

Q.4 A) Attempt any two of the following.

- 1) State the Chapman Kolmogorov equation for obtaining higher transition probabilities of a Markov chain.
- 2) Explain briefly what do you understand by transient state and steady state in queuing problem.
- 3) Find the distribution of range, if a random sample is taken from U(0,1) distribution.
- **B)** Let Y_n be the nth order statistic corresponding to a random sample from U (0,1) distribution.

Find the distribution of Y_n and test $Y_n \to 1$ in probability as $n \to \infty$

Q.5 Attempt any two of the following.

a) For the T.P.M.

 $P = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$, Find P² and verify the same using Chapman Kolmogorov equation.

- **b)** Let $Y_1 < Y_2 < Y_3 < Y_4$ be a order statistics with respect to a random sample of size 4 from exp (3) distribution. Find the mean & variance of minimum of the random sample.
- c) Suppose X_1, X_2, \dots, X_n are i.i.d. random variables with common p.d.f. $f(x) = e^{-x}; 0 < x < \infty$

Examine the convergence of smallest order statistic $X_{(1)}$ in probability.

Seat	
No.	

B.Sc. (Semester - VI) (New) (CBCS) Examination: Oct/Nov - 2022 **GEOLOGY** (Special Paper – XIV) Geomorphology and Geotectonic

Day & Date: Monday, 06-02-2023 Time: 03:00 PM To 06:00 PM

C)

Max. Marks: 80

Set

Instructions: 1) All questions are compulsory

- 2) Draw neat labelled diagrams wherever necessary.
- 3) Figures to right indicate full marks.

Q.1 Fill in the blanks by choosing correct alternatives given below. 10 A)

- Alluvial fans and alluvial cones, meanders and ox-bow lakes and 1) natural levees are characteristics of _____ stage in the fluvial evolution.
 - mature a) youth b)
 - C) old d) all of the above

A landscape produced by the effect of many cycles of erosion of is 2) called as

- monocyclic a) b) multicyclic
- C) exhumed d) resurrected

The "Inversion of relief' is found in 3) region.

- Folded b) Faulted a) non-jointed
 - highly jointed d)

Choose the incorrect statement about Himalayan rivers. 4)

- Their tributaries are engaged in headward erosion. a)
- Pot holes are normal features. b)
- They are more sinuous and develop numerous meanders C)
- Long profiles of rivers are characterized by rapids and water falls. d)

Radial or centrifugal drainage pattern forms over _ 5)

- Circular basin domal structure a) b) elongated ridge C)
 - d) oceanic cliffs

6) What do scientists believe is the force behind the plate tectonics theory?

- a) convection currents b) the Sun's gravity
- gravity slab pull the movement of the planets C) d)
- What happens to rock around a subducting slab? 7)
 - It goes under the other plate. a)
 - b) It goes over the other plate.
 - It combines with the other rock. C)
 - It disappears from Earth. d)
- 8) The rock which is well polished by wind abrasion is called
 - b) Pedestal rock
 - C) Ventifacts d) **Desert pavements**
- 9) The mechanical loosening and removal of the material from the rocks due to pressure exerted by the running water is called
 - Gradient a) Hydraulic action

Yardangs

a)

C)

Weathering b) d) Cavitation

	10)			The gently sloping land part that remains partly submerged under seawater is				
			a) c)	Continental shelf Beach	b) d)	Continental bench Continental slope		
	B)	Ansv 1) 2) 3) 4) 5) 6)	wer th Name What Whicl What What What	e following questio e the exogenetic proc causes dynamic reju- n feature along the riv- is another name of s is lithosphere? is headward erosion	ns in one s cesses. uvenation? ver represe supercontine ?	entence. nt Knick point? ent?	06	
Q.2	Ans a) b) c) d) e) f) g) h) i) j)	wer a What What Wher Whic What What Wher What	ny Eig are co is seif are th re tran h ager is gor is deg re do y is the e the z	The following onvection currents? f? aree types of morainer sform faults occur? at is responsible for the rge? gradation? rou find sea notch? term for collision of the cone where one plate	es? he depositio two plates? e slide belov	on of stalactite and stalagmites?	16	
Q.3	A)	Atter 1) 2) 3)	n pt ar Expla Island Give	iy Two of the follow in Interruptions in ero d arc. the list of large and s	ring. osion cycle mall plates.	due to Base level Changes.	10	
	B)	Expla	in the	term 'Uniformitariani	ism'.		06	
Q.4	A)	Atten 1) 2) 3)	n pt ar Trans Give Chara	Two of the follow portation by ocean. any four evidences to acteristics of old stag	r ing. o support co e river.	ontinental drift theory.	80	
	B)	Mid-C	Oceani	ic Ridges.			08	
Q.5	Atte a) b)	mpt a Give Desc	ny Tw topogi ribe in	ro of the following. raphic evidences of re detail erosional featu	ejuvenation ures formed	I by the work of river.	16	

c) Describe in detail epigenic and exogenic processes.

Seat No.		Set F	כ
	B.Sc	c. (Semester - VI) (New) (CBCS) Examination: Oct/Nov - 2022 MICROBIOLOGY (Special Paper- XIV) Microbial Biochemistry	
Day 8 Time:	Date 03:00	e: Monday, 06-02-2023 Max. Marks: 8 0 PM To 06:00 PM	0
Instru	uction	 ns: 1) All questions are compulsory. 2) Figures to the right indicate full marks. 3) Draw neat labeled diagrams wherever necessary. 	
Q.1	A) 1)	Choose the correct alternatives form options.1Urease is example of specificity.a) relativea) relativeb) groupc) absoluted) bond	0
	2)	is precursor for biosynthesis of Peptidoglycan. a) Sucrose b) Maltose c) Glucose d) Fructose	
	3)	In CAP/CRP binds with DNA.a) Catabolite repressionb) End product repressionc) Feedback inhibitiond) Competitive inhibition	
	4)	Bioluminescence is known asa) Cold sterilizationb) Flurexinc) Cold lightd) Luciferin	
	5)	is starting amino acid in protein synthesis in procaryotes. a) Methionine b) N-formyl methionine c) Aspartic acid d) Alanine	
	6)	When $V_0 = \frac{1}{2} V_{max}$ then $K_m = $ a) [E] b) [S] c) [ES] d) [P]	
	7)		
	8)	acid contains pyrimidine nucleus and is the key intermediate in pyrimidine synthesis. a) Inosinic b) Acetic c) Citric d) Orotic	
	9)	is group specific enzyme. a) Cellulase b) Amylase c) Caseinase d) Hexokinase	
	10)	is the major component of RNA but not DNA. a) Adenine b) Uracil c) Guanine d) Thymine	

Q.1	В)	 Answer in one or two words. 1) Write correct Michaelis Menten equation. 2) List nonsense codons 3) Who crystallized urease enzyme? 4) What is long form of CEOGAT? 5) Give names of key enzymes of glyoxylate cycle. 6) Which enzyme involved in cross linkage formation in peptidoglycan biosynthesis? 	06
Q.2	Ans 1) 2) 3) 4) 5) 6) 7) 8) 9) 10)	wer the following questions (Any Eight) What is function of ara-c protein in arabinose operon? Define cofactor. Define coenzyme. What is habitat of Bioluminescent organisms. Define allosteric enzyme. Which amino acids are commonly present in active site of enzyme? What is nucleoside? Define Isozyme. Define Translocation. Tryptophan operon	16
Q.3	A)	 Answer the following questions (Any two) 1) Extraction of intracellular enzymes 2) Initiation of protein synthesis 3) Lock and key hypothesis 	10
	B)	Write short note on – Assimilation of sulfur	06
Q.4	A)	 Answer the following questions (Any two) 1) Proximity and orientation 2) Pyruvate as key metabolite 3) Acid - base catalysis 	08
	B)	Explain in detail Assimilation of carbon.	08
Q.5	Ans a) b)	wer the following questions (Any two) Glyoxylate bypass Immobilization of enzymes	16

c) Mechanism of action of allosteric enzymes (Two models of action)

1	• •	T		
	Seat No.		Set	Ρ
	B.Sc.	. (Se	nester - VI) (New) (CBCS) Examination: Oct/Nov - 2022 ELECTRONICS (Special Paper- XIV) Embedded System Design	
	Day & Dat Time: 03:0	e: Mo 00 PN	nday, 06-02-2023 Max. Marks: To 06:00 PM	80
	Instructio	ns: 1 2 3	All questions are compulsory.) Figures to the right indicate full marks.) Neat diagrams must be drawn wherever necessary.) Use of log table or calculator is allowed.	
	Q.1 A)	Cho 1)	ose the correct alternatives from the options.Which one of these is not an embedded product?a) Mouseb) Keyboardc) TV remoted) Laptop	10
		2)	The main component of an embedded system isa) Memoryb) Application specific circuitryc) Microcontrollerd) Communication interface	
		3)	In uC89C51. the hardware RESET is a) Active high b) Active low c) both a and b d) high impedance	
		4)	C programs are converted into machine language usinga) an assemblerb) an interpreterc) a compilerd) an operating system	
		5)	Which one of these is not a C keyword? a) char b) if c) while d) next	
		6)	Which one of these statements in C is a loop control statement?a) ifb) if-elsec) switch-cased) for	
		7)	The data type used for addressing bit addressable SFR bit isa) sbitb) bitc) sfrd) int	
		8)	The header file required for writing an embedded C program for uC8051 family isa) std51.hb) 8051.hc) reg51.hd) uC51.h	
		9)	Which one of these is not a 4-bit code for full-stepping a stepper	

- motor?
 - b) 9 d) 8 a) A c) 6

06

16

10

80

10) To display alphanumeric data on LCD, the data is sent in format. a) ASCII b) BCD c) 7-Segment d) alpha-numeric Fill in the blanks.

Q.1 B)

- The size of unsigned integer data type is bytes. 1)
- A microcontroller-based, software driven, reliable and real-time 2) system, operating on diverse physical variables in diverse environment at a lesser cost is called _____ system.
- If the a-b-c-d-e-f-g segments of common-anode seven segment 3) display are connected to port pins P1.0 to P1.6 (Pin P1.7 unused), the HEX code for displaying numeric 7 will be _____.
- The delimiter "Square Bracket []" is used in C-programs for 4)
- The operator "^"is used in embedded-C for 5)
- Which port of uC89C51 require external passive pull-up resistors? 6)

Q.2 Answer the followings (Any Eight):

- Name any four applications of an embedded system 1)
- What is Power-On-Reset in uC8051? 2)
- 3) Explain the role of Compiler in short.
- What is Global Declaration in C programming? 4)
- Give the concept of Super-loop. 5)
- Write the embedded C instructions to declare Port-0 as input port and 6) Port-1 as output port.
- Give the basic principle of speed control of DC motor using PWM 7) technique.
- What is Humidity? Explain in short. 8)
- Explain the role of Header files in C programming. 9)
- 10) What is difference between C and Embedded-C?

Q.3 A) Answer the followings (Any two):

- Write a C program to arrange ten integer numbers in ascending or 1) descending order.
- Write an embedded-C program to turn ON and turn OFF the relay 2) connected to port line P1.5 with long delay.
- Draw the interfacing diagram for Seven-Segment Display connected 3) to Port-1 of uC 89C51 and write the embedded-C program.
- B) Explain with neat block diagram, the architecture of an Embedded 06 System.

Q.4	A)	Answer the followings (Any two):	
		1) Explain the data types in C	

- Explain the data types in C. 1)
- 2) Discuss various bit-wise operators in embedded-C.
- Explain the interfacing of Thumb-wheel switch 3)
- B) Design 89C51 based embedded system for measurement of 80 temperature in degree Celsius.

16

Q.5 Answer the following (Any Two).

- a) Explain the interfacing of LCD to uC 89C51 and hence display "PAHSU Solapur" on LCD.
- b) Design uC 89C51 based embedded system for speed control of DC motor using PWM technique.
- c) Write an embedded-C program to generate a square wave on port pin P1.5, with and without the use of timers, and explain.

Set

Seat No.

B.Sc. (Semester - VI) (New) (CBCS) Examination: Oct/Nov - 2022 **COMPUTER SCIENCE (Paper – XV)** Advanced Java

Day & Date: Monday, 06-02-2023 Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

Q.1 A) Choose the correct alternatives from the options.

- Generic-Servlet is a protocol dependent. 1)
 - a) True b) False
- 2) Method Returns the parameter value for the specified parameter name in web.xml.
 - a) getInitParameter(String name)
 - b) getParameter(String name)
 - c) setInitParameter(String name)
 - d) setParameter(String name)

Which of the following is not an attribute of <jsp:useBean> tag 3)

- b) scope a) id
- c) class d) property
- What type of error object is thrown from the <c:catch> tag? 4)
 - a) java.lang.error b) java.lang.exception
 - c) java.lang.throwable d) all of these
- Which character is used to represent an input parameter in a 5) callableStatement?
 - a) # b) /
 - d) ? c) &
- How many layer are available in hibernate architecture? 6)
 - a) 1 b) 4 c) 3
 - d) 5
- method is used to perform DML statement in JDBC. 7)
 - a) executeResult()
- b) executeQuery()
- c) executeUpdate() d) Execute()
- What are the advantages of spring framework? 8)
 - a) predefined template c) power abstraction

c) programming tool

- b) loose couple d) all of these
- Hibernate is a _____. 9)
 - a) CRM

- b) ORM
- d) SQL tool


		10) TLS stands for Tag library data.a) Trueb) False	
Q.1	B)	 Fill in the Blanks. CGI stands for types of driver used in JDBC. types of driver used in JDBC. XML file called a deployment descriptor. The action tag is used to forward the request to another resource it may be jsp, html or another resource. is an open source framework that extends the Java Servlet API and employs a Model, View, Controller (MVC) architecture. Text files stored on the client computer and they are kept for various information tracking purpose. 	06
Q.2	Ansv 1) 2) 3) 4) 5) 6) 7) 8) 9) 10)	wer the followings (Any Eight): What is use of PreparedStatement? What is Java Bean? What is use of RequestDispatcher? List out of advantages of Hidden form filed. List out: General purpose tag in JSP. What is use of struts? What is scriplet? List out the techniques used for Session tracking. List out implicit object used in JSP. What is JDBC?	16
Q.3	A)	 Answer the followings (Any two): 1) What are the features of Struts? 2) Explain custom tag in JSP with example. 3) Write a program to demonstrate the Prepared Statement. 	10
	B)	Explain servlet life cycle.	06
Q.4	A)	Answer the followings (Any two):(1)Explain collection mapping in hibernate in detail.2)List out Difference between servlet and JSP.3)What is cookies? Explain advantages of cookies.	08
	B)	Write a program to demonstrate use of jsp: forward action tag.	08
Q.5	Ansv a) b)	wer the following (Any Two). Explain Session tracking mechanism in servlet. Explain steps for JDBC connectivity with example.	16

c) Explain Hibernate architecture.

в.	Sc. (Semester - V	I) (New) (CE PHYSICS	BCS) Ex (Paper-)	amination: XVI)	Oct/Nov-
	A	tomic, wored	ular Physic	s and G		echanics
Dat)3:0	e: Tu)0 PN	esday, 07-02-20 1 To 06:00 PM)23			Ма
tio	ns: 1 2 3 4) All questions a 2) Figures to the 3) Use of logarith •) Draw neat lab	are compulsor right indicate nmic table and elled diagrams	y. full marks l calculato s whereve	r is allowed. r necessary.	
۹)	Fill	in the blanks b	y choosing c	orrect alt	ernatives giv	ven below.
	1)	X-rays are a) Electron c) electric	waves. magnetic	b) d)	mechanical longitudinal	
	2)	In general, the	e electrons in a	subshell	have	spins.

	Ate	omic,	, woecula	ir Physic	cs and Q	uantu
Day & Date Time: 03:00	e: Tue 0 PM	sday, To 06:	07-02-2023 :00 PM			
Instructior	ns: 1) 2) 3) 4)	All que Figure Use c Draw	estions are o es to the righ of logarithmic neat labelle	compulso nt indicate c table and d diagram	ry. full marks d calculato is whereve	r is allov r neces
Q.1 A)	Fill in 1)	n the k X-rays a) c)	blanks by cl s are Electromag electric	h oosing (_ waves. Inetic	b) d)	ernativo mecha longitu
	2)	In ger	neral, the ele	ectrons in	a subshell	have

antiparallel parallel a) b) C) opposite d) zero

Spin quantum number always has the magnitude _____. 3)

	a)	1	b)	2
	C)	0	d)	1/2
4)	Elec	tronic configuration of	is	1s ² 2s ² 2p ⁶ 3s ¹

- b) Na a) Li C) Κ d) Rb
- The $nP \rightarrow 2S$ transitions of principal series n > 2 correspond to 5) $\underline{}$ series of *Li*. b) fundamental

a)	diffuse	b)	fundamenta
2)	charn	d)	principal

- c) sharp d) principal
- In alkali spectra, the selection rule for *j* in emission transitions is 6)

a)	$\Delta j = 0$	b)	$\Delta j = \pm 1$
c)	$\Delta j = 0, \pm 1$	d)	$\Delta j = 2$

- 7) If the coupling between I* and s* is broken in an external magnetic field, then we observe
 - Anomalous Zeeman effect a)
 - b) Paschen-Back effect
 - C) Stark effect
 - d) Compton effect
- The effect of electrical field on spectral lines is known as 8) a)
 - Zeeman effect Paschen-Back effect b)
 - Raman effect C)
- d) Stark effect
- 9) If wave function Ψ is imaginary then probability density is _____.
 - negative a positive real quantity b) a) positive C)
 - a negative real quantity d)

anics Max. Marks: 80

SLR-FZ-215

- - Set

Ρ

10

t/Nov-2022

Seat

No.

		10) /	A moving p a) wav	particle of mat	ter is always b)	as p	ssociated with	
			c) radi	ation	d)	C	charge	
	B)	Fill in 1) (2) (1) (3) (2) (4) (1) (5) (1) (6) (2)	the blank d-state cor Uncertaint was given The unit of Maximum L-shell cor The theory	s. responds to l y in simultaned by Planck's cons number of electrosponds to n of matter way	= ous measure stant is ctrons prese = /es was prop	eme Int i	ent of position and momentur in the n th shell is sed by	06 n
Q.2	Solv a) b) c) d) e) f) g) h) i) j)	<i>v</i> e any Eight of the following.16State the names of mechanical quantum numbers. Name the four series observed in Li and Na spectra. Give Zeeman splitting of Sodium D-lines with necessary energy level diagram. What is molecular bond? Give its types. What is Heisenberg's Uncertainty principle? Give the concept of matter waves. What is tunnel effect? What is an operator? Give the properties of Raman lines. Write a note on selection rules for alkali spectra.16						
Q.3	A)	Attem 1) (4 2) [3) (6 i i i	pt any Tw Write a not effect in Hy Derive Sch Obtain exp) Linea i) Total	o of the follo te on Stark eff (drogen along prodinger's tim ression for, r momentum of energy opera	wing. ect in Hydro with Selecti ie independe operator tor	ger on ent	n. Explain strong field Stark rules. wave equation for a particle.	10
	B)	Write a	a note on I	Doublet fine st	ructure of Al	kal	li metals.	06
Q.4	A)	Attem 1) \ 1 2) (3) \ (pt any Tw What is Ar mechanica field. (Zeer Obtain an Write a not on Frank-C	o of the follo amolous Zeer I and magneti nan effect). expression for te on electroni Condon princip	wing. man effect? c moments o r rotational e c spectra of ole.	Dra of a ner dia	aw vector atom model showin an atom in weak magnetic rgy of a diatomic molecule. atomic molecule. Write a note	08 g
	B)	What i levels.	s linear ha Explain ze	rmonic oscilla ero point energ	tor? Derive a gy.	an	expression for its energy	08
Q.5	Atte a) b) c)	mpt an Explain classic Show Obtain	by Two of n Raman e cal theory of that $[L_x, L_y]$ n Schroding cal polar of	the following effect. What ar of Raman effect $] = i \hbar L_z$ ger's wave equipates O	e Stoke's ar ct. uation for hy	nd / rdro	Anti-Stoke's lines? Give the ogen atom in terms of	16
		parts.				5101		

				CHEMISTRY (Organi	Special Pair ic Chemis	aper - XV) try	
Day Time	& Dat e: 03:0	e: Tue 00 PM	esday, To 06	07-02-2023 ::00 PM		Max.	Marks: 80
Instr	ructio	ns: 1) 2 3 4) All qu) Figur) Use () Draw	uestions are compuls res to the right indica of log table and calcu r neat labelled diagra	ory. te full marks ulator is allov ims whereve	ved. r necessary.	
Q.1	A)	Cho	ose th	e most correct alte	rnative from	n those given below.	10
	-	1)	Pyrro a) c)	le is in nature acidic amphoteric	e. b) d)	basic neutral	
		2)	Pyrro	le gives electrophilic	substitution	reactions preferentially at	
			a) c)	1 3	b) d)	2 6	
		3)	Molee a) c)	cular formula of vitan C ₂₀ H ₄₀ O C ₂₀ H ₃₀ O	nin A is b) d)	C20 H44 C20 H30 O2	
		4)	Drug: a) c)	s used to lower the b antibiotic antipyretic	ody tempera b) d)	ature are called as antifungal anesthetic	
		5)	Chlor a) c)	omycetin is a dextro racemic	_ rotatory ar b) d)	ntibiotic. laevo none of these	
		6)	a) c)	is an anticancer c Ethambutol Chlorambucil	lrug. b) d)	Tolbutamide Paludrin	
		7)	Acidi a) c)	c dye is an example water soluble reactive	of d b) d)	ye. water insoluble Ingrain	
		8)	a) c)	stimulates latex p Carbamate Indole 3 acetic acic	roduction in b) d d)	rubber trees. Ethophan Baygon	
		9)	The c a) c)	chemicals used to co Insecticides fungicides	ntrol weeds b) d)	are called as herbicides rodenticides	
		10)	Whic a) c)	h of the following is a sucrose fructose	a non-reduci b) d)	ng sugar? glucose None of the above	

Seat No.

B.Sc. (Semester - VI) (New) (CBCS) Examination: Oct/Nov-2022 CHEMISTRY (Special Paper - XV) Organic Chemistry

Page **1** of **2**

022

Set P

SLR-FZ-216

Skraup's synthesis is used to prepare 3) Vitamin-A is also known as 4) The relationship between colour and constitution was pointed out by 5) scientist 6) Sucrose on hydrolysis produces and . Solve any Eight of the following. 16 Write any two objections to open chain structure of D-glucose. a) Define mutarotation. b) Draw the structure of thyroxine. C) Give two examples of fat soluble and water-soluble vitamins. d) Define CNS drugs with example. e) Define carbohydrates with example. f) What is used as synergist in pyrethroid? g) What are dyes? Give qualities of a good dye. h) Which acid will be produced on the ozonolysis of vitamin-A? i) j) Why pyridine is more basic than Pyrrole? Attempt any Two of the following. 10 A) 1) What are Agrochemicals? Give synthesis and uses of Indole 3 acetic acid. 2) Define chromophore and auxochrome. Classify following functional groups into chromophore and auxochrome. -OH, -NH₂, C=O, C=C, -CN, -C=S 3) Explain the classification of dyes based on the mode of application of dyes. Define hormones with example. Give synthesis of adrenaline. 06 B) A) Attempt any Two of the following. 08 1) Write synthesis and use of methoxychlor. Give any two methods of preparation of pyrrole. 2) 3) Give the synthesis and uses of Phenolphthalein. Define polysaccharides? Write structural formulae and uses of the following: 08 B) 1) Starch 2) Cellulose 3) Lactose Attempt any Two of the following. 16 What are heterocyclic compounds? Give anyone method of preparation of a) pyridine. What is action of following on pyridine? 1) KNO₃/ H₂SO₄, 300⁰ C 2) SO₃/ H₂SO₄ 3) Br₂/ charcoal 4) NaNH₂/100^oC Write synthesis of vitamin-A. Discuss the analytical evidences putforth in b) the support of the structure of vitamin-A.

What are drugs? What are the qualities of an ideal drug? Discuss synthesis C) and uses of Ibuprofen.

B) Fill in the blanks.

- The pentacyclic ring containing one nitrogen hetero atom is called as 1)
- Beta carotene is the provitamin for vitamin _____. 2)

Q.2

Q.3

Q.4

Q.5

SLR-FZ-216

Seat No.

B.Sc. (Semester - VI) (New) (CBCS) Examination: Oct/Nov-2022 Botany (Special Paper - XV) Cell Biology

Day & Date: Tuesday, 07-02-2023 Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

Ana phase

Telophase

a)

C)

3) Use of logarithmic table and calculator is allowed.

Q.1 A) Rewrite the following question choosing correct alternative. 1) When the power of ocular lens is 10 X and objective lens is 20X, the magnification is

	, magn			
	a) c)	30 times 200 times	b) d)	20 times 2000 times
2)	Electr a) c)	on Microscope can give a 400,000X 15000 X	magn b) d)	ification up to 100,000X 100 X
3)	The c a) c)	omponents of prokaryotic plasma membrane cytoplasm	cells a b) d)	are DNA All of these
4)	a) c)	organelle present in Eul Nucleus Golgi apparatus	karyot b) d)	ic cell. Mitochondria Chloroplast
5)	a) c)	activities are characteris Dehydrogenase Remove of hydrogen	stics o b) d)	f organelle peroxisomes. Catalase All of these
6)	lon ca a) c)	arriers are located in cell _ Plasma membrane Nucleus	b) d)	Cell wall Cellular space
7)	The te a) c)	erm chromosome was first Sutton Waldeyer	coine b) d)	d by Boveri Hoffmeister
8)	centro a) c)	types of chromosomes a omere. 4 3	are div b) d)	vide on the basis of position of 2 6
9)	a) c)	is longest stage in the c Inter phase Meta phase	ell cyc b) d)	cle. Ana phase None of the above
10)	Chror	nosome structure can be c	bserv	ved best during

Meta phase

None of the above

b)

d)

Max. Marks: 80

Set

Ρ

06

SLR-FZ-217

	-	give the name / predict the product. 1) Give the Definition of Mitosis?	
		2) The chromosome number in Meiosis, Tellophase-II is	
		3) organelles is called the power house of cell.	
		4) Which Microscope is used, to study the ultra structure of cell organelles?	
		5) The genes are present in structure.	
		6) Which organelles is trap the light photons?	
Q.2	Solv	ve any Eight of the following.	16
	a)	What is mean by Microscope?	
	b)	What is mean by prokaryotic cell?	
	C)	Sketch and label the Metacentric chromosome.	
	d)	Give the functions of Lysosome.	
	e)	Sketch and label the cell wall.	
	f)	Give the significance of Mitosis.	
	g)	Give the any four principles of microscopy.	
	h)	Give the principle of phase contrast microscope.	
	i)	Write the any four dis tinging wishing character of Eukaryotic cell.	
	J)	Write the characteristic of Y, chromosome.	
Q.3	A)	Attempt any Two of the following.	10
	,	1) Give the advantage and application of phase contrast microscope.	
		2) What is prokaryotic cell and give components of its?	
		3) Describe the importance and uses of mitosis.	
	B)	What are the four types of chromosome?	06
Q.4	A)	Attempt any Two of the following.	08
	-		
	-	1) Write the sample preparation for Electron Microscope.	
		 Write the sample preparation for Electron Microscope. Write on the ultra structure of chloroplast and its function. 	
	·	 Write the sample preparation for Electron Microscope. Write on the ultra structure of chloroplast and its function. Write short note on telophase of mitosis. 	
	B)	 Write the sample preparation for Electron Microscope. Write on the ultra structure of chloroplast and its function. Write short note on telophase of mitosis. What is cell cycle? write the note on significance of cell cycle. 	08
Q.5	B) Atte	 Write the sample preparation for Electron Microscope. Write on the ultra structure of chloroplast and its function. Write short note on telophase of mitosis. What is cell cycle? write the note on significance of cell cycle. mpt any Two of the following. 	08 16

Fill in the blank / Definition / one sentence answer /one word answer /

Explain the different models of cell membrane. b)

B)

Describe the stages of meiosis -I with labelled diagram. C)

B.Sc.	(Semes	ster - VI) (New) (CB ZOOLOGY (Spe Animal Behavior a	CS) Exa cial Pa nd Chr	amination: Oct/No per- XV) onobiology	v-2022
Day & Date: 1 Time: 03:00 F	Fuesday, PM To 06:	07-02-2023 :00 PM			Max. Marks: 80
Instructions	: 1) All qu 2) Figure 3) Use c 4) Draw	estions are compulsory. es to the right indicate fu of logarithmic table and c a neat labelled diagram	III marks calculato whenev	r is allowed. er necessary.	
Q.1 A) Fi 1)	II in the b Promi a) c)	blanks by choosing co iscuous sexual selection coming together leaving out	rrect alt is for b) d)	ernatives given below producing young one all the above	w. 10 s
2)	In the a) c)	male rivalry typ dominant and best poor	bes of off b) d)	spring's are formed. bad young's recessive	
3)	Troph a) c)	iism is found in plants monkey	b) d)	cat elephant	
4)	ln inte a) c)	er sexual selection male chickens	show b) d)	s specific characters. female dominant male	
5)	a) c)	behaviour is stimulate mimicry stereotype	ed throug b) d)	gh the life. experienced all the above	
6)	a) C)	term was proposed by Pharmacology Ecology	y F Hallb b) d)	erg. Osteology Chronobiology	

7) In circannual rhythm certain activities are repeated by _____.

b)

seven

year by year d) C) one

a)

a)

five

adult

In males fighting is done for _____ purpose. 8) feeding b) mating

a) d) C) watering sheltering

Learning behaviour involves ____ ____ experience. 9) b) new old a)

previous d) confusing C)

10) Imprinting learning behaviour is only found in _____.

> b) male

C) female d) only in just borned

Seat No.

SLR-FZ-218

Set Ρ

Q.2 Solve any Eight of the following.	16
 a) What is the purpose of foraging in animals? b) What is mean by sexual dimorphism in animals? c) What is tidal rhythm? d) What is associate learning behaviour in animals? e) What is Lunar rhythms? f) Give significance of biological clocks. g) What is Chronotherapy? h) Role of melatonin in biological clock. i) What is inter -sexual selection? j) Describe types biological rhythms. 	
 Q.3 A) Attempt any Two of the following. 1) Describe types of sexual behaviours in animals. 2) What is concept of society specially in honey bees? 3) What is photo period and regulation? 	10
 B) Short notes/solve. Give the brief profile of Karl Von Frish. 	06
 Q.4 A) Attempt any Two of the following. 1) Describe purpose of scent marking in various animals. 2) Describe in detail chronobiology. 3) What is chrono-medicine and its use? 	08
B) Describe / Explain /solve Explain the role of males in sexual behaviour in different animals, Give suitable example.	80
 Q.5 Attempt any Two of the following. a) Wheat is Chrono-pharmacology and its role in various diseases. b) Describe classical and operant conditioning behaviour. 	16

c) Describe various types of sexual selection in various animals.

Seat No.		Set I	D
	B.S	Sc. (Semester - VI) (New) (CBCS) Examination: Oct/Nov-2022 MATHEMATICS (Special Paper- XV) GRAPH THEORY	
Day 8 Time:	Date 03:0	e: Tuesday, 07-02-2023 Max. Marks: 8 00 PM To 06:00 PM	30
Instru	ictio	ns: 1) All questions are compulsory.2) Figures to the right indicate full marks.	
Q.1	A) 1)	Fill in the blanks by choosing correct alternatives given below.1If $e = (u, v)$ is edge in a diagraph then u is called asa) isolated vertexb) terminal vertexa) isolated vertexb) terminal vertexc) initial vertexd) None of these	0
	2)	A vertex is called pendant if and only if it has a degree a) 0 b) 1 c) 2 d) 3	
	3)	In pseudograph are allowed. a) only loop	
	4)	Repeated vertex is not allowed in a) walk b) trail c) circuit d) path	
	5)	If plane graph has k components, then $n - e + r =$ a) K b) K+1 c) K - 1 d) K ² +1	
	6)	Complete graph K_n is Eulerian if $n = $ a) 2 b) 4 c) 5 d) 6	
	7)	A tree with n vertices has edges.a) $n+1$ b) $n-1$ c) nd) n^2	
	8)	A tree with vertex is called a trivial tree. a) one b) two c) three d) four	
	9)	The binary number $1010101111_{(2)}$ is equivalent to octal number a) $2537_{(8)}$ b) $2357_{(8)}$ c) $2735_{(8)}$ d) $2573_{(8)}$	
	10)	Convert $9719_{(10)}$ to Hexadecimal is a) $255F_{(16)}$ b) $25F7_{(16)}$ c) $2F57_{(16)}$ d) $2F75_{(16)}$	
	B)	 Give answer of following. 1) Convert the number 10110100101110₍₂₎ to Hexadecimal 2) Draw complete Bipartite graph K_{2,3} 3) Draw a cycle C₆)6

SLR-FZ-219

4) Write incidence matrix of



- 5) Define planner graph.
- 6) Draw tree on three vertices.

Q.2 Attempt any eight of the following.

- 1) Convert $684_{(10)}$ in quintal.
- 2) Convert $626_{(10)}$ to base 4.
- 3) Find deg of each vertex.



- 4) Define Complete and Regular graph.
- 5) Find any two sub graph of



6) Find diameter of graph.



7) Write Adjacency matrix of graph.



- 8) Show that in a complete *n* ary tree with '*i*' internal vertices the number of leaf vertex *P* is given by $P = \frac{(n-1)(x-1)}{n}$
- 9) Find spanning tree of $f \stackrel{e}{\rule{0.5ex}{1.5ex}} d$

а

10) Draw binary tree represent of (a + b) * c/d

b

Q.3 A) Attempt any two of the following.

V₁

V2

- 1) What is size of r regular (p, q) graph? Does their exists four regular graph on six vertices? If so construct it.
- 2) Find number of walk of length 3 from V_2 to V_4 and also check the connectedness of graph.



V٦

B) Convert hexadecimal to decimal system $73D5_{(16)}$ and also convert decimal **06** from hexadecimal $39 \cdot B8$

Q.4 A) Attempt any two of the following.

- 1) Write prefix and postfix from the expression $A * B C \uparrow D + E/F$ also represent the expression a binary tree.
- 2) Show that a simple graph with *n* vertices and *K* components can not have more than $\frac{(n-K)(n-K+1)}{2}$ edges.
- 3) Find in degree out degree and total degree of each vertex of following graph.



- i) $111.1101_{(2)}$ to decimal
- ii) $\log_{(10)}$ to binary
- iii) $10101011111_{(2)}$ to Hexadecimal
- iv) $33.24_{(8)}$ to binary

Q.5 Answer the following questions. (Any two)

1) Apply Dijkstra's algorithm to find the shortest path between the indicated vertices in the given weighted graph from a to f.



2) By using Kruskal's algorithm, find M.S.T. of graph



16

08

10

3) a) Show that following graphs are isomorphic.





b) Verify Euler's formula for graph.



	В.\$	Sc. (S	eme	ester - VI) (New) (CB STATISTICS (Sp Designs of E	CS) Exa ecial Pa Experim	amination: Oct/Nov-202 aper- XV) ients	2
Day Time	& Date : 03:0	e: Tue 0 PM ⁻	sday To 06	y, 07-02-2023 6:00 PM	-	Max. M	larks: 80
Instr	uctio	ns: 1) 2) 3)	All qu Figure Jse c	uestions are compulsory. es to the right indicate full of log table and calculator	l marks. s is allow	ved.	
Q.1	A)	Choo 1)	ose t The assu	he correct alternative fr expected value of error o umed to be	om the f compone	following. nt in a design of experiment i	10 s
			a) C)	0	d)	2 0 or 1	
		2)	In R trea	BD with error d.f. 12, with tment would be	1 4 block	s the required number of	
			a)	5	b) d)	4	
		3)	In C	RD with 5 treatments d f	for trea	tment sum of squares is	
		0)	a) c)	3 5	b) d)	4 6	
		4)	The a) c)	total number of interaction 3 1	on effects b) d)	in 2 ² factorial experiment is 4 2	
		5)	Rep a) b) c) d)	lication in an experiment The number of treatmen The number of blocks The number of times a t None of these	means: its reatment	toccurs	
		6)	In C a) c)	RD with K treatments, the N-K K-1	e d.f. for b) d)	treatment is N-1 (N-K) (K-1)	
		7)	Whi a) c)	ch of the following is prine Randomization Local control	ciple of d b) d)	esign of experiment? Replication All of these	
		8)	The a) c)	method confounding is a Experiment Blocks	device t b) d)	o reduce the size of Replication None of these	
		9)	A m a) c)	edicine is a treatment app A patient Both a) and b)	plied to b) d)	A field plot None of these	
		10)	lf dif be	fferent effects are confour	nded in c	lifferent replicates, it is said to)
			a) c)	Complete confounding Partial confounding	b) d)	Balanced confounding None of these	

Seat No.

SLR-FZ-220

Set P

c) Partial confounding

a) St a) St b) Ex c) St d) Ex e) Gi f) St g) Do h) Gi	pt any eight of the following. tate main effects in a 2 ² factorial experiment. xplain principle of randomization. tate the mathematical model used in RBD xplain partial confounding. vive two merits of CRD. tate formula to estimate one missing observation in Latin square Design. efine layout of an experiment. vive the formula for efficiency of RBD over CRD. xplain split-plot design. efine concomitant variable in ANOCOVA.	16
j) De	ttempt any two of the following:	40
9.3 A) A t 1) 2) 3)	 What is Latin square design? Give its layout. Describe in brief two principles of design of experiments; replication and local control. Explain the procedure of testing equality of two treatment means in case of RBD. 	10
B) Es	stimate the parameters in RBD	06
9.4 A) A (1) 2) 3)	 ttempt any two of the following. Derive the formula for estimating efficiency of LSD over RBD when rows are taken as blocks. What is meant by the main effect and interaction effect in a 2² factorial experiment? Derive the expression for interaction effect. State mathematical model, assumptions and analysis of variance (ANOVA) table in case of CRD. 	08
B) Ex	xplain yate's procedure to obtain factorial effect totals in a 2 ³ factorial xperiment.	08
a) Contract (19	pt any two of the following.omplete the following ANOVA table in LSDSource of variationd.f.Source of variationd.f.Source of variation-72-2Columns-	16

B) Attempt all of the following

- 1) Define a treatment.
- Define experimental unit.
 Define efficiency of design
- Define efficiency of design of experiment

Q

Q

Q

Q

Source of variation	a.t.	১.১.	IVI.S.S.	F
Rows	-	72	-	2
Columns	-	-	36	-
Treatments	-	180	-	-
Error	6	-	12	-
Total	-	_		
Total	-	-		

- Give mathematical model, assumptions and Analysis of Variance table in b) case of RBD.
- Give the statistical analysis of split plot design. C)

SLR-FZ-220

06

Seat	
No.	

B.Sc. (Semester - VI) (New) (CBCS) Examination: Oct/Nov-2022 **GEOLOGY** (Special Paper – XV) **Environmental Geology**

Day & Date: Tuesday, 07-02-2023 Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.

- 2) Draw neat labelled diagrams wherever necessary.
- 3) Figures to right indicate full marks.
- 4) Use of log table and calculators is allowed.

Q.1 Choose the appropriate answer from the given option. A)

- Sinkhole collapse subsidence in karst areas commonly occurs 1) because which reason?
 - a) collapse of cavern roofs
 - collapse of surface materials over a cavity b)
 - rapid solution of limestone near the surface C)
 - all of these reasons given in a, b & c d)
- 2) The solid material falls down under influence of gravity in which hazard?
 - a) cvclone. Tsunami b)
 - Landslide d) volcano C)
- 3) Head of district level disaster management team is,
 - collector prime minister a) b)
 - C) chief minister d) home minister
- 4) Which symptom is associated with the hazard of volcanoes?
 - rise in groundwater temperature a)
 - water breaking the limits of banks b)
 - violent sea waves C)
 - d) heavy rain

5) Building the strong foundation of structures is part of preparedness for which hazard mainly?

- Earthquake b) Tsunami a)
- C) Landslide d) Volcano
- Process of cut-off of photosynthesis may cause drought due to which 6) product of volcano?
 - a) volcanic bomb b) ash
 - mud lava d) C)
- The most destructive landslides generally occur on which type of 7) slope?
 - gentle slopes intermediate slopes a) b) steep slopes C)
 - leveled ground d)
- What percent of the total water available is potable? 8)
 - 10 a) C)
 - 5 b) 3 15 d)

Max. Marks: 80

Set

- 9) Gas masks are used in which disasters?
 - a) Cyclone
 - c) Landslide d) Volcano
- 10) Channel spreading & artificial levee are control measures for which hazard?

b)

Tsunami

- a) Flood b) Tsunami
 - Landslide d) volcano
- Fill in the blank/Definition/One sentence answer/ One word answer/ 06
 Give the name/Predict the product etc.
 - 1) Define Retention Wall.
 - 2) Define Avalanche.

C)

- 3) What is the name of a volcanic hazard where mud flows down slopes?
- 4) Which life supporting gas increased in the atmosphere in due course of its evolution?
- 5) Give the name of the region of India where avalanches are common.
- 6) What can be the exploding product of volcanic eruption?

Q.2 Answer any Eight of the following.

- a) Give two examples of global scale disasters.
- b) Give examples of any two man made disasters.
- c) With reference to flood, if green cover is removed what will be its effect on infiltration?
- d) With reference to landslide, if green cover is removed; how will it affect the landslide?
- e) What are two main purposes of dam construction?
- f) What has caused subsidence in Shanghai?
- **g)** In which condition of beds dipping in relation to slope direction; landslide will be less possible?
- h) What are two preparedness measures for COVID 19 pandemic?
- i) What percentage of sun energy is reflected back from earth's atmosphere?
- j) What is the percentage of water trapped in the form of ice on the earth surface?

Q.3 A) Attempt any Two of the following.

- 1) Describe the lithosphere and the processes involved in.
- 2) Describe the water cycle of Hydrosphere.
- 3) Describe the Biosphere of the earth.

B) Short note/Solve

Describe the process of energy distribution of the sun on the earth. Add note on reflected energy interaction with the atmosphere.

Q.4 A) Attempt any Two of the following.

- 1) Describe the difference between climate and the weather with examples.
- 2) Describe the role of humans in climate change of the atmosphere.
- 3) Describe the preparedness for volcanic disaster.
- **B)** Describe the interaction of Lithosphere and atmosphere. Add note on the relevant process that causes drought.

16

08

06

16

Q.5 Attempt any Two of the following.

- a) Describe the structure of the atmosphere. Add note on the greenhouse effect.
- **b)** Describe the nature of interaction of Lithosphere & Biosphere. Add note on anthropogenic impact on this interaction process.
- c) Describe the nature of interaction of Hydrosphere & Biosphere. Add note on anthropogenic impact on this interaction process.

SLR-FZ-222 Set P

Clinical Microbiology Day & Date: Tuesday, 07-02-2023 Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.

Seat

No.

Q.1

A)

2) Figures to the right indicate full marks.

3) Use of log table and calculator is allowed.

4) Draw neat labelled diagrams whenever necessary.

Fill in the blanks by choosing correct alternatives given below.

Which of the following is a bacterial disease? 1) Malaria a) Rabies b) Leprosy d) Cryptococcosis C) Which of the following pathogens causes Leprosy in humans? 2) Salmonella b) **Mycobacterium** a) TMV Monocystis C) d) Which is the most common type of biological vector of human disease? 3) bacteria a) Viruses b) mammals d) arthropods C) Which of the following would NOT be considered an emerging 4) disease? a) Ebola hemorrhagicfever b) West Nile virus fever/encephalitis c) Zika virus disease **Tuberculosis** d) Which type of toxin is tetanus toxin? 5) enterotoxin b) neurotoxin a) cytotoxin d) endotoxin C) Which of the following would be a sign of an infection? 6) a) muscle aches b) headache C) fever d) nausea 7) What is the chemical nature of endotoxins? polysaccharide protein b) a) lipid lipopolysaccharide C) d) Which of the following type of vaccines authorized by the FDA and 8) WHO are proven to be effective and safe against the COVID-19? a) Live attenuated mRNA vaccine b) Toxoid vaccine Conjugated vaccine d) C) 9) Which antibiotic has a beta-lactam ring? Cephalosporin Penicillin a) b) Tetracyclin d) Streptomycin C) Which of the following resistance mechanisms is the most nonspecific 10) to a particular class of antimicrobials? a) drug modification target mimicry b) C) target modification d) efflux pump

B.Sc. (Semester - VI) (New) (CBCS) Examination: Oct/Nov-2022 MICROBIOLOGY (Special Paper – XV)

Max. Marks: 80

	B)	 Fill in the blank/ Definition/ One sentence answer/ One word answer/ Give the name/Predict the product etc. 1) Define 'Chemotherapy'. 2) Define 'Pathogenicity'. 3) Enlist all chemotherapeutic agents that inhibit protein synthesis. 4) Enlist all chemotherapeutic agents that inhibit cell wall synthesis. 5) Give the significance of the vaccine. 6) Enlist all COVID-19 vaccines. 	06
Q.2	Solv a) b) c) d) e) f) g) h) i)	 Performance of the following. What is microbial adhesion? Give examples of any two fungal diseases. Enlist all bacterial toxins. Enlist ideal characteristics of biological weapons. Give the name of the pathogen is a major cause of dental disease. What is microbial invasion? Enlist any four ideal characteristics of the chemotherapeutic agent. What is antibiotic resistance? Give the two names of chemotherapeutic drugs acting on folic acid synthesis. Enlist all tests to guide chemotherapy. 	16
Q.3	A)	 Attempt any Two of the following. 1) Explain the mechanism of bacterial invasion. 2) Describe the mode of action of streptomycin. 3) Describe the mode of action of penicillin. 	10
	B)	Write a short note on the mechanism of antibiotic resistance.	06
Q.4	A)	 Attempt any Two of the following. 1) Explain recombinant vaccine. 2) Explain the mechanism of pathogenicity of viral infections. 3) Describe the various characteristics of bioweapons. 	08
	в)	laboratory diagnosis of AIDS disease.	08
Q.5	Atte	mpt any Two of the following. What are beta-lactam antibiotics? Give a detailed account of the mode of	16
	aj	action of penicillin.	
	b)	Enlist all biomedical wastes and explain in detail biomedical waste management.	
	C)	Discuss in detail modes of transmission, pathogenesis, symptoms, and treatment of leprosy disease.	

Time	e: 03:0	0 PM	To 06	6:00 PM			5. 0
Instr	ructio	o ns: 1 2 3 4) All qu) Figur) Use) Draw	uestions are compulsory. res to the right indicate ful of log table and calculator a neat labelled diagram	l marks r is allo whene	s. wed. ver necessary.	
Q.1	A)	Mul 1 1)	ti ple c The (a) c)	hoice questions. grounding and shielding to Power consumption Cost and size	echniqu b) d)	ues are used to reduce Noise in the circuit Signal level	1
		2)	In mu the c a) c)	ultichannel data acquisitio onditioned outputs from d Buffer A/D converter	n syste lifferent b) d)	em unit is used to scan t channels. Controller Multiplexer	
		3)	The i from a) c)	nstrumentation amplifiers of the following. Active filters D/A converters	are us b) d)	ed principally to amplify signals Choppers Transducers	
		4)	In ca a) c)	se of DMM, to measure th source is utilized. constant voltage variable voltage	ne valu b) d)	e of unknown resistance the constant current variable current	
		5)	The s a) c)	standard glass pH electro potentiometric variable capacitive	de is o b) d)	f electrode. Ampeometric variable inductive	
		6)	In ca a) c)	se of CRO, the delay line horizontal dual	circuit b) d)	is introduced in channel. Vertical none of these	
		7)	The / voltag a) c)	AD594/595 is precalibrate ge from thermoco 1 mV/ºC 10 mV/ºC	ed prec ouple si b) d)	ision amplifier to produce output gnal. 10μV/ºC 1μV/ ⁰ C	
		8)	The _ a) c)	method is employ direct recording pulse code modulation	red in n b) d)	nagnetic tape recording. frequency modulation all of these	
		9)	The f a) c)	requency generator utilize Integrator both a and b	es b) d)	to produce the frequency. differentiator amplifier	
		10)	The p	programmable instrument	ation a	mplifier has	

Seat

B.Sc. (Semester - VI) (New) (CBCS) Examination: Oct/Nov-2022 ELECTRONICS (Special Paper- XV) **Electronics Instrumentation**

Day & Date: Tuesday, 07-02-2023 Tir

No.

SLR-FZ-223

low offset voltage drift

all of these C) low noise d)

b)

low offset voltage

a)

Max. Marks: 80

Set

- 0

Ρ

	B)	 Give One sentence answer. 1) List the names of display units. 2) Give Salient features of Programmable Instrumentation amplifier. 3) What is chopper amplifier? 4) Which is the most popular liquid crystal structure used in LCD? 5) List out the basic components of a Magnetic recorder. 6) What is Data Acquisition System? 	06
Q.2	Solv a) b) c) d) e) f) g) h) i) j)	Ve any Eight of the following. Draw the block diagram of Conductivity meter. Draw block diagram of DC signal conditioning system. State the applications of IC AD 620. What is the role of preamplifier in signal conditioning? Give the advantages of instrumentation amplifier. Give the objectives of data acquisition system. Write the role of proper grounding of the circuit. Distinguish between LED and LCD. What is Isolation amplifier? Draw block diagram of digital multimeter.	16
• •	A \	Attempt on True of the fellowing	40
Q.3	A)	 What is signal conditioning? Explain the basic elements of the signal conditioning system. Explain digital data recorder. Write a note on LCR-Q meter. 	10
Q.3	A) B)	 What is signal conditioning? Explain the basic elements of the signal conditioning system. Explain digital data recorder. Write a note on LCR-Q meter. Write a note on Function generator. 	10 06
Q.3 Q.4	A) B) A)	 Attempt any Two of the following. What is signal conditioning? Explain the basic elements of the signal conditioning system. Explain digital data recorder. Write a note on LCR-Q meter. Write a note on Function generator. Attempt any Two of the following. Explain X-Y recorder. Explain the bridge amplifier for signal conditioning. Explain the 4-20 mA current transmission. Draw the block diagram and explain the working of each block of CRO. 	10 06 08 08
Q.4	A) B) A) B)	 Attempt any Two of the following. 1) What is signal conditioning? Explain the basic elements of the signal conditioning system. 2) Explain digital data recorder. 3) Write a note on LCR-Q meter. Write a note on Function generator. Attempt any Two of the following. 1) Explain X-Y recorder. 2) Explain the bridge amplifier for signal conditioning. 3) Explain the 4-20 mA current transmission. Draw the block diagram and explain the working of each block of CRO. 	10 06 08 08
Q.3 Q.4 Q.5	A) B) A) B) Atte a) b)	 What is signal conditioning? Explain the basic elements of the signal conditioning system. Explain digital data recorder. Write a note on LCR-Q meter. Write a note on Function generator. Attempt any Two of the following. Explain the bridge amplifier for signal conditioning. Explain the bridge amplifier for signal conditioning. Explain the 4-20 mA current transmission. Draw the block diagram and explain the working of each block of CRO. mpt any Two of the following. Explain the vorking of digital storage oscilloscope with the help of block diagram Explain the data logger system in details. Describe general Data acquisition system with block diagram and explain 	10 06 08 08 16

the multichannel DAS.

Seat									Set	
No.									261	P
	B.S	Sc. (S	Seme I	ester CC Data C	- VI) (Nev MPUTE Commun	w) (CBC R SCIEN ication	S) Ex NCE (I and N	amination: C Paper- XVI) letworking –	Dct/Nov-2022 II	
Day 8 Time:	03:0	e: Tue 0 PM	esday To 0	/, 07-02 6:00 Pl	2-2023 M			_	Max. Mark	s: 80
Instru	ictio	n s: 1) 2)) All q) Figu	uestior ires to	ns are corr the right in	pulsory. dicate ful	l marks	.		
Q.1	A)	Mult 1)	i ple The a) c)	choice eleme Sende Trans	question nts of data er mission m	s. commun edium	ication b) d)	are Receiver All of the abov	re	10
		2)	logic a) c)	is t cal cha Multip Proto	he proces nnels for b lexing col	s of dividi etter effic	ng a lir iency. b) d)	ik, the physical Switching Modulation	medium, into	
		3)	A de a) c)	evice o Bridge Repea	perating at e ater	the phys	ical lay b) d)	er is called a Router All of these		
		4)	AM a) c)	and FN Analo Digita	l are exan g-to-analo I-to-digital	ples of _ g	b) d)	modulation. Analog-to-digi Digital-to-anal	tal og	
		5)	arch a) c)	mcm nitecture TCP/I Netwo	odel is a m e. P ork Model	odel for u	ndersta b) d)	anding and desi Open system None of these	gning network	
		6)	of tin a) c)	is a me. Switcl Throu	a number o ning ghput	of packets	s passiı b) d)	ng through the r Modulation Multiplexing	network in a unit	
		7)	Mos a) c)	t packe Stop a Stop a	et switches and wait and wait A	s use RQ	pri b) d)	nciple. Store and forw None of the at	vard oove	
		8)	over a) c)	is t comm Data Netwo	he transm unication communic orking	ission of d links. ation	data be b) d)	tween two or m Data networki Communicatic	ore computer ng on	
		9)	In com a) c)	munica Simpl Full-d	transmissi ating devic ex uplex	on, the ch es at all ti	ime. b) d)	capacity is shar Half-duplex None of the al	ed by both bove	
		10)	Whi a) c)	ch of th Prese Sessi	ne following ntation lay	g layer of er	OSI m b) d)	odel also called Network layer Transport laye	end-to-end layer er	?

	B)	 Fill in the blank. 1) The packet of information at the application layer is called 2) provides a connection-oriented reliable service for sending messages. 3) In the OSI model, encryption and decryption are functions of the layer. 4) As frequency increases, the period 	06
		 5) is a set of rules that governs data communication. 6) DNS is the abbreviation of 	
Q.2	Solv a) b) c) d) e) f) g) h) i)	The any Eight of the following. Define Computer Network. And what are the benefits of the networks? Define the term half-duplex and full-duplex. What are the different transmission media? Define Analog and Digital signal. What is Attenuation? Define the term Multiplexing. Define Parity Check. What do mean by congestion control? Define the term Period and Phase.	16
Q.3	A)	 Attempt any Two of the following. 1) Explain the Connection oriented and connection less services in data Communication. 2) Describe Manchester and Differential Manchester scheme. 3) Define Network devices? Explain Hub and Switch. 	10
	B)	Short note on TCP and UDP.	06
Q.4	A)	 Attempt any Two of the following. 1) Explain Fiber Optic Cable transmission media. 2) Differentiate packet switching and circuit switching. 3) Explain the Point to Point Protocol in detail. 	08
	B)	Explain ISO- OSI Reference Model in detail with suitable diagram.	08
Q.5	Atte a) b)	mpt any Two of the following. Briefly explain the different data transmission modes: Parallel and Serial. Explain the TCP/IP protocol suite with SMTP, HTTP and SNMP.	16

c) Briefly explain the CSMA/CD method with neat diagram.

ς,	oupuolioi	α,	Biodo
An S a) c)	SCR Combines the features Resistor Capacitor	of a ro b) d)	ectifier and Transistor Inductor
A DI a) c)	AC has semiconduc One Three	tor lay b) d)	vers. Two Four
a) c)	_ is passive display. LCD CRT	b) d)	LED Gas Discharge Plasma
In ga are (a) c)	as discharge plasma display called Anode Gate	vs, col b) d)	d cathode numerical indicators Cathode Nixies

4) Use of log tables and calculator is allowed.

Instructions: 1) All questions are compulsory.

Choose correct alternatives Q.1 A)

Day & Date: Wednesday, 08-02-2023

Time: 03:00 PM To 06:00 PM

1)

9)

Seat

No.

The feedback path in an OP-Amp differentiator consists of a

B.Sc. (Semester - VI) (New) (CBCS) Examination: Oct/Nov-2022 **PHYSICS** (Paper-XVII) **Electronics**

- a) Capacitor
 - b) Resistor
 - c) Resistor and an inductor.

2) Figures to the right indicate full marks.

3) Draw neat labelled diagrams wherever necessary.

d) Resistor and a capacitor in series.

2) An inverting amplifier has R_2 = 3 M Ω and R_1 = 3K Ω . Its gain is a) -1000 1000 b)

c) 10 -10 d)

3) OP-AMP performs operations.

- a) Arithmetic Logical b)
 - c) Alphanumeric Both a) and b) d)
- The Pin 6 of IC555 is _____. 4)
 - a) Control Voltage b) Threshold
 - c) Ground d) Vcc
- 5) SCR is a type of device.
 - a) Thyristor b) Resistor d) Diode
 - c) Capacitor

6) An SC

- a) F
- c) (

7) A DIA

- a) (
- C)
- 8)
 - a) L
 - c) (

10

Set

Max. Marks: 80

Page 1 of 2

		 An n-Channel D-MOSFET with a positive V_{GS} is operating in a) Cutoff b) Enhancement mode c) Depletion mode d) Saturation 							
	B)	 Give the answers in one sentence/one word of the following. 1) How many pins do The IC555 timer consist of? 2) At what condition does SCR turn off? 3) How many minimum thyristors are required to make a TRIAC? 4) Which material is used to give a green colour in LED? 5) In which region FET should be operated as a voltage variable resistor? 6) What is the bandwidth of an ideal operational amplifier? 	06						
Q.2	Sol	ve any eight of the following:	16						
	a)	Draw the block diagram of OP-AMP							
	b)	If monostable mode of IC555 consists of R=1 M Ω and C-47 μ F then find the							
	-	value of time period monostable multivibrator.							
	d)	Write transconductance of D-MOSEET blasing.							
	e)	Give any four commonly used displays in digital electronics field.							
	f)	State different types of liquid crystals used for LCD display. Draw the symbol of DIAC and TRIAC.							
	g)								
	n) i)	State the important applications of TRIAC.							
	i)	Draw equivalent circuit of SCR.							
	3/								
Q.3	A)	Attempt any two of the following:	10						
		 Explain OP-AMP as a differentiator. Explain IC555 as a square wave generator 							
		 Give important features of LCD. 							
	B)	Write a short note on	06						
		1) IC555as Astable Multivibrator.							
04	۵)	Attempt any two of the following:	08						
ч .т	~)	1) Explain circuit operation of n-channel D-MOSFET.	00						
		2) What are the advantages of LED?							
		3) Explain the construction and working of DIAC.							
Q.4	B)	Solve.	08						
		An OP-AMP is used in non-inverting mode with $R_1 = 1K\Omega$ and $R_2 = 10 K\Omega$							
		1) $V_i = 100 \text{mV}$							
		2) $V_i = 5V$							
Q.5	Atte	empt any two of the following.	16						
	a)	Explain the construction and working of a SCR.	-						
	b)	Give comparison between JFET and D-MOSFET.							
	C)	Explain with a diagram the operation of a seven segment display using							

			SLR-F	Z-2	26
Sea No.	t		S	Set	Ρ
	В.	Sc. (\$	mester - VI) (New) (CBCS) Examination: Oct/Nov-202 CHEMISTRY (Special Paper – XVI) Analytical and Industrial Organic Chemistry	2	
Day Time	& Da : 03:	te: We 00 PN	iesday, 08-02-2023 Max. M ວ 06:00 PM	1arks	: 80
Instr	uctio	o ns: 1 2 3 4	Il questions are compulsory. igures to the right indicate full marks. Jse of log table and calculators is allowed. Draw neat labelled diagrams wherever necessary.		
Q.1	A)	Mult 1)	le choice questions. olymers synthesized using two or more types of monomers are alled as		10
			a) homopolymers b) graft polymers c) natural polymers d) heteropolymers		
		2)	linear polymer of 1,3 butadiene is formed when olymerization takes place. a) 1,2 b) 1,1 b) 1,4		
		3)	io-catalytic reactions are carried out by a) enzymes or microbes b) heat c) radiations d) organic catalysts		
		4)	is an example of oxidizing agent. A) NaBH4 b) LiAlH4 b) SeO2 d) 1,3-dithiane		
		5)	litrogen/Helium/Argon is used as mobile phase in hromatography. a) Thin layer b) Gas		
		6)	b) Paper d) Column n adsorption chromatography the main force operating for separat	ion	
		-	a) distribution force b) ion-exchange force c) surface active force d) ligand attractive force		
		7)	is an example of saponifying alkali. A) Potassium hydroxide b) Ethanol amine b) Ethylene oxide adduct d) Sodium bicarbonate		
		8)	oilet soap can be represented by general formula. a) (RCOO ⁻) ₂ Mg ⁺⁺ b) (RCOO ⁻) ₂ Ca ⁺⁺ c) RCOO ⁻ K ⁺ d) RCOO ⁻ Na ⁺		
		9)	Iolasses is the main byproduct of industry. a) Alcohol b) Sugar c) Paper d) Soan		
		10)	one charcoal is used for process in manufacturing of sugation b) Decolourization	ar.	

c) Dilution d) Sulphitation

06

16

B) Write One Word Answer for the following.

- 1) Heating of raw rubber in presence of sulfur and white lead at moderate temperature is known as?
- 2) In green chemistry context PTC means?
- 3) Umpolung or polarity inversion is carried by which reagent in presence of base?
- 4) What is the term used for describing distance moved by solute to that by solvent front?
- 5) Soap when vigorously shaken in water forms aggregate structure called as?
- 6) What is the percentage of Ethanol present in rectified sprit?

Q.2 Solve any Eight of the following.

- a) Give the classification of polymers based on the origin.
- b) Write the steps involved in synthesis of Deriphat.
- c) Name the detectors used in Gas Chromatography.
- d) Write the steps involved in synthesis of Polystyrene.
- e) Write the steps involved in synthesis of Polychloroprene.
- f) Give the composition of Denatured spirit and absolute alcohol.
- g) Mention the byproducts of Sugar industry.
- Write the steps involved in conversion of Benzaldehyde into Acetophenone by using 1.3-dithiane
- i) Give two examples of ionic liquids.
- j) Mention the different types of soaps.

Q.3	A)	Attempt any Two of the following.	10
		 Write a note on refining of raw sugar. 	
		2) Write any five principles of Green Chemistry.	
		3) Write a note on Gas Chromatography.	
	B)	Short Note/Solve	06
	,	Describe the steps involved in manufacture of soap by hot/boiled process.	
Q.4	A)	Attempt any Two of the following.	08
	-	1) How will you convert Benzaldehyde into Benzyl alcohol and	
		Acetophenone into 2-phenyl ethanol?	
		2) Write any four synthetic applications of Osmium tetroxide.	
		3) Write synthesis and uses of BUNA-S rubber.	
	B)	Describe/Explain/Solve	08
	-	Describe in detail Thin Layer Chromatography.	
05	Δtta	and any Two of the following	16
Q.0			10

- a) Describe in detail classification of synthetic detergents.
- **b)** Write a note on manufacture of ethyl alcohol from molasses; mention the by-products of alcohol industry.
- c) Write a note on Ziegler Natta polymerisation and give synthesis and uses of Phenol formaldehyde resin.

			Nursery, G	ardening a	k Horticulture	
Day Time	& Dat : 03:0	te: W D0 PN	ednesday, 08-02-20 I To 06:00 PM	23		Max. Marks: 80
Insti	ructio	ons: 1 2 3) All questions are c) Draw neat diagran) Figures to the righ	compulsory. ns and equations and equations and equations and equations are shown as the second second second second second s	ons wherever necessar narks.	у.
Q.1	A)	Chc 1)	ose the correct alt Seed viability test i a) Ragdoll test c) Vigour test	ernatives fro s otherwise ca b) d)	m the options. alled Tetrazolium test Germination test	10
		2)	Liver red is variety a) Orchid c) Anthurium	of b) d)	Aster Gladiolus	
		3)	Mound layring is of a) Stool layring c) Serpentine lay	therwise called b) ring d)	d Chinese layring Tip layring	
		4)	Which among thes a) Auxin c) Abscisic acid	e is plant grov b) d)	vth retardant? Gibberellin Cytokinin	
		5)	Chip budding is do a) Rose c) Hibiscus	ne in b) d)	 Grapes Rubber	
		6)	is leading a) Maharashtra c) Karnataka	l flower produc b) d)	cing state. Tamilnadu Kerla	
		7)	Which among the (a) Mumbai c) Delhi	given cities is b) d)	known as garden city? Chandigarh Bengaluru	
		8)	The tag colour ass a) Golden yellow	ociated with c b)	ertified seeds Blue White	

B.Sc. (Semester - VI) (New) (CBCS) Examination: Oct/Nov-2022 BOTANY (Special Paper – XVI)

Seat No.

SLR-FZ-228

Set

Ρ

c) Purple a) White

			c)	1966	d)	1972	
		10)	Que a) c)	een of flowers is Orchid Anthurium	 b) d)	Gladiolus Rose	
	B)	Ansv 1) 2) 3) 4) 5) 6)	wer Wh Def Wh Def Def Enl	the following. at are the three types of fine seed bank. at is manure? fine pomology. fine olericulture. ist the methods of seed	of nurs I dorm	eries? ancy breaking.	06
Q.2	Ansv 1) 2) 3) 4) 5) 6) 7) 8) 9) 10)	wer tl Wha Defir Wha Defir Defir Wha Defir Wha	he fe t are t are t is s ne s ne T ne a t is s ne ru t is s	ollowings (Any Eight) e cut flowers? iofertilizers. e biopesticides? seed viability? eed technology. -Budding. pproach grafting. scion? unner. sucker?	:		16
Q.3	A)	Ans 1) 2) 3)	wer Wri Wh Wh	the followings (Any to te the aims and objecti at is grafting? Describe at is seed dormancy? I	wo): ves of e differ Enlist t	the nursery and gardening ent types of grafting. he importance of seed dormancy.	10
	B)	Writ 1) 2)	e sh Gei Hor	n ort notes. netic erosion me gardening and its ty	rpes		06
Q.4	A)	Ans 1) 2) 3)	wer Wh Wh Hor Wh	the followings (Any to at is weed? Describe ir at are Plant Growth reg ticulture. at is Bonsai? Describe	wo): n detai gulator in deta	l methods of weed control. s? Describe the role of PGR's in ail method of making Bonsai.	10
	B)	Deso 1) 2)	c rib e Def Wh	e/Explain/Solve the fo fine gardening and type at is CAD? How CAD h	llowin s of ga nelps in	ig. ardening in detail studied by you. n landscaping?	06

b)

1946

9)

a) 1958

The seed act came into force

- Q.5 Answer the following (Any Two).a) What is seed? Describe the importance of seed testing and seed certification.
 - What is floriculture? Describe the importance of flower shows and b) exhibitions.
 - What is layring? Describe different types of layring techniques. C)

			SLR-FZ-	229		
Seat No.			Set	Ρ		
B.Sc	B.Sc. (Semester - VI) (New) (CBCS) Examination: Oct/Nov-2022 BOTANY (Special Paper – XVI) Biostatistics					
Day & Date Time: 03:0	e: Wedne 0 PM To	esday, 08-02-2023 06:00 PM	Max. Marl	<s: 80<="" td=""></s:>		
Instruction	s: 1) All (2) Dra 3) Fig 4) Use	questions are compulsory. aw neat labeled diagrams whures to the right indicate full e of log table and calculators	nerever necessary. marks. s is allowed.			
Q.1 A)	Rewrite 1) x ⁻ s a)	• the sentence by using co sign is used for Arithmetic mean	b) Median	10		
	2) Pie a) c)	e diagram is a One-dimensional diagram Circular diagram	b) Two-dimensional diagramd) Three-dimensional diagram			
	3) Sta a) c)	andard deviation was first wo Karl Pearson b Harvey Goldstein c	orked out by) Milton Friedman) Herman Hollerith			
	4) T-t a) c)	test is developed by Carl Pearson b William Gosset c	b) R.A. Fischer d) Laplace			
	5) Sta a) b) c) d)	atistics helps in field Decision making, LIC bank Government agencies and Business, trade, index nur All the above	s. <s I industries nbers</s 			
	6) Pri a) b) c) d)	imary data means Original data It may be result of survey It may be result of enquiry All the above				
	7) <u>a)</u> c)	is not a measure of ce Mode b Range c	ntral tendency.) Mean 1) Median			

	8)	 A variable which has some chance or probability of its occurrence is known as a) Simple variable b) Quantitative variable c) Qualitative variable d) Random variable 	
	9)	Number of students in your class is an example ofa) Meanb) Statisticsc) Moded) Median	
	10)	 Secondary data may be a) Finished data b) Processed data c) Already collected by some other agency d) All the above 	
B)	Fill i 1) 2) 3) 4) 5) 6)	A qualitative characteristics is called The definition of probability is provided by The group of items selected in particularly manner is called Standard deviation was first worked out by In columns charts, bars are in position. deals with collection, organization and interpretation of data.	16
Ansv 1) 2) 3) 4) 5) 6) 7) 8) 9) 10)	wer tl Wha Meni Enlis Write Sam Defir Defir Give Disco	he followings (Any Eight): 1 t is mean by continuous variable? 1 tion merits of Median. 1 at methods of primary data collection. 1 be the characteristics of chi-square test. 1 be the formula of Standard Deviation. 1 ple point and sample space. 1 he tabulation. 1 he arithmetic mean. 1 the formula for the calculation of probability. 1 us demerits of arithmetic mean. 1	6
A)	Ans 1) 2)	wer the followings (Any two): 1 Discus the basic concepts of biostatistics. Calculate the arithmetic mean of following data by using formula (The height of 10 plants found to be17,15,21,17,16,18,17,14,19,13 cm	0
B)	S) Write	e a note on co-efficient of variations)6

Q.2

Q.3

Q.4	A)	 Answer the followings (Any two): 1) Discus merits and demerits of standard deviation. 2) Give the difference between primary data and secondary data. 3) Mention the functions of biostatistics. 	
	B)	Solve mean deviation and co-efficient of mean deviation from the arithmetic mean from the following data on seed weight: Data - 4.8, 5.5, 6.5, 7.1, 7.3, 7.5, 8.0 & 8.5	08
Q.5	Ans a)	Calculate the range of following data by using formula. (The heights (in cm) of ten individual of wheat plants in a plot are 70, 50, 60, 90, 80, 65, 40, 75, 55 and 85)	16

- b) Describe the methods of primary data collection.c) Describe the different type of probability.

Set

D So	(Somostor	
No.		
Seat		

mester - VI) (New) (CBCS) Examination: Oct/Nov-2022 **ZOOLOGY (Special Paper – XVI) Applied Zoology**

Day & Date: Wednesday, 08-02-2023 Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.

- 2) Draw neat labeled diagrams wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Use of Log table and calculators is allowed.

Choose the correct alternatives from the options. Q.1 A)

- If more than single species of fish is cultured at a time, then it is 1) called . b) Aquaculture
 - a) Monoculture
 - c) Polyculture

- d) Mori culture
- Cod liver oil is rich in 2)
 - a) Vitamins A and D
 - c) Vitamins A and B
- d) Vitamins A and E
- Cultivation of fishes in artificially prepared ponds or water bodies is 3) called .
 - a) Aquaculture c) Vermiculture
- b) Pisciculture d) Agriculture
- *Pinctada vulgaris* produces very important product known as 4)
 - a) Shagreen b) Isinglass
 - c) Pearl d) Fish glue
- fish is used for controlling mosquito larvae. 5)
 - a) Gambusia b) Labeo c) Catla
 - d) Scoliodon
- Fish flour is rich in _____. 6)
 - b) Protein a) Fat
 - c) Vitamins d) Minerals
- Most efficient gear used for exploiting the pelagic fishery resources 7) along Karnataka coast is
 - a) Beachsiene b) Rampani
 - c) Dol net d) Scoop net
- Natural pearl is formed by _____ 8)
 - b) Prawn a) Bivalve
 - c) Crayfish d) Fish
- Broiler Poultry Farming is mainly aimed at? 9) b) Meat
 - a) Eggs c) Quils
- d) Animal or Bird Fat Oil



Ρ

- b) Vitamins A and C

10)	Which of the following species are commonly cultivated species of
	Lac Culture in India?

a) Kerria lacca

- b) Laciffer Laccad) Both a and d
- c) Rana tigrina

	В)	 Fill in the blank/Definition/One sentence answer/ One word answer/ Give the name/Predict the product etc. 1) Define fish preservation. 2) Note on Honey bee species in India. 3) Write a short note on Fish seed. 4) Write a short note on Species of honey bees in India. 5) Write a short note on Species of Lac insects. 6) Note on Nutritive value of egg. 	06
Q.2	Ans 1) 2) 3) 4) 5) 6) 7) 8) 9) 10)	wer the followings (Any Eight): Give an account on Fish culture. Write a short note on Fish harvesting. Give an account on Cultivation of lac insect. Write a short note on Natural enemies of silkworm. Give an account on common dairy animals. Note on Incubation and hatching of eggs. Give an account on Mulberry silkworm culture. Write a short note on Medicinal value of honey. Note on Types of silk. Give an account on Zebrafish; as a model organism in research.	16
Q.3	A)	 Answer the followings (Any two): 1) Describe in detail Application of biostatistics in Fishery. 2) Give an account on Depletion of fisheries resources. 3) Write a note on Natural enemies of honey bee and their control. 	10
	B)	Write a short note on Fishing crafts and Gears.	06
Q.4	A)	 Answer the followings (Any two): 1) Give an account on Life history of Apis. 2) Write a note on Milk and milk products. 3) Give an account on Housing and Equipment for poultry birds. 	08
	B)	Describe in detail the byproducts of fishing industry.	08
Q.5	Ans a) b) c)	wer the following (Any Two). Give an account on processing and uses of lac. Give an account on Culture of fresh water prawn. Write a note on application of remote sensing and GIS in fisheries.	16
Seat No.

B.Sc. (Semester - VI) (New) (CBCS) Examination: Oct/Nov-2022 MATHEMATICS (Special Paper - XVI) Integral Calculus

Day & Date: Wednesday, 08-02-2023 Time: 03:00 PM To 6:00 PM

Instructions: 1) All questions are compulsory. 2) Figures to the right indicate full marks.

Q.1 A) Fill in the blanks by choosing correct alternatives given below. 10 1) $\int_0^\infty e^{-ax} x^{n-1} dx =$ _____.

	a) <u>n</u>	b)	\overline{n}
	a^n	-1)	a
	C) n	a)	$\frac{n}{a^{n-1}}$
2)	If $0 < P < 1$ the $ P 1 - P$ a) 1	= <u>b</u>)	$\pi_{/2}$
	$r_{\rm c}$ π	d)	72 Ρπ
	$\sin P\pi$	ч)	$\frac{1}{\sin P\pi}$
3)	$\beta(m+1,n)$ =		
	a) $\beta(m, n+1)$	b)	m n
			m+n
	c) $\frac{m}{(m+n)}\beta(m,n)$	d)	$\frac{1}{2}$
4)	$\int_0^2 (8-x^3)^{-1/3} dx = _$		
	a) $\frac{1}{2}\beta(\frac{1}{2},\frac{2}{3})$	b)	$\frac{1}{2}\beta\left(\frac{1}{2},\frac{1}{2}\right)$
	$3 (3^{-3})$	d)	3 (2 3)
	c) $\frac{1}{2}\beta(\frac{1}{3}, \frac{2}{3})$	a)	β(2,3)

5) The area bounded by the polar curve $r = f(\theta)$ and the lines $\theta = \alpha$ and $\theta = \beta$ is given by _____.

a)
$$\int_{\alpha}^{\beta} \int_{r=0}^{f(\theta)} r dr d\theta$$

b) $\frac{1}{2} \int_{\alpha}^{\beta} \int_{r=0}^{f(\theta)} r dr d\theta$
c) $\int_{\alpha}^{\beta} \int_{\theta}^{f(\theta)} r dr d\theta$
d) $\frac{1}{2} \int_{\alpha}^{\beta} \int_{\theta}^{f(\theta)} dr d\theta$

Max. Marks: 80

Change the order of integration in the double integral 6) $\int_0^1 \int_v^1 f(x, y) dx dy = \underline{\qquad}.$ $\int_{0}^{1} \int_{x}^{1} f(x, y) dx dy$ $b) \quad \int_{0}^{1} \int_{0}^{x} f(x, y) dy dx$ $d) \quad \int_{1}^{y} \int_{0}^{x} f(x, y) dx dy$ C) Area laying between the parabola $y = 4x - x^2$ and the line y = K7) a) $\frac{1}{2}$ units c) $\frac{3}{2}$ units b) 3 units d) $\frac{9}{2}$ units Integral $\int_{a}^{b} f(x) dx$ is said to be improper if _____. 8) one or both the limits of integration are infinite a) both the limits are finite b) c) f(x) is bounded in (a, b)d) f(x) is bounded in [a, b]9) The μ test states that if b is the only point of infinite discontinuity of f on [a, b] and $\lim_{n \to b} (b - x)^{\mu} f(x)$ exists and _____ then $\int_{a}^{b} f(x) dx$ converges if and only if $\mu < 1$. b) is any non zero a) is zero c) is non zero finite d) is any value The integral $\int_0^\infty \frac{x^{2n}}{1+x^{2m}} dx$ is convergent if _____. 10) b) n > md) $n \neq m$ a) m > nc) n = mB) Give answer of following 06 $\int_0^{\pi/2} \sin^5 \theta \cos^3 \theta \, d\theta = _$ 1) If $\int_a^{\infty} |f(x)| dx$ is convergent then the integral $\int_a^{\infty} f(x) dx$ is _____. 2) $\int_{a}^{\infty} \sin x \, dx$ is an improper integral of _____ kind. 3) 4) The improper integral $\int_a^b \frac{dx}{(b-x)^p}$ converges if _____. Value of $\int_{1}^{2} \int_{0}^{3y} y \, dy \, dx =$ _____. 5) Value of 2 ls _____. 6) Solve any Eight of the following. 16 Test the convergence of $\int_0^1 \frac{dx}{x^3}$ a) Test the convergence of $\int_{2}^{\infty} \frac{2x^2}{r^4-1} dx$ b) Test the convergence of $\int_0^1 \frac{dx}{x^{3(1+x^2)}}$ C) Define improper integral of second kind. d) Prove that $\beta(m, n) = \beta(n, m)$ e)

Q.2

Page 3 of 3

SLR-FZ-231

- **f)** Show that $\int_0^{\pi/2} \sqrt{\tan \theta} \, d\theta = \frac{1}{2} \left[\frac{3}{4} \right] \left[\frac{1}{4} \right]$
- g) Define Beta and Gamma function.
- **h)** Prove that $\left[\frac{1}{2} = \sqrt{\pi}\right]$
- i) Solve $\int_{1}^{\log \infty} \int_{0}^{\log y} e^{x+y} dx dy$
- **j**) Solve $\int_0^{\pi} \int_0^{a\theta} r^3 d\theta dr$

Q.3 A) Attempt any Two of the following.

- 1) Show that the improper integral $\int_a^{\infty} \frac{dx}{x^p}$ converges if and only if P > 1 and divergent if $p \le 1$
- 2) Prove that $\beta(m, n) = \int_0^1 \frac{x^{m-1} + x^{n-1}}{(1+x)^{m+n}} dx$
- 3) Show that area of ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ is π ab using double integration.
- **B)** Solve $\iint xydxdy$ over the first quadrant of $x^2 + y^2 = a^2$

Q.4 A) Attempt any Two of the following.

- 1) If f(x) and g(x) are positive and $\lim_{x\to\infty} \frac{f(x)}{g(x)} = L$ where *L* is non zero finite number then show that two integral $\int_a^{\infty} f(x) dx$ and $\int_a^{\infty} g(x) dx$ behave alike.
- 2) State and prove relation between Beta and Gamma function.
- 3) Change the order of integration

$$\int_{0}^{2a} \int_{x^2/4a}^{(3a-x)} f(x,y) dx dy$$

B) Show that $\sqrt{\pi} \quad \boxed{2m} = 2^{2m-1} \quad \boxed{m} \quad \boxed{m+1/2}$

Q.5 Attempt any Two of the following.

- State and prove Abel's Test for improper integrals of a product of two function.
- b) 1) Show that $\beta(m, n) = \beta(m + 1, n) + \beta(m, n + 1)$ 2) Evaluate $\boxed{-1/2}$ $\boxed{-3/2}$

c) Using transformation $\frac{x^2}{y} = u$, $\frac{y^2}{x} = v$ find $\iint x^2 y^2 dx dy$ over the area bounded by four parabola $y^2 = 4x$, $y^2 = 8x$, $x^2 = 4y$, $x^2 = 8y$

16

10

06

			SLR-FZ-	232
Seat No.			Set	Ρ
B.Sc	:. (S	emester - VI) (New) (CBCS) Examination: C MATHEMATICS (Special Paper - XVI) Programming In C	Oct/Nov-2022	2
Day & Dat Time: 03:0	:e: W 00 PN	ednesday, 08-02-2023 И То 06:00 РМ	Max. Mark	s: 80
Instructio	o ns: 1 2	 All questions are compulsory. Figures to the right indicate full marks. 		
Q.1 A)	Chc 1)	bose the correct alternatives from the options		10
	2)	is the derived type of data. a) Pointer b) Hoat c) Union d) None of these		
	3)	The is the header file contains math functiona) <stdio.h>b) <math.h>c) <coin.h>d) None of these</coin.h></math.h></stdio.h>	1.	
	4)	is the jumping statement. a) switch b) white c) goto d) none of these		
	5)	Input data through keyboard using function.a) printfb) scan-fc) floatd) Integer		
	6)	is the conditional statement. a) for b) while c) dowhile d) switch		
	7)	The meaning of operator "If" is a) OR b) AND c) NOR d) Address		
	8)	Math function for 'arctangent of x' is a) tan (x) b) tanh (x) c) atan(x) d) None of these		
	9)	 'If not equal to' is the meaning of the operator a) <= b) \= c) >= d) None of these 		

						SLR-FZ-2	32
		10)	Modulo division is a a) % c) 🛞	a meaning of t b) d)	he operators + None of these	<u> </u>	
	В)	Ans 1) 2) 3) 4) 5) 6)	wer in the one sent C - language contai The meaning of the Every C program st One dimensional ar What is the meanin What is the meanin	ence. ins how many character '\V atement ends ray is called? g of the functi g of the functi	keywords. ' is? s with? on 'atan2(x,y)'? on 'fmod (x,y)'?		06
Q.2	Ans 1) 2) 3) 4) 5) 6) 7) 8) 9) 10)	wer t Writ Expl Stat Expl Writ Wha Why Writ Drav	the followings. (Any te the C - arithmetic of lain 'Basic structure' te the general form of lain the term 'condition lain one dimensional te the general form of at does 'int main (void y and when we use '# te the flowchart of 'ex w a tree diagram of '0	Fight) of C program. f "scanf function onal operator". array. f "goto" and "la d)' mean? finclude direct it controlled lo C - Tokans'?	heir meaning. on" and "printf fur able statement". tives'? oop'?	nction".	16
Q.3	A)	Ans 1) 2) 3)	wer the followings. Explain logical and Give two note on th Explain Multidimens	(Any two) assignment o e switch state sional Array.	perator. ment.		10
	B)	Exp	lain goto and 'For' sta	atement with e	example.		06
Q.4	A)	Ans 1) 2) 3)	wer the followings. Explain Bitwise and Write the program ' Explain the need of	(Any two) I spatial opera for' to calculat one dimensio	tors. te the average no onal array.	o of set N.	08
	B)	Writ	e the table for Math f	unction with n	neaning.		08
Q.5	Ans a) b) c)	wer t Writ Expl Writ	t he following. (Any the table for summ lain all types of C - co the program with flo	Two) ary of C - ope onstant. owchart for "D	rator. Þisplay a pyramid	l".	16

				SLR-FZ-	233	
Seat No.				Set	Ρ	
Β.	B.Sc. (Semester - VI) (New) (CBCS) Examination: Oct/Nov-2022 STATISTICS (Special Paper - XVI) Quality Management and Reliability					
Day & I Time: 0	Day & Date: Wednesday, 08-02-2023 Max. Marks: 80 Time: 03:00 PM To 06:00 PM					
Instruc	tions:	 All questions are compulse Draw neat labeled diagran Figures to the right indicate Use of log table and calcu 	ory. ns whe e full r lators	erever necessary. narks. is allowed		
Q.1 A	.) Cho 1)	 cose the correct alternative Shewhart control charts are a) Small (< 1.5σ) c) Big (> 6σ) 	es fron e inse	n the options. nsitive to process shifts. b) Medium $(1.5\sigma < \text{shift} < 3\sigma)$ d) Very Big	10	
	2)	The purpose of Acceptance a) Estimate lot conformity c) Estimate lot defectives	e sam / b) / d)	pling is to Estimate lot quality Sentence lots		
	3)	Which of these is not a par a) Pareto chart c) Scatter Diagram	t of ma b) d)	agnificent seven of SPC? Check Sheet 2k factorial design		
	4)	One-sided upper cusum state a) C_i^+ c) C_i	atistic b) d)	is C_i^- None of these		
	5)	In Quality Management 'Ca as a) Fish diagram c) Fishbone diagram	ause a b) d)	nd effect diagram' is also known Flowchart None of these		
	6)	Exponential distribution is a) IFR c) both (a) and (b)	b) d)	 DFR None of these		
	7)	Cut vector of a parallel sys a) (1, 1) c) (0, 1)	tem of b) d)	f 2 components is (1, 0) None of these		
	8)	EWMA charts are better th the shifts. a) Small process c) Large process	an Sh b) d)	ewhart control charts in detecting Medium process None of these		

- The structure function of a binary system S takes any one of _____possible values
 - a) 4 b) 2
 - c) 3 d) None of these
- 10) In a Single Sampling Plan if incoming lots are of quality p = 0.01, $P_a = 0.9397$ and the lot size *N* is large relative to the sample size *n*, then AOQ is approximately equal to
 - a) 0.9397 b) 0.009397
 - c) 0.09397 d) 0.09793

B) Define the following

- 1) The full form of 'P' in the PDCA cycle in Quality Management is _____.
- 2) If the value of \overline{X}_i = 9.29, C_{i-1} = 2.56 and μ = 10 then the cumulative sum C_i up to and including the *i*th sample is _____
- 3) The full form of M in the EWMA chart is _____
- 4) In a Single Sampling Plan if the lot size *N* is large relative to the sample size *n*, then we may write the equation of AOQ approximately as _____.
- 5) A set of components whose functioning ensures the functioning of the system is known as _____.
- 6) The full form of 'Q' in the AOQL is _____.

Q.2 Answer the followings (Any Eight):

- 1) What is the meaning of Quality?
- 2) What is Producer's risk?
- 3) What is ATI?
- 4) Define a parallel system.
- 5) Define a structure function of a system of n components.
- 6) Define 2-out-of-3 system.
- 7) What is the long form of DMAIC cycle?
- 8) Define AQL.
- 9) What is process control?
- **10)** What is a cut vector?

Q.3 A) Answer the followings (Any two):

- 1) In a single sampling plan if sample size n = 10, acceptance number c = 1, and lot quality p = 0.08, find the probability of rejecting the lot by using binomial distribution.
- 2) Explain any two dimensions of quality.
- 3) Find the minimal cut vectors of a series system of 2 components.
- **B)** Write a procedure of Single Sampling Plan.

06

10

16

80

16

B) Find the failure rate function (hazard rate) for a series system of 3 80 independent components, where life time $T_1 of i^{th}$ component is exponentially distributed with mean 10^i hrs. for i = 1.2.3.

Answer the following (Any Two). Q.5

- Explain the Tabular CUSUM for monitoring the process mean. 1)
- Write a note on a magnificent tool of guality-Pareto diagram. 2)
- 3) Suppose a mobile phone company produces mobile phones in lots of size 400 phones each. To check the quality of lots, the quality inspector of the company uses a double sampling plan with $n_1 = 15, c_1 = 1$, $n_2 = 30, c_2 = 3$. If the incoming quality of the lot is 0.05, calculate the probabilities of acceptance of the lot on first sample (P_a^1) and on the second sample (P_a^2) . What is the probability of acceptance of the lot on the combined sample in the double sampling $plan(P_a)$? Find AOQ.

Assume number of defective items found in the samples follows binomial distribution.

Answer the followings (Any two): Q.4 A)

- What is the value of lower control limit for the period i = 1 for a 1) EWMA chart which has value of $\lambda = 0.10, L = 2.7, \sigma = 1$ and the value of $\mu_0 = 10$?
- 2) Find the reliability of a parallel system of 3 independent components whose reliabilities are $p_1 = p_2 = p_3 = 0.7$.
- What are the advantages of acceptance sampling? 3)

Date 03:0	e: We 0 PM	dnes To 0	day, 08-02-2023 6:00 PM		Max. Marks: 80
ctio	n s : 1) 2)	All q Figu	uestions are compulsory. Ires to the right indicate full r	narks	
A)	Multi 1)	ple c The a) c)	hoice questions. long-term movement of time Trend seasonal variation	e serie b) d)	10 es is cyclical variation Noise
	2)	The estir a) c)	data is defined as the nated seasonal component Seasonalised Deseasonalised	e origi remov b) d)	nal time series data with the /ed. Seasonal None of these
	3)	Valu a) c)	e of b in the trend line Y = a Always negative Always zero	i + bX b) d)	is Always positive Can be negative or positive
	4)	Mov a) b) c) d)	ing averages remove the cy the average is weighted the period is even the period is odd the period is same as that o	clical	variation if
	5)	The calle a) c)	rise and fall of a time series ed Secular trend Cyclical variation	over b) d)	periods longer than one year is Seasonal variation Irregular variation
	6)	Mov a) c)	ing average method is used Trend is linear Trend is curvilinear	for m b) d)	easurement of trend when:) Trend is non linear) None of them
	7)	An c occu a) c)	orderly set of data arranged i urrence is called: Arithmetic series Geometric series	in acc b) d)	ordance with their time of Harmonic series Time series
	8)	A tre resic a) c)	end is the better fitted trend f duals is: Maximum Positive	for wh b) d)	ich the sum of squares of) Minimum) Negative
	9)	Incre is a)	ease in the number of patier Secular trend	nts in t b)	he hospital due to heat stroke

Seasonal variation Cyclical variation C) d)

SLR-FZ-234

Set

Ρ

Seat No.

B.Sc. (Sem-VI) (New) (CBCS) Examination: Oct/Nov-2022 STATISTICS (Special Paper-XVI) Time Series Analysis

Day & D Time:

Instru

Q.1

- 10) The fire in a factory is an example of: _
 - a) Secular trend
 - c) Cyclical variations
- b) Seasonal movements
- d) Irregular variation

Q.1 B) Fill in the blank.

- 1) There are <u>components</u> in the time series.
- 2) Exponential smoothing is also called as _____.
- 3) Link relative method is also called as _____
- 4) If for a time series process, its mean, variance and autocorrelation structure do not change over time, then it is called as _____.
- 5) Non predictable fluctuations observed in time series data are termed as _____.
- 6) In time series analysis independent variable is _____.

Q.2 Solve any eight of the following.

- a) Define Seasonal variation of a time series.
- **b)** List down all the components of a time series.
- c) Define MA(1) model.
- d) Define auto-covariance function.
- e) Which tests are used to check randomness of a series against trend and seasonality?
- f) State additive model of a time series. Also describe every term involved in it.
- g) Define stationary time series
- h) Define AR(2) model.
- i) Define irregular variation. Also give examples of this kind of variation.
- j) What are the demerits of moving average method?

Q.3 A) Attempt any two of the following.

- 1) Write a note on moving average method.
- 2) Describe run test for checking randomness of a series against trend and seasonality.
- 3) Discuss various time series plots as well as historigram.
- **Q.3 B)** Write a note on harmonic analysis.

Q.4 A) Attempt any two of the following.

- 1) Describe least square method for trend estimation.
- 2) Describe auto-covariance function. Also state its properties.
- 3) Describe link relative method.

Q.4 B) Describe double exponential smoothing.

- Q.5 Attempt any two of the following.
 - a) Discuss ratio to moving average method.
 - b) Discuss estimation of mean square error of forecasting.
 - c) Write down the estimation procedure for parameters of MA (2) process.

06

16

10

5

06

08

08

Seat No.

B.Sc. (Semester - VI) (New) (CBCS) Examination: Oct/Nov-2022 GEOLOGY (Special Paper-XVI) Geochemistry

Day & Date: Wednesday, 08-02-2023 Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.

- 2) Draw neat labelled diagrams wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Use of log table and calculators is allowed

Q.1 A) Choose the correct alternatives from the options.

- 1) Elements which readily-form ions with an outermost 8-electron shell are:
 - a) Siderophilec) Lithophile
- b) Chalcophiled) Atmosphere
- 2) Among the chemical elements, the most abundant chemical element in the earth's crust is _____.
 - a) Silicon b) Oxygen
 - c) Iron d) Aluminium
- 3) Long-term changes in the geochemical cycle are known as:
 - a) Periodic changes b) Permanent changes
 - c) Secular changes d) Perennial changes
- 4) Which of the following method is used for dating relatively recent geological event?
 - a) K Ar method b) U Pb method
 - c) Carbon 14 methods d) Rb Sr method

5) The water loving colloids are called as:

- a) Hydrophobic b) Hydrophilic
- c) Dispersion d) Emulsions
- 6) Siderites consist essentially of a.
 - a) Nickle iron alloy
- b) Nickel-iron alloy and silicates
- c) Silicates only d) Silicates and graphite
- 7) In the periodic table of elements, the elements are arranged in order of:
 - a) Decreasing atomic weight
 - b) Increasing atomic number
 - c) Increasing volume
 - d) Decreasing atomic number
- 8) Different element with, same neutron number but with different values of atomic weight and protons are known as.
 - a) Isotopes b) Isotones
 - c) Isobars d) Isotherms

Set P

Max. Marks: 80

- 9) Two or more substances that have the same or closely similar chemical formulas but different crystal structures are known as:
 - a) Isomorphism
- b) Polymorphismd) None of the above

b) Covalent bond

d) Van der Waals bond

- c) Pseudomorphism
- 10) A bond that results from the total transfer of electrons from one atom to another is known as:
 - a) Ionic bond
 - c) Hydrogen bond

B) Define the following

- 1) Isotope
- 2) Chondrites
- 3) Isomorphism
- 4) Adsorption
- 5) Camouflaged
- 6) Metallic Bonding

Q.2 Answer the followings (Any Eight):

- 1) List the four most abundant elements in the continental crust.
- 2) Give any two examples of polymorphs.
- 3) List the four types of colloids.
- 4) Name the types of adsorption.
- 5) Name the two types of siderolites.
- 6) List the four chalcophile elements of geochemical classification.
- 7) Name the high field strength elements.
- 8) Give examples of hydrophobic sol.
- 9) Name any four stable isotopes.
- **10)** List the four major oxides of average composition of igneous rocks.

Q.3 A) Answer the followings (Any two):

- 1) Write note on Aerolite type of meteorite.
- 2) Discuss in detail cosmic abundance of elements with suitable diagram.
- 3) Describe in brief geochemical cycle with suitable diagram.

B) Write short note on types of radioactivity with suitable examples. 06

Q.4 A) Answer the followings (Any two):

- 1) Explain the different types of solid solution substitution with diagram.
- 2) Discuss the applications of radiogenic isotopes.
- 3) Discuss any four minor elements in magmatic crystallization.
- B) Describe in brief the Goldsmith's classification of geochemical elements. 08

Q.5 Answer the following (Any Two).

- 1) Explain in detail the composition of Meteorites.
- 2) Describe the types of chemical bonding with coordination number.
- 3) Discuss any four radiogenic methods used for dating geologic events.

16

10

80

16

. .

Seat No.

1)

B.Sc. (Semester - VI) (New) (CBCS) Examination: Oct/Nov-2022 MICROBIOLOGY (Special Paper - XVI) Environment Microbiology

Day & Date: Wednesday, 08-02-2023 Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Neat diagrams must be drawn wherever necessary.
- 4) Use of log table or calculator is allowed.

Q.1 A) Choose the correct alternatives from the options.

- 5.
- 10
- The term biosafety refers to _____. a) the prevention of large-scale loss of biological integrity
- b) the focus both on ecology and human health
- c) protect from harmful incidents
- d) All of the above
- 2) _____ feature allows fungal spores to remain viable in air for longer period than their vegetative forms.
 - a) Thicker cell wall b) Smaller in size
 - c) resistance to heat d) resistance to alcohol
- 3) _____ causative agent of airborne pulmonary anthrax disease.
 - a) Bacillus anthracis
 - b) Coccidiodesimmitis
 - c) Legionella pneumophila
 - d) Blastomyces dermatitis
- 4) What happens when phosphorus, nitrates, and detergents in water lead to an acceleration in the growth of algae?
 - a) Extinction
 - b) Eutrophication
 - c) Increase in the number of fishes
 - d) increase in the number of aquatic plants
- 5) Which extremophile lives in high areas of pressure?
 - a) Acidophile b) Barophile
 - c) Psychrophile d) Halophile
- 6) _____ is the amount of oxygen required to oxidize only organic matter in sewage.
 - a) Turbidity b) BOD
 - c) COD d) DO
- 7) _____ is determined by measuring the dissolved oxygen used during the chemical oxidation of organic matter in 3 hours.
 - a) COD b) BOD c) ThOD d) TOC

Set P

Max. Marks: 80

8) _____ indicates chemical characteristics of industrial wastewater.

b) BOD

- a) pH
- c) COD d) All of these
- The bioremediation process involving the usage of plants to degrade pollutants is _____.
 - a) Composting b) Biopile
 - c) Phytoremediation d) Land farming
- 10) _____ is the scientific field at the intersection of geology and microbiology and is a major subfield of geobiology.
 - a) Air Microbiology

c) Geomicrobiology

- b) Water Microbiologyd) Marine Biology
- B) Fill in the blank/Defamation/One sentence answer/One-word 06 answer/ Give the name/Predict the product etc. 1) Define 'Bioremediation' Define 'Extremophiles' 2) Give the two examples of thermophiles 3) 4) Give the two examples of acidophiles 5) Define 'Geomicrobiology' Define Air Microbiology' 6) Q.2 Answer the followings (Any Eight): 16 What is Eutrophication? 1) 2) Give the sources of air pollution. Give the significance of COD. 3) Enlist the methods to study aquatic microorganisms. 4) What is Carbon Credit? 5) 6) Give the significance of bioaerosol. What is carbon sequestration? 7) What is bioleaching? 8) Enlist the various types of industrial waste. 9) 10) Enlist the various methods of wastewater assessment and management. Q.3 A) Answer the followings (Any two): 10 Describe the various methods to study airborne microorganisms. 1) 2) Describe in detail Eutrophication. Explain the treatment of waste from the dairy industry. 3) B) Write a short note on Bioremediation. 06 Answer the followings (Any two): Q.4 A) **08** Explain the significance of Bioaerosol. 1) 2) Explain the various general characteristics of extremophiles. 3) Explain the significance of BOD. Describe the sugar industry as 'Zero waste technology'. B) 08 Answer the following (Any Two). 16 Q.5 Explain the concept of carbon sequestration in detail. a) b) Describe the methods of oil recovery. Explain the bioleaching of uranium. C)

-	1							
Seat No.							Set	Ρ
B.Sc	. (Se	mester - ELE M	- VI) (New) CTRONIC odern Cor	(CBCS) I S (Specia nmunicat	Exa al P ion	mination: (aper – XVI) Systems	Oct/Nov -2022	2
Day & Dat Time: 03:0	e: We 0PM	ednesday, To 06:00	08-02-2023 PM			eyeteme	Max. Mark	(s: 80
Instructio	ns: 1) 2 3 4) All questi) Draw nea) Figures t) Use of Le	ions are com at labeled dia to the right in og table and	apulsory. agrams whe idicate full n calculators	erevo nark is a	er necessary. s. llowed .		
Q.1 A)	Cho 1)	ose the c PIN photo a) II c) K	orrect alterr o diode conta	natives fror ains	n th laye b) d)	e options. r. I V		10
	2)	Synchron a) SYN c) SOH	ious transmi	ssion begin	s wit b) d)	th STX ETB		
	3)	Cellular r called as a) MAM c) FAM	adio contain: 	s a program b) d)	NA RA	e read only m M M	emory chip is	
	4)	a) Duple c) Equa	s device that exer Ilizer	converts up b) d)	o linl Eai Tra	k frequency ir rth station insponder	ito down link.	
	5)	The prob a) sky c) space	lem of overc e	rowding rad b) d)	io s mic dire	pectrum is so cro ect	lved by wa	ves.
	6)	In optical refractive a) more c) equa	fiber commu index of cor than I to	unication tot re is b) d)	al in cla les nor	iternal reflecti dding. s than าe	on takes place if	;
	7)	Band wid is a) 28 Kl c) 112 k	th required t Hz <hz< td=""><td>o transmit 5 b) d)</td><td>6 KI 56 14</td><td>b/s binary sigi KHz KHz</td><td>nal without noise</td><td>}</td></hz<>	o transmit 5 b) d)	6 KI 56 14	b/s binary sigi KHz KHz	nal without noise	}
	8)	Receiver <u>N</u> a) 870.3 c) 870.9	channel 22 /IHz. 36 96	is 870.66 M	Hz s b) d)	so receiver ch b70.63 870.69	annel 23 is	
	9)	Typical d a) 14 G	own link freq Hz	uency for s	atell b)	ite is 6 GHz		

d) Any of these c) 2 GHz

- 10) Pulsed RADAR uses _____ type of display.
 - a) CRO b) PPI c) CRT d) ILD
 -) CRI (D) ILL

B) Answer in one sentence.

- 1) What is communicating satellite?
- 2) What are the types of optical fiber?
- 3) What is frequency range of cellular phone system?
- 4) What are the types of computer networking?
- 5) Name the semiconducting devices used in microwave communication.
- 6) What are the types of modems?

Q.2 Answer the followings (Any Eight):

- 1) Calculate bit rate if bit deviation period is 2.5 ms.
- 2) What is working principle of optical fiber communication?
- 3) Define up link and down link frequency of satellite.
- 4) Explain any four applications of microwave.
- 5) What is computer communication? What are its types?
- 6) What are the sources and detectors used in optical fiber communication?
- 7) Define transmission line? What are its types?
- 8) Define protocol and server.
- 9) What is role of transponder in satellite communication?
- **10)** What is hand off process used in mobile communication?

Q.3 A) Answer the followings (Any two):

- 1) Explain wave guide used in micro wave communication.
- 2) Explain Avalanche photo diode as detector used for optical fiber communication.
- 3) Explain satellite communication system.
- **B)** Explain concept of digital data communication along with different digital **06** codes used for computer communication.

Q.4 A) Answer the followings (Any two):

- 1) Explain frequency synthesizer block used in mobile communication.
- 2) Explain principle of RADAR.
- 3) Explain how satellite is used for surveillance and navy.
- **B)** Describe splicing techniques used in optical fiber.

Q.5 Answer the following (Any Two).

- a) Explain pulsed RADAR system with necessary block diagram.
- b) What is internet? Explain the applications of the internet.
- c) Explain satellite earth station with necessary block diagram.

06

16

80

16

10

B.Sc. (Semester - VI) (New) (CBCS) Examination: Oct/Nov-2022 **COMPUTER SCIENCE (Paper - XVII) Advance Python**

Day & Date: Wednesday, 08-02-2023 Time: 03:00 PM To 06:00 PM

Seat No.

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Neat diagrams must be drawn wherever necessary.
- 4) Use of log table or calculator is allowed.

Choose the correct alternatives from the options. Q.1 A)

- Config() in Tkinter is used for 1)
 - b) Change the property of the widget a) Delete the widget
 - c) Place the widget d) Bind the widget

2) method of layout manager is used based on x, y coordinate.

- a) pack() b) grid()
 - c) place() d) bind()
- The widget is used to display multiline text. 3)
 - b) Text Area a) Label
 - d) Message c) Entry
- The method pf ListBox widget is used to retrieve the index 4) or position of selected item.
 - a) curselection() b) get()
 - d) xview() c) index()
- 5) The module is used to work with MySQL database in python.
 - b) MySQLdb a) mysql
 - c) mysglclient d) MySQLLite
- The widget is used to enter or display one line of text. 6) a) Label
 - b) Text Area
 - c) Entry d) Text
- Django can follow _____ architectural pattern. 7)
 - a) PHP b) Angular JS
 - c) MVVC d) MVT
- In Diango, view.py file contains _____. 8)
 - a) list of files in templates folder
 - b) form to enter the data in database
 - c) functions to return HTML files
 - d) list of HTML files
- In Django command is used to retrieve all the 'User' records 9) from a given database.
- a) Users.objects.all()
 b) User.objects.all()
 c) Users.all_records()
 d) User.object.all()

Max. Marks: 80

06

16

10

06

80

16

- **10)** In Django, there are _____ number of HTTP requests.
 - a) 2 b) 3
 - c) 4 d) 6

Q.1 B) Fill in the blank.

- 1) _____ command is used to check version of Django.
- 2) DOM stands for _____
- **3)** The _____ method of socket object is used to translate a host name to IPv4 address format.
- 4) _____ file is very useful for a command-line utility that lets you interact with Django project in various ways.
- 5) After creating connection with MySQL, you can interact with database using _____ object.
- 6) _____ command is used to install all classes related to MySQL connection.

Q.2 Answer the followings (Any Eight):

- 1) What are different parameters required for connect method?
- 2) What is XML? Give example.
- 3) Write a command to create Dingo project and app?
- 4) What are the uses of the start and extend attribute of create_arc?
- 5) List out containers used in python GUI with an example.
- 6) What is URL Routing in Django?
- 7) What is Spinbox? Give an example.
- 8) How to connect google website using socket?
- 9) What is the difference between grid and place layout managers?
- **10)** How to create a superuser in the Dingo project?

Q.3	A)	Answer the followings (Any two):				
	-	1) Write python code to insert and delete records from the database.				
		 Explain different Server Socket Methods and Client Socket Methods in detail. 				
		 Explain MVC design pattern used in Django. 				
	B)	Write python code for creating a line, oval, rectangle, and arc on the				

Q.4 A) Answer the followings (Any two):

window.

- 1) Explain different methods used for cursor objects.
- 2) What is migration? Explain migration with an example.
- 3) Explain XML Parser Architecture.
- B) Describe event biding and event patterns used in python GUI08programming with example.

Q.5 Answer the following (Any Two).

- a) Write python code for client and server communication.
- **b)** Explain the menu widget with example.
- c) Write python code for parse any XML file using SAX and DOM API technique.

B.Sc. (Semester - VI) (New) (CBCS) Examination: Oct/Nov-2022 **Software Testing**

Day & Date: Thursday, 09-02-2023 Time: 03:00 PM To 06:00 PM

a)

1)

Seat

No.

Instructions: 1) All questions are compulsory.

- 2) Draw neat labeled diagrams wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Use of Log table and calculators is allowed.

Q.1 A) Choose the correct alternatives from the options.

- is not a Software Development Life Cycle Phase?
 - **Requirements Gathering** b) Coding
 - c) Test Closure
- Test cases are designed during 2) b)
 - a) Test recording
 - c) Test configuration
- Which of the following comes under the Control Structure Testing? 3)

Testing

Test planning

d) Test specification

d)

- a) Condition testing b) Loop testing
- c) Data Flow Testing d) All of these

4) Which of the following is black box testing technique?

- a) Basic path testing b) Boundary value analysis
- c) Code path analysis d) None of these
- Which of the following is not a part of test plan? 5)
 - b) Mission a) Scope
 - c) Objective d) Risk

Which is the following example of load testing? 6)

- a) Downloading large contents from the internet
 - b) Running multiple applications on a computer or server simultaneously
 - c) Printing large document using printer in a queue
 - d) All the above

7) Which are the following characteristics of Exploratory Testing?

- a) Minimum planning and maximum execution
- b) Useful in situations with poor specification and limited time
- c) Both A and B
- d) None of these

Max. Marks: 80

SLR-FZ-240

Set

06

16

SLR-FZ-240

c) The safety-critical parts of the system shall contain zero faults

b) The response time shall be less than one second for the

d) The system shall be built to be portable

a) The system shall be user friendly

Which of the following requirements is testable?

- In the V model, testing starts in parallel with the development. 9)
 - b) False
- 10) Which is not a part of Decision Table?

specified design load

- a) Rule portion
- b) Driver portion d) Action portion c) Condition portion

Fill in the blank. B)

a) True

8)

- Testing is done without planning and documentation is called . 1)
- Cyclomatic Complexity is measured by 2)
- A logical collection of test cases is called as 3)
- Testing phase starts after the Development phase _____. 4)
- Testing of individual components by the developer's in . 5)
- User Acceptance testing is a type of 6)

Solve any eight of the following. Q.2

- What is Pair Testing? 1)
- Define Error guessing. 2)
- What are the phases of testing? 3)
- 4) What are the objectives of system testing?
- What is the use Loop Testing? 5)
- Define Test Summary Report. 6)
- Distinguish between Alpha & Beta Testing. 7)
- 8) What are the needs of testing?
- Define Failure. 9)
- 10) Define Boundary value analysis.

Q.3 A) Attempt any two of the following questions.

- 1) What is Requirement Traceability Matrix? How to prepare Requirement Traceability Matrix.
- 2) What is Review process? How to Preparing Review Report.
- 3) What is Integration testing? Discuss Top-down and bottom-up Integration Testing.
- B) Design a Test case for login page.

Q.4	A)	 Attempt any two of the following questions. 1) What is white box testing? How decision coverage is differing from statement coverage? 2) What is stress testing? Why stress testing is needed? Explain with example. 3) What is Test Case? Explain Test Case Template suitable with example. 	08
	B)	What is Performance testing? Explain types of performance testing.	08
Q.5	Atte a) b) c)	Explain Defect Life Cycle. Explain regression testing with its types. What are the advantages of smoke testing? How Smoke Testing works. Explain with Example.	16

'Values in Life' is a speech delivered by Kipling before a group of university 1) students in _____ a) Canada b) England C) Scotland d) Ireland 2) 'Don't be _____' is the message delivered by Kipling. a) selfish b) liar c) smart d) thief Shaw is addressing to ______ students in 'Spoken English and Broken 3) English'. a) native b) foreign c) British d) common 4) According to Shaw, if foreigners want to be understood by the British people, they should not try and speak English. a) perfect b) broken c) incorrect d) bad 5) When the grandmother died, the house withdrew into a) silence b) noise d) happiness darkness C) 6) O Captain! my Captain! rise up and hear the a) song b) music C) bells d) sounds 'All that is best of _____ and _____ meet in the woman's aspects and her 7) eyes,' according to Byron. a) day and night b) day and bright c) dark and bright d) dark and night Upagupta was the disciple of ____ 8) a) Buddha b) Tagore c) Ashoka d) None of the above 9) is the synonym for 'cheat'. honest a) deceive C)

B.Sc. (Semester - VI) (Old) (CBCS) Examination: Oct/Nov-2022 ENGLISH (Compulsory) **Literary Quest**

Day & Date: Tuesday, 28-03-2023 Time: 03:00 PM To 05:30 PM

Seat

No.

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

Choose the correct alternatives from the options. Q.1

SLR-FZ-241

Set

Max. Marks: 70

- 'Wax' is the antonym for _____. 10)
 - a) fax C) dewax

- is the antonym for 'folly'. 11)
 - a) Wisdom
 - Clear C)
- 12) is the synonym for 'remote'.
 - Wet a)
 - Mobile C)

is the synonym for 'novel'. 13)

- New b) Prize a) d)
- C) Medal
- 14) is the antonym for 'eager'
 - a) Meager b) Sugar
 - c) Sad d) Reluctant

Q.2 Answer any four of the following questions.

Comment on the subject matter of the poem 'My Grandmother's House'. a)

b) Silly

d)

b)

Mistake

Shadow

d) Distant

Old

- What is the speaker's desire in the poem 'My Grandmother's House'? b)
- What awaits the Captain in the poem 'O Captain! My Captain!'? C)
- Analyze the metaphors used in the poem 'O Captain! My Captain!'. d)
- Comment on the beauty of the woman described in the poem 'She Walks in e) Beauty'.
- Comment on the theme of the poem 'Upagupta'. **f**)

Q.3 Answer any two of the following questions.

- What will happen when you will meet a man who does not want money, a) according to Kipling?
- How should a foreigner speak when he/she wants to communicate or ask b) for directions, according to Shaw?
- What is meant by Prefix? Give four examples of prefixes. C)
- What is meant by Suffix? Give four examples of suffixes. d)

Q.4 Answer any one of the following questions.

What is meant by leadership Skills? Comment on gualities of a good leader.

OR

What are the techniques one should follow to become an effective team member?

Q.5 Write in detail about how to manage your time in a better way.

16

14

14

Se B.Sc. (Semester - VI) (Old) (CBCS) Examination: Oct/Nov-2022 PHYSICS (Special Paper - XIII)

Electrodynamics

Day & Date: Monday, 27-03-2023 Time: 03:00 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

3) Draw a neat labeled diagram wherever necessary.

4) Use of logarithmic table and calculator is allowed.

Q.1 Choose the correct alternatives from the options.

The trajectory of a charged particle moving in uniform & constant magnetic fields is _____.

 \vec{B}

V

a) Ellipse b) Parabola c) Cycloid d) Circle

2) The drift velocity of a charged particle in crossed fields is independent

of _		
a)	\vec{E}	b)

- c) q/m d)
- 3) Sun rays are _____ waves.
 - a) Electromagneticb) Electricc) Magneticd) Longitudinal

4) Back emf ε in a circuit with current I and inductance L is .

a)	$-L\frac{dI}{dt}$	b)	$L\frac{dI}{dt}$
c)	$-L\frac{dV}{dt}$	d)	$L\frac{dV}{dt}$

5) The correction term in Maxwell's fourth equation $\frac{\partial D}{\partial t}$ is known as _____.

a) current b) displacement current

c) charge d) constant current

6) 'Magnetic free poles do not exist' is justified by _____ Maxwell's equation.

- a) $\nabla X \vec{B} = 0$ b) $\nabla \cdot \vec{B} = 0$ c) $\nabla X \vec{D} = 0$ d) $\nabla \cdot \vec{D} = 0$
- 7) The radiation emitted from a source exerts _____.
- a) force b) no force
 - c) restoring force d) reaction force
- 8) For free space, $\rho = J =$ ____. a) 0 b) E
- c) B d) ∞ 9) Retarded time corresponds to of radiation
 - Retarded time corresponds to _____ of radiation.
 absorption
 b) emission
 - c) polarization d) scattering

Seat No. SLR-FZ-242

Set | P

Max. Marks: 70

	10)	The tangential component of electric field at the interface is a) discontinuous b) continuous c) zero d) ∞	
	11)	Total power radiated by electric dipole is proportional to of frequency.a) cubeb) squarec) square rootd) fourth power	
	12)	Incident waves and transmitted waves are a) always in phase b) always out of phase c) perpendicular d) crossed	
	13)	Electromagnetic equations are known as equations. a) Einstein's b) Maxwell's c) Newton's d) Rutherford's	
	14)	The phase difference between H and E is given by $\underline{\alpha}$.	
		a) $\phi = \sin^{-1} \frac{\beta}{\alpha}$ b) $\phi = \tan^{-1} \frac{\alpha}{\beta}$	
		c) $\phi = tan \frac{\beta}{\alpha}$ d) $\phi = tan^{-1} \frac{\beta}{\alpha}$	
Q.2	A)	 Answer the following questions. (Any Four) 1) Define displacement current density D. 2) Define wave impedance. 3) State Lenz's law of Electromagnetic induction. 4) State any two examples of EM waves. 5) State Poisson's equation. 	08
	B)	Write note. (Any Two)1) Obtain an expression for total power radiated by an electric dipole.2) Prove $\nabla X \vec{B} = \mu_0 \vec{J}$ 3) Write a note on Boundary condition for EM Field vectors.	06
Q.3	A)	 Answer the following questions. (Any Two) 1) State Maxwell's equations in vacuum. 2) Explain Total Internal Reflection. 3) A glass-air interface has Refractive index n₂ = 1.59 and n₁ = 1.0 for normal incidence of EM wave. If Transmission coefficient is T = 0.65 then calculate Reflection coefficient R. 	08
	B)	 Answer the following questions. (Any One) 1) Explain Maxwell's correction to Ampere's circuital law. 2) State plane wave solutions for wave equations and prove transverse nature of EM waves. 	06
Q.4	A)	 Answer the following questions. (Any Two) 1) Derive an expression for Retarded Time & Retarded potential. 2) Explain Mutual inductance and derive Newmann's formula. 3) 	10
	B)	 Answer the following questions. (Any One) 1) Explain skin depth. 2) Calculate critical angle of incidence for EM waves passing through dielectric quartz having dielectric constants 4. 	04

Q.5 Answer the following questions. (Any Two)

- a) Explain physical significance of Maxwell's equations.
- b) Obtain solutions to Laplace's equation in spherical coordinate system.
- c) Obtain Maxwell's wave equations and expression for phase velocity of Electromagnetic waves in dielectrics.

Cast			
Seat		Set	Ρ
	B.S	Sc. (Semester - VI) (Old) (CBCS) Examination: Oct/Nov-2022 CHEMISTRY (Special Paper - XIII) Physical Chemistry	
Day 8 Time:	C Date 03:00	e: Monday, 27-03-2023 Max. Marks 0 PM To 05:30 PM	;: 70
Instru	uction	 ns: 1) All questions are compulsory. 2) Figures to the right indicate full marks. 3) Draw a neat labeled diagram wherever necessary. 4) Use of logarithmic tables and scientific calculator is allowed. 	
Q.1	Selec 1)	ct most correct alternative from among those given below.Number of cycles passing a given point per time is called asa) Frequencyb) Wavelengthc) Both a & bd) None of these	14
	2)	The distance between two nearest troughs or crests is known asa) Wavelengthb) Wavenumberc) Frequencyd) Speed	
	3)	The radiation used to study vibrational spectra of a molecule is aa)Near infraredb)visiblec)Ultravioletd)Radio waves	
	4)	is the fundamental equation in spectroscopy. a) $I = \mu r^2$ b) $I \neq \mu r^2$ c) $\Delta E = hv$ d) $E = mc^2$	
	5)	For vibrational transition selection rule is a) $\Delta J = \pm 1$ b) $\Delta V = \pm 1$ c) $\Delta E = \pm 1$ d) None of these	
	6)	The liquid mixture which boils at constant temperature without change in its composition is called mixtures.a) Zeotropicb) Fractional d) Azeotropic	
	7)	In the formation of an ideal solution is evolved or absorbed. a) Heat b) light c) No heat d) All of these	
	8)	Triethyl amine -water system has consolute temperature.a) Lowerb) Upperc) both a & bd) None of these	
	9)	For non-spontaneous process ΔG and ΔS a) -Ve, +Veb) +Ve, -Vec) +Ve,+Ved) -Ve,-Ve	
	10)	At equilibrium free energy change is a) Zero b) One c) Two d) Three	
	11)	According to law of mass action, the rate at which a substance reacts is directly proportional to its	

Active mass Active volume a) b)

Temperature Both a & b c) d)

SLR-FZ-243

Seat No.

	12)	The reaction which proceed in a series of success stage initiated bysuitable primary process are called reaction.a) Chain b) Sidec) Parallel d) All of these	
	13)	The reaction K35 / K25 representsa) Rate of reactionb) Velocity Constantc) Activity ratiod) Temperature coefficient	
	14)	An increasing in temperature, temperature coefficient of reaction a) Increase b) Decrease c) Remain constant d) None of these	
Q.2	A)	 Answer the following questions. (Any Four) 1) What is fugactity? mention its unit. 2) Give example of third order reaction. 3) Define ideal and non-ideal solution. 4) What do you mean by electromagnetic spectrum? 5) What is mole fraction? 	08
	B)	 Write short notes. (Any Two) 1) Van't Hoff isochore 2) Opposing and Side reaction 3) Cause of molecular spectra 	06
Q.3	A)	 Answer the following questions. (Any Two) 1) Derive Gibb's- Helmholtz equation in its slandered form. 2) Explain Phenol-water system. 3) Derive rate constant equation of third order reaction. 	08
	B)	 Answer the following questions. (Any One) 1) Derive thermodynamically the law of mass action. 2) Calculate the reduced mass and moment of inertia of Br^{79 -} Cl³⁵ molecule the bond length of Br-Cl is 0.214 nm (N= 6.024 x 10²³). 	06
Q.4	A)	 Answer the following questions (Any Two) 1) Discuss the system with boiling point maximum. 2) What is Arrhenius equation? How it is used to determine the value of energy of activation. 3) Calculate the free energy change accompanying the reaction H₂ + I₂ = 2HI at 443°C if the value of equilibrium constant at 443°C is 50.52. 	10
	B)	 Answer the following questions. (Any One) 1) Explain nicotine-water system, what is the effect of impurities on CST values? 2) Explain transition state theory. 	04
Q.5	Ans a) b)	wer the following questions. (Any Two) Explain in detail Van't Hoff isotherm. If the rate of reaction gets doubled from 298k to 308 k. Calculate the energy	14
	C)	of activation ($R = 8.314 \text{ JK}^{-1}$). Describe briefly the rotational spectra of diatomic molecules.	

Seat No.							Set	Ρ
	B.S	ic. (Semester - I	VI) (Old) (C BOTANY (S Molecu	BCS) Ex pecial Pa ular Biol	xamination: Oct/N aper-XIII) ogy	ov-2022	
Day & Time:	Date 03:00	: Mo) PM	nday, 27-03- To 05:30 PN	2023 1			Max. Marks	: 70
Instru	iction	i s: 1) 2) All question) Figures to tl	s are compuls ne right indicat	ory. e full marł	(S.		
Q.1	Answ 1)	vert The a) b) c) d)	he following DNA replica Conservative Conservative Conservative Semiconserv	and rewrite t tion in E.coli is and unidirect and bidirection and bidirection vative and bidi	he senter ional onal onal rectional	ıce		14
	2)	Unv a) c)	vinding of DN Topoisomera Ligase	A occurs due ase	to the enz b) d)	yme Helicase DNA Polymerase		
	3)	Sigr a) c)	na factor is c RNA polyme DNA polyme	omponent of_ rase rase	 b) d)	DNA ligase Endonuclease		
	4)	Froi a) c)	n the followir DNA Processed n	ng does nRNA	not have b) d)	introns. Primary RNA transcr rRNA	ipt	
	5)	a) c)	is not invo rRNA tRNA	lved in transla	tion. b) d)	siRNA SnRNA		
	6)	a) c)	process d Transcriptior Replication	oes not occur 1	in prokary b) d)	otes. Translation Splicing		
	7)	Sho a) c)	rt strands of DNA Protein	are use	d as prime b) d)	er for DNA synthesis. RNA SnRNA		
	8)	The a) c)	coding initiat AUG UAA	tor site on DNA	A is b) d)	ATG UAG		
	9)	The a) c)	B - DNA has 12 10	s base p	bairs per tu b) d)	urn. 11 09		
	10)	a) c)	is te UAA CUU	rmination code	on. b) d)	UUU AAC		
	11)	A ta a) c)	il is added to RNA polyme Polyadenyla	mRNA by the rase te polymerase	action of b) d)	enzyme. DNA polymerase RNA polyemerase II		

	12)	is a DNA repair enzyme, a) DNA polymerase III b) DNA polymerase I c) DNA polymerase II d) Topoisomerase	
	13)	 Catebolite repression occurs when a) galactose is in higher amount b) Lactose in higher amount c) Glucose in higher amount d) Glucose and lactose in higher amount 	
	14)	RNA polymerase I synthesis a) tRNA b) mRNA c) Sn RNA d) rRNA	
Q.2	A)	 Answer the following. (Any Four) 1) Enlist the enzymes of DNA replication, 2) What is DNA denaturation? 3) What is Operon? 4) Enlist the steps in protein synthesis. 5) What are heat shock proteins? 	08
	B)	 Write notes on (Any Two) 1) B-DNA 2) DNA Denaturation 3) Catabolite repression 	06
Q.3	A)	 Answer the following (Any Two) 1) Explain the structure of m - RNA. 2) Describe the structure of Z DNA. 3) Explain the organization of DNA in eukaryotes. 	08
	B)	 Answer the following (Any One) 1) Describe the post translational modifications in protein. 2) Describe the process of DNA replication in prokaryotes. 	06
Q.4	A)	 Answer the following (Any Two) 1) Describe the structure of Ribosomes. 2) Explain the Griffith experiment for DNA discovery. 3) Explain the difference between Prokaryotic and Eukaryotic DNA replication. 	10
	B)	 Answer the following (Any One) 1) Describe the structure of tRNA with suitable diagram. 2) Describe the structure of B - DNA. 	04
Q.5	Ans a) b)	swer the following (Any Two) Describe the lactose operon with suitable diagram. Explain the process of protein synthesis. Describe the organization of DNA in eukaryotes	14

c) Describe the organization of DNA in eukaryotes.

Seat No.		Set	Ρ
	B.S	c. (Semester - VI) (Old) (CBCS) Examination: Oct/Nov-2022 ZOOLOGY (Special Paper-XIII) Physiology	
Day & Time:	Date 03:00	e: Monday, 27-03-2023 Max. Marks: D PM To 05:30 PM	: 70
Instru	iction	1) All questions are compulsory.2) Figures to the right indicate full marks.	
Q.1	Comj 1)	plete the sentence selecting appropriate answer. Gastric Hcl is secreted by a) Oxyntic cells b) Serots cells c) Kuffer's cells	14
	2)	C) Ruller's censd) R-CensCardiac cycle required time.a) 0.4 Secb) 0.2 Secc) 0.3 Secd) 0.8 Sec	
	3)	Mammalian urine is to the blood.a) Isotonicb) Hypotonicc) Hypertonicd) Dilute	
	4)	Axon of all sensory neurons are classified asa) Motor nervesb) Sensory nervesc) Mixed nervesd) rotator nerves	
	5)	Exchange of O2 & CO2 of respiratory surface across througha) Active Transportb) Passive Transportc) Diffusiond) Osmosis	
	6)	Vitamin is water soluble.a) Vit Ab) Vit Cc) Vit Kd) Vit D	
	7)	Bowman's capsules are located in region in kidney.a) Cortexb) Medullac) Pelvicd) Calyx	
	8)	O2 is carried from lungs to each cell of human body in combination witha) Hemoglobinb) Heparinc) Malanind) Tanin	
	9)	In case, blood sugar level crosses the 100mg/ml of blood the condition is known a) Glycaemia b) Hyper glycaemia c) Homo glycaemia d) Hetero glycaemia	
	10)	Glycogenolysis is process of breakdown of to glucose.a) Glucoseb) Glycogenc) Galactosed) Glycans	
	11)	Sliding filament theory of muscle contraction firstly proposed bya) H.E. Huxley & Hansonb) Necolsonc) Watsond) Robertson	

	12) is the artificial process of removing wastes, excess salts & excess water from the blood.		
		a) Dialysis b) Diagnosis c) Deamination d) Detoxification	
	13)	Blood Pressure in healthy person is mmhg. a) 140/60 b) 80/120 c) 120/80 d) 90/80	
	14)	Auricular systole lasts for abouta) 0.1 Secb) 0.2 Secc) 0.3 Secd) 0.0 Sec	
Q.2	A)	 Answer of the following. (Any Four) 1) Heart Sound 2) Dialysis 3) S-A Node 4) Depolarization 5) Glycogenolysis 	08
	B)	 Write short note on (any two) 1) Chloride Shift 2) Sarcomere 3) Ornithine Cycle 	06
Q.3	A)	 Answer of the following (any two) 1) CO₂ transport - Describe 2) Gastric Digestion 3) Ultra Structure Nephron - Explain, 	08
	B)	 Answer the following (any one) 1) Glycolysis - Explain 2) Explain synaptic transmission 	06
Q.4	A)	 Answer of the following (any two) 1) Structure of neuron- Explain 2) Ornithine Cycle- Explain 3) Ultra Structure of striate muscle- explain 	10
	B)	 Answer the following (any one) 1) ECG - Describe 2) Vit K Sources, significance deficiency - Describe 	04
Q.5	Ans a) b) c)	Swer of the following (any two) Describe molecular mechanism muscle contraction. Describe physiology of urine formation What are vitamin? Describe in details fat soluble vitamin with respect to source consequences and physiological role.	14

Seat No.		Set I	Ρ
	B.S	c. (Semester - VI) (Old) (CBCS) Examination: Oct/Nov - 2022 MATHEMATICS (Special Paper - XIII) Metric Spaces	
Day 8 Time:	Date 03:00	e: Monday, 27-03-2023 Max. Marks: 7 D PM To 05:30 PM	70
Instru	uction	ns: 1) All questions are compulsory.2) Figures to the right indicate full marks.	
Q.1	Choc 1)	Descriptions from the options.The Metric Space $< R, d >$ is called Metric.a) Normalb) Discreetc) Absoluted) None of these	14
	2)	If A and B are closed subset R then $A \times B$ is called subset ofa) Ab) Bc) R^2 d) R^3	
	3)	The subset $\{1, \frac{1}{2}, \frac{1}{3}, \dots\}$ of the real has as a limit of a) 0	
	4)	Every convergent sequence in Metric space is a) Convergent b) Divergent c) Cauchy Sequence d) None of these	
	5)	Every Compact Metric space isa) complete and not bddb) bounded and not completec) not complete & not bddd) compact and totally bounded	
	6)	M has a Heine - Borel property of M isa) Compactb) Completec) Connectedd) Not bounded	
	7)	If A is not bounded then diam $A =$ a) 1b) 2c) $-\infty$ d) ∞	
	8)	If $< M, \varrho >$ is a complete Metric space & A is closed subset of M then $< A, \varrho >$ is alsoa) Completeb) Compactc) Connectedd) Not bounded	
	9)	Any polynomial function is at each point in R'.a) Not continuousb) Continuousc) Not boundedd) Closed	
	10)	If <i>E</i> is subset of Metric space <i>M</i> then <i>E</i> is closed subset of <i>M</i> if a) $E > \overline{E}$ b) $E < \overline{E}$ c) $E = \overline{E}$ d) $E \neq \overline{E}$	
	11)	If $f: R' \to R'$ and $a \in R'$, if f is continuous at a then a) $w[f, a] > 0$ b) $w[f, a] < 0$ c) $w[f, a] \neq 0$ d) $w[f, a] = 0$	

	12)	$\lim_{x \to \infty} \begin{bmatrix} 1/x^2 \end{bmatrix} = \underline{\qquad}$	
		c) ∞ d) $-\infty$	
	13)	The Metric ρ be absolute value Metric if a) $\rho(x, y) = x, y $ b) $\rho(x, y) = x - y $ c) $\rho(x, y) = x + y $ d) $\rho(x, y) = x'/y $	
	14)	The Norm is function with domain l^2 and Range a) $(-\infty, +\infty)$ b) $(-\infty, 0)$ c) $(0, \infty)$ d) $[0, \infty)$	
Q.2	A)	Answer the following questions. (Any Four) 1) Define Metric space. 2) If $ x - 2 < 8$ then prove that $\left \frac{x-2}{x+3}\right < \frac{8}{4}$ 3) Explain Heine - Borel property. 4) $f(x)$ is continuous at $a \in R$ then prove that $ f(x) $ is continuous.	80
	B)	 5) Explain Open Ball. Answer the following questions. (Any Two) 1) Show that the function <i>ρ</i> defined by <i>ρ</i>(<i>x</i>, <i>y</i>) = <i>x</i> - <i>y</i> is a metric for <i>R</i> of the real number. 2) Explain Open set with example. 3) Prove that <i>R_d</i> is complete. 	06
Q.3	A)	 Answer the following questions. (Any Two) 1) If x, y ∈ l² and ρ(x, y) = x - y ₂ then show that ρ is a metric for l². 2) If F₁ and F₂ are closed subset of Metric space < M, ρ > then prove that F₁ ∪ F₂ is closed. 3) If the subset A of the Metric space < M, ρ > is totally bounded then prove that A is bounded. 	80
	B)	 Answer the following questions. (Any One) 1) If <i>f</i> and <i>g</i> are real valued function. If <i>f</i> is continuous at <i>a</i> and <i>g</i> is continuous at <i>f</i>(<i>a</i>) then prove that <i>g</i> of is continuous at <i>a</i>. 2) State and prove Minkowski inequality. 	06
Q.4	A)	 Answer the following questions. (Any Two) 1) Let < M, ρ > be a metric space. Let a be point in M. If lim f(x) = L, lim g(x) = M, then lim [f(x).g(x)] = L.M. 2) If G₁ and G₂ are open subset of Metric space M then G₁ ∩ G₂ is also open. 3) Show that l² is a Complete Metric Space. 	10
	B)	 Answer the following questions. (Any One) 1) If <i>E</i> is any subset of <i>M</i> then <i>Ē</i> is closed. 2) If < M, <i>ρ</i> > complete Metric space and <i>A</i> is a closed subset of <i>M</i> then probe that < A, <i>ρ</i> > is also complete. 	04
Q.5	Ans a) b)	wer the following questions. (Any Two) State and prove Schwartz' inequality in l^2 space. Let $< M, \varrho >$ be a Complete Metric space. If T is a contraction on M then there is one and only one point r in M such that $T = r$	14
	C)	Define function f is monotone. Let R^* be the set of all real sequence.	
		If $x = \{x_n\}_{n=1}^{\infty}$ and $y = \{y_n\}_{n=1}^{\infty}$ are in R^*	
		We define $d^*(x, y) = \sum \frac{1}{2n} \cdot \frac{ x_n - y_n }{(1 + x_n - y_n)}$ then Prove that $\langle R^*, d^* \rangle$ is a metric space.	

Seat No.					Set	Ρ
	B.S	c. (Semester ST	- VI) (OId) (CBCS ATISTICS (Speci Statistical Infe) Ex ial P erene	amination: Oct/Nov-2022 Paper – XIII) ce – II	
Day & Time:	Date 03:00	: Monday, 27-03) PM To 05:30 Pl	-2023 M		Max. Marks	3: 70
Instru	iction	 s: 1) All question 2) Figures to 1 3) Use of scie 	ns are compulsory. The right indicate full n ntific calculators and st	mark tatisti	s cal tables is allowed.	
Q.1	Choc 1)	se most approp اf p - value is < ۵	priate alternative fro	om th	ose given in each case	14
	·	a) we reject Ho c) we reject Ho	α at α o at $(1-\alpha)$	b) d)	we accept Ho with α we accept Ho with $(1 - \alpha)$	
	2)	Power function	of a test is related to			
		a) Type I errorc) both (a) and	l (b)	b) d)	Type II error neither (a) nor (b)	
	3)	The decision cri	terion of SPRT deper	nds c	on	
		a) Type I errorc) both (a) and	l (b)	b) d)	Type II error neither (a) nor (b).	
	4)	LRT for equality to test.	of two population va	rianc	es of normal distribution reduces	
		a) t c) F		b) d)	$\begin{array}{c} \chi^2 \\ Z \end{array}$	
	5)	Which of the foll	owing is applicable fo	or pa	ired data?	
		a) Sign test		b)	signed rank test	
		c) median test		d)	(a) and (b)	
	6)	A wrong decisio	n about null hypothes	sis le	ads to	
		a) Type I error		b)	Type two error	
		c) both (a) and	l (b)	d)	neither (a) nor (b)	
	7)	If X is $exp(\theta)$, the	en 95% central confi	denc	e limit for large n are	
		a) $\left(1 \pm \frac{1.96}{\sqrt{n}}\right) \bar{X}$		b)	$\frac{\left(1\pm\frac{1.96\bar{X}}{\sqrt{n}}\right)}{\bar{v}}$	
		c) $\frac{\left(1 \pm \frac{1.96}{\sqrt{n}}\right)}{\overline{\chi}}$		d)	None of these	
	8)	In SPRT decision a) after each s b) After a fixed c) after at leas	n about the null hypo uccessive observatio number of observati t 5 observations	othes on ions	is Ho is taken	

		3LR-FZ-24/
	9)	Most of the non-parametric methods utilize measurement on a) Interval scale b) Ratio scale c) Ordinal scale d) None of these
	10)	Kolmogrov-Smirnov test is a a) one sample test b) Two sample test c) both (a) and (b) d) neither (a) nor (b)
	11)	Critical region of size α which minimized β amongst all critical regions of size α is called critical region.
		c) best d) worst
	12)	Wilcoxon's signed rank test considers the differences (Xi – Mo) by way of
		a) sign only b) magnitude c) both (a) and (b) d) neither (a) nor (b)
	13)	If these are 10 symbols of two types, equal in number, then the minimum possible number of runs =
		a) 5 b) 3 c) 1 d) None of these
	14)	Mann-Whitney test statistic 'U' depends on the fact that a) How many times Y'e proceeds X's b) How many times X's proceeds Y's c) Both (a) and (b) d) Neither (a) nor (b)
Q.2	A)	Attempt any four from the following.081) Define one sided confidence interval.082) Define pivotal quantity with suitable illustration.083) Define power of a test.084) Define best critical region.085) Define operating characteristic function.08
	B)	Answer any two from the following.061) State the properties of likelihood ratio test.062) Describe the procedure for run test for one sample.3) Give $100(1-\alpha)$ % confidence interval for population proportion.
Q.3	A)	Attempt any two form the following. 08 1) Let X_1, X_2, \dots, X_n be a r.s. of size n from $N(\theta, \sigma^2)$. obtain $100(1 - \alpha)$ % confidence interval for θ when σ^2 is known.
		2) Give the SPRT for testing Ho : $\theta = \theta_0$ V/s H1 : $\theta = \theta_1$ (> θ_0), in sampling from normal density with σ^2 unknown.
		Explain sign test for a paired sample.
	B)	 Answer any one from the following. 06 Explain median test for two independent samples. 2) Give 100(1-α) % confidence interval for difference of population proportions.
- Q.4 A) Answer any two from the following.
 - 1) Let $X_1, X_2, ..., X_n$ and $Y_1, Y_2, ..., Y_n$ be random samples of sizes n and m respectively from N (μ_1, σ_1^2) and N(μ_2, σ_2^2).

Obtain $100(1 - \alpha)\%$ confidence interval for $\frac{\sigma_1^2}{\sigma_2^2}$.

- 2) Explain Mann-Whitney U test.
- 3) Given the SPRT for testing Ho: $\theta = \theta_0$ V/s $H1 : \theta = \theta_1$ (> θ_0), in sampling from a P (θ) distribution.
- B) Answer any one from the following.
 - 1) Write a note on Kolmogrov-Smirnov test for one sample.
 - 2) Discuss the advantages and disadvantages of non-parametric tests.

Q.5 Attempt any two from the following.

- a) Explain the procedure of Wald's SPRT and construct SPRT for testing Ho : $\theta = \theta_0$ V/s H1 : $\theta = \theta_1 (> \theta_0)$, in sampling from exp(θ) distribution.
- **b)** State and prove Neyman-Pearson Lemma.
- c) Give the assumptions of non-parametric tests and explain the procedure of Wilcoxon's signed rank test.

10

14

	SLR-FZ-24		
Seat No.		Set F)
	B.S	c. (Semester - VI) (OId) (CBCS) Examination: Oct/Nov- 2022 GEOLOGY (Special Paper- XIII) Economic Geology and Prospecting	
Day 8 Time:	03:00	Monday, 27-03-2023 Max. Marks: 7 PM To 05:30 PM	0
Instru	uction	 s: 1) All questions are compulsory. 2) Draw neat labelled diagram wherever necessary. 3) Figures to the right indicate full marks. 	
Q.1	Fill ir 1)	the blanks with correct answer from given options.1The type of vein commonly found in igneous rocks isa) Fissure-veinsb) Ladder-veinsc) Gash-veinsd) Stock works	4
	2)	Chromite is mostly of which origin? a) Igneous b) Sedimentary c) Metamorphic d) Any origin	
	3)	 Generally tourmaline-rich rocks are products of a) Metamorphism b) Metasomatism c) Magmatic crystallisation d) Oxidation and supergene enrichment. 	
	4)	Hutti gold mines are located in which state of India? a) Karnataka b) Madhya Pradesh c) Sikkim d) Bihar	
	5)	Most of the bauxite deposits of central and western India have been formed from: a) Granite b) Syenite c) Nepheline Syenite d) Basalt	
	6)	Supergene sulphide enrichment zone is found: a) Above the water table b) Below the water table c) Near the ground surface d) In oxidizing zone	
	7)	 The ore deposits formed due to weathering do not form any metallogenic epoch because: a) Weathering is not ore forming process. b) The process of weathering as operated at all times in the earth's history. c) Weathering cannot form ore deposits. d) Weathering process includes both chemical and mechanical processes. 	
	8)	 Prospecting by geophysical methods is based on the typical properties exhibited by rock formations like a) Electrical, magnetic and gravitational b) Electrical and magnetic c) Magnetic and gravitational 	

d) None of these

	9)	Tor a) c)	sion balance surveys are conducte Gravity prospecting Electrical prospecting	ed fo b) d)	or: Magnetic prospecting Seismic prospecting.	
	10)	The eco a) c)	e minerals from which one or more nomically are called as mi ore secondary	me ⁻ nera b) d)	tals can be extracted als. industrial important	
	11)	Bau a) c)	uxite is concentration depos Rudaceous Arenaceous	it ric b) d)	h in Al. Residual Hydrothermal	
	12)	Self a) c)	f potential method is the most suita Carbonates. Ferruginous ores	able b) d)	method for prospecting of: Sulphide ore None of these.	
	13)	Iron a) c)	is commonly precipitated as Siderite Hematite	b) d)	Limonite All the above	
	14)	Wh a) c)	ich of the following geological crite Magmagene criteria Climatic criteria	ria i b) d)	s used for placer deposits Structural criteria All of the above	
Q.2	A)	Ans 1) 2) 3) 4) 5)	wer the following (Any Four) Define prospecting. What is gauge minerals? Give essential conditions for the p Name two geological criteria for p Name the types of magmatic cond	olace rosp	er deposits pecting Iron deposits. ration.	08
	B)	Writ 1) 2) 3)	e notes on. (Any Two) Mineralogical guide for ore depos Saddle reef Three objectives of National Mine	its ral I	Policy.	06
Q.3	A)	Ans 1) 2) 3)	wer the following (Any Two) Formation of laterites. Correction of data for gravity meth Climatic criteria of geological pros	nod.	ting	08
	B)	Ans 1) 2)	wer the following (Any One) Discuss the self potential method Write the brief note on manganes	e de	eposits of India.	06
Q.4	A)	Ans 1) 2) 3)	wer the following (Any Two) Explain the oxidation and superge deposit with Indian example. Discuss in short the applications of Describe the tenor of ore.	ene of m	enrichment processes of ore agnetic method.	10
	B)	Ans 1) 2)	wer the Following (Any One) Conservation of minerals, give ex Fissure vein deposit.	amp	bles.	04

14

Q.5 Answer the following (Any Two)

- a) Discuss the origin and distribution of copper deposits of India.
- **b**) Describe the field procedure of seismic refraction method with interpretation.
- c) Explain in detail the mechanical concentration of ore deposits.

Seat	
No.	

B.Sc. (Semester - VI) (Old) (CBCS) Examination: Oct/Nov-2022 **MICROBIOLOGY** (Special Paper - XIII) **Microbial Genetics**

Dav & Date: Monday, 27-03-2023 Time: 03:00 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Draw a neat labeled diagram wherever necessary.

Q.1 Rewrite the following sentences by choosing correct alternatives from 14 given below. In DNA replication unwinding of DNA is carried out by _____ enzyme. 1)

- Topoisomerase b) Primase a)
 - Helicase d) DNA polymerase C)
- Genetic complementation test in the rll region of phage T4 developed 2) by
 - S. Benzer a)
 - C) Griffith
 - d) Watson
- provide the binding site for RNA polymerase in operon. 3)
 - b) Operator Promoter a) d) Inducer
 - Repressor C)
- A base pair substitution mutation that changes a codon specifying an 4) amino acid into a stop codon is called as mutation.
 - a) Missense
- Non sense b) d) Deletion

b) S. Altman

- c) Frame shift enzyme which add phosphate moiety at either 5'end or 3'end of
 - DNA in gene manipulation.
 - a) S1 nuclease

5)

6)

9)

- b) Polynucleotide kinase
- Phosphatase C)
- d) RNase H If a particular short DNA sequence is AGATTC, the corresponding mRNA
- sequence will be _____. b) TCTAAG
 - AGATTC a) d) UCUAAG C) AGAUUC
- The restoration of function by a second mutation at a different site in the 7) same gene is called _____.
 - a) Back mutation
- b) Conditional lethal
- Intragenic suppression d) intergenic suppression
- 8) DNA fingerprinting technique was developed by
 - a) Francis crick Alec Jeffrey C)

- b) H. Khurana
- d) James Watson
- type of restriction enzyme most commonly used in r-DNA technology.
 - a) Type I

C)

C) Type III

- b) Type II
- d) Type IV

Max. Marks: 70

Set

- 10) _____ is not a structural gene of Lac operon.
 - a) Lac Z b) Lac Y
 - c) Lac A d) Lac I
- 11) In the Lac-operon the genes in the operon are _____.
 - a) always expressed
 - b) expressed only when lactose is present
 - c) never expressed
 - d) only expressed when lactose is absent
- 12) DNA replication by semiconservative mode in *E.coli* was experimentally proved by _____.
 - a) Watson and Crick
- b) Meselson and Stahl
- c) Zinder and Lederberg d) Delbruck and Ellis
- Vectors designed to replicate in two different species is called as ______ vector.
 - a) Phasmid b) Phagemid
 - c) Shuttle d) Transfer
- 14) _____ type of gel electrophoresis most commonly used for separation of large DNA fragments.
 - a) PAGE

c) Agarose

b) SDS PAGE d) 2D PAGE

Q.2	A)	 Answer the following questions. (Any Four) 1) Define Semi conservative DNA replication. 2) Give the role of DNA polymerase I. 3) How cyclic AMP is formed? Give its significance. 4) Give the significance of phenotypic lag in isolation of auxotropic mutants. 5) What are Restriction endonucleases. Give their use. 	08
	B)	 Answer the following questions. (Any Two) 1) Define adaptor & Give its use. 2) Define Okazaki fragments. 3) Define Cosmids. 	06
Q.3	A)	 Answer the following questions. (Any Two) 1) Define DNA fingerprinting. Discuss in brief steps involved in DNA fingerprinting. 2) Write briefly on folded fiber model of <i>E.coli</i> chromosome. 3) Give brief account of frame shift mutations. 	08
	B)	 Answer the following questions. (Any One) 1) Write brief account DNA Polymerase III enzyme. 2) Describe in detail the applications of Bioinformatics. 	06
Q.4	A)	 Answer the following questions (Any Two) 1) Discuss in detail Negative and Positive regulation of Lac operon. 2) Describe in detail Mechanism of transcription in prokaryotes. 3) Give brief account of techniques in Genetic engineering. 	10
	B)	Answer the following questions. (Any One) 1) Give an account of base pair substitution mutations.	04

2) Give brief account of Restriction Endonucleases enzymes.

Q.5 Answer the following questions. (Any Two)a) Describe in detail Mechanism of DNA replication.

- b)
- Write briefly on Applications of protein engineering. Describe briefly the time course of phenotypic expression of mutation. C)

Date 03:00	e: Mo D PM	nday, 27-03-2023 To 05:30 PM			Max. M	lark
uction	ns: 1) 2 3 4) All questions are) Figures to the rig) Draw a neat labe) Use of logarithm	compulsory. Int indicate full r eled diagram wh ic table and calc	narks ereve culato	er necessary. r is allowed.	
Choc	ose t	he correct altern	atives from the	optio	ons.	
1)	Pow a) c)	ver MOSFET is a Current Field	controlle	ed dev b) d)	vice. Voltage Current and voltage	
2)	Coll a) c)	ector, Emitter and IGBT Power MOSFET	Gate are the te	rmina b) d)	lls of Power BJT GTO	
3)	In ca betv deca a) c)	ase of power diod veen instant diode ays to 25%Irr 15% Irr	e, reverse recov e current becom	very til es zer b) d)	me is defined as the time ro and reverse recovery time Zero 10% I _{rr}	
4)	Rev a) c)	erse recovery cur Storage charge Peak inverse vol	rent depends or tage	n b) d)	Temperature Forward current	
5)	SCF a) c)	R is a trigg Voltage Voltage as well a	gered device. as current	b) d)	Current None of these	
6)	The calle a) c)	minimum value o ed break over curre gate trigger curre	f current below v nt ent	which b) d)	the thyristor becomes turn of latching current holding current	ff is
7)	A fre a) c)	eewheeling diode Inductive load Capacitive load	is used in contro	olled ı b) d)	rectifier in case of Resistive load None of these	
8)	An e a) c)	electronic circuit w inverter chopper	hich converts a	c pow b) d)	er into dc power is rectifier amplifier	
9)	SMF	PS means	Mode Power S	vlaau		

ELECTRONICS (Special Paper - XIII)

Power Electronics Day & Da

Time: 03: Instructio

Seat

No.

Q.1

Ρ Set

ks: 70

- 8)
- 9)
 - Switched Single b) a) Series Shunt C) d)

B.Sc. (Semester - VI) (Old) (CBCS) Examination: Oct/Nov-2022



	10)	is used as a DC to DC converter. a) Rectifier b) Inverter c) Chopper d) Cyclo-converter	
	11)	The series inverter uses type of commutation. a) Class A b) Class B c) Class C d) Class D	
	12)	If firing angle of SCR is 45° then conduction angle is a) 45° b) 110° c) 135° d) 145°	
	13)	a) TRIAC b) DIAC c) SBS d) SCR	
	14)	The UJT may be used asa) Saw tooth oscillatorb) triggering devicec) Negative resistance deviced) all of these	
Q.2	A)	 Answer the following questions. (Any Four) 1) What is the need of heat sink? 2) Write classification of Choppers. 3) Draw the construction diagram and symbol of PUT. 4) State the principle of DC motor. 5) State any two advantages of IGBT. 	08
	B)	 Write notes. (Any Two) 1) Power diode 2) Static Induction Transistor 3) UPS 	06
Q.3	A)	 Answer the following questions. (Any Two) 1) Explain switching characteristics of power BJT. 2) Explain two transistor analogy of SCR. 3) Explain working of flasher circuit. 	08
	B)	 Answer the following questions. (Any One) 1) Describe single phase half wave controlled rectifier with resistive load. 2) Explain working of parallel inverter using SCR. 	06
Q.4	A)	 Answer the following questions (Any Two) 1) Define GTO, and explain its construction. What are the applications of GTO? 2) With the help of neat circuit diagram explain operation of Jones chopper. 3) Explain single phase full wave controlled rectifier with resistive load. 	10
	B)	 Answer the following questions. (Any One) 1) With suitable diagram explain emergency lighting system. 2) Describe construction and working of IGBT with suitable diagram. 	04
Q.5	Ans a) b) c)	wer the following questions. (Any Two) What is SCR triggering? What are its types? Explain any one of them. Explain construction and switching characteristics of power MOSFET. Draw circuit diagram of three phase full wave controlled rectifier with Resistive load and explain its operation.	14

Login View b) LoginName d) .NET Passport Authentication. b) d) All of the above b) Script Manager None of the above d) GridView b) d) None of these above CompareValidator b) equals () method RequiredFieldValidator d) Webforms b) d) None of these ListBox b) d) All the Above Application objects b) View State d) All the Above

Day & Date: Monday, 27-03-2023 Time: 03:00 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives from the options.

Which of the following control provides a link for unauthenticated users to 1) log on?

B.Sc. (Semester - VI) (Old) (CBCS) Examination: Oct/Nov-2022 **COMPUTER SCIENCE (Special Paper - XIII)** Web Technology

- a) Login
 - LoginStatus C)

How many types of authentication ASP.NET supports? 2)

- Windows Authentication. a)
- Forms Authentication. C)
- 3) Which control is required for every page that has AJAX Extensions for ASP.NET?
 - Update Panel a)
 - Content Panel C)
- 4) Which of the following server control shows data in a tabular format and allows sorting, paging, edit, delete each record?
 - List Box a)
 - Repeater C)
- Which of the following control is used to validate that two fields are equal? 5)
 - RegularExpressionValidator a) C)
- 6) Choose the form in which Postback occur.
 - HTMLForms a)
 - C) Win forms
- 7) Which of the following denote the web control associated with Table control function of ASP.NET?
 - a) DataList
 - TableRow C)
- Which of the following denote ways to manage state in an ASP.Net 8) Application?
 - a) Session objects

a)

C)

- C)
- Select the type Processing model that asp.net simulate. 9)
 - Event-driven Static a) b)
 - C) Linear d) Top down
- 10) Attribute must be set on a validator control for the validation to work. ControlToValidate
 - ControlToBind b)
 - ValidateControl d) Validate

SLR-FZ-251

Set

Max. Marks: 70



Seat No.

14

Ρ

	11)	Where do we include the user lists for windows authentication?a) < Credential>b) < authorization>c) < identity>d) < authentication>	
	12)	Which of the following languages can be used to write server side scripting In ASP.NET? a) C-sharp b) VB	
		c) C++ d) A and B	
	13)	 Which control is required inside a content page to reference ContentPlaceHolder control inside the master page? a) Content control on a content page b) ContentPlaceHolder on a content page c) Placeholder control is required on content page d) None of the above 	
	14)	ASP.NET separates the HTML output from program logic using a feature	
		a) Exception b) Code-behind c) Code-front d) None of the above	
Q.2	A)	 Answer the following questions. (Any Four) 1) What is AJAX? 2) What is Data Adapter? 3) Define Validation? 4) What is exception handling? 5) List out the event in life cycle of webpage. 	08
	B)	 Write note. (Any Two) 1) Explanation session state? 2) What is Script Manager in AJAX? 3) Explain cross page posting with example. 	06
Q.3	A)	 Answer the following questions. (Any Two) 1) Explain any folder in asp.net. 2) Explain ASP.Net tracing in detail. 3) Explain Radio Button & checkbox with example. 	08
	B)	 Answer the following questions. (Any One) 1) Explain any two validation control with example. 2) What is cookies & Explain type of cookies in brief? 	06
Q.4	A)	 Answer the following questions (Any Two) 1) Write difference between asp & asp.net. 2) What is ADO.net? Explain How to connect to database? 3) Explain Tree view & Menu view control. 	10
	B)	 Answer the following questions. (Any One) 1) Explain Update Panel & Timer Control in AJAX. 2) Explain compilation with suitable block diagram. 	04
Q.5	Ans	wer the following questions. (Any Two)	14
	a) b) c)	What are the components of ASP.Net AJAX architecture? Define Authentication & Explain its type in detail. What is master page & Explain the relationship between master page & content page?	

			SLR-FZ-252
Seat No.			Set P
	B.S	c. (Semester - VI) (Old) (CBCS) Exam PHYSICS (Special Pape Materials Science	nination: Oct/Nov - 2022 er- XIV) e
Day & Time:	Date 03:00	e: Monday, 06-02-2023 0 PM To 05:30 PM	Max. Marks: 70
Instru	ictior	 ns: 1) All questions are compulsory. 2) Figures to the right indicate full marks. 3) Neat diagrams must be drawn whereve 4) Use of log table or calculator is allowed. 	r necessary.
Q.1	Choc 1)	ose the correct alternatives from the optionStructure can be studied by naked eyea) Atomicb) Gic) Microd) Micro	ns. 14 e. rain acro
	2)	Applied Force per unit Cross Sectional Areaa) Stressb) Stc) Creepd) Du	is called rain uctility
	3)	Time dependent permanent deformation is ca) Elasticityb) Crc) Plasticityd) Fa	alled reep atigue
	4)	The dielectric Strength is function is ofa) Thicknessb) Lec) Charged) No	 ength one of these
	5)	Bakelite is obtained by reaction of Formaldera) Phenolb) Stc) Ethaned) Ur	nyde with Tyrene rea
	6)	Polymers occurs naturally. a) Nylon b) St c) PVC d) Te	arch eflon
	7)	The degree of polymerization is the ratio of n to a) Molecular weight of monomer b) At c) Atomic weight of polymer d) No	nolecular weight of polymer comic weight of monomer
	8)	materials of combination of two or m different properties from constituent materials a) Polymer b) Cr c) Composite d) Ar	ore materials which have s. ystalline morphous
	9)	Cermets are example ofa) Micro compositeb) Coc) Short fibre compositesd) La	ontinuous fiber composites arge particle composites
	10)	Strength of Composite isa) Lowb) Hic) Zerod) Int	gh finite

08

06

08

06

10

14

- 11) Oxide ceramics are _____ materials.
 - a) Insulator b) Conductor c) Polymer
 - d) Monomer
- 12) technique is used to determine the crystal structure of materials.

b) XRD

- a) SEM
- c) FTIR d) UV-VIS
- prepared and explained carbon nanotubes for first time. 13)
 - a) Richard Feynman b) Richard Smalley
 - c) Eric Drexler d) Sumia lijima
- 14) materials have occupied an important role in bone repairing materials in the medical field.
 - a) Bioactive glasses and glass ceramics
 - b) Polymers
 - c) Composites
 - d) Nanomaterials

Q.2	A)	Answer the following questions. (Any Four)	
-----	----	--	--

- 1) What is biomechanism?
- What are composites important in nature? 2)
- Define polymerization mechanism. 3)
- Define i) Fatigue ii) Hardness 4)
- Give any four examples of ceramics. 5)

Write short notes. (Any Two) B)

- Write applications of nanomaterials. 1)
- 2) Give classification of ceramics.
- 3) Explain any one ceramic structure.

Answer the following questions. (Any Two) Q.3 A)

- Write note on ceramic processing. 1)
- Explain the properties of composites. 2)
- What are biomaterials? Explain biocomposite materials. 3)

Answer the following questions. (Any One) B)

- 1) Explain in details classification of nano-structured materials.
- Explain particle & fibre reinforced composites. 2)

Q.4 A) Answer the following questions. (Any Two)

- Explain mechanical, electrical and magnetic properties of materials. 1)
- Write a note on thermosetting & thermoplastic polymers. 2)
- 3) Explain physical methods synthesis of nanomaterials.

Answer the following questions. (Any One) 04 B)

- Explain properties & applications of biomaterials. 1)
- Explain chemical bath deposition method of formation of thin film. 2)

Q.5 Answer the following questions. (Any Two)

- Explain classification of materials. a)
- Discuss various methods of fabrication of polymers in details. b)
- C) Discuss various techniques of characterization of nanostructured materials.

Seat No.				Set	Ρ	
	B.Sc. (Semester - VI) (Old) (CBCS) Examination Oct/Nov - 2022 Chemistry (Special Paper - XIV)					
	Dete	UNI CCOC CO CO Automatica de la companya	rganic Chemi	Stry	. 70	
Day 8 Time:	03:00) PM To 05:30 PM		Max. Marks	: 70	
Instru	uction	 s: 1) All questions are con 2) Draw neat diagrams 3) Figures to the right in 	pulsory. and give equati	ons wherever necessary.		
01	Cho	5) Figures to the right in	rom the follow	is. ing ontions	14	
Q. 1	1)	In Be (CH) ₂ , the boding is a) $3c - 2e$	best described b)	by bonds. 2c – 3e	14	
	•	c) 2c – 2e	d)	4c – 2e		
	2)	Organometallic compound	ls of Alluminium م	1 are Molecular species		
		c) Ionic species	d)	Coordinate species		
	3)	is essential for corr	osion.			
		a) Solid	b)	Liquid		
	4)	C) Gas	a) and in a	water		
	4)	a) Oxygen	gas is e b)	Nitrogen		
		c) Carbon dioxide	d)	Hydrogen		
	5)	In xeo4 molecule Xenon u	ndergoes	_hybridization.		
		a) sp^2d	b)	sp ³ d ²		
	6)	c) sp°u In the valence shell of dib	u) Srane there are	sp		
	0)	a) 14	bianc there are b)	12		
		c) 10	d)	8		
	7)	In xef ₂ , bond length for xe	f is pm.			
		a) 195 c) 185	b)	190 200		
	8)	is called as inorgan	ic henzene	200		
	0)	a) Diborane	b)	Borazine		
		c) Xenodifluoride	d)	Ethane		
	9)	Ceramic superconductors	are also called	superconductors.		
		a) 321 c) 123	(d (d	121 131		
	10)	Germanium doped with do	onor atom is cal	led		
	,	a) Mixed oxide conducto	r b)	n-type semiconductor		
		c) p-type semiconductor	d)	Super conductor		
	11)	Transuranic elements are	also called as	elements.		
		c) Manmade	(a (b	Lanthanide		
	12)	In lanthanide series differe	entiating electro	ns are added in		
	·-/	a) 4f sub shell	b)	(n-2) sub shell		
		c) 3f sub shell	d)	5f sub shell		

	13)	Most of the lanthanons showsoxidation state.a) + Vb) + IIIc) + IVd) + VI	
	14)	Superconductors shows effect. a) Resonance b) Raman c) Meissner d) Trans	
Q.2	A)	 Answer the following questions. (Any Four) 1) Define transuranic elements. 2) Why metal shows good lustre? 3) Draw the structure of P4°6. 4) Define immersed corrosion. 5) Draw geometrical structure of xef₆. 	08
	B)	 Write notes on. (Any Two) 1) Mononuclear carbonyl and terminal carbonyl. 2) Mechanical Properties of metal. 3) Give the IUPAC nomenclature of super heavy elements with atomic number 102, 111 and 107. 	06
Q.3	A)	 Answer the following questions. (Any Two) 1) Explain the structure of xeo₄. 2) Discuss the structure of alkyl and aryl compounds of lithium. 3) What is TU elements? Explain the preparation of transuranium elements by bombardment with accelerated projectile method. 	08
	B)	 Answer the following questions. (Any One) 1) Give the name, symbol and electronic configuration of lanthanides. 2) What are semiconductors? Explain extrinsic semiconductors in detail. 	06
Q.4	A)	 Answer the following questions. (Any Two) 1) Describe the structure of diborane. 2) Explain methods of protection of metals from corrosion. 3) Discuss preparation and properties of alkyl aluminium compounds. 	10
	B)	 Answer the following questions. (Any One) 1) Explain classification of solids based on band theory. 2) Discuss the effect of purity of metals on corrosion. 	04
Q.5	Ansv 1) 2)	wer the following questions. (Any Two) What is lanthanide? Explain in detail ion exchange method used for separation of lanthanide. Discuss the properties of metals.	14

3) Draw and explain the structure of P₄O₁₀.

	B.S	c. (Semester - VI) (Old) (CBCS) BOTANY (Special Plant Bioteck	Ex Pa nno	amination: Oct/Nov- 2022 per – XIV) logy	
Day Time	& Date : 03:00	e: Monday, 06-02-2023 0 PM To 05:30 PM		Max. Marks: 70)
Instr	uctior	 ns: 1) All questions are compulsory. 2) Figures to the right indicate full n 3) Neat diagrams must be drawn w 4) All questions carry equal marks. 	nark here	s. ever necessary.	
Q.1	Rew 1)	rite the sentences by choosing correct carry the gene of insert integra a) Vectors c) Proteins	ect a ted b) d)	alternatives. 14 for cloning. Transformer RNA	1
	2)	 enzymes are called molecular a) DNA ligase c) Helicase 	scis b) d)	sors in genetic engineering. DNA polymerase Restriction endonucleases	
	3)	Northern blotting technique is used to a) DNA molecules c) Protein molecules	sep b) d)	erate RNA molecules None of these	
	4)	Polymerase chain reaction (PCR) was a) Robert brown c) Karry Mullis	s dis b) d)	covered by Watson and Crick E. M. Southern	
	5)	Gene library is a collection of total gen a) DNA c) Proteins	nom b) d)	ic of a single organism. RNA Enzymes	
	6)	gas is used in gene gun. a) Oxygen c) Helium	b) d)	Hydrogen Nitrogen	
	7)	Transgenic plants and animals are ca a) MLOs c) BLOs	lled b) d)	as GMOs BPOs	
	8)	Agrobacterium tumefaciens causes _ a) Rust diseases c) Crown gall diseases	b) d)	_ in dicot stem. Smut diseases Early blight diseases	
	9)	Marker genes are used for the selecti a) Vectors c) Transformed cells	on c b) d)	of Enzymes Proteins	
	10)	NOS, lux gene and cat genes are exaa) Reporter genesc) Selectable markers	mpl b) d)	es of Marker genes Transformed cells	
	11)	The production of adventitious roots a is termed as	ind s	shoots from cell of tissue cultures	

Seat

No.

SLR-FZ-254

Set

Ρ

b) Somatogenic embryogenesisd) Suspension culture

a) Micro propagationc) Organogenesis

	12)	Haploid plants can be obtained from.a) Bud cultureb) Root culturec) Leaf cultured) anther culture	
	13)	In plant tissue culture part shows maximum totipotency. a) Stem b) Xylem c) Phloem d) Meristem	
	14)	 Protoplast can be produced from suspension cultures, callus tissue or intact tissues by enzymatic treatments with a) Cellulolytic enzymes b) Pectolytic enzymes c) Both cellulolytic & pectolytic d) Proteolytic enzymes 	
Q.2	A)	 Answer the following questions. (Any Four) 1) Define plasmid. 2) Define chimeric DNA. 3) What is electroporation. 4) Define transgenic plants. 5) Enlist enzymes involved in rDNA technology. 	08
	B)	 Write notes on. (Any Two) 1) Cosmids 2) Totipotency. 3) Anther culture. 	06
Q.3	A)	 Answer the following questions. (Any Two) 1) Process of DNA figure printing. 2) Micro injection method of gene delivery. 3) Explain in brief somatic hybridization. 	08
	B)	 Answer the following questions. (Any One) 1) Write on DNA libraries. 2) Describe southern blotting technique. 	06
Q.4	A)	 Answer the following questions. (Any Two) 1) Explain in detail gene gum method of gene delivery. 2) Describe method of anther culture. 3) Describe the method of bacterial transformation. 	10
	B)	 Answer the following questions. (Any One) 1) Enlist the achievements in plant biotechnology. 2) Transgenic plants with insect resistance. 	04
Q.5	Ans a) b)	wer the following questions. (Any Two) Explain in detail any two types of vectors studied by you. Describe in detail the process of protoplast culture.	14

c) Describe PCR with its applications.

Seat No.		Set P								
	B.Sc. (Semester - VI) (Old) (CBCS) Examination: Oct/Nov- 2022 ZOOLOGY (Special Paper- XIV) Economic Zoology									
Day 8 Time:	Date 03:00	Monday, 06-02-2023 Max. Marks: 70 PM To 05:30 PM								
Instru	uction	1) All questions are compulsory.2) Figures to the right indicate full marks.								
Q.1	Choc 1)	e the correct alternatives from the options. 14 n Indian major carp Catla isfeeder. 19 n) Surface b) Middle n) middle as well as bottom d) bottom								
	2)	Crustacean fishery consists of) sole, tuna, pomphret b) sardine, mackerel) lobster, crab, shrimp d) mackerel, sole, sardine								
	3)	is called falling nest? Trawl net Rampani d) Cast net								
	4)	ish liver oil mainly consists of) Vit. A and D b) Vit. B and C) Vit. C d) Vit. B only								
	5)	 Anadromosus migration in fish means Adult fish live in sea and migrate into freshwater to spawn Adult fish live in freshwater migrate to salt water to spawn Adult fish live in salt water migrate to estuarine water to spawn Adult fish live in freshwater migrate to estuarine water to spawn 								
	6)	is the polyphagous pest.) Pyrilla b) Tribolium) Cotton ball worm d) Grass hopper								
	7)	The intraspecific semiochemicals are known as) Hormones b) pheromones c) Proteomones d) carbomones								
	8)	Which method used at least in integrated Pest Management (IPM)) physical control methodb) chemical control method) cultural control methodd) biological control method								
	9)	rood pouch is found in male of fish.) hippocampus b) catla) Sardine d) mackerel								
	10)	kin of shark fish is used for preparation of) plagreen b) shagreen ;) somgreen d) solgreen								
	11)	silk moth species is native of Assam.) Mulberry silk moth b) Tassar silk moth) Muga silk moth d) Oak silk moth								

	12)	Pebrine is disease of silkworm.a) Bacterialb) Protozoanc) Virald) Fungal	
	13)	Silk is secretion of caterpillar larva from its specialized a) poison gland b) Spiracle c) salivary gland d) malpighian tubules	
	14)	Pearl is made up ofa) calcium carbonateb) calcium oxylatec) calcium phoritd) calcium sulphate	
Q.2	A)	Answer the following questions. (Any Four)(Any Four)1)Sardine.2)Tuna fish.3)Raft.4)Gill net.5)Pyrilla.	08
	B)	 Write short notes. (Any Two) 1) Tribolium Jowar grain borer 2) Integrated Pest Management. 3) Silk worm rearing appliances 	D6
Q.3	A)	 Answer the following questions. (Any Two) 1) Flacheries silk worm disease. 2) Wood borer pest. 3) Crustacean fishery. 	80
	B)	 Answer the following questions. (Any One) 1) Silk worm rearing house. 2) Economics importance of fish products. 	06
Q.4	A)	 Answer the following questions. (Any Two) 1) Describe trawal net and rampani net. 2) Parental care in fishes. 3) Explain cotton ball worm as pet of cotton. 	10
	B)	 Answer the following questions. (Any One) 1) Green muscardine. 2) Biological control method of crop pest. 	04
Q.5	Ans ^y a) b) c)	wer the following questions. (Any Two) Write in brief about pearl culture and its applications. Describe offshore fishery. Explain inland fishery.	14

Seat No.				Set	Ρ		
	В.	Sc. (Semester - VI) (Old) (CBCS) MATHEMATICS (Spec Numerical A	Exa cial nalv	mination: Oct/Nov - 2022 Paper - XIV) sis			
Day & Time:	& Date : 03:00	e: Monday, 06-02-2023 0 PM To 05:30 PM	,	Max. Marks	: 70		
Instru	 Instructions: 1) All questions are compulsory. 2) Figures to the right indicate full marks. 3) Use the scientific calculator is allowed. 						
Q.1	Choo	ose the correct alternatives from the c	optio	ns.	14		
_	1)	The relation between <i>E</i> and <i>D</i> is			• •		
		a) $E = e^{-hd}$	b)	$E = e^{hd}$			
		c) $D = E - 1$	d)	$D = 1 - E^{-1}$			
2) If the interval of differencing is unite, then $\Delta^4[(1-x)(1-2x)(1-3x)] = $							
		a) 36	b)	-36			
		$c) -6x^{3}$	a)	zero			
	3) If $\left(E^{1/2} + E^{-1/2}\right) \left(1 + \Delta\right)^{1/2} = $						
		a) Δ + 1	b)	$\Delta - 1$			
		c) $\Delta + 2$	d)	$\Delta - 2$			
	4) If $(1 + \Delta)(1 - \nabla) =$						
		a) 1	b)	$1 - \Delta \nabla$			
		$C) \Delta = V$	a)	-1			
	5)	If $f(x) = e^x$ then $\Delta^5 e^x =$	b)	(-h, 1) - x			
		a) $(e^{h} + 1)e^{h}$ c) $(e^{h} + 1)e^{5x}$	(U (b	$(e^{h} - 1)e^{h}$ $(e^{h} - 1)e^{5x}$			
	6)	Guase Forward interpolation formula i		d to interpolate value of a for			
	0)	a) $0 < n < 1$	b)	-1 < n < 0			
		c) 0	d)	$-\alpha$			
	7)	Interpolation is the technique of estimation	ting t	he value of a function for any			
	,	a) Intermediate value of technique	b)	Intermediate value of constant			
		c) Intermediate value of variable	d)	both b and c			
	8)	If $f(0) = 1, f(2) = 5, f(3) = 10$ and $f(x) = 10$;) = 1	14, then $x = $			
		a) $\frac{13}{-}$	b)	5			
		5 11		13			
		c) $\frac{11}{5}$	d)	$\frac{3}{11}$			
		6 dr					
	9)	The exact value of $\int \frac{dx}{x^2 + 1}$ is					
		a) 1.4056	b)	2.4056			
		c) 3.4056	d)	4.4056			
	10)	If Trapezoidal rule, the function $y = f(x)$	c) is t	aken to be			
		a) ellipse	b)	circle			
		c) straight line	d)	parabola			

Seat

SLR-FZ-256

Page 1 of 3



- 1) Prove that $\Delta^3 y_2 = \nabla^3 y_5$
- 2) Evaluate $\Delta^2(a b^{cx})$
- 3) State the Newtone's Backward interpolation formula.
- 4) State the Trapezoidal rule.
- 5) State $\Delta^2 u_n + 2\Delta u_2 + u_n = 0$

B) Answer the following questions. (Any Two)

- 1) Solve $y_{p+3} 3y_{p+2} + 3y_{p+1} y_p = 1$
- 2) Evaluate $\int_0^1 \frac{dx}{1+x}$ by Simpson's (1/3)rd rule by $h = \frac{1}{4}$
- 3) Find the missing term in following data by using interpolation.

<i>x</i> :	0	1	2	3	4
<i>y</i> :	1	3	9		81

Q.3 A) Answer the following questions. (Any Two)

1) Find the cubic polynomial which takes following values.

x:	0	1	2	3
f(x):	1	2	1	10
Prove that	at $\mu =$	$\frac{2+\Delta}{2\sqrt{1+\Delta}} = 4$	$\sqrt{1+\frac{\delta^2}{4}}$	

3) Give that:

2)

<i>x</i> :	1.0	1.1	1.2	1.3	1.4	1.5	1.6
<i>y</i> :	7.989	8.403	8.781	9.129	9.451	9.750	10.030

Find
$$\frac{dy}{dx}$$
 at $x = 1.1$

08

80

B) Answer the following questions. (Any One)

- State and prove Newtone's forward interpolation formula. 1)
- 2)

Answer the following questions. (Any Two) Q.4 A)

- Prove that $\nabla y_{n+1} = h\left(1 + \frac{1}{2}\nabla + \frac{5}{12}\nabla^2 + \cdots\right)y'_n$ 1)
- 2) Find the maximum and minimum value of *y* from the following data:

<i>x</i> :	-2	-1	0	1	2	3	4
<i>y</i> :	2	-0.25	0	-0.25	2	15.75	56

3) Solve $y_{n+2} + 5y_{n+1} + 6y_n = n + 2^n$

Answer the following questions. (Any One) B)

- Prove that $\delta = \Delta (1 + \Delta)^{-1/2} = \nabla (1 \nabla)^{-1/2}$ 1)
- Using Lagrange's formula express the function 2) $\frac{3x^2+x+1}{(x-1)(x-2)(x-3)}$ as sum of partial fraction.

Answer the following questions. (Any Two) Q.5

- State and prove Simpson's $(\frac{3}{8})^{\text{th}}$ rule and hence evaluate $\int \frac{dx}{1+x^2}$ a)
- State and prove Lagrange's interpolation formula for unequal interval. b)
- Solve : C)

i.
$$y_{x+1} y_x + 5y_{x+1} + y_x + 9 = 0$$

ii. $y_{x+2} + 6 y_{x+1} + 9y_x = x2^x$

Use Simpson's 1/3rd rule to find $\int e^{-x^2} dx$ by taking seven ordinates.

10

06

14

Seat	
No.	

B.Sc. (Semester - VI) (Old) (CBCS) Examination: Oct/Nov-2022 STATISTICS (Special Paper- XIV) Probability Theory

Day & Date: Monday, 06-02-2023 Time: 03:00 PM To 05:30 PM

Instructions: 1) All questions are compulsory and figures to the right indicate full marks. 2) Use of scientific calculators and statistical tables is allowed.

Q.1 Choose the correct alternatives from the options. 1) In queuing system, for achieving steady state control

-) In queuing system, for achieving steady state condition which one of the following is a possible value of traffic intensity?
 - a) -0.5 b) 0.5 c) 1.5 d) 20
- 2) Which of the following statements is/are correct?
 - a) Convergence in probability is stronger than convergence in distribution.
 - b) Convergence in probability is stronger than convergence in quadratic mean.
 - a) Only a) b) Only b)
 - c) Both a) and b) d) Neither a) nor b)
- 3) Time between two successive arrivals is known as _____ time.
 - a) Arrival b) Service
 - c) Inter arrival d) Waiting
- 4) Which one of the following expressions is used to know the probability that there is no-one in the system i.e. P(0)?

a)	$\frac{(\mu-\lambda)}{\mu}$	b)	$\frac{\lambda}{\mu}$
c)	$\frac{(\lambda)}{(\mu-\lambda)}$	d)	$\frac{1}{(\mu-\lambda)}$

5) Distribution of _____ can be obtained using order statistic.

- a) Sample rangeb) Sample medianc) Both a) and b)d) Neither a) nor b)
- 6) If Xi are iid N (0, 1) r. vs. then, limiting distribution of z = _____ is N (0,1). a) $\sqrt{n} \bar{X}$ b) $\frac{\sum x_i^2 - n}{\sqrt{2n}}$

c) Both a) and b)

7)

- If $Xn \xrightarrow{D} K_1$ and $Yn \xrightarrow{D} K_2$ then, _____.
 - a) $(Xn + Yn) \xrightarrow{D} (K_1 + K_2)$
 - c) Both a) and b) d) Neither a) nor b)
- 8) A state 'i' is said to be transient if _____

a)
$$P_{ii} = 1$$

c) $P_{ii}^{(n)} < 1$

b) $P_{ii}^{(n)} = 1$ d) None of these

d) Neither a) nor b)

b) $(Xn + Yn) \xrightarrow{P} (K_1 + K_2)$

Max. Marks: 70

Set

- 9) In Markov chain state space is _____.
 - a) Discrete b) Continuous
 - c) Both a) and b) d) Neither a) nor b)
- 10) Suppose *Xn* is the number of students present in the college campus at any time of the day. If *S* is state space and *T* is parameter space for this process then, _____.
 - a) S and T are discrete
 - b) *S* is discrete and *T* is continuous
 - c) S is continuous and T is discrete
 - d) S and T are continuous

11) We say that state 2 communicates with state 4 if _

a)
$$P_{24}^{(n)} > 0, P_{42}^{(m)} = 0$$

b) $P_{42}^{(n)} > \overline{0, P_{24}^{(m)}} = 0$
c) $P_{24}^{(n)} > 0, P_{42}^{(m)} > 0$
d) None of these

12) Convergence in probability of sample mean to population mean is implied

- by _____. a) CLT b) WLLN c) Both a) and b) d) Neither a) nor
- c) Both a) and b) 13) If $P = \begin{bmatrix} 0 & 1 \\ -1 & -1 \end{bmatrix}$ then two step TPM would be
 - If $P = \begin{bmatrix} 0 & 1 \\ 0.5 & 0.5 \end{bmatrix}$ then two step TPM would be _____. a) $\begin{bmatrix} 0 & 1 \\ 0.5 & 0.5 \end{bmatrix}$ b) $\begin{bmatrix} 0.25 & 0.75 \\ 0.5 & 0.5 \end{bmatrix}$ c) $\begin{bmatrix} 0.5 & 0.5 \\ 0.25 & 0.75 \end{bmatrix}$ d) $\begin{bmatrix} 0 & 1 \\ 0.25 & 0.75 \end{bmatrix}$
- 14) For a random sample of size 2 from exp (1) distribution. First order statistic is distributed like _____.
 - a) exp(1)b) exp(2)c) exp(n)d) None of these

Q.2 A) Answer the following questions. (Any Four)

- 1) Fill in the blanks:- If the number of arrivals in interval follow ______ distribution then, inter arrival time follows ______ distribution.
- 2) Write the expression for average number of customers in the queue when arrival rate is λ and service rate is μ .
- 3) Define convergence in probability.
- 4) Define first order statistic and state (only) its pdf in usual notations.
- 5) Define transient and recurrent state of a Markov chain.

B) Answer the following questions. (Any Two)

- 1) If $Xn \xrightarrow{P} X$ and $Yn \xrightarrow{P} Y$ then show that $(Xn + Yn) \xrightarrow{P} (X + Y)$ as $n \to \infty$.
- State Weak Law of Large Numbers (WLLN). Also state the conditions for existence of WLLN.
- 3) If the arrival and departure rates in M /M / 1: ∞ /FIFO queuing model are $\frac{1}{2}$ and $\frac{2}{3}$ per minute respectively, find average waiting time of a customer in the queue.

Q.3 A) Answer the following questions. (Any Two)

- 1) State the assumptions made in queuing system on number of arrivals and departures.
- 2) Define Poisson process with parameter λ , stating assumptions involved.

08

06

3) For the following markov chain with 3 states {0, 1, 2} and initial

distribution $P[X_0 = i] = \frac{1}{3}$ for i=0, 1, 2 and one step TPM P = $\begin{bmatrix} 0.25 & 0.75 & 0\\ 0.25 & 0.5 & 0.25\\ 0 & 0.25 & 0.75 \end{bmatrix}$ Find $p(X_2 = 1, X_0 = 2)$.

B) Answer the following questions. (Any One)

- 1) State central limit theorem (CLT) for a sequence of iid r.vs. Prove the same for a sequence of B(n, p) r. vs.
- 2) i) Prove WLLN for iid r.vs.
 - ii) If $X_1, X_2, ..., Xn$ is a r.s. from $\chi^2(10)$ distribution then test whether WLLN holds good for this sequence.

Q.4 A) Answer the following questions. (Any Two)

- 1) Let $X_1 X_2, X_3, X_4$ be a random sample of size four from U(0,3) distribution. Let $Y_1 < Y_2 < Y_3 < Y_4$ be corresponding order statistic. Find
 - i) $p(Y_1 > M)$ and
 - ii) $P(Y_4 > M)$, where M = Median of U(0,3) distribution.
- 2) Describe all the parameters of $M/M/1 : \infty /FIFO$ queuing model.
- 3) The school of international studies for population had a survey and found that the mobility of the population (in percentages) of a given state to a village, town and city is as below.

			То	
		Village	City	Town
	Village	50	30	20
P = From	City	10	70	20
	Town	10	40	50l

What will be the proportion of population in village, city and town after one year given that the present population has proportions of 70, 20, 10 percent in village, town and city.

B) Answer the following questions. (Any One)

- 1) If *Xi* are *iid* Poisson (0.02) r.vs. for i = 1, 2, ..., 100 and $S = \sum X_i$. Using CLT to evaluate $p(S \ge 3)$.
- 2) Customers arrive at a petrol pump in poisson process with an average time of 5 minutes between arrivals. The time intervals between services follow exponential distribution with mean 2 minutes. Find
 - i) Is the queue finite?
 - ii) Find the probability that the pump is idle
 - iii) Find the probability that there are 3 customers in the system.

Q.5 Answer the following questions. (Any Two)

- a) Let { Xn } be a sequence of iid $B\left(n,\frac{\lambda}{n}\right)r$. vs., $\lambda > 0$. Show that $Xn \xrightarrow{D}$, as $x \to \infty$ where X is $P(\lambda)r.v$.
- b) For the following one step TPM of a markov chain, obtain stationary distribution.

$$P = \begin{bmatrix} 0 & 1 & 0 & 0 \\ 0.5 & 0 & 0.5 & 0 \\ 0 & 0.5 & 0 & 0.5 \\ 0 & 0 & 1 & 0 \end{bmatrix}$$

06

10

04

c) Find the distribution of Yr when a random sample of size n is taken from exp (θ) distibution. Hence show that $Z = Y_{(r+1)} - Y_r$ is exponential r.v. with parameter $(n - r)\theta$.

Seat No.		Set F	>						
	B.Sc. (Semester - VI) (Old) (CBCS) Examination: Oct/Nov-2022 MICROBIOLOGY (Special Paper – XIV) Microbial Biochemistry								
Day 8 Time:	k Date 03:00	Monday, 06-02-2023 Max. Marks: 7 PM To 05:30 PM	0						
Instru	uction	 s: 1) All questions are compulsory. 2) Figures to the right indicate full marks. 3) Draw a neat labeled diagram wherever necessary. 							
Q.1	Choo 1)	se the correct alternatives from the options.1Aspartate transcarbamoylase is activated bya) ADPb) C-AMPc) ATPd) AMP	4						
	2)	is allosteric protein. a) Albumin b) Gelatin c) Globulin d) Haemoglobin							
	3)	is precursor for biosynthesis of peptidoglycan. a) Glucose b) Fructose c) Sucrose d) Maltose							
	4)	In catabolite repression catabolite of glucose play important role. a) TTP b) CTP c) ATP d) C-AMP							
	5)	is not used for preparation of gradient in density gradient centrifugation. a) Ceiszium chloride b) Ceiszium formate c) Ceiszium acetate d) sucrose							
	6)	In protein synthesis amino acid is not used. a) Citruline b) Methionine c) Arginine d) Valine							
	7)	In absence of arabinose, Ara 'C' protein acts as a a) inducer b) promoter c) stimulator d) repressor							
	8)	is used immobilization of enzyme. a) sodium chloride b) sodium carbonate c) sodium alginate d) sodium nitrate							
	9)	Movement of ribosome on mRNA is known as a) translation b) transcription c) translocation d) transduction							
	10)	When Vo= ½ Vmax, then Km = a) [E]							

	11)	 The precursors for pyrimidine nucleotide synthesis are a) aspartate and acetyl CoA b) aspartate and aceto acetic acid c) aspartate and butyryl CoA d) aspartate and carbomoyl – P 				
	12)	Induced fit hypothesis was proposed by a) Emil Fischer b) Koshland c) Monod d) Kuhne				
	13)	is isoenzyme. a) Aspartate transcarbomolyase b) Aspartate lyase c) Lactate dehydrogenase d) transpeptidase				
	14)	Luminescent organisms are generally found in a) soil b) air c) fresh water d) marine water				
Q.2	A)	 Answer the following questions. (Any Four) 1) Two examples of Luminescent bacteria. 2) Nucleotide. 3) Structure of tRNA. 4) Steriochemical specificity. 5) Ribozyme. 	08			
	B)	 Answer the following questions. (Any Two) 1) Extraction of extra cellular enzymes. 2) Processing of polypeptide chain. 3) Induced fit hypothesis. 				
Q.3	A)	 Answer the following questions. (Any Two) 1) Acid – Base catalysis. 2) Assimilation of sulfur. 3) Pyruvate as key metabolite. 	08			
	B)	 Answer the following questions. (Any One) 1) Ion exchange chromatography. 2) Biosynthesis of peptidoglycan. 	06			
Q.4	A)	 Answer the following questions (Any Two) 1) Affinity chromatography. 2) Initiation of protein synthesis. 3) Regulation of allosteric enzyme. 	10			
	B)	 Answer the following questions. (Any One) 1) Arabinose operon. 2) List uses of immobilized enzymes. 	04			
Q.5	Ans a) b) c)	wer the following questions. (Any Two) Methods of immobization. Derive Michaelis-menten equation. Assimilation of carbon.	14			

INO.					
	B.S	c. (Semester - VI) (Old) (CBCS) ELECTRONICS (Spe Embedded Syst) Ex cia tem	amination: Oct/Nov- 2022 I Paper- XIV) Design	
Day & Time:	k Date 03:00	: Monday, 06-02-2023) PM To 05:30 PM		Max. Marks:	70
Instru	uction	 s: 1) All questions are compulsory. 2) Draw neat labelled diagram whe 3) Use of log-table and regular calc 	ereve	er necessary. or is allowed.	
Q.1	Fill ir comp 1)	the blanks by choosing correct all blete sentence. The C language was developed by _ a) Patrick Naughton c) Ken Thompson	b)	ative given below and write Dennis Ritchie Martin Richards	14
	2)	The memory space reserved for the " bytes. a) 1 c) 4	d) 'long b) d)	integer" C data type is 2 8	
	3)	Which one of these is a looping state a) if-else c) do-while	men b) d)	t in C? switch-case break	
	4)	An Embedded System isa) Microcontroller-based systemc) software-driven system	b) d)	dedicated system all of these	
	5)	89S51 microcontroller has 4K bytes ofa) UVEPROMc) NVRAM	of b) d)	memory. Flash One Time Programmable	
	6)	The minimum system using 89S51 do a) RAM c) Clock circuit	bes b) d)	not include ROM LCD	
	7)	 By default all the ports of uC89S51 at a) input port b) output port c) upper nibble as input and lower r d) upper nibble as output and lower 	re co nibbl [.] nibl	onfigured as e as output ole as input	
	8)	To configure upper nibble of PORT-1 the hex value to besent to the port is a) 0x00 c) 0xf0	as i b) d)	nput and lower nibble as output, 0xff 0x0f	
	9)	Which of these is an infinite loop statea) while(1)c) for(a=0;a<=20;)	eme b) d)	nt? for(;;) all of these	
	10)	The hex data to turn-on alternate LEI a) 00 and FF c) 0A and A0	Ds o b) d)	f PORT-1 is 55 and AA All of these	

Seat No.

Set P

SLR-FZ-260

Page 1 of 3

08

06

08

06

10

- 11) The resolution or step-size of AD0804 for maximum input of +5V is _____.a) 1.95 Vb) 50 mvc) 19.5 mvd) 1 mv
- **12)** The reference current of the DAC is 2-mA for +5V Vcc, the reference resistance value will be _____.
 - a) $2.5 K\Omega$ c) $25 K\Omega$ d) $0.5 K\Omega$
- **13)** If stepper motor takes 200 steps to complete one revolution, the stepping angle is
 - a) 7.2° b) 2.5°
 - c) 18° d) 1.8°
- 14) As per ANSI standard, which one of these is not a keyword in C?
 - a) While b) When
 - c) If d) Do

Q.2 A) Answer the following questions. (Any Four)

- 1) Definition of an embedded system. Enlist any two examples.
- 2) Enlist the decision making and loop control statements in C.
- 3) Explain the need of an operating system.
- 4) What is PWM? Briefly explain its use in DC motor speed control.
- 5) Explain the concept of super-loop.

B) Write notes on. (Any Two)

- 1) Explain the interfacing of switch and LED.
- 2) Write an embedded-C program to turn-on and turn-off LEDs connected to PORT-1 with one second time-delay.
- 3) Give the applications of embedded system.

Q.3 A) Answer the following questions. (Any Two)

- 1) Write an embedded-C program to generate a square-wave on port pin P1.4, without using timers.
- 2) Explain the basic structure of C-program.
- Give the interfacing of an optocoupler and relay to a microcontroller. Write an embedded-C program to turn-on and off the relay through optocoupler.

B) Answer the following questions. (Any One)

- 1) Explain the interfacing of DAC0808 to a microcontroller. Write an embedded-C program to generate a triangular wave.
- 2) Explain arrays in C. Write a program to arrange ten numbers in ascending and descending order.

Q.4 A) Answer the following questions. (Any Two)

- 1) Write an embedded-C program to read PORT-1 data and send it serially at a standard baud rate of 9600 repeatedly in mode-1. Assume a crystal frequency of 11.0592 MHz.
- 2) Explain the basic architecture of an embedded system. Discuss at least three characteristics.
- 3) Explain the data types and data ranges in C.

B) Answer the following questions. (Any One)

- 1) Draw the interfacing diagram for thumb-wheel switch. Write an embedded-C program to read thumb-wheel switch and send the data to PORT-2.
- 2) Explain the concept of global declaration and local declaration in C, with suitable examples.

Q.5 Answer the following questions. (Any Two)

- a) Design 89S51 based embedded system for the measurement of temperature or humidity of an environment.
- b) Explain the interfacing of 16X2 LCD. Write an embedded-C program to display "WELCOME".
- c) Explain minimum system using 89S51 for general embedded application. Write an embedded-C program to rotate the stepper motor in clock-wise direction.

14

SLR-FZ-261 Set

B.Sc. (Semester - VI) (Old) (CBCS) Examination: Oct/Nov- 2022 **COMPUTER SCIENCE (Special Paper- XIV)** Advanced Java

Day & Date: Monday, 06-02-2023 Time: 03:00 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate full marks.

Choose the correct alternatives from the options. Q.1

- JDBC-ODBC Bridge driver Performance degraded because JDBC method 1) call is converted into the ODBC function calls.
 - a) True b) False
- Execute normal SQL statements with no IN and OUT parameters. 2)
 - a) statement c) callbale statement
- b) Preparestatement d) all of these
- 3) The java specification defines an application programming inteface for communication between the web server and the application program. b) Servlet
 - a) Swing
 - c) Server d) Program
- A deployment descriptor describe 4)
 - a) Web component request setting
 - b) Web component setting
 - c) Web component request and responce objects
 - d) Web component response setting
- 5) The include() method of RequestDispatcher
 - a) Appends the request object to the current servlet
 - b) Sends a request to another resource like servlet, jsp or html
 - c) Appends the request object to the current servlet
 - d) all of these
- In HTTP Request _____ method is secured because data is not appeand 6) in URL.
 - a) GET b) POST
 - d) PUT c) Both a & b
- Syntax of JSP expression tag 7)
 - a) <%= statement %> b) <% statement %>
 - c) < @% = statement % >d) <@% statement %>
- In JSP, config is an implicit object of type _____ 8)
 - a) ServletConfig b) Servletcontext
 - c) ServletRequest d) ServletResponse
- 9) Which is/are the attribute of <c:set> JSTL core tag. a) Value
 - b) Variable
 - d) All of these
- Cookies maintain client side. 10)
 - a) True

c) Score

b) False

Max. Marks: 70

	11)	ORM stands for object Relation Mapping. a) True b) False	
	12)	 Which of the following is true about SessionFactory object in hibernate? a) The Session Factory is heavy weight object. b) Session Factory object is created during application start up and kept for later use. c) You would need one SessionFactory object per database using a separate configuration file. d) All of the above. 	
	13)	The struts framework is Used to develop MVC-based web application. a) True b) False	
	14)	 Which configuration files are used in Struts? a) Application Resources Properties b) struts-config.xml c) All the above d) None of the above 	
Q.2	A)	 Answer the following questions. (Any Four) 1) What is Framework? 2) What is ODBC? 3) What is DSN? 4) Define Servlet API. 5) What are the stages of the JSP life cycle? 	08
	B)	 Write notes on. (Any Two) 1) JSTL SQL tags. 2) JDBC drivers. 3) Architecture of Struts. 	06
Q.3	A)	 Answer the following questions. (Any Two) 1) Explain Generator classes of Hibernate. 2) Explain JSP architecture. 3) Write a JSP page to demonstrate that use of config and application implicit object. 	08
	B)	 Answer the following questions. (Any One) 1) Explain JSP tag elements with example. 2) Write a program to insert employee information in emp table. (use type-I driver) 	06
Q.4	A)	 Answer the following questions. (Any Two) 1) Explain hibernate annotation in detail. 2) Write a servlet program to implement cookies. 3) Difference Between JDBC and Hibernate Framework. 	10
	B)	 Answer the following questions. (Any One) 1) List out Difference between servlet and CGI. 2) Write a JSP page to display current date time. 	04
Q.5	Ans a) b)	wer the following questions. (Any Two) Explain steps to create application of Hibernate. What is struts? Explain use of Struts and write steps to create application of Struts.	14

c) Explain ReuestDispatcher interface with example.

							SLR-	FZ-2	62
Seat No.								Set	Ρ
	B.S) . c.)	Semester	- VI) (Old) (C Physics (Spe ocular Physi	BCS) Ex ecial Paj	camination: C per – XV) Quantum Mo)ct/Nov-20 chanics	22	
Day & Time:	Date 03:00	: Tue PM	esday, 07-02 To 05:30 Pl	-2023 M			Max.	Marks	: 70
Instru	ction	i s: 1) 2) 3) 4)	All question Figures to t Draw a nea Use of loga	is are compulso he right indicate It labeled diagra rithmic table is	ory. e full mark am wherev allowed.	s. /er necessary.			
Q.1	Choc 1)	b se tl In al a) b) c) d)	he correct a kali spectra, increase in increase in decrease ir none of the	Iternatives fro the doublet se atomic number principal quant orbital angular se	m the opt paration d um numbe momentu	t ions. ecreases with er (n) m quantum nun	 nber (e)		14
	2)	In al a) c)	kali spectra, $\Delta j = 0$ $\Delta j = 0, \pm 1$	the selection r	ule for j in b) d)	emission transit $\Delta j = \pm 1$ $\Delta j = 2$	ions is		
	3)	The moti a)	ration of ma on of electro $e/_{2m}$	gnetic moment on is	to the me b)	chanical momer $2\frac{e}{2m}$	nt of orbital		
		c)	$2\frac{e}{m}$		d)	e/m			
	4)	lf the then a) c)	e coupling b we observe anomalous Stark effect	etween <i>l</i> * and <i>s</i> Zeeman effect	* is broker b) d)	n in an external i Paschen back Strong field sta	magnetic fiel effect ark effect	d	
	5)	Elec a) c)	tronic Spect uv-vis infared	ra of diatomic r	nolecules b) d)	occurs in microwave X-ray	_ region.		
	6)	Ram a) c)	nan shift for s zero positive	stokes line is	b) d)	negative extremum			
	7)	Ener to a) b) c) d)	rgy of particl square of le reciprocal of length of bo reciprocal of	e which is moviength of box of square of leng ox of length of box	ing in one∙ gth of box	dimensional rigi	id box is prop	portiona	al.
	8)	Frar a)	k-Condon p	rinciple, helps i lands	n estimatiı b)	ng the width of lands			

c) intermolecular distance d) energy levels

	9)	The zero point energy of linear harmonic oscillator is given by a) $E_0 = 0$ b) $E_0 = \hbar w$					
		c) $E_0 = mc^2$ d) $E_0 = \frac{1}{2}\hbar w$					
	10)	The total energy operator is given by					
	,	a) $\hat{E} = i\hbar \frac{\partial}{\partial t}$ $\hat{E} = -i\hbar \frac{\partial}{\partial t}$					
		c) $\hat{E} = \frac{-i}{\hbar} \partial /_{\partial t}$ d) $\hat{E} = i\hbar \partial^2 /_{\partial t^2}$					
	11)	The quantity ψψ* is calleda) Probability densityb) Probability current densityc) Reflection co-efficientd) Transmission coefficient					
	12)	If sin 4x is eigen function and $\frac{d^2}{dx^2}$ is operator then eigen value of operator					
		is a) -16 b) +16 c) -4 d) 4					
	13)	For a free particle the potential energy $V(r) =$					
		a) -1 b) 0					
		c) +1 d) +2					
	14)	Momentum operator is given by a) $\frac{\hbar}{i} \frac{d^2}{dx^2}$ b) $\frac{\hbar}{i} \frac{d}{dx}$					
		d d d					
		$i\hbar \frac{d}{dx}$ (i) $-i\hbar \frac{d}{dx}$					
Q.2	A)	 Answer the following questions. (Any Four) 1) Give the electronic configuration of K (potassium) 2) What is an energator? 					
		 What is an operator? What are intensity rules? Give any four observations of Alkali Spectra What are adapting a log for all all as a start 					
	B)	/rite note. (Any Two)					
	-,	1) Frank Condon principle					
		 Zero-point energy Electronic Spectra of diatomic molecules 					
03	Δ)	A) Answer the following questions (Any Two)					
	1) Prove that $[L^2, L_x] = [L^2, L_y] = [L^2, L_z] = 0$						
	 Write a note on quantum numbers. Obtain the Schrodinger's time independent wave equation for particle. 						
	B)	Answer the following questions. (Any One)	06				
		 rigid box and hence determine energy Eigen value of a particle. 2) Give an account of Raman effect. 					
04	^)	Answer the following questions (Any Two)	10				
U. +	~)	1) Write a note on quantum numbers.	ĨŪ				
	 Explain sodium spectrum with neat labelled diagram. Give a brief account of stark effect. 						

B) Answer the following questions. (Any One)

- 1) Write a note on
 - i) Energy operator
 - ii) momentum operator
- 2) Show that $[L_x, L_y] = i\hbar L_z$

Q.5 Answer the following questions. (Any Two)

- a) Explain anomalous Zeeman effect and derive an expression for term shift.
- **b)** Obtain Eigen value of operator L^2
- c) Obtain an expression for rotational energy of a diatomic molecule and explain its spectrum with energy level diagram.

In *CO*, the $J = 0 \rightarrow J = 1$ absorption line in rotational spectra occurs at a frequency 1.153×10^{11} Hz. Calculate the moment of inertia of molecule and bond length.

Given: Mass of $12_{\rm C} = 1.99 \times 10^{-26} kg$ Mass of $16_0 = 2.66 \times 10^{-26} kg$ 14
			Or	ganic Che	emis	stry	
Day & Time	& Date : 03:00	e: Tues D PM T	day, 07-02-2023 o 05:30 PM				Max. Marks: 70
Instr	uction	ns: 1)	All questions are con Figures to the right ir Draw neat diagram a	npulsory. ndicate full r and give equ	marks Jatior	s. Is wherever necessary.	
Q.1	Choc 1)	pyreth a) p	e most correct alter is used as a syne nrum. piperonylpentoxide	r native of t l rgist to incre	he fo ease b)	llowing. the insecticidal potency piperonylbutoxide	14 / of
	2)	Pyridi a) 2 c) 4	ne on heating with s 2-amino pyridine 4-amino pyridine	odamide giv	ves _ b) d)	3-amino pyridine no reaction	
	3)	Vat dy a) S c) p	yes are water Soluble partly soluble	_ dyes.	b) d)	insoluble dispersed	
	4)	N-me a) (c) E	thyl amide of aceto a Carbaryl Baygon	acetic acid i	s use b) d)	d in the synthesis of IAA monocrotophos	
	5)	a) E c) (is used for latex p Ethophan Carbaryl	production ir	n rubt b) d)	ber tree. Sevin all of these	
	6)	Heter	ocyclic compounds o	containing n	nitrog	en are named by using	prefix
	7)	a) c c) p	oxa ohospha		b) d)	aza thia	
	7)	a) N c) T	is a hatural dye. Methyl red Thioindigo		b) d)	Picric acid Indigo	
	8)	Chem a) r c) r	nically Adrenaline is a resorcinol naphthol	a derivative	of b) d)	amino acid catechol	
	9)	D-ara a) a c) k	binose is a t aldohexose ketopentose	type of suga	ar. b) d)	aldopentose ketohexose	
	10)	Drugs a) A c) a	s used to lower body Anti-inflammatory antipyretics	temperatur	re are b) d)	called as analgesics anesthetics	

B.Sc. (Semester - VI) (Old) (CBCS) Examination: Oct/Nov-2022 CHEMISTRY (Special Paper- XV)

Seat

No.

SLR-FZ-263

Set Ρ

	11)	Lactose is on hydrolysis gives a mixture of a) glucose + fructose b) glucose + glucose c) galactose + glucose d) glucose + gulose	
	12)	Vitamin is soluble in water. a) C b) D c) A d) K	
	13)	Chloromycetin is a rotatorybroad spectrum antibiotic.a) dextrob) laevoc) mesod) none of these	
	14)	is the precursor of vitamin-A. a) Isoprene b) Thiophene c) Ecosprene d) (beta) β-Carotene	
Q.2	A)	 Answer the following questions. (Any Four) Define mutarotation. What is meant by chromophore and auxochrome? Draw the structure of penicillin. What are drugs? Mention qualities of an ideal drug. Draw the structure of thyroxine. 	08
	B)	 Write note. (Any Two) Synthesis and uses of phenolphthalein. The structure and uses of sucrose. CNS drugs. 	06
Q.3	A)	 Answer the following questions. (Any Two) Write a note on Killiani Fischer synthesis. Explain basic character of Pyrrole and Pyridine. What are the limitations of open chain structure of D-glucose? 	08
	B)	Answer the following questions. (Any One)1)Write sources, structures and uses of starch and cellulose.2)Match the following pairs.Group AGroup Bi)Palludrinii)Ethambutolb)Antidiabeticiii)Phenobarbitonec)Anticanceriv)Tolbutamidev)Chlorambucile)Antitubercularvi)Penicillin-Gf)CNSg)Anti-inflammatory	06
Q.4	A)	 Answer the following questions (Any Two) 1) What are hormones? Write synthesis of Adrenaline. 2) Mention different types of water soluble dyes with example. 3) Write mechanism of Skraup's synthesis of Quinoline. 	10
		-	

14

Q.5 Answer the following questions. (Any Two)

- Explain in detail analytical evidences putforth in support of structure of a) Vitamin-A.
- Discuss methylation method used to determine ring size of D-glucose. b)
- C) What is the action of following on pyrrole?
 - HNO₃/Ac₂O, 0⁰C i)
 - I_2/KI iii)
 - (CH₃CO)₂O, SnCl₄ V)
- SO₃/Pyridine 100^oC ii) $C_6H_5N_2^+Cl^$ iv)
- Cr0₃/CH₃COOH vii)
- vi) Ni/H₂. 200⁰C

NO.			
	B.S	:. (Semester - VI) (Old) (CBCS) Examination: Oct/Nov-2022 BOTANY (Special Paper - XV) Plant Metabolism	
Day & Time	& Date : 03:00	Tuesday, 07-02-2023 Max. Marks: 7 PM To 5:30 PM	0
Instr	uction	 1) All questions are compulsory. 2) Figures to the right indicate full marks. 3) Draw neat diagram and give equations wherever necessary. 	
Q.1	Fill ir 1)	the blanks by choosing the correct alternatives given below.1The main function of is to store energy within the cell.1a) AMPb) ABPc) ADPd) ATP	4
	2)	The PPP is also known as pathway. a) Warburg-Christian b) Christian-Warburg c) Warburg-Dickens d) Dickens –Christian	
	3)	The condensation of two monosaccharide yields a) disaccharides b) polysaccharides c) large amino acid chains d) large β sheets	
	4)	Stearic acid contains carbon atoms. a) 14 b) 16 c) 18 d) 20	
	5)	The conformational model of ATP synthase was proposed by a) Walkar b) Boyer c) Skou d) Walkar & Skou	
	6)	The cyanide resistant respiration in plants is possible due to special type of enzyme a) Aldose b) Enolase c) Alternative oxidase d) Isomerase	
	7)	is a disaccharide of Glucose and galactose sugar units. a) Fructose b) Lactose c) Sucrose d) Ribose	
	8)	are the simple lipids. a) Waxes b) Phospholipids c) Glycolipids d) as sulfolipids	
	9)	n polysaccharides, monosaccharides are joined by a) Peptide bond b) glucose bond c) glycosidic bond d) covalent bond	
	10)	 The ATP molecule is formed by combination of Adenine, sucrose and phosphate Adenine, ribose and phosphate Cytosine, ribose and phosphate 	

d) Adenine, glucose and phosphate

SLR-FZ-264

Seat No

Set P

	11)	The Glycolysis occurs ina) cytosolb) mitochondriac) chloroplastd) peroxisomes	
	12)	The is a saturated fatty acid.a) palmitic acidb) linoleic acidc) linolenic acidd) α linolenic acid	
	13)	The is very sensitive to inhibitors like cyanide. a) Cytochrome 'C'oxidase b) catalase c) peroxidase d) dehydrogenase	
	14)	The word ATP stands fora) Adenosine monophosphateb) Adenosine biphosphatec) Adenosine diphosphated) Adenosine triphosphate	
Q.2	A)	 Answer the following questions. (Any Four) 1) Define photophosphorylation. 2) Define carbohydrates. 3) Give the outline of lipid classification. 4) Define glycolysis. 5) Define Isomers. 	08
	B)	 Answer the following questions. (Any Two) 1) Explain the structure of ATP molecule. 2) Give the properties of monosaccharides. 3) Explain Racker's experiment. 	06
Q.3	A)	 Answer the following questions. (Any Two) 1) Explain conversion of pyruvate to acetyl Co. A. 2) Give the properties of saturated fatty acids. 3) Explain the cyanide resistant respiration. 	08
	В)	 Answer the following questions. (Any Two) 1) Give the properties of oligosaccharides. 2) Explain epimersin carbohydrates. 3) Explain oxidative phosphorylation. 	06
Q.4	A)	 Answer the following questions. (Any Two) 1) Explain in brief classification of carbohydrates. 2) Describe electron transport system in mitochondria. 3) Explain Glycolysis. 	10
	B)	 Answer the following questions. (Any One) 1) Write a note on linoleic acid. 2) Explain biosynthesis and degradation of starch. 	04
Q.5	Ans a) b)	wer the following questions. (Any Two) Explain ATP synthase and add a note on Boyer's conformational model. Describe TCA cycle.	14

c) Explain biosynthesis and degradation of sugar.

SLR-FZ-26	5
-----------	---

Seat No.			Set	Ρ
	В.5	Sc. (Semester - VI) (Old) (CBCS) Examination Oct/Nov ZOOLOGY (Special Paper- XV)	/-2022	
Day 8 Time:	C Date 03:00	Molecular Biology and Biotechnology e: Tuesday, 07-02-2023 0 PM To 05:30 PM	Max. Marks	: 70
Instru	uction	 ns: 1) All questions are compulsory. 2) Figures to the right indicate full marks. 3) Draw neat diagram and give equations wherever necessary. 		
Q.1	Multi 1)	iple choice questions.Transcriptionally active areas of chromosomes are calleda) Euchromatinb) Hetero chromaticsc) Telomered) Allochromosome		14
	2)	DNA synthesis occurs in phase of cell.a) Mb) Sc) G0d) G1		
	3)	In eukaryotes transcription is initiated by a) RNA polymerase I b) RNA polymerase II c) RNA polymerase III d) RNA polymerase IV		
	4)	The enzyme which cleans DNA at 5' of 3' end is called asa) Exonucleaseb) Nucleasec) Endonucleased) Pronuclease	<u>-</u> :	
	5)	Restriction endonuclease enzymes are also called asa) Transporterb) Isomerasec) Permeased) Molecular scissor		
	6)	RNA polymerase III transcribes a) Small nuclear RNAs & tRNAs b) tRNA c) mRNA d) rRNA		
	7)	Prokaryotic RNA polymerase has subunits. a) Four b) Six c) Three d) Five		
	8)	DNA replication is discontinuous for strand synthesized in overall direction.a) $5' \rightarrow 3'$ b) $3' \rightarrow 5'$ c) Both directiond) All directions		
	9)	First direct evidence sharing that genetic material is DNA isa) Griffith's Transformationb) Hershey Chase experic) Watson & Crick Experimentsd) Avery McDade, Nc. Ca	 ment arty	
	10)	The mechanism of DNA replication isa) Conservativeb) Semi conservativec) Dispersived) Duplicate		
	11)	Coding regions are known asa) Jumping genesb) Exonsc) Intronsd) Pseudogenes		

		_	
	12)	146 nucleotide long segment of DNA resistant to nuclease is calleda)Base pairb)Nucleosidec)Nucleosomed)Nucleoid	<u>.</u> .
	13)	vectors replicate in both E.coli and Eukaryotes. a) YE plasmid b) YR plasmid c) YI plasmid d) Shuttle vectors	
	14)	Terminator sequences in prokaryotic mRNA's are a) 5 ¹ UUUUUU3 ¹ b) 5 ¹ GUGGG3 ¹ c) 5 ¹ CCCC3 ¹ d) 5 ¹ AAAAA3 ¹	
Q.2	A)	 Answer the following questions. (Any Four) 1) DNA ligase. 2) Amino acid. 3) tRNA. 4) Cosmid 5) Insulin. 	08
	B)	 Write note. (Any Two) 1) Nobble hypothesis 2) Restriction enzymes 3) Photo reactivation 	06
Q.3	A)	 Answer the following questions. (Any Two) 1) Nucleosome concepts. 2) Griffith's transformation experiment. 3) Cloning technique and applications 	08
	B)	 Answer the following questions. (Any One) 1) Golden rice and its application. 2) Excision repair mechanism. 	06
Q.4	A)	 Answer the following questions (Any Two) 1) Applications of biotechnology in agriculture. 2) Avery, McDade and Mc Carty experiments. 3) Cloning vectors. 	10
	B)	 Answer the following questions. (Any One) Properties of genetic code. Post transcriptional modifications in Eukaryotic mRNA. 	04
Q.5	Ans a) b) c)	wer the following questions. (Any Two) Describe steps in rDNA technology. Explain protein synthesis in Prokaryotes. Describe DNA synthesis i.e. replication in eukaryotes.	14

		SLR-FZ-266	3
Seat No.		Set F	>
	B.S	c. (Semester - VI) (OId) (CBCS) Examination: Oct/Nov-2022 MATHEMATICS (Special Paper- XV) Programming in C	
Day 8 Time:	k Date 03:00	: Tuesday, 07-02-2023 Max. Marks: 70 PM To 05:30 PM	0
Instru	uctior	 s: 1) All questions are compulsory. 2) Figures to the right indicate full marks. 	
Q.1	Choo 1)	se the correct alternatives for each of the following.1The C language was developed along with the operating system.a)LINUXb)MS-officec)UNIXd)XP	4
	2)	Who is father of C Language?a) Bjarne stroustrupb) James A Goslingc) Ken Thomsand) Dennis Ritchel	
	3)	escape sequence character causes the cursor to more to the next a) \t b) \a c) \n d) \v	
	4)	is the largest value that an unsigned char type variable can store. a) 127 b) 255 c) 32767 d) 65535	
	5)	The operator not equal to is. a) ?= b) != = c) != d) ?= =	
	6)	Which of the following operator used as Ternary operator? a) <= b) = c) ?: d) ?=	
	7)	The function is used to display output on the screen.a) scanf()b) print f()c) getch()d) getchar()	
	8)	In C 21%4 = a) 1 b) -1 c) 2 d) -2	
	9)	The header file contains mathematical functions. a) <stdio.h> b) <math.h> c) <conio.h> d) <char.h></char.h></conio.h></math.h></stdio.h>	
	10)	Multiway selection can be accomplished using an else-if statement or the	
	11)	a)Forb)Whilec)Do-whiled)Switch	

	12)	 Which is correct for loop statement? a) For (initialization: test - condition ; increment) b) For (initialization ; condition, increment) c) For (increment : test condition : initialization) d) For (increment: initialization : test condition) 	
	13)	In a C, Vector is a a) One dimensional array b) Two dimensional array c) Multi dimensional array d) Mixed array	
	14)	By default the C function returns value. a) Character b) Float c) Double d) Integer	
Q.2	A)	Attempt any four1)What does int main (void) mean?2)Write names of mathematical function used in c.3)Write any four reserved keywords.4)Write logical operator in c.5)Write syntax of formatted input & formatted output	80
	B)	 Attempt any Two. 1) Explain one dimensional array. 2) Explain simple if statement. 3) Explain do-while statement. 	06
Q.3	A)	 Attempt any Two. 1) Explain if else statement. 2) Write a programme to accept height and base of triangle and calculate area of triangle. 3) Explain two dimensional array. 	80
	B)	 Attempt any one. 1) Write note on increment operator and decrement operator. 2) Explain reading a character and writing a character. 	06
Q.4	A)	 Attempt any two. 1) Explain in detail C-data types. 2) Explain Bitwise operator and special operator 3) Write a C-programme to find maximum number between given three number. 	10
	B)	Attempt any one.1)Explain switch statement.2)Explain for statement.	04
Q.5	Atte a) b) c)	Explain if else, Nested if else and else if ladder statement. Describe Basic structure of C-program. Write a C program to find the solution of the equation $ax^2 + bx + c = 0$; $a \neq 0$.	14

r			-			1	
Seat No.						Set	Ρ
	B.S	c. (Semester S	- VI) (OId) (CBC TATISTICS (Spe Designs of E	S) Exa ecial P xperin	amination: Oct/Nov-20 aper- XV) nents	22	
Day & Time:	Date: 03:00	: Tuesday, 07-0 PM To 05:30 P	2-2023 M		Max.	Marks	: 70
Instru	ction	s : 1) All question 2) Figures to t	ns are compulsory. the right indicate full	marks.			
Q.1	Choo 1)	se the correct The expected v assumed to be a) 1 c) 0	alternative from the alue of error compo	e follov nent in b) d)	ving. a design of experiment is 2 0 or 1		14
	2)	In RBD with erronumber of treat	or degrees of freedo ment would be	bm 12, v b) d)	with 4 blocks, the required		
	3)	In CRD with 5 to a) 3 c) 5	reatments, degrees	of freec b) d)	lom for treatment S.S is 4 6		
	4)	The principle of a) RBD c) CRD and I	່ local control is not ເ LSD	used in b) d)	CRD LSD		
	5)	The total number a) 3 c) 1	er of interaction effe	cts in a b) d)	2 ² factorial experiment is 4 2		
	6)	In case of LSD a) m-1 c) (m-1) (m-2	with m treatments, t ?)	he degr b) d)	rees of freedom for error is: m ² m ² -1		
	7)	In a RBD, which variance? a) Treatment b) Treatment c) Error sum d) Error mear	n of the following is a sum of squares mean sum of squar of squares n sum of squares	an unbia es	ased estimator of error		
	8)	Randomized blo a) One restric c) Three rest	ock design is a ctional design rictional design	b) d)	Two restrictional design None of these		
	9)	Local control he a) reduce the b) increase th c) reduce the d) increase th	elps to e number of treatmer ne number of plots e error variance ne error d.f.	nts			

08

06

08

06

SLR-FZ-267

- 10) The main purpose of confounding in a factorial experiment is to reduce the size of replicates
 - Blocks a)

a)

- b) treatments experimental units d) C)
- 11) Randomization is a process in which the treatments are allocated to the experimental units:

b)

d)

b)

- a) In a sequence
- At the will of the investigator C)
- 12) In the replicate given below:

Block 1	b	ac	be	(1)	
Block 2	а	b	С	abc	
Confounded effect is					
a) AB			b)	AC	
c) BC			d)	ABC	

13) The factors like dale of sowing and breeds are often used as

- experimental unit treatments b)
- replicates d) None of these C)

14) A factorial experiment with three factors each at two levels is called. 3x2 factorial experiment

- 2x3 factorial experiment a)
- 3² factorial experiment 2³ factorial experiment C) d)

Q.2 A) Attempt any four of the following:

- Define efficiency of design. 1)
- 2) Explain partial confounding.
- State the formula for efficiency of LSD over RBD, when rows are 3) taken as blocks.
- 4) Give two merits of CRD.
- 5) State the formula to estimate one missing value in LSD.

B) Attempt any two of the following

- Explain Layout of an experiment. 1)
- Explain the missing plot technique. 2)
- Define Block and critical difference (C.D.) 3)

Q.3 A) Attempt any two of the following

- Describe the ANOVA technique for one- way classification. 1)
- What is Randomized block design? Give its layout. 2)
- Give the mathematical model, assumptions and analysis of variance 3) table in case of LSD.

Attempt any one of the following: B)

- Following data are available for 5x5 LSD 1) Row S.S.= 22, Column S.S.= 26, Treatment S.S.= 16, Error S.S.= 18. Prepare ANOVA table and test equality of treatment effects. (Given, $F_{(4,12)}$; 0.05 = 3.26)
- 2) Obtain the formula for estimating one missing observation in LSD.

Q.4 A) Attempt any two of the following:

- Derive the equations to estimate two missing values in RBD. 1)
- 2) Explain Yate's procedure to obtain factorial effect totals in a 2³ factorial experiment.
- Describe the basic principles randomization and local control in a 3) design of experiment.

10

with equal probability None of these

B) Attempt any one of the following.

- 1) Obtain the efficiency of RBD over CRD.
- 2) Compute relative efficiency of LSD over CRD with the following information:

Treatment. S.S. = 98.4Row S.S. = 121.3Column S.S. = 103.1Error S.S. = 111.8Degrees of freedom for total S.S. = 24.

Q.5 Attempt any two of the following.

- a) State mathematical model, assumptions and ANOVA table in CRD
- **b)** What is meant by the main effect and interaction effect in a 2² factorial experiment? Derive the expression for main and interaction effect.
- c) What is 'ANOCOVA'? Explain in brief the technique of analysis of covariance in CRD.

14

Seat No.					Set	Ρ
	B.S	Sc. (Semester G	- VI) (OId) (CBCS EOLOGY (Specia Stratigraphy of Ir) Exa al Pa ndia	amination: Oct/Nov-2022 per – XV) Part – II	
Day 8 Time:	k Date 03:00	e: Tuesday, 07-02 D PM To 05:30 Pl	2-2023 M		Max. Marks	s: 70
Instru	uction	is : 1) All question 2) Figures to	ns are compulsory. the right indicate full r	narks		
Q.1	Fill ir 1)	n the blanks wit l 'Paleoslope' of l a) N-W c) N	h correct answer fro ndian gondwana towa	m giv ards _ b) d)	ven options. S N-E	14
	2)	Out of the follow a) Deccan Tra c) Haimanta	ring highest fossil rich ap	forma b) d)	ation is Kutch Muth quartzite	
	3)	The maximum th a) Raniganj c) Talchir	nickness of coalfields	are d b) d)	erived from formation. Barren measures None of the above	
	4)	Main Deccan pla a) Sahyadri c) Malwa plat	ateau includes	 b) d)	Satpura hills Mandla lobe	
	5)	Intertrappean be a) Deccan Tra c) Trichinapol	eds are found in ap ly	b) d)	Satpura hills Spitti	
	6)	MuthQuartzites a) Proterozoio c) Palaeozoio	belongs to ag	ge. b) d)	Mesozoic Archean	
	7)	Lilang formation a) Deccan Tra c) Spiti	belongs to gro ap	up. b) d)	Siwalik Trichinapolly	
	8)	Cambrian of spi a) Haimanta c) Po	ti is also known as	b) d)	Lilang Kanawar	
	9)	Most of the coal a) Deccan Tra c) Gondwana	feilds in India belong ap	s to _ b) d)	Siwalik Trichinapolly	
	10)	Bagh Beds in Na a) Outcrops c) Intrusion	armada Valley are ex	posec b) d)	l as in Deccan Traps. Graben Horst	
	11)	Thickest formati a) Pancham c) Chari	on of jurassic of Kach	nchh is b) d)	s Umia Katrol	

	12)	Indian gondawana basins are commonly found in type of structures. a) Horst b) Graben c) Anticline d) Syncline						
	13)	Beginning of Deccan volcanic province is found inera.a) Mesozoicb) Paleozoicc) Cenozoicd) Proterozoic						
	14)	Inter-trappean beds are found in a) Himalaya b) Dharwar c) Cuddapah d) DVP						
Q.2	A)	 Answer the following. (Any Four) 1) What is the geological age of Deccan Volcanic Province? 2) On which formation of gondwana glacial depositional environment is derived? 3) Correct the following sequence ' Katrol, pancham, Chari,umia'? 4) Write a note on fenestella shales? 5) What is the geological age of Muth Quartzite? 	08					
	B)	 Answer the following. (Any Two) 1) What is the depositional environment of Pranhita-Godavari valley? 2) Write a short note on Rajmahal basin? 3) Write a brief note on Lonarlake? 	06					
Q.3	A)	 Answer the following. (Any Two) 1) Write a breif note on Surma-Tipam succession in Assam? 2) Write a note on Kioto limestone? 3) Write a short note on tectonic characteristics of gondwana? 	80					
	B)	 Answer the following. (Any One) 1) Describe in detail haimanta series? 2) Describe in detail depositional environment of gondwana formation? 						
Q.4	A)	 Answer the following. (Any Two) Write a note on Inter-trappean beds? Write a brief note on west coast alluvium deposits? List out the paleozoic formation in spiti with its lithology and fossils? 	10					
	B)	 Answer the following. (Any One) 1) Write a note on Lipak and Po series? 2) Explain lameta beds? 	04					
Q.5	Ans a) b) c)	wer the following. (Any Two) Explain phanerozic stratigraphy of Maharashtra? Describe litho and biostratigraphy of Jurassic of Kutch? Describe in brief, stratigraphy of Prahnita-Godawari valley with its economic importance?	14					

Page 1 of 2

Seat No.

B.Sc. (Semester - VI) (Old) (CBCS) Examination: Oct/Nov-2022 MICROBIOLOGY (Special Paper- XV) Environmental Microbiology

Day & Date: Tuesday, 07-02-2023 Time: 03:00 PM To 05:30 PM

Instructions: 1) All questions are compulsory & carry equal Marks.

- 2) Draw a neat labeled diagram wherever necessary.
- 3) Figure to the right indicates full marks.

Q.1 Rewrite the sentences by selecting correct answer from given alternatives. 14

- 1) The ozone is present in _____ layer of atmosphere.
 - a) Exosphere b) Troposphere
 - c) Stratosphere d) Mesosphere
- 2) Barophiles are the organisms which require _____ for its growth.
 - a) Highly alkaline condition
 - b) Higher temperature
 - c) High salt concentration
 - d) High hydrostatic pressure
- 3) _____ gas has the highest affinity for blood hemoglobin.
 - a) Carbon dioxide b) CO
 - c) PAN d) Nitrogen
- 4) _____ is the main cause of Eutrophication.
 - a) Animal population b) Algal mass
 - c) Pollutants d) Reduction in DO
- 5) If BOD of a river is high, it means that the river _____.
 - a) Is very polluted
 - b) Is not polluted

a)

- c) Gets least amount of light
- d) Does not have green plants
- 6) _____ is a liquid form of aerosol.
 - a) Fume b) Dust
 - c) Mist d) Smoke
- 7) A lake with low primary productivity, as a result of low nutrient content is known as _____.
 - a) Eutrophic lake b) Oligotrophic lake
 - c) Mesotrophic lake d) Hypereutrophic lake
- 8) Bioremediation carried out by plants to degrade pollutants is called as _____.
 - Biopile b) Land farming
 - c) Composting d) Phytoremediation
- 9) Dyes are common in the waste generated from _____ industry.
 - a) Textile b) Dairy
 - c) Distillery d) Sugar

Set | F

Max. Marks: 70

	10)	 is non-biodegradable. a) Fertilizers b) Crop waste c) Radioactive substance d) Agrochemicals 	
	11)	 play an important role in leaching of uranium. a) Escherichia coli b) Thiobacillus ferroxidans c) Bacillus Polymyxa d) Strepto verticillium spp 	
	12)	Halophillic bacteria grow best at salt concentration of %.a) 2.5 to 4b) 0.5 to 2c) 4 to 5d) 0.1 to 1	
	13)	Incubation time for BOD test is days. a) 5 b) 7 c) 10 d) 20	
	14)	Study of animals in germ free environment is known as a) Geology b) Gnotobiology c) Geomicrobiology d) Xenobiology	
Q.2	A)	 Write answers of the following question. (Any Four) 1) What is bioremediation? 2) Explain Bioaerosol. 3) Enlist the Germ free animals. 4) Define Pollution. 5) What are Osmophiles? 	08
	B)	 Answer the following. (Any Two) 1) Characteristics of textile industry waste water. 2) Mechanism of adaptations of halophiles. 3) Explain CO₂ as air pollutant. 	06
Q.3	A)	 Attempt any Two of the following. 1) Explain in brief biological oxygen demand (BOD) of water. 2) What are Extremophiles? What are the applications of extremozymes? 3) Explain bioleaching of uranium. 	08
	B)	 Attempt any One of the following. 1) Explain causes, effects and control measures of Eutrophication. 2) Write an essay on types of waste and Waste water assessment and management. 	06
Q.4	A)	 Attempt any Two of the following. 1) Write an essay of biological safety. 2) What is microbial leaching? Explain it with respect to copper. 3) Give characteristics of wastes generated from Sugar and Distillery industry. 	10
	B)	 Attempt any One of the following. 1) Explain characteristics and treatment of waste generated from Paper and Pulp Industry. 2) What are the various sampling methods for airborne microorganisms? 	04
Q.5	Atte a) b) c)	mpt any Two of the following. Explain causes, impact and control of depletion of ozone layers. Explain in detail characteristics and treatment of dairy waste. Describe in detail microbial-enhanced oil recovery.	14

Set

Seat No.

B.Sc. (Semester - VI) (Old) (CBCS) Examination: Oct/Nov-2022 **ELECTRONICS (Special Paper- XV) Electronics Instrumentation**

Day & Date: Tuesday, 07-02-2023 Time: 03:00 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

- 2) Draw neat labeled diagram wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Use of log table and calculator is allowed.

Fill in the blanks by choosing correct alternatives given below. Q.1

- In case of multichannel DAS, the device is of importance. 1)
 - signal conditioner multiplexer a) b)
 - input output C) d)
- The technique are used to eliminate noise or interference from the 2) signal.
 - a) grounding
 - electrostatic shielding b)
 - electromagnetic shielding C)
 - d) all of the above
- 3) The frequency generator utilizes to produce the frequency
 - differentiator a) integrator b)
 - both a & b d) amplifier C)
- The 4-20 mA current transmission is an example of technique. 4)
 - ratiometric conversion a)
 - offset compensation b)
 - logarithmic conversion C)
 - grounding d)

a)

C)

- The X-Y recorder is a _____ type recorder. 5)
 - magnetic graphic a) b)
 - strip chart d) digital C)
- The AD 494/495 is pre calibrated precision amplifier to produce output voltage 6) from thermocouple signal.
 - 1 m V/°C 10 m V/°C a) b) C)
 - 1 micro V/°C d) 10 micro V/°C
- The _____ device handles the data in digital form. 7)
 - data logger frequency generator a) b)
 - CRO digital multimeter d) C)
- The standard glass pH electrode is electrode. 8)
 - Ampeometric b) potentiometric a)
 - variable capacitance d) variable resistance C)
- 9) The programmable instrumentation amplifier has
 - Low offset voltage Low offset voltage drift b)
 - low noise
- all of these d)

Max. Marks: 70

	10)	To remove low frequency noise from the circuit is used. a) filter b) chopper c) pre-amplifier d) multiplexer	
	11)	The essential component in digital storage oscilloscope is circuita)pre-amplifierb)sample and holdc)oscillatord)filter	
	12)	To measure unknown resistance the digital multi-meter uses source.a)constant voltageb)variable voltagec)variable currentd)constant current	
	13)	Typical gain range of AD 620 Instrumentation amplifier is a) 1 – 10 b) 1 – 100 c) 1 – 1000 d) 1 – 10,000	
	14)	Oscilloscope isa) a ohmmeterb) an ammeterc) a voltmeterd) a multimeter	
Q.2	A)	 Write answers of the following question. (Any Four) 1) State the salient features of AD 620. 2) Draw block diagram of CRO. 3) Give features of data loggers. 4) Draw pin diagram of AD 594. 5) Explain need of DAS. 	08
	B)	 Write notes on (Any Two) 1) Single channel DAS 2) Magnetic Recorder 3) Grounding techniques 	06
Q.3	A)	 Attempt any Two of the following. 1) Describe computer based DAS. 2) Explain ratiometric and logarithmic conversion. 3) Explain 4-20 mA current transmission. 	08
	B)	 Attempt any One of the following. 1) Explain DC & AC signal conditioning system. 2) Describe function generator with suitable block diagram. 	06
Q.4	A)	 Attempt any Two of the following. 1) Describe pH meter. 2) Explain bridge amplifier for signal conditioning. 3) Explain multichannel DAS with the help of block diagram. 	10
	B)	 Attempt any One of the following. 1) Explain digital Multimeter. 2) Explain LCR Q meter using block diagram. 	04
Q.5	Atte 1) 2) 3)	mpt any Two of the following. Explain digital oscilloscope with the help of block diagram. Give the principle, block diagram and working of a temperature meter. Explain basic operation of data loggers with suitable block diagram.	14

					SLR-FZ-	271
Seat No.					Set	Ρ
	B.Sc. ((Semester COMP Data (- VI) (OId) (0 UTER SCIEN Communicat	CBCS NCE (tion a	6) Examination: Oct/Nov-2022 Special Paper - XV) and Networking – II	
Day & Time:	Date: Tu 03:00 PN	iesday, 07-02 /I To 05:30 P	2-2023 M		Max. Mar	ks: 70
Instru	ctions: 1	 All question Figures to 	ns are compuls right indicate fu	ory. Ill mar	ks.	
Q.1	Choose 1) TCI a) c)	the correct a P groups a ne Packet Segment	alternatives. umber of bytes	togeth b) d)	her into a packet called Buffer Stack	14
:	2) a) b) c) d)	layer is a del. Application Presentatio Session lay Both Sessi	n addition to O l layer on layer yer on and Presen	SI moo	del when compared with TCP/ IP layer	
:	3) The a) c)	e physical lay into hard data link la transport la	er translates lo ware specific o yer ayer	ogical o peratio b) d)	communication requests from the ons. network layer application layer	
	4) CR a) b) c) d)	C stands for cyclic redu code repea code redur cyclic repe	ndancy check at check adancy check at check			
	5) FTF a) c)	^D is built on _ Client-serv Data centri	architect er c	ure. b) d)	Point to Point Service oriented	
	6) A s call a) c)	ubset of a ne ed. spanning ti spider tree	twork that inclu ree	udes a b) d)	Ill the routers but contains no loops is spider structure none of the mentioned	
	7) The a) c)	e underlying ⁻ TCP Either TCP	Fransport layer or UDP	protoc b) d)	col used by SMTP is UDP IMAP	
;	8) Wil a) c)	dcard domair @ &	n names start v	vith lat b) d)	bel *	
2	9) Tra a) b)	nsport layer application process to	protocols deals to application process comm	with. comm nunicat	iunication tion	

c) node to node communicationd) none of the mentioned

- 10) The sharing of a medium and its link by two or more devices is called _____.
 - a) Fully duplexing
 - b) Multiplexing
 - c) Both Fully duplexing and Multiplexing
 - d) Duplexing
- 11) Radio channels are attractive medium because _____.
 - a) Can penetrate walls
 - b) Connectivity can be given to mobile user
 - c) Can carry signals for long distance
 - d) All of the mentioned
- 12) What is a web browser?
 - a) a program that can display a web page
 - b) a program used to view html documents
 - c) it enables user to access the resources of internet
 - d) all of the mentioned

13)	The HTTP reg	uest message is se	entin ı	part of three-way	/ handshake.
/					

- a) Firstb) Secondc) Thirdd) Fourth
- 14) What are the Methods to move data through a network of links and switches?
 - a) Packet switching
 - b) Circuit switching
 - c) Line switching
 - d) Both Packet switching and Circuit switching

 B) Write notes on (any two) Period, amplitude Framing Data compression Q.3 A) Attempt any Two of the following questions. Briefly explain design issues for layers. Define multiplexing. Explain frequency division multiplexing. Discuss optimality principal with one example. B) Attempt any One of the following questions. What is mean by modulation? Explain Amplitude Modulation, Frequency Modulation. Explain WWW in detail. Q.4 A) Attempt any Two of the following questions. What is mean by guided media? Explain its types. How CSMA/CD works. What is mean by congestion? Explain its prevention policies. 	2.2	A)	 Write answers of the following questions. (Any Four) 1) What is hamming distance? 2) Define any four applications of network. 3) Explain Manchester coding. 4) Which are the two types of bridge? 5) Why protocols needed? 	08
 Q.3 A) Attempt any Two of the following questions. Briefly explain design issues for layers. Define multiplexing. Explain frequency division multiplexing. Discuss optimality principal with one example. B) Attempt any One of the following questions. What is mean by modulation? Explain Amplitude Modulation, Frequency Modulation. Explain WWW in detail. Q.4 A) Attempt any Two of the following questions. What is mean by guided media? Explain its types. How CSMA/CD works. What is mean by congestion? Explain its prevention policies. 		B)	 Write notes on (any two) 1) Period, amplitude 2) Framing 3) Data compression 	06
 B) Attempt any One of the following questions. What is mean by modulation? Explain Amplitude Modulation, Frequency Modulation. Explain WWW in detail. Q.4 A) Attempt any Two of the following questions. What is mean by guided media? Explain its types. How CSMA/CD works. What is mean by congestion? Explain its prevention policies. 	Q.3	A)	 Attempt any Two of the following questions. 1) Briefly explain design issues for layers. 2) Define multiplexing. Explain frequency division multiplexing. 3) Discuss optimality principal with one example. 	08
 Q.4 A) Attempt any Two of the following questions. 1) What is mean by guided media? Explain its types. 2) How CSMA/CD works. 3) What is mean by congestion? Explain its prevention policies. 		B)	 Attempt any One of the following questions. 1) What is mean by modulation? Explain Amplitude Modulation, Frequency Modulation. 2) Explain WWW in detail. 	06
	Q.4	A)	 Attempt any Two of the following questions. 1) What is mean by guided media? Explain its types. 2) How CSMA/CD works. 3) What is mean by congestion? Explain its prevention policies. 	10

04

14

B) Attempt any One of the following questions.

- 1) What is mean by transmission imperilment? Explain its types.
- 2) What is DNS?

Q.5 Attempt any Two of the following.

- a) What is Channelization? Explain the FDMA and CDMA in detail.
- b) Explain ISO-OSI model in detail.
- c) Explain working of SMTP in detail.

			-	
Seat No.		Se	ət	Ρ
	B.S	c. (Semester - VI) (Old) (CBCS) Examination: Oct/Nov- 2022 PHYSICS (Special Paper - XVI) Electronics		
Day & Time:	Date 03:00	: Wednesday, 08-02-2023 Max. Ma 9 PM To 05:30 PM	rks	: 70
Instru	ction	 s: 1) All questions are compulsory. 2) Figures to the right indicate full marks. 3) Neat diagrams must be drawn neat wherever necessary. 4) Use of log table or calculator is allowed. 		
Q.1	Choc 1)	a) Infinite A _v b) infinite R _i c) zero R ₀		14
	2)	An inverting amplifier has $R_2 = 2M\Omega$ and $R_1 = 2K\Omega$, its gain is a) 1000 b) -1000 c) 10^{-3} d) -10^{-3}		
	3)	If $R_A = R_B = 1 \text{ K}\Omega$, $C = 1\mu\text{F}$ then frequency of astable circuit is Hz. a) 380 b) 480 c) 580 d) 680		
	4)	Astable multivibrator is also calleda) asymmetricb) free running multivibratorc) symmetricd) constant multivibrator		
	5)	An SCR is turned OFF bya) reducing anode voltage to zerob) reducing gate voltage to zeroc) reverse biasing the gated) none of these		
	6)	An a.c. power in load can be controlled by connecting two SCRs ina) seriesb) parallelc) parallel in oppositiond) none of these	÷	
	7)	The normal way to turn ON diac is bya) gate currentb) gate voltagec) breakover voltaged) anode voltage		
	8)	The I.V. characteristics of triac in the first and third quadrant are essentialidentical to those of in the first quadrant.a) transistorb) SCRc) FETd) UJT	ly	
	9)	The liquids used in LCDs area) nematicb) tantalumc) oild) electrolytic		
	10)	In LED, material used to give green colour is a) GaAs b) GaAsP c) GaP d) AsP		
	11)	is passive display. a) LED b) LCD c) CRT d) gas discharge plasma		

Seat

	12)	A MOSFET uses electric field of a to control the channel current.a) capacitorb) batteryc) generatord) both battery and generator	
	13)	An n-channel D-MOSFET with positive V _{Gs} is operating in a) the depletion mode b) the enhancement mode c) cut off d) saturation	
	14)	The slew rate of OP-AMP is measured ina) μsec/vb) v/μsecc) μV/secd) sec/μV	
Q.2	A)	 Answer the following questions. (Any Four) 1) What is an operational amplifier? 2) Define duty cycle in astable multivibrator. 3) Draw equivalent circuit of SCR. 4) Define the terms breakover voltage and holding current. 5) What is triac? 	80
	B)	 Write short notes. (Any Two) 1) What are advantages of LEDs? 2) Give comparison between D-MOSFET and E-MOSFET 3) What are characteristics of LCD? 	06
Q.3	A)	 Answer the following questions. (Any Two) 1) Explain circuit operation of E-MOSFET. 2) Explain operational amplifier as Schmitt trigger. 3) Give the application of SCR to control the speed of DC motor. 	08
	B)	$\begin{array}{llllllllllllllllllllllllllllllllllll$	06
Q.4	A)	 Answer the following questions. (Any Two) 1) An astable mode of IC 555 is designed to a rectangular waveform with T_{ON} = 0.6 ms. Draw the circuit diagram with various component values. Also calculate the frequency of oscillations and duty cycle. Assume total period (T) to be 1 ms. (Given: C = 0.1 μF). 2) Derive an expression for gain of inverting operational amplifier. 3) Explain gas discharge plasma displays. 	10
	B)	 Answer the following questions. (Any One) 1) Explain construction and working of a SCR. 2) Give the application of IC-555 as a linear ramp generator. 	04
Q.5	Ans a) b) c)	wer the following questions. (Any Two) Explain circuit operation and transfer characteristics of D-MOSFET. Explain segmental displays using LEDs. Explain construction, working and characteristics of a Triac.	14

SLR-FZ-273 Set

Seat No.

B.Sc. (Semester - VI) (Old) (CBCS) Examination: Oct/Nov-2022 **PHYSICS (Special Paper – XVI)** Instrumentation

Day & Date: Wednesday, 08-02-2023 Time: 03:00 PM To 5:30 PM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Draw a neat labeled diagram wherever necessary.

Q.1 Choose the correct alternatives from the options.

- is active transducer. 1)
 - Thermocouple LVDT a) b)
 - Stain gauge d) Thermistor C)

2) The secondary electron radiated back in scanning microscope is collected

- by_ specimen b) a)
- anode vacuum chamber C) d) cathode
- 3) XPS is widely use for
 - a) biological analysis
 - chemical analysis C)
- 4) The range of wave number of near infrared spectroscopy is
 - 12500-4000 cm⁻¹ 4000-200 cm⁻¹ a) b)
 - C) 200-10 cm⁻¹ d) 50-1000 cm⁻¹
- 5) arrangement for the sequence of the main component of a Uv/visible spectrometer is correct.
 - Light source → Monochromator → Sample Cell → Detector → Readout a)
 - Light source → Sample Cell → Monochromator → Detector → Readout b)
 - Light source → Monochromator → Detector → Sample Cell → Readout C)
 - Light source → Detector → Sample Cell → Detector → Readout d)

The region of the electromagnetic spectrum in which the highest energy 6) photon are observed is the _____.

- infrared ultraviolet b) a)
- microwave C) d) X-rav
- 7) The Uv/ spectroscopy
 - generates colored spectrum a)
 - b) can determine the concentration
 - can be used to make light visible C)
 - can determine the pH d)
- is similar to diffractometer. 8)
 - Optical grating spectrometer Photo multiplier a) b) Photovoltaic cell
 - Prism spectrometer d) C)
- 9) Raman effect is scattering of _____
 - a) molecules b) protons C) photons d) neutrons

Max. Marks: 70

14

electromagnetic analysis d)

electrical analysis

b)

	10)	In R a) c)	aman spectroscopy, the radiatior micro wave UV	n lies i b) d)	n the region. visible X-ray		
	11)	Mos a) c)	sbauer spectroscopy is also know beta ray spectroscopy theta ray spectroscopy	vn as b) d)	alpha ray spectroscopy gamma ray spectroscopy		
	12)	The a) c)	full form of MRI is magnetic resonance imaging mass resonance imaging	b) d)	molecular resolution imaging magnetic resolution imaging		
	13)	Pror a)	npt emission of X-ray by an atom phenomena. spontaneous emission	ioniz b)	ed by a higher energy X-ray is a fluorescence		
	14)	c) Con a)	luminescence vert 0.379 absorbance in terms o 41.8	d) f trans b)	phosphorescence smissions. 54.8		
Q.2	A)	C) Ansv 1)	ver the following questions. (A	a) ny Fo	ur)	08	
	 List the optical spectroscopic techniques. List the important features of Uv-Vis spectrometer. What information does the XRD pattern of a crystal provide? What is Mossbauer effect? 						
	B)	 Answer the following questions. (Any Two) 1) Describe piezoelectric transducer. 2) Draw labeled diagram of X-ray diffractometer. 3) State and explain the principle of XPS. 					
Q.3	A)	Ansv 1) 2) 3)	ver the following questions. (A What is an electron microscopy? Draw the labeled diagram Moss applications of it. Write a note on ECG.	ny Tw ? Write bauer	vo) e the application of SEM. spectroscopy and write the	08	
	B)	Ansv 1) 2)	ver the following questions. (A What do you mean by transduce transducer. State the applications of MRI an	ny Or er? Ex d EEC	ne) plain passive and active G.	06	
Q.4	A)	Ansv 1) 2) 3)	ver the following questions (Ar What is thermistor? Draw the sy types of it. Discus in brief MRI. A beam of X-ray of wavelength o or rock salt with lattice constant for the second order diffraction.	y Tw mbol 0.071 of 0.2	o) thermistor and explains the <i>nm</i> is diffracted by <i>(110)</i> plane 8 nm. Find the glancing angle	10	
	B)	Ansv 1) 2)	ver the following questions. (A Distinguish between SEM and T Write the application of Raman s	ny Or EM. spectr	ie) oscopy.	04	

Q.5 Answer the following questions. (Any Two)a) Describe in brief servometer sensor.

- Draw the labeled diagram of TEM and explain its working. b)
- c) Explain it detail IR-spectroscopy.

		SLR-FZ-274
Seat No.		Set P
	B.S	c. (Semester - VI) (Old) (CBCS) Examination: Oct/Nov - 2022 CHEMISTRY (Special Paper-XVI) Analytical Industrial Organic Chemistry
Day & Time:	Date 03:00	Wednesday, 08-02-2023 Max. Marks: 70 PM To 05:30 PM Max. Marks: 70
Instru	iction	 a: 1) All questions are compulsory. 2) All questions carry equal marks.
Q.1	Choc 1)	se the correct alternatives from the options.14Soaps area) alkali metal salts of higher fatty acids.b) alkaline earth metal salts of higher fatty acids.c) alkali metal salts of higher fatty acid esters.d) alkaline earth metal salts of higher fatty acid esters.
	2)	Dark coloured mechanical mixture of soap in soap solution is called as a) brine b) nigre c) lay d) kettle
	3)	The molecular weight of polymer is the sum of molecular weight of constituent monomer units.a) condensationb) copolymerc) additiond) natural
	4)	1,3-Butadine produces branched polymer due to addition of monomerunits.a) 1,1b) 1,2c) 1,3d) 1,4
	5)	Defication is the process used in of cane juice. a) extraction b) concentration c) purification d) dilution
	6)	The clarified sugar cane juice contains% water. a) 85 b) 15 c) 65 d) 35
	7)	The concept of umpolung refers to the a) reversal of carbon polarity b) dehydration c) hydrogenation d) hydroxylation
	8)	Sodium borohydride (NaBH₄) is reagent a) oxidizing b) reducing c) nitrating d) brominating
	9)	is a chemical agent which facilitates inter phase migration of reactants in bi-phase system. a) onic solvent b) biocatalyst c) MAQR d) Phase transfer catalyst
	10)	Green chemistry suggests principles to achieve. a) 8 b) 12 c) 16 d) 10

08

06

08

06

10

04

- **11)** The rate of flow value (R_f) is the ratio of _____
 - a) distance moved by solute to that by solvent front
 - b) distance moved by solvent front to by solute
 - c) distance moved by mobile phase to stationary phase
 - d) distance moved by stationary phase to mobile phase

12) In paper chromatography paper acts as ____

- a) solid phase b) mobile phase
- c) stationary phase d) support
- **13)** _____ is used as carrier gas in gas chromatography.
 - a) Helium b) Oxygen
 - c) Ammonia d) Carbon monoxide

14) Neoprene is polymer of _____.

c) 2-chlorobutadine

a) ethane

- b) styrene
- d) vinyl chloride

Q.2 A) Answer the following questions. (Any Four)

- 1) What is natural rubber? Write structure of its monomer unit.
- 2) What are the steps involved in synthesis of Deriphat (sodium lauryl sarcosinate)?
- 3) What are thermosetting polymers?
- 4) Write any four characteristics of Bio-catalytic reactions.
- 5) What are lonic liquids? Give two examples.

B) Write short notes. (Any Two)

- 1) Write a note on synthesis and uses of polystyrene.
- 2) Write a note on Microwave Assisted Reactions.
- 3) Write a note on umpolung and give its application in organic synthesis.

Q.3 A) Answer the following questions. (Any Two)

- 1) Explain in details cleansing action of soap.
 - 2) What are polymers? Explain what are isotactic, syndiotactic and atactic polymers.
 - 3) What are different by-products obtained from Sugar industry?

B) Answer the following questions. (Any One)

- 1) How soap is manufactured by Hot or Boiled process? Describe in details.
- 2) What are different types of Alcohol depending on the composition? What are different by-products of Alcohol industry?

Q.4 A) Answer the following questions. (Any Two)

- 1) How will you compare soaps with detergents?
- 2) Explain the methodology of Thin Layer Chromatography (TLC).
- 3) What are different synthetic applications of Selenium dioxide?

B) Answer the following questions. (Any One)

- 1) Write any four synthetic applications of Sodium Borohydride (NaBH₄).
- 2) How will you prepare polyvinyl chloride (PVC) and novolac from its monomers?

Q.5 Answer the following questions. (Any Two)

- a) What is Paper Chromatography? Discuss in details, mention its advantages.
- b) Explain different processes involved in Refining of Raw Sugar.
- c) How BUNA-S and BUNA-N rubber is manufactured from butadiene? Give its applications.

Seat No.							Set	Ρ	
	B.Sc. (Semester - VI) (Old) (CBCS) Examination: Oct/Nov-2022 BOTANY (Special Paper - XVI) Biostatistics								
Day & Time:	Pay & Date: Wednesday, 08-02-2023 Max. Marks: 70 Time: 03:00 PM To 05:30 PM								
Instru	iction	s: 1) All qu 2) Figur 3) Draw 4) Use d	uestions are cor res to the right in a neat labeled of calculator is a	npulsory. ndicate full ma diagram whe allowed.	arks. rever	necessary.			
Q.1	Choo 1)	se the con Statistics p a) Prese b) Foreo c) Contr d) All Th	rrect alternativ performs functio entation Of Fac casting And Pla rolling And Expl he Above	es from the o ons such as ts And Figures nning oring	s s	IS. . [.]		14	
	2)	A variable a) Discr c) Nomi	taking all possi rete Variable inal	ble values in	a cert b) d)	ain range is called a Continuous Ordinal	IS		
	3)	Number of a) Discr c) Nomi	f students in a c rete Variable inal	class is an exa	ample b) d)	of Continuous Ordinal			
	4)	Primary da a) Direc b) Indire c) Inves d) all the	ata are collected of personal investig ect oral investig stigation through e above	d by method c stigation ation n questionnair	of re				
	5)	Data taker a) Prima c) Prima	n from the "Bull ary data ary and second	etin" will be co ary data	onside b) d)	red as Secondary data Neither a or b			
	6)	The main a) To re c) To av	purpose of diag present data in void tabulation	rams and cha simple way	arts is b) d)	To avoid data in ter All the above	rms of text		
	7)	\overline{x} sign is used a) Arithresiden Arithresiden Arithresiden (b) Arithre	sed for metic Mean e		b) d)	Median Deviation			
	8)	Standard (a) Karl I c) Harve	deviation was fi Pearson ey Goldstein	rst worked ou	t by _ b) d)	Milton Friedman Herman Hollerith			
	9)	Mode is de a) \overline{x} c) <i>Moor</i>	enoted by	sign.	b) d)	Me or Mdn Σ			
	10)	In a throw	of coin what is	the probability	y of ge	etting tail?			

a) 1 c) 1/2 b) 2 d) 0 **SLR-FZ-276**

Seat

	11)	In a throw of a) 1/2 c) 1/5	dice is the pr	robability of b) d)	getting number greater than 5 1/3 1/6	
	12)	A legume co a number me a) 5/40 c) 3/40	ntains 40 seeds mai ultiple of 10 is	rked as 1 to — b) d)	40. The probability of drawing 4/40 2/40	
	13)	In column ch a) Vertical c) False b	arts, bars are ase line	 b) d)	Horizontal None of above	
	14)	The test of s a) <i>t-test or</i> c) <i>a and b</i>	ignificance used spe r student's t test o test	ecially for lar b) d)	rge size samples is chi square test None of the above	
Q.2	A)	 Answer the following questions. (Any Four) 1) Give the definition of biostatistics. 2) Define variable with any suitable example. 3) Define histogram. 4) Give the formula to calculate probability. 5) What is mean by arithmetic mean? 				08
	B)	Write notes (1) Samplin 2) Differer 3) Merits a	on (Any two) ng methods. nce between primary and demerits of Med	and secondian.	dary data.	06
Q.3	A)	 Answer the following questions. (Any Two) Mention merits and demerits secondary data. What is range? Find out the range of following data by using formula. 70, 50, 60, 90, 80, 65,40, 75, 55 and 85. Write short note on student's trest)) / data. Ilowing data by using formula. 5.	08
	 B) Answer the following questions. (Any One) 1) Discuss merits and demerits of mean deviation. 2) Mention the functions of biostatistics. 				eviation.	06
Q.4	A)	 Answer the following questions (Any Two) 1) Write note on two-dimensional diagrams. 2) Write short note on chi square test. 3) Describe the different types of probability. 				10
	B)	Answer the f 1) Describ 2) Find ou tossed?	following questions be the basic principle it the probability of go	s. (Any One s of biostati etting (i) He	e) stics. ad, (ii) Tail, when single coin is	04
Q.5	Ans ^r a) b) c)	Wer the following questions. (Any Two) Mention the sources of secondary data. Describe the different sampling methods. Calculate the S. D. of the following data on the heights (in cm) of 10 plants: 73, 75, 80, 42, 57, 65, 52, 42, 47, 67.			14	

Set

Max. Marks: 70

Seat	
No.	

B.Sc. (Semester - VI) (Old) (CBCS) Examination: Oct/Nov-2022 **ZOOLOGY (Special Paper - XVI)**

Endocrinology, Environmental Biology and Toxicology

Day & Date: Wednesday, 08-02-2023 Time: 03:00 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Draw a neat labeled diagram wherever necessary.

Choose the correct alternatives from the options. Q.1

- Insulin and glucagon are antagonistic hormone because they increase and 1) decrease _____.
 - a) calcium
 - b) d) C) glucose
- Exothalmic goitre is due to _____. 2)
 - hypo secretion of thyroxin a)
 - hypo secretion of calcitonin C)
- 3) Zonaglomerulosa or glomerular area of adrenal cortex is involved in
 - a) water and electrolyte balance melanocyte enhancement b)

b)

d)

d)

- C) steroid inhibition
- Long term exposure to a toxic chemical produces effect which is 4)
 - a) sub vital b)
 - C) acute d) chronic
- Mytilus, an intertidal rocky shore marine molluscan fauna which has 5) adaption to its habitat.
 - plough like foot a) c) chitin plate
- b) byssal threads

Biodistructor

sub chronic

blood pressure

potassium

hyper secretion of thyroxin

hyper secretion of calcitonin

sodium

- hsooked oral arms d)
- 6) are the species which are used to monitor, health of an environment or specific ecosystem.

b)

- a) Biodegradation
- **Biological indicator** d) Biofussion C)
- Domestic wet waste constitutes ____ 7)
 - non-biodegradable waste biodegradable waste a) b)
 - effluents air pollution C) d)
- 8) Excess intake of substances than organism ability to remove it from the body is known as
 - a) bio- remediation b) bio-accumulation
 - c) bio- dynamics d) contamination
- Epinephrine and non-epinephrine are produced by the _____. 9)
 - a) anterior pituitary pancreas b)
 - adrenal cortex adrenal medulla d) C)
- SimpleGoiter is results from _____. 10)
 - lack of lodine b) a)
 - lack PTH C)
- lack of GH
- Lack of insulin d)

	11)	Adrenal cortex secretsa) adrenalineb) calcitoninc) epinephrined) aldosterone			
	12)	An autoimmune disease in which an antibody mimic the action of TSH is			
		a)myxedemab)cretinismc)acromegalyd)Grave's disease			
	13)	The hormone responsible for regulation of calcium and phosphorus metabolism is secreted by gland. a) pancreas b) adrenal			
	14)	 a) parathyroid b) Tropic c) Temperate d) parathyroid d) parathyroid 			
Q.2	A)	 Answer the following questions. (Any Four) 1) GnRH. 2) Pesticides. 3) Islets of Langerhans. 4) Bio-Magnification. 5) Histological structure of thyroid. 			
	B)	 Write note. (Any Two) 1) What are Toxicants? 2) Rocky shore animal adaptation 3) Biological Indicators 	06		
Q.3	A)	 Answer the following questions. (Any Two) 1) Explain neurosecretory hormones. 2) Action of acetylcholine. 3) Desert habitat. 			
	B)	 Answer the following questions. (Any One) 1) Solid waste management. 2) Explain animal ethics, give brief account on prevention of cruelty to animals. 			
Q.4	A)	 Answer the following questions (Any Two) 1) Waste water management. 2) Toxic agents as metals. 3) Explain hormones of Pineal gland and its functions. 			
	B)	 Answer the following questions. (Any One) 1) Faunal adaptation in lentic water ecosystem. 2) Histological structure of adrenal gland. 	04		
Q.5	Ans a) b) c)	wer the following questions. (Any Two) Describe characteristic of sea habitat and give the faunal adaptation. Discuss the roles and disorders of hormones of Islets of Langerhan's. Give an account on rain water harvesting.	14		

Seat	
No.	

B.Sc. (Semester – VI) (Old) (CBCS) Examination: Oct/Nov-2022 **ZOOLOGY (Special Paper – XVI) Techniques in Biology**

Day & Date: Wednesday, 08-02-2023 Time: 03:00 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Draw neat and labeled diagrams wherever necessary.

Rewrite the following sentences by choosing the correct alternatives. Q.1

- The working principle of calorimeter is based on 1) Absorption of light
 - a) Working properties of light b) c) R.I. of light
 - d) None of the above
- The basicity of given sample is measured from the device _____. 2)
 - a) Calorimeter
 - c) Balance
- 3) The full form of TLC is
 - a) Thin liquid chromatography
 - c) Thick liquid chromatography
- In western blotting 4)
 - a) Agarose gel is commonly used
 - b) Polyacrylamide is commonly used
 - c) High resolution gel
 - d) Both a & b
- 5) Gel electrophoresis is the most common method used for the purification and separation of
 - a) DNA and Proteins b)
 - c) RNA and Proteins
- DNA and RNA DNA, RNA and Proteins
- d)
- 6) DNA finger printing was first invented for the purpose of
 - a) Paternity Testing
 - b) Identify victims of war
 - c) Diagnosis and Treating diseases
 - d) None of these
- 7) Full form of PCR is
 - a) Polymer Chain Reaction
 - c) Polymer Chemical Reaction
- 8) The preservation of biological material in the frozen state is called as

b)

b)

d)

d)

- a) Fixation
- c) Preservation d)
- 9) PCR is discovered by _____.
 - a) Kary Mullis b)
 - c) Hardy
- Radioactivity discovered by _____. 10)
 - a) Becquerel
 - c) Roseland

Block preparation b) Cryopreservation

Protein Chain Reaction

Protein Chemical Reaction

Hooke

Jaffrey

Crick

- Watson d)

- pH meter b)
- Spectrometer d)
- b) Thin layer chromatography
- Thick layer chromatography d)

Max. Marks: 70

Set

	11)) is the machine that spins in order to separate out components making up a mixture.			
		a) Centrifuge b) Rotator c) Calorimeter d) Balance			
	12)	technology is used in forensic science. a) DNA foot printing b) DNA finger printing c) Staining d) All of above			
	13)	Autoradiography was first discovered by a) Curies b) Robertson c) Hooke d) Crick			
	14)	DNA chip is also known as a) Biochip b) DNA microarray c) DNA microtomy d) All above			
Q.2	A)	 Answer the following questions. (Any Four) pH meter Aim of the separation technique Principle of PCR Role of stem cell Uses of Microtomy 			
	B)	 Write short notes. (Any Two) 1) Applications of Calorimeter 2) Double staining procedure 3) DNA chip 	06		
Q.3	A)	 Answer the following questions. (Any Two) 1) PAS staining method. 2) Describe methodology of microtomy up to sectioning. 3) Give an account on Feulgen Technique. 			
	B)	 Answer the following questions. (Any One) 1) Describe the procedure of column chromatography. 2) Give an account on DNA barcoding. 			
Q.4	A)	 Answer the following questions. (Any Two) 1) Describe the Southern blotting technique. 2) Describe the Cryopreservation of gametes and its applications. 3) Uses of electrophoresis 			
	B)	 Answer the following questions. (Any One) Write in brief Ultracentrifugation. Steps of PCR technique 	04		
Q.5	Ans 1) 2) 3)	wer the following questions. (Any Two) Definition of Microtomy. Explain the method of microtomy. Describe types of centrifugation. Describe in detail the DNA finger printing.	14		

	B.S	Sc. (Semester - VI) (Old) (CBCS MATHEMATICS (Sp Integral Tra	S) Ex ecial ansf	amination: Oct/No Paper - XVI) orm	ov -2022
Day Time	& Date 2: 03:0	e: We 0 PN	ednesday, 08-02-2023 1 To 05:30 PM			Max. Marks: 70
Instr	ructio	n s: 1 2) All questions are compulsory.) Figures to the right indicate full	mark	ïS.	
Q.1	Choo 1)	tions.	14			
		a)	$(2s^2-8)$ $(2s^2-8)$ $(2s^2-8)$ $(2s^2-8)$	b)	$\frac{\cos h2t}{2}$	
		c)	$\frac{\cos ht}{2}$	d)	$\frac{\cos 2t}{2}$	
	2)	lf <i>L</i> { a)	$\{F(t)\} = f(p) \text{ then } L\{e^{at} \cos 2t\}$ $\frac{2}{(n-a)^2 + 4}$	= b)	$\frac{p-a}{(p-a)^2+4}$	
		C)	$\frac{p}{(p-a)^2+4}$	d)	$\frac{1}{(p-a)^2+4}$	
	3)	lf <i>L</i> a)	${F(t)} = f(p)$ then $L^{-1} {f(3p)} = F(t/3)$	b)	$\frac{1}{a}F(t/3)$	
		c)	$\frac{1}{3}F(t/3)$	d)	$\frac{1}{3}F(3t)$	
	4)	L^{-1}	$\left\{\frac{1}{(p-3)(p+4)}\right\} = \underline{\qquad}.$			
		a)	$\frac{1}{7}(e^{3t}-e^{-4t})$	b)	$\frac{e^{3t} - e^{-4t}}{3}$	
		c)	$e^{-4t}-e^{3t}$	d)	$\frac{e^{-4t} + e^{3t}}{7}$	
	5)	lf <i>L</i> ⁻	$f^{-1}{f(p)} = F(t) \text{ and } F(0) = 0 \text{ the } F(t)$	en L ⁻¹	${}^{1}\left\{pf(p)\right\} = \underline{\qquad}.$	
		a)	$\frac{F(t)}{t}$	b)	F''(t)	
		c)	F'(t)	d)	tF(t)	
	6)	The	e initial value theorem is $\lim_{t \to \infty} F(t) = \lim_{t \to \infty} nf(n)$	b)	$\lim_{n \to \infty} f(n) = \lim_{n \to \infty} F(t)$	
		a)	$\lim_{t \to \infty} r(t) = \lim_{p \to 0} p(p)$	U)	$\lim_{p \to \infty} f(p) = \lim_{t \to \infty} F(t)$	
		C)	$\lim_{p\to\infty} pf(p) = \lim_{t\to\infty} F(t)$	a)	$\lim_{t\to 0} F(t) = \lim_{p\to\infty} pf(p)$	

Page 1 of 3

SLR-FZ-280

Set P

Seat No.

7) If
$$L\{f(t)\} = f(p)$$
 then $P L\{\int_{0}^{t} F(u) du\} =$
a) $f(p)$ b) $f'(p)$
c) $\frac{f(p)}{p}$ d) $pf(p)$
8) If $y = y(x,t)$ then $L\{\frac{\partial y}{\partial t}\} =$
a) $P\overline{y}(x,p) - y_{t}(x,\theta)$ b) $P\overline{y}(x,p) - y(x,\theta)$
c) $\overline{y}(x,p) - y(x,\theta)$ d) $\frac{\partial \overline{y}}{\partial t}$
9) The value of $\int_{0}^{t} \sin u \cos(t - u) du =$
a) $\frac{1}{(P + 1)^{2}}$ b) $\frac{1}{(P^{2} + 1)^{2}}$
c) $\frac{P}{(P^{2} + 1)^{2}}$ d) $\frac{1}{p^{2} + 1}$
10) $1 * 1 * 1 * \dots * 1 (n \text{ time}) =$ where $* \text{ is the convolution functions.}$
a) $\frac{t^{n-1}}{(n-1)}$ b) $\frac{t^{n}}{n!}$
c) $\frac{t^{n+1}}{(n-1)}$ d) $\frac{t^{n-1}}{(n-1)!}$
11) According to Heavi-Side's expansion formula $L^{-1}\{\frac{f(p)}{G(p)}\} =$ where then distinct zero's of $G(P)$ are $\alpha_{i}(i = 1, 2, \dots, n)$.
a) $\frac{F(\alpha_{i})}{G'(\alpha_{i})}$ b) $\sum_{i=1}^{n} \frac{F(\alpha_{i})}{G(\alpha_{i})}e^{i\alpha_{i}}$
c) $\sum_{i=1}^{n} \frac{F(\alpha_{i})}{G'(\alpha_{i})}e^{i\alpha_{i}}$ d) $\sum_{i=1}^{n} \frac{F(\alpha_{i})}{G(\alpha_{i})}e^{-i\alpha_{i}}$
12) The value of $L^{-1}\{\frac{1}{p^{2}-(\sqrt{3})^{2}}\} =$...
a) $\frac{\sin h\sqrt{3}t}{\sqrt{3}}$ b) $\sin h\sqrt{3}t$
c) $\frac{\cos h\sqrt{3}t}{\sqrt{3}}$ d) $\sqrt{3} \sin h\sqrt{3}t$
13) $L^{-1}\{\frac{1}{\sqrt{ni}}\} =$...
a) $\frac{1}{p}$ b) $\frac{1}{p^{3/2}}$
c) $\frac{1}{p^{1/2}}$ d) $\frac{\pi}{\sqrt{p}}$
14) If $L^{-1}(f(p)) = F(t)$ then $L^{-1}\{f^{(n)}(P)\} =$...
c) t^{n+1} d) $t^{n-1}F(t)$
1) Find
$$L[\cos n \, at - \cos at]$$

2) Determine the Laplace transform of $\sin^2 at$.
3) If $L^{-1}\{f(P)\} = F(t)$ then prove that $L^{-1}\{f(p-a)\} = e^{at}F(t)$
4) Find $L^{-1}\{\frac{p+2}{p^2-2p+3}\}$
5) Using Heavy-Side's expansion formula find $L^{-1}\{\frac{1}{(p-1)(p-2)(p+3)}\}$
6) Write note. (Any Two)
1) Find $L\{\frac{\sin at}{t}\}$ does the laplace transform of $\frac{\cos at}{t}$ exist.
2) If $y = y(x, t)$ then prove that $L\{\frac{a^2y}{dt^2}\} = p^2 \bar{y}(x, p) - py(x, 0) - y_t(x, 0)$
3) State and prove second shifting theorem for inverse Laplace transform.
4) Answer the following questions. (Any Two)
1) If $F(t) = t^2$ $0 < t < 2$ and $F(t + 2) = F(t)$ find $L\{F(t)\}$
2) Prove the final value theorem for Laplace transform.
3) Find $L^{-1}\{\frac{p}{(p^2 + a^2)^2}\}$
8) Answer the following questions. (Any One)
1) Using Laplace transform solve
 $x''(t) + 4x'(t) + 4x(t) = 4e^{-2t}$ with
 $x(0) = -1$ $x'(0) = 4$
2) State and prove the convolution theorem for inverse Laplace transform.
4) Answer the following questions (Any Two)
10 1) If $L\{F(t)\} = f(p)$ then prove that $L\{t^n F(t)\} = (-1)^n \frac{d^n}{dp^n} f(p)$
2) Show that $\int_0^{\infty} \cos x^2 dx = \frac{\sqrt{\pi/2}}{2}$
3) Apply Laplace transform to solve
 $\frac{\partial y}{\partial t} = 1 - e^{-t}$ $0 < x < 1$ $t > 0$ $y(x, 0) = x$
8) Answer the following questions. (Any One)
1) Show that $L\{(1 + te^{-t})^3\} = \frac{1}{p} + \frac{3}{(p+1)^2} + \frac{6}{(p+2)^2} + \frac{6}{(p+3)^4}$
2) Find $L^{-1}\{\frac{e^{-s^n}}{(p+4)^{5/2}}\}$
4) Using Laplace's transform solve the equation $t^{-2} x = 0$

Q.2 A) Answer the following questions. (Any Four) 1) Find $L(\cos h at - \cos at)$

Q

Q

Q

- $\frac{dx}{dt} + \frac{dy}{dt} = t \qquad \frac{d^2x}{dt^2} y = e^{-t}$ given that $x(0) = 0 \qquad y(0) = 0 \qquad \frac{dx}{dt} = 0$ at t = 0Find the inverse Laplace transform of $\frac{2P^3+2P^2+4P+1}{(P^2+1)(P^2+P+1)}$ b)
- C) Find $L\{\sin\sqrt{t}\}$ and $L\{\frac{\cos\sqrt{t}}{\sqrt{t}}\}$

08

SLR-FZ-280

4

Seat	
No.	

B.Sc. (Semester - VI) (Old) (CBCS) Examination: Oct/Nov -2022 STATISTICS (Special Paper- XVI) **Quality Management and Reliability**

Day & Date: Wednesday, 08-02-2023 Time: 03:00 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Use of simple or scientific calculators.
- 3) Graph papers will be supplied if requested.

Q.1 Choose the correct alternatives from the following options.

- Shewhart control charts are insensitive to process shifts. 1)
 - a) Small (< 1.5σ)
 - c) Big (> 6σ)
- 2) Cusum control charts were originated in
 - a) 1920s b) 1950s c) 1960s d) 1980s
- What is the full form of M in the EWMA chart? 3)
 - a) Mean b) Motion
 - c) Median d) Moving
- 4) EWMA charts are better than Shewhart control charts in detecting the shifts.
 - a) Small process b) Medium process d) None of these
 - c) Large process
- 5) What DMAIC process does is, to
 - a) Manufacture any product
 - b) Define specification limits for a product
 - c) Solve root cause of quality and process problems
 - d) Define quality system standards
- The purpose of Acceptance sampling is to 6)
 - a) Sentence lots b) Estimate lot quality
 - c) Estimate lot defectives d) Estimate lot conformity
- 7) What is done in single sampling plan?
 - a) Only one unit is checked
 - b) Only the first lot is checked 100%
 - c) Only one sample of n units is checked
 - d) Only n samples of 1 unit are checked

8) In a Single Sampling Plan if the lot size N is large relative to the sample size *n*, then we may write the equation of AOQ approximately as .

- a) pnP_a b) $(1-p)P_a$
- d) None of these c) pP_a
- Which of these is not a part of magnificent seven of SPC? 9)
 - a) Pareto chart
 - c) Scatter diagram
- b) Check sheet
- d) 2k factorial design

Max. Marks: 70

14

b) Medium $(1.5\sigma < \text{shift} < 3\sigma)$

d) Very big

SLR-FZ-282

Set

- Pareto chart identifies the _____ defects not the _____ defects. 10)
 - a) The most important, the most frequent
 - b) The smallest defects, the largest defects
 - c) The most frequent, the most important
 - d) The largest defects, the smallest defects
- A set of components whose functioning ensures the functioning of the 11) system is known as
 - a) path set b) cut set
 - c) minimal cut set d) minimal path set
- The structure function $\phi(X)$ of a series system of 2 components is _____. 12)
 - a) $x_1 x_2$ b) $x_1 + x_2$
 - c) $1 x_1 x_2$ d) None of these
- 13) Exponential distribution is _____.
 - a) IFR b) DFR c) Both a & b d) None of these
- 14) Cut vector of a parallel system of 2 components is .
 - a) (1, 1) b) (1, 0)
 - c) (0, 1) d) None of these

Attempt any four of the following questions. Q.2 **A**)

- What is the meaning of Quality? 1)
- 2) When does a series system function?
- 3) Define AOQL.
- State the formula of one-sided upper cusum statistic C_i^+ . 4)
- Define a structure function of a parallel system of two components. 5)

Attempt any two of the following questions. B)

- What is the value of upper control limit for the period i = 1 for a EWMA 1) chart which has value of $\lambda = 0.10, L = 2.7, \sigma = 1$ and the value of $\mu_0 = 15$?
- If the value of $\overline{x_i} = 9.29$ and $C_{i-1} = -1.56$, what will be the value of the 2) cumulative sum C_i for this sample, if the value of $\mu_0 = 12$.
- In a single sampling plan if sample size n = 7, acceptance number 3) C = 2, and lot quality p = 0.07, find the probability of accepting the lot by using binomial distribution.

Q.3 A) Attempt any two of the following questions.

- Find the minimal cut sets of a series system of two components. 1)
- Find the reliability of a parallel system of 3 independent components 2) whose reliabilities are $p_1 = p_2 = p_3 = 0.5$
- Find ATI for single sampling plan. 3)

Attempt any one of the following questions. B)

- Show that hazard rate of series system of components having 1) independent life times is summation of components' hazard rates.
- 2) Write a note on Six Sigma methodology.

Q.4 A) Attempt any two of the following questions.

- Write a note on a magnificent tool of guality Control chart. 1)
- 2) Write a note on a magnificent tool of quality – Histogram.
- 3) Write the procedure of single sampling plan.

06

08

08

06

10

B) Attempt any one of the following questions.

- 1) State the steady-state control limits of EWMA control chart for monitoring process mean.
- 2) In reliability theory, when a system is said to be coherent?

Q.5 Attempt any two of the following questions.

- a) Explain the Tabular CUSUM for monitoring the process mean.
- **b)** Suppose a shirt manufacturing company supplies shirts in lots of size 500 to the buyer. A double sampling plan with $n_1 = 10$, $C_1 = 0$, $n_2 = 25$, $C_2 = 1$ is being used for the lot inspection. The company and the buyer's quality control inspector decide that AQL = 0.04. Compute the producer's risk for this sampling plan. Assume number of defective items found in the samples follows binomial distribution.
- c) Life time of components of a series system of two independent components follow exponential distribution with parameters $\theta_1 = 0.2$ and $\theta_2 = 0.05$ respectively. Find the survival function of the system.



04

		Time Series /	4na	lysis	
Day & Time:	& Date 03:00	: Wednesday, 08-02-2023) PM To 05:30 PM			Max. Marks: 70
Instru	uction	 s: 1) All questions are compulsory an 2) Use of scientific calculators and 3) Graph papers are to be supplied 	d fig stati I on	ures to the right indicate stical tables is allowed. demand.	e full marks.
Q.1	Choc 1)	 bse the correct alternatives from the Long term fluctuations in time series a) seasonal c) cyclical 	e op t are d b) d)	ions. called variations trend irregular	14
	2)	 In single exponential smoothing if sm a) F_{t+1} = constant c) both (a) and (b) 	ooth b) d)	ing constant is 0 then _ F _{t+1} = F _t neither (a) nor (b)	
	3)	Single exponential smoothing is appr a) no upward trend c) both (a) and (b)	opria b) d)	ate when there is no downward trend neither (a) nor (b)	·
	4)	 In time plot a) the observations are plotted agai b) the scatter points are joined with c) the various components are remo d) all of these 	nst t free oved	ime observations hand curve	
	5)	In fitting the straight line of the form y of a) origin c) both (a) and (b)	= a b) d)	+ bt, value of slop b is in scale neither (a) nor (b)	ndependent
	6)	Sum of half yearly seasonal indices in a) 0 c) 400	n mu b) d)	Itiplicative model is 200 600	
	7)	If T = 500, S = 90%, C = 80%, I = 120 value of time series is = a) 342 c) 432	0% tl b) d)	nen under multiplicative 324 None of these	model
	8)	 The first thing to do in time series and a) plot the data b) identify the components at work c) delete the effect of various component d) all of these 	alysi: oner	s is hts	
	9)	In moving average method with perio periods. a) first time point	d 'm b)	' we can not find trend v last time point	alues for

Seat

No.

B.Sc. (Semester - VI) (Old) (CBCS) Examination: Oct/Nov–2022 STATISTICS (Special Paper -XVI)

Set Ρ

SLR-FZ-283

Page 1 of 3

- b) last time point
- d) total (m+1) time points c) total m time points

- 4

Sha a) c)	are index is recorded da increasing trend seasonal variation	aily for 6 m	onth b) d)	s. Tl deo cyc	his d crea clic fl	lata sing luctu	shov tren ıatioi	vs _ d ns		<u>_</u> .		
Wh a) c)	en components in time additive both (a) and (b)	series are	inde b) d)	epen Mu nei	dent Itipli ther	t cativ (a)	/e nor (mo b)	del i	s suit	able.	
For a) c)	AR(1) model $Y t = a Y$ series need not be sta both (a) and (b)	$b_{t-1} + b + \in,$ ationary	we a b) d)	assu a ₁ nei	me f < ∶ ther	that 1 (a)	nor (b)				
For if	AR(2) model $Yb = a_1 Y$	$Y_{t-1} + a_2 Y_t$	-2 +	- <i>b</i> +	∈, tł	ne p	roce	ss is	s sta	tionai	ry	
a) c)	$ a_1 = a_2 a_1 + a_2 > 1$		b) d)	a ₁ No	+ ne o	$a_2 \cdot$	< 1 ese					
Sup the aut	opose time series data series by 1 month. The ocorrelation.	are availab en p	le fo airs	or 50 will I	moi be a'	nths vaila	and ble f	sup for c	pose omp	e we l uting	lag	
a) c)	25 49		b) d)	48 50								
Ans 1) 2) 3) 4) 5)	Swer the following questions. (Any Four)08Define time series.How would convert annual trend equation to monthly trend equation?Define seasonal fluctuation with suitable illustration.Define seasonal fluctuation with suitable illustration.Write the forecasting model of single exponential smoothing.Fill in the blanks : In ratio to moving average method for quarterly data, the sum of seasonal indices is for additive model and it is for multiplicative model.											
Writ 1) 2) 3)	te short notes. (Any T Suppose the last period the single exponential Describe additive mod Write three examples	wo) od forecast smoothing del in time s of trend.	was fore serie	70 a ecas s.	and t witl	dem h α :	and = 0.4	was ł for	60. next	Wha perio	t is od?	06
Ans 1) 2)	wer the following que Define period of movin obtain centered movir Discuss utility of time Write merits and demo	estions. (A ng average ng averages series anal erits of leas	ny T and s. ysis.	wo) exp	lain	whe	n, h	ow a	and v	vhy y	ou	08
Ans 1)	wer the following que Obtain the quarterly s assuming absence of	estions. (A easonal inc trend.	ny C lices	Dne) by :	simp	le a	vera	ge n	neth	od		06

Quarter →	Ι	П	Ш	IV
Year ↓				
2010	40	38	35	33
2011	37	39	36	36
2012	40	41	33	31
2013	33	44	40	40

2) Describe in detail ratio to moving average method.

10)

11)

12)

13)

14)

Q.2 A)

B)

Q.3 A)

B)

Q.4 A) Answer the following questions. (Any Two)

- 1) Compare moving average method and exponential smoothing.
- 2) Draw a time plot for the following time series data

Year	1	2	3	4	5	6	7	8	9	10
Value	130	127	124	135	140	132	129	127	145	158

- 3) State the specific components that can be observed in following time series.
 - i) Variation in quality of a product when production is under statistical control.
 - ii) Daily record of gold prices in one month.
 - iii) Stock of luxurious articles in departmental stores.
 - iv) online transactions and purchases.
 - v) Reduced production in a factory due to strike.

B) Answer the following questions. (Any One)

1) Fit a straight-line trend to the following data.

Year	1989	1990	1991	1992	1993	1994	1995
Profit in thousands	95	105	107	98	109	107	119

2) Explain moving average method of trend estimation.

Q.5 Answer the following questions. (Any Two)

a) Explain how would you determine the period of moving average for the following data. Use this period to estimate trend values.

Year	1	2	3	4	5	6	7	8	9
Value	130	127	140	135	150	155	148	156	160

- b) Write a note on AR(1) model.
- c) Use double exponential smoothing to forecast time series value for one period, two periods and three periods ahead, using following data and when $\alpha = 0.501$ and $\beta = 0.072$

· _		• p • • • • •				
	Т	1	2	3	4	5
	Yt	143	152	161	139	137

04

14

10

Seat No.		Se	t P									
	B.Sc. (Semester - VI) (Old) (CBCS) Examination: Oct/Nov - 2022 GEOLOGY (Special Paper-XVI) Applied Geology Part – II											
Day & Time:	& Date 03:00	e: Wednesday, 08-02-2023 Max. Mar 0 PM To 05:30 PM	ks: 70									
Instru	uction	 ns: 1) All questions are compulsory. 2) Figures to the right indicate full marks. 3) Draw neat labeled diagrams wherever necessary. 										
Q.1	Fill ir 1)	 n the blanks with correct answer from given options. Gamma rays in electromagnetic spectrum has a) Short wavelength and high frequency b) long wavelength and high frequency c) Short wavelength and low frequency d) long wavelength and low frequency 	14									
	2)	Nadir point on the terrain is represented by point on the aerialphotograph.a) Principalb) Principlec) Printedd) None of these										
	3)	Band number 5 of LANDSAT isa) NIR - near-infraredb) SWIR - short wave infraredc) TIR-Thermal infraredd) Blue										
	4)	In the low oblique aerial photographs tilt angle of the axis is a) $5^{0}-6^{0}$ b) $20^{0}-30^{0}$ c) $30^{0}-60^{0}$ d) $60^{0}-90^{0}$										
	5)	Sandstones show tone in the aerial photograph. a) black b) dark c) intermediate d) light										
	6)	Raster data is a type of data.a) Numericalb) Non-spatialc) Spatiald) Vector										
	7)	Basic elements of vector data area) Pointb) Linec) Polygond) All of these										
	8)	Which one of the following data is represented in grid form? a) Point b) Line c) Polygon d) Raster										
	9)	Which one of the following instruments is NOT used in field? a) Chisel b) Pocket stereoscope c) Compass-clinometers d) Goniometer										
	10)	The tube bubble in Brunton compass is used while measuringa) Strikeb) Dip anglec) Bearingd) Trend of fault										

08

06

06

10

04

14

- 11) Which one of the following is vector quantity?
 - a) Elevation b) Strike c) Dip d) None of these
 - a) None
- **12)** Which one of the following colours in the visible spectrum has maximum frequency?
 - a) Red b) Green
 - c) Violet d) Yellow
- **13)** Thermal IR spans the _____ range in the electromagnetic spectrum.
 - a) $3.0 100 \mu m$ b) $0.8 3.0 \mu m$
 - c) $0.4 0.8 \mu m$ d) $0.1 0.4 \mu m$
- **14)** Wavelengths of _____ region falling on water surface are completely absorbed by water.
 - a) Visible b) IR
 - c) UV d) Radio

Q.2	A)	Answer the following questions. (Any Four)
-----	----	--

- 1) Define Geographic information System.
- 2) What is range of microwave in electromagnetic spectrum?
- 3) What is false colour composite?
- 4) What are two data types in GIS?
- 5) India falls in which zones of UTM?

B) Write notes. (Any Two)

- 1) Explain two types of base maps.
- 2) What is Spectral resolution?
- 3) Advantages of raster data structure.

Q.3	A)	Ans	Answer the following questions. (Any Two)				
	-	1)	What are the parameters required to describe lithology in the field?				

- 2) Describe components of GIS.
- 3) Describe types of aerial photographs depending on optical axis position?

B) Answer the following questions. (Any One)

- 1) What is buffer analysis? Explain one application in geology?
- 2) Write note on non-spatial data.

Q.4 A) Answer the following questions. (Any Two)

- 1) Explain the construction of simple lens stereoscope.
- 2) How can be folds interpreted on aerial photograph.
- 3) Distinguish planimetric maps from topographic maps and briefly outline their specific uses.

B) Answer the following questions. (Any One)

- 1) What is radiance?
- 2) Differentiate vector and raster data.
- 3) What are data input methods in GIS?

Q.5 Answer the following questions. (Any Two)

- a) What are atmospheric windows?
- **b)** Describe in detail tone of aerial photographs.
- c) Describe methods of locating field data on a base map?

	1						1
Seat No.						Set	Ρ
	B.S	c. (Semest M	er – VI) (Old) (ICROBIOLOG Clinical	(CBCS) E Y (Specia Microbiol	xamination: Oct/Nov al Paper - XVI) logy - I	-2022	
Day & Time:	Date 03:00	: Wednesday PM To 05:30	v, 08-02-2023 0 PM		Μ	ax. Marks	: 70
Instru	ction	s: 1) All ques 2) Figures	stions are compul to the right indica	sory. ate full marl	(\$.		
•	~						
Q.1	Choc	se the corre	ect alternative fro	om the follo	owing options.		14
	1)	Streptomycir	n innibits s		Dacteria.		
		a) Cell wall		(U d)			
		c) Lipiu		u)	Cell membrane		
	2)	is ven	ereal disease tra	nsmitted by	sexual contact.		
		a) Syphilis		b)	Malaria		
		c) Typhoid		d)	Dysentery		
	3)	The genome	e of Hepatitis B vir	us is	<u>_</u> .		
		a) DS RNA	١	b)	SS DNA		
		c) SS RNA	۱.	d)	DS DNA		
	4)	is Gra	am positive, spore	e bearing ar	naerobic rod shaped patho	ogen.	
		a) Pseudor	nomas aeruginos	a b)	Vibrio cholera		
		c) Mycobad	cterium tuberculo	sis d)	Clostridium perfringens		
	5)	Hydrophobia	a is symptom of				
	•	a) Hepatitis	байанан тайтаан r>Байтаан тайтаан	b)	Rabies		
		c) Filariasis	S	d)	Malaria		
	6)	Negler's read	ction is shown by				
	•	a) Cl. perfri	ingens	b)	Ps. Aeruginosa		
		c) Myc. Tul	berculosis	d)	Hepatitis B.		
	7)	The gastric a	and dueodonal ul	cer is cause	ed by		
	,	a) Pseudor	monas	b)	Vibrio		
		c) H. pylori		d)	Shigella		
	8)	is cyc	lic polypeptide ar	ntibiotic prod	duced by Bacillus subtilis.		
	,	a) Bacillin		b)	Subtilin		
		c) Penicillir	า	d)	Bacitracin		
	9)	Complete He	epatitis B virus pa	rticle is kno	wn as		
	,	a) Australia	a antigen	b)	HAV		
		c) Cowdry	bodies	d)	Dane particles		
	10)	inhibit	ts cell wall synthe	sis in bacte	eria.		
	,	a) Strepton	nycin	b)	Penicillin		
		c) Chloram	phenicol	d)	Sulphonamides		
	11)	is not	a viral disease	,			
	••)	a) Svohilis		b)	Rabies		
		c) Hepatitis	5	d)	HIV		

	12)	Plasmodium reproduces sexually in thea) Humanb) Airc) Mosquitod) Water			
	13)	Typical lesions caused by Herpes virus is called a) Chancre b) Impetigo c) Carbuncle d) Fever blister			
	14)	The incubation period of Ebola virus is days.a) 1-2b) 8-10c) 3-4d) 15-20			
Q.2	A)	 Answer the following questions. (Any Four) 1) Define Antimicrobials. 2) Define prophylaxis. 3) Define Mycology. 4) Define pathogenesis. 5) Give two examples of broad-spectrum antibiotics. 	08		
	B)	 Write Short Notes. (Any Two) 1) Leptospirosis 2) Properties of ideal antimicrobial drugs 3) Swine flu 	06		
Q.3	 Q.3 A) Answer the following questions. (Any Two) 1) Describe the mechanism of action of antibiotics acting on cell wa 2) Describe in brief Rabies. 3) Describe in brief Candidiasis 				
	B)	 Answer the following question. (Any One) 1) Describe in detail AIDS. 2) Describe the mechanism of drug resistance. 	06		
Q.4	A)	 Answer the following questions. (Any Two) 1) Describe in brief Malaria. 2) Describe in detail Syphilis. 3) Describe in brief Gas gangrene. 	10		
	B)	 Answer the following question. (Any One) 1) Discuss in detail Antifungal drugs. 2) Discuss in brief Aspergillosis. 	04		
Q.5	Ans a) b)	swer the following questions. (Any Two)1Write an essay on Tuberculosis.Describe in detail Hepatitis A and B infections.			

c) Describe the various methods of antibiotic sensitivity testing.

ay & ime:	& Date : 03:00	: We PM	dnesday, 08-02-2023 To 05:30 PM		Max. Marks	;: 70
stri	uction	is: 1) 2 3) All questions are compulsory.) Figures to the right indicate full) Draw a neat labeled diagram wl	marks nereve	er necessary.	
.1	Choc 1)	o se t If pa calle	he correct alternatives from the athogenicity / virulence of toxin is ed	e opti remov	ons. /ed by heat or chemicals it is	14
		a) c)	toxoid exotoxin	b) d)	antitoxin endotoxin	
	2)	Swii a) c)	ne flu is a borne disease. water fungal	b) d)	air arthropod	
	3)	Pse a) c)	<i>udomonas</i> is an example of gram positive bacteria actinomyces	 b) d)	gram negative bacteria virus	
	4)	Org a) c)	anism produces swarming growtł Escherichia Klebsiella	n on c b) d)	ulture media is Proteus Shigella	
	5)	Bloo a) c)	od agar medium is mediu enriched differential	m. b) d)	selective both a and c	
	6)	a) c)	is NOT a viral disease. Hepatitis A Malaria	b) d)	Rabies HIV	
	7)	Cau a) c)	sative agent for bacillary Tubercu <i>E. coli</i> <i>Shigella</i>	ulosis b) d)	is <i>M. lepriae M. tuberculosis</i>	
	8)	HIV a) c)	is transmitted through food water	b) d)	air blood	
	9)	a) c)	is acid fast bacterium. Neisseria gonorrhoeae Mycobacterium tuberculosis	b) d)	Staphylococcus aureus Klebsiella pneumoniae	
	10)	Ger a) c)	m tube test is used for the diagno Typhoid fever Syphilis	osis of b) d)	AIDS Candidiasis	
	11)	The a) c)	reduction of virulence of a micro Attenuation Inactivation	organ b) d)	ism is known as Exaltation Tyndalization	

B.Sc. (Semester - VI) (Old) (CBCS) Examination: Oct/Nov-2022 MICROBIOLOGY (Special Paper - XVI) **Clinical Microbiology - II**

Day & Date: Wednesday, 08-02-2023 Ti

Seat

No.

Q

Tyndalization

SLR-FZ-287

Set Ρ

	12)	The Oxidase test is positive and used for identification ofa) Salmonellab) Pseudomonasc) Pneumococcusd) Staphylococcus			
	13)	The interval period between HIV infection and appearance of antibodies inserum is called period.a) Intrinsicb) incubationc) windowd) Interval			
	14)	On Mac Conkey's agar medium <i>Klebsiella</i> species forms colonies. a) Colourless b) greenish c) Pink d) yellow			
Q.2	A)	 Answer the following questions. (Any Four) 1) What is biomedical waste management? 2) What is CDC? 3) What is Acid fast organism? 4) What are Toxoids? 5) Define the Vaccine. 	08		
	B)	 Write note. (Any Two) 1) Cultural properties of <i>Escherichia coli</i> 2) Isolation of members of <i>Enterobacteriaceae</i> 3) Vitek-2 system in identification of bacteria 	06		
Q.3	A)	 Answer the following questions. (Any Two) 1) Nosocomial infection 2) Use of Biological warfare 3) What is Pathogenicity? 	08		
	B)	 Answer the following questions. (Any One) 1) Emerging and re-emerging of diseases causing epidemics and pandemics 2) Disposal of waste 	06		
Q.4	A)	 Answer the following questions (Any Two) 1) Role of WHO in prevention of diseases 2) Use of BACTEK 3) Differentiate between is toxin and toxoid 			
	B)	 Answer the following questions. (Any One) 1) What is Biotyping serotyping and Phage typing? 2) How to control of epidemics of diseases? 	04		
Q.5	Ans a) b) c)	wer the following questions. (Any Two) Amoebiasis Human immunodeficiency virus Live attenuated vaccines	14		

Seat No.							Set	Ρ
	B.Sc. (Semester - VI) (OId) (CBCS) Examination: Oct/Nov-2022 ELECTRONICS (Special Paper - XVI) Virtual Instrumentation							
Day & Time:	Date 03:00	: We) PM	dnesday, 08 To 05:30 Pl	8-02-2023 VI		Max.	Marks	: 70
Instru	ction	(s: 1 2	All question Figures to t	ns are compulsory. the right indicate fu	ll marks.			
Q.1	Choo 1)	se tl The a) c)	ne correct a is v block diagr file input	Ilternatives from t isible as user progr am	t he optic rammabl b) d)	o ns. e interface (GUI interface). back panel Front panel		14
	2)	The a) c)	is d FPGA PGA	esigned to support	real time b) d)	e application. RT PLA		
	3)	In La a) c)	abVIEW Probe wake up	buttons were	created s b) d)	specifically for dubbing. Toolbar both a and b		
	4)	Virtu a) c)	variable Ial Instrume Global both a & b	s can be used to p nts (Vis).	ass and b) d)	access data among several Local none of these		
	5)	Grou a) c)	uping object Graphs & c Loops & ch	's in LabVIEW are lusters arts	b) d)	arrays & clusters charts & graphs		
	6)	File a) c)	IO means _ File input & File output	output	b) d)	File input All of these		
	7)	Lab\ a) c)	VIEW FPGA FPGA PAL	adds support for _	ir b) d)	n embedded system. PGA PLA		
	8)	Lab\ a) c)	VIEW suppo Microcontro WSN	ort oller	b) d)	DSP All of these		
	9)	A co a) c)	ntrol in Lab ^v Input Input & Out	VIEW is at	to the co b) d)	de. Output state		
	10)	GUI a) c)	means Graphical L Global Use	Jser Interface r Interconnect	b) d)	Global User Interface Graphical User Interconne	ct	
	11)	Pale a) c)	ettes can be drop-up Both a & b	selected through th	ne windo b) d)	ws menu. drop-down start		

	12) function is used to replace the element in an existing order.						
		a)	Bundle	b)	unbundle		
		C)	bundle by name	d)	unbundle by name		
	13)	G Pi	rogramming Language is				
		a)	Graphical	b)	Textual		
		C)	Simple	d)	Hard		
	14)	A fu	nction palette is specific to the				
		a)	Panel	b)	Diagram		
		C)	Graph	d)	All of these		
Q.2	A)	Ansv 1) 2) 3) 4)	ver the following questions. (Ar Define the term Virtual Instrumer Give basic structure of G progran Draw block diagram of window. Define array and clusters.	1y Fo ntatior m.	ur) ٦.	08	
		5)	Mention any four tools for Virtual	Instru	umentation.		
	B)	Ansv 1) 2) 3)	ver the following questions. (Ar What do you mean by LABVIEW Write a note on case and sequer Explain local and global variables	iy Fo ?? nce st s.	ur) ructures.	06	
Q.3	A)	Ansv	ver the following questions. (Ar	יע Tw	vo)	08	
	,	1)	Write a note on LAB VIEW windo	JW.	- ,		
		2)	Explain string and file IO with sui	table	example.		
		3)	Explain virtual Instrumentation p	rograr	mming techniques.		
	B)	Ansv 1)	ver the following questions. (Ar Explain difference between virtua instrumentation.	iy On al inst	e) rumentation and traditional	06	
		2)	Write a note on data flow technic	lues.			
Q.4	A)	Ansv 1) 2) 3)	ver the following questions (An What is need of IDE for developr Explain graphical programming in Explain terminals and nodes.	y Tw o ment o n data	o) of virtual instrumentation system? a flow.	10	
	B)	Ansv	ver the following questions. (Ar	ıy On	e)	04	
		1) 2)	What are the advantages of virtu Explain functions and wires.	al ins	trumentation?		
Q.5	Ans	wer tł	ne following questions. (Anv Tw	vo)		14	
	a)	Expla	ain architecture of virtual instrume	ntatio	n.	-	
	b)	Explain in brief "G" programming language.					
	c) Explain standard tools for virtual instrumentation.						

Seat	
No.	

B.Sc. (Semester - VI) (Old) (CBCS) Examination: Oct/Nov-2022 **ELECTRONICS (Special Paper - XVI) Modern Communication Systems**

Day & Date: Wednesday, 08-02-2023 Time: 03:00 PM To 05:30 PM

Instructions: 1) All questions are compulsory.

- 2) Figures to the right indicate full marks.
- 3) Use of calculator is permissible.
- 4) Draw neat labeled diagram wherever necessary.

Q.1 Choose the correct alternatives from the following options.

- In optical fiber large data transmission is possible due to _____. 1)
 - a) low bandwidth
 - c) low attenuation d) high attenuation

are the up link and down link frequencies in satellite communication. 2)

- a) 2 GHz and 4 GHz
 - c) 6 GH_z and 4 GH_z
- b) 14 GH_z and 16 GH_z
- d) 10 GH_z and 12 GH_z

b) high bandwidth

- The GSM system in mobile communication uses 3)
 - a) Time division multiplexing
 - c) Phase division multiplexing
- In radar, is the most common type of CRT display. 4)
 - b) M-scan a) A-scan
 - c) PPI d) None
- is the most widely used data communication code. 5)
 - a) Morse code b) Baudot code b) ASCII code d) EBCDIC code
- is the best source of light for fiber optic communication. 6)
 - a) Bulb b) LED
 - c) Laser diode d) None of these
- The main function of a communication satellite is as a 7)
 - b) Reflector a) Repeater station
 - d) Transmitter c) Recorder
- The transmission of user from weaker cell to stronger cell is called as _____. 8)
 - b) Transfer a) Hand-off
 - c) Migration d)
- 9) is not a microwave device.
 - a) Gunn diode
 - d) Klystron tube c) Tunnel diode
- 10) For high speed data transmission, the bandwidth of the communication channel must be _____.

a)	Very low	b)	Low
C)	Zero	d)	High

Max. Marks: 70

14

- b) Frequency division multiplexing
- d) Code division multiplexing

Set

- None
- b) BJT

	11)	The height of geostationary satellite is about km. a) 3600 b) 10000 c) 36000 d) 360	
	12)	Fiber optic communication is based on the principle ofa) Reflectionb) Refractionc) Total internal reflectiond) Polarization	
	13)	Microwaves are the frequencies above a) 100Kz b) 1 MHz c) 10 MHz d) 1 GHz	
	14)	QAM uses a) AM b) FM c) PM d) Both AM and FM	
Q.2	A)	 Answer the following questions. (Any Four) 1) Define bit rate and baud rate. 2) What is geostationary satellite? 3) Give the advantages of microwave communication. 4) What is step index and graded index fiber? 5) What is wave guide? 	08
	B)	 Write short notes. (Any Two) 1) Explain in brief the applications of satellite communication. 2) What is LAN, MAN and WAN? 3) Write a note on cavity resonator. 	06
Q.3	A)	 Answer the following questions. (Any Two) 1) Explain the working of frequency synthesizer in cellular phone. 2) Write a note on Gunn diode. 3) Explain the working of satellite transponder. 	08
	B)	 Answer the following question. (Any One) 1) Explain star, ring and bus network topologies. 2) Explain the operational procedure in a mobile telephone call. 	06
Q.4	A)	 Answer the following questions. (Any Two) 1) What are different light sources in optical communication? Explain the working of laser diode. 2) Explain the working of Klystron tube. 3) Explain the block diagram of cellular receiver. 	10
	B)	 Answer the following question. (Any One) 1) Explain optical transmitter using LED. 2) Write a note on QPSK modulator. 	04
Q.5	Ans a) b) c)	wer the following questions. (Any Two) Explain fiber optic communication system using block diagram. What is radar? Explain pulsed radar system. Explain the block diagram of earth station in satellite communication.	14

	В.\$	Sc. (Semester - VI) (O COMPUTER S	ld) (CBCS) Exa CIENCE (Spec	amination: Oct/Nov-2022 al Paper - XVI)
Dav	& Date	a: Wednesday, 08-02-2023		May Marks
Time	e: 03:0	0 PM To 05:30 PM)	
Insti	ructio	ns: 1) All questions are con2) Figures to the right i	mpulsory. ndicate full marks	S.
Q.1	Cho	ose the correct alternativ	es from the opti	ons.
	1)	AngularJS expressions a	re written using _	
		a) (expression) c) {{expression}}	(d (b	{{expression}}
	2)		u)	
	2)	a) Some Page App	 	Single Page Application
		c) Similar Page Applica	ation d)	Server Page App
	3)	Angular directive	is used to binds t	the value of HTML controls like
	-,	input, select, textarea to a	application data.	
		a) ng-model	b)	ng-bind
		c) ng-connect	d)	ng-show
	4)	MVC is composed of	components	
		a) Member Vertical Co	ntroller b)	Model View Control
		c) Model view Control	er u)	
	5)	of the followings	is/are validation c	lirectives.
		c) ng-nattern	(d (b	all of these
	6)	Scope act as interconnec	↔ tion between con	troller and view
	0)	a) True	b)	False
	7)	Modules can be applied a	-,	
	')	a) Attribute	b)	Elements
		c) Comments	d)	All of these
	8)	Using a, you cou	ld able to make a	n image increases in size when a
		user mouse over it.		-
		a) Transform	b)	Transition
		c) controller	d)	None of These
	9)	Controller in MVC is/are		- 4 -
		a) It is a software Code	e that stores the d	1818 User interface
		c) It is a software Code	that controls the	interactions between the Model
		and View		
		d) None of the above		
	10)	Angular JS filters are use	ful for	
		a) Sort Date	b)	Clean Data
		c) Format Data	d)	None of these

Seat

No.

Set Ρ

70

14

08

06

08

06

10

04

14

- 11) attribute tells AngularJS what part of our HTML page contains the AngularJS app.
 - a) ag-app

C)

- b) is-app
- aj-app d) ng-app
- 12) AngularJS applications can run on Android and iOS based phones/tablets. a) True False b)
- 13) With the \$routeProvider function, we are able to configure the routing mechanism of our application. This can be done by adding each route through the function. a) when navigate
 - b)
 - controller transform C) d)
- HTML page have multiple "ng-app" directive for bootstrapping multiple 14) AngularJS application.
 - a) True b) False

Answer the following questions. (Any Four) Q.2 A)

- 1) What is use of ng-class directive? Explain with example.
- What is difference between ng-Disable and ng-readonly directive? 2)
- Explain Creation and use of model with example. 3)
- 4) Explain Object Expressions in AngularJS.
- Why Angular JS is important? 5)

B) Answer the following questions. (Any Two)

- Explain Bootstrapping in AngularJS with example. 1)
- 2) Explain lowercase and uppercase filter with example.
- What is Dependency Injection? Explain in detail. 3)

Q.3 A) Answer the following questions. (Any Two)

- 1) What is validation? Explain different validation properties and classes with example.
- 2) Explain ng-repeat directive's built in variables with example.
- Explain how to use Multiple Controllers in AngularJS. Give example. 3)

B) Answer the following questions. (Any One)

- What is use of filter? Explain order by, json and limitTo with example. 1)
- 2) Explain single page application. Explain its advantages and disadvantages.

Q.4 A) Answer the following questions (Any Two)

- What is custom filter? How to create it? Write custom filter for word 1) countina.
- What is scope? Explain Scope Hierarchies in detail. 2)
- Explain different ways of data binding with example. 3)

B) Answer the following questions. (Any One)

- Explain Scope Life Cycle in detail. 1)
- Write code for validate student information using built-in validation. 2)

Answer the following questions. (Any Two) Q.5

- What is ng-anima be model? Explain transition and keyframe based a) animation with example.
- Explain AngularJS Archilecture in detail. b)
- What is routing? Explain different attribute used in when function with example. C)

				SLR-FZ-29	91
Seat No.				Set	Ρ
	B.S	c. (Semester - VI) (Old) (CBCS) COMPUTER SCIENCE (Linux Operatin) Ex Spe Ig S	amination: Oct/Nov- 2022 cial Paper -XVI) ystem	
Day & Time:	Date 03:00	: Wednesday, 08-02-2023) PM To 05:30 PM		Max. Marks:	70
Instru	iction	s: 1) All questions are compulsory.2) Figures to the right indicate full r	nark	S.	
Q.1	Choc 1)	ose the correct alternatives from the Which of the following is the features a) multiuser c) Multi-tasking	e opt of Li b) d)	t ions. inux operating system? multi process All of these	14
	2)	What command is used with Vi editor a) x c) a	to d b) d)	elete a single character? y z	
	3)	A process can run only in background a) True	d. b)	False	
	4)	Octal representation of rw w- rw - p a) 644 c) 626	ermi b) d)	ission are 646 654	
	5)	In Linux file system is the top-I a) home c) bin	evel b) d)	directory. root etc	
	6)	Which of the following symbols repres a) _ c) &	sents b) d)	s redirection? < 	
	7)	NIS means Network Information Syst a) True	em b)	False	
	8)	How many links are created when we a) 1 c) 3	e crea b) d)	ate a directory file? 2 4	
	9)	To change the priority of a job we can a) nice c) set	n use b) d)	e the command. pr priority	
	10)	command is used to copy files a) mv c) copy	b) d)	pr cp	
	11)	LILO stands for a) Linux boot loader c) Linux Loader	b) d)	Is a tool used to boot the kernel None of these	
	12)	Which of the following tool is used to a) mkfs c) mount	parti b) d)	tion your hard drive? fsck fdisk	

	13)	Which option of 1s command used to view hidden file? a) -i b) -d	
		c) -r d) -a	
	14)	symbol matches only a single character in file.a) ?b) *c) -d) None of these	
Q.2	A)	 Answer the following questions. (Any Four) 1) What is kernel? 2) What is the hardware requirement of Linux? 3) What is boot block? 4) What is NFS? 5) Write short note DHCP. 	08
	B)	 Write short notes. (Any Two) 1) What is the role of system administrator? 2) Explain wc command with example. 3) How to create group? Explain with example. 	06
Q.3	A)	 Answer the following questions. (Any Two) 1) What are the features of Linux operating system? 2) Which are the directory related command? Explain with example. 3) What is boot loader? Explain its types. 	08
	B)	 Answer the following questions. (Any One) 1) What is 1s command with its different options? 2) Write a shell script to check entered number is even or odd. 	06
Q.4	A)	 Answer the following questions. (Any Two) 1) Explain hierarchy of file system. 2) Explain filter command with example. 3) Explain file operation commands with example. 	10
	B)	 Answer the following questions. (Any One) 1) What is redirection? Explain I\O redirection. 2) Explain the architecture of Linux operating system. 	04
Q.5	Ans a) b)	wer the following questions. (Any Two) Explain Vi editor in detail. How to archive and compression of the file in Linux.	14

c) Write a Shell program to check the given integer is Prime or not.

Sea No.	t						Set	Ρ	
	B.Sc. (Semester - I) (New) (CBCS) Examination: Oct/Nov-2022 NCC STUDIES Compulsory								
Day Time	Day & Date: Monday, 06-02-2023 Max. Marks: 20 Time: 12:00 PM To 01:00 PM								
सूचन	Π:1 2	।) सर्व प्रश्न अनिवार्य) उजवीकडील अंक	आहेत. पूर्ण गुण दर्शवितात						
प्र.1	खाल 1)	नीलपैकी पर्यायांपैकी ——— हे भारतीय र अ) राष्ट्रपती क) उपराष्ट्रपती	योग्य पर्याय निवडून् नेनेचे सुप्रीम कमांडर	f रिव अस ब) ड)	त्राम्या जागा भरा. तिति. प्रधानमंत्री यापैकी एकही न	ाही		04	
	2)	एन्. सी. सी ची स्थ अ) 1948 क) 1950	ापना —— साली	झाली ब) ड)	1949 1947				
	3)	वृक्षारोपण हा ——– अ) ड्रील क) सामाजिक सेव	चा एक भाग आहे. 11	ब) ड)	वेपन ट्रेनिंग यापैकी एकही न	ाही			
	4)	गरीबी ही एक —— अ) आर्थिक क) अर्थशास्त्र	- समस्या आहे.	ब) ड)	औद्योगिक सामाजिक				
प्र.2	खाल 1) 2) 3)	नीलपैकी कोणत्याही RDC व TSC यांचे भारतातील विविध ध राष्ट्रीय एकतेला बाष्	दोन प्रश्नांची उत्तरे फुल फॉर्म् लिहा. ग्रमांची नावे लिहा. धा आणणारे घटक	लिह लिहा	Τ.			06	
प्र.3	1) 2)	एन्.सी.सी. ट्रेनिंगचे आदर्श नागरिकांची	फायदे सविस्तर लि कर्त्तव्य आणि अधिव	ाहा. किंवा हार र	मविस्तर लिहा.			05	
प्र.4	एन्.	सी.सी. मध्ये केली ज	ाणारी समाजसेवेची	कामे	सविस्तर लिहा.			05	

Seat No.	t					Set	Ρ
	В.	Sc. (Semester	- I) (New) (CB NCC STUDIE	BCS) Ex ES Com	amination: Oct/No pulsory	ov-2022	
Day & Time	& Date : 12:0	e: Monday, 06-02 0 PM To 01:00 Pl	-2023 M			Max. Mark	s: 20
Instr	uctio	ns: 1) All question 2) Figures to t	ns are compulsor the right indicate	y. full mark	S.		
Q.1	Fill i 1)	n the blanks by o The supreme Co a) The Preside c) Vice Preside	choosing correc ommander of Ind ent ent	c t alterna lian Army b) d)	ative from the given to is Prime Minister None of these	below:	04
	2)	N.C.C. came int a) 1948 c) 1950	o existence in	 b) d)	1949 1947		
	3)	Tree plantation i a) Drill c) Social Servi	s a part of ce	 b) d)	Weapan Training None of these		
	4)	Poverty is a a) Financial c) Economic	problem.	b) d)	Industrial Social		
Q.2	Atte 1) 2) 3)	mpt any Two of t Write down the fu Write down the d Write down the fa	the following: Ill forms of RDC ifferent religions actors affecting o	and TSC in India. n nationa	al integration.		06
Q.3	Desc	cribe the benefits	of N.C.C. training	j. OR			05
	Desc	cribe the duties ar	nd right of an idea	al citizen.			
Q.4	Desc	cribe the social se	rvice activities do	one in N.	C.C.		05

			SLR-FZ-60	00
Seat No.	Marks Obtained	Signature of Examiner	Signature of Junior Supervisor	
В	Sc. (Semester - II). DEMOCRACY,	(New) (First Year) Ex ELECTIONS AND GC	amination: Oct/Nov-2022 OOD GOVERNANCE	
Day & Time:	Date: Sunday, 12-02-2 12:00 PM to 02:00 PM	023	Max. Marks:	50
सूचना	: 1) सर्व प्रश्न अनिवार्य 2) उजवीकडील अंक र्	आहेत. Jुण दर्शवतात.		
प्र1 र	गेग्य पर्याय निवडा		Answer	٢
1	. महाराष्ट्रातील स्थानिक आहेत?	स्वराज्य संस्थांमध्ये महिलांर	ताठी किती जागा राखीव	
	अ) 50%	ब) 33%		
	क) 25% ्	ड) 70%		
2	. —— हे भारताचे सध्य २१) ग्रानिज अगोग	ाचे मुख्य निवडणूक आयुक्त यो वाणिक	आहेत.	
	अ) सुनिल असरा क) के. उन्नीकृष्णन	ब) सामक ड) रामनाध	थ कोविंद	
3	. भारतीय राज्यघटनेत म् आला आहे	्लभूत हक्कांचा समावेश —–	— भागात करण्यात	
	अ) तिसऱ्या	ब) घटनाव	रूस्ती	
	क) त्याहत्तराव्या	ड) सारांश		
4	. अप्रत्यक्ष लोकशाहीला	लोकशाही असेही म्हट	.ले जाते.	
	अ) वाईट	ब) प्रातिनि च) सम्प्रम	धिक 	
_	क) नकारात्मक	७) सकारा 		
5	. जर मारतात काणा व्य आणली तर नागरिकांन	क्ता किंवा राज्यसंस्थन मूलम् 1 ——– दाद मागता येते	ति हक्कावर बंधन	
	अ) सर्वोच्च आणि उच्च	ा न्यायालय ब) संसदेत		
	क) सरकारकडे	ड) ग्रामसंग	मेत	
6	. सामाजिक लोकशाहीचे	उद्दिष्ट प्रोत्साहन देणे	होय.	
	अ) सामाजिक न्यायाल	ा ब) नोकरश् —) ——	ाहीला	
	क) श्रामत लोकाना	् ् २) सीशाक्ष		
7	. भारतीय राज्यघटनेत ि आहे	कता मूलभूत अधिकाराचा संग	मावश करण्यात आला	
	अ) सहा	ब) एक		
	क) दहा	ु बारा		

8.	आदिवासी रोजंदारीवरील कामगार, मचि	छमार, बांधकाम मजूर यांचा समावेश	
	भारताच्या ——— समूहामध्य होती.	_\ _'~	
	अ) पुढारलल्या क) मन्त्रणमी	ब) वायत च) गागैकी गर्व	
	क) सत्ताधारा	७) यापका संव	
9.	प्रातिनिधिक लोकशाहीत —— प्रक्रिया	शासन आणि जनतेला जोडते.	
	अ) भ्रष्टाचार	ब) हुकूमशाहा	
	क) निवडणूक	હ) અથશાસ્ત્ર	
10	.प्रत्यक्ष लोकशाही इसवी सन पूर्व तिसन	या शतकात —— येथे सुरू झाली. ```	
	अ) भारत	ब) इंग्लंड	
	क) अथन्स	ड) अमारकचा संयुक्त संस्थान	
11.	.खालीलपैकी कोणता अधिकार भारतीय आहे?	राज्यघटनेमधील मूलभूत अधिकार	
	अ) शिक्षणाचा अधिकार	ब) संप करण्याचा अधिकार	
	क) संपत्तीचा अधिकार	ड) क्रांती करण्याचा अधिकार	
12	ही तळपातळीवरील संसदेची छोव	टी प्रतिकृती आहे.	
	अ) लोकसभा	ब) विधानपरिषद	
	क) ग्रामसभा	ड) राज्यसभा	
13	.सुशासनासाठी ——– हे आवश्यक आहे		
	अ) केंद्रीकरण	ब) खाजगीकरण	
	क) लोकसहभाग	ड) दंगा नियंत्रक पोलीस	
14	.भारतीय मतदार ——– सदस्य प्रत्यक्षपप	गे निवडतात.	
	अ) राज्यसभेचे	ब) लोकसभेचे	
	क) विधान परिषदेचे	ड) निवडणूक आयोगाचे	
15	.73 वी आणि 74 वी घटना दुरूस्ती —-	-– सरकारशी संबंधित आहेत.	
	अ) केंद्र	ब) राष्ट्रीय	
	क) राज्य	ड) स्थानिक	
16	लोकशाहीला घटनात्मक शासन असेही	म्हटले जाते, याचा अर्थ ––– राज्य	
	असा होतो.		
	अ) शक्तीचे	ब) कायद्याचे	
	क) सत्ताधारी शक्तीच्या लहरीप्रमाणे	ड) हुकूमशहाचे	
17.	.सार्वजनिक उत्तरदायित्व म्हणजे प्रातिनि	ाधीने लोकांना ——– असणे होय.	
	अ) विरोधी	ब) बेजबाबदार	
	क) जबाबदार	ड) यापैकी सर्व	
18	.स्वातंत्र्य, समता आणि बंधुता ही ——	लोकशाहीची मुख्य मूल्ये आहेत.	
	अ) जुन्या	ब) ग्रीक	
	क) सामाजिक	ड) परदेशी	

19. ज्या राजकीय प्रक्रियेद्वारे केंद्र सरकारकडून स्थानिक सरकारकडे प्रशासकीय अधिकार आणि जबाबदाऱ्या हस्तांतरित केल्या जातात त्याला ——— असे म्हणतात. अ) विकेंद्रिकरण ब) केंद्रीकरण ड) हस्तक्षेप क) हुकूमशाही 20. राजकारणाने गुन्हेगारीकरण हे भारतीय लोकशाहीपुढील मुख्य --- आहे. अ) गरज ब) आव्हान ड) देणगी क) पात्रता 21.भारतात राजकीय सहभागाच्या संधी --- मर्यादित असतात. अ) महिलांना ब) नेत्यांना क) श्रीमंत लोकांना ड) यापैकी नाही 22. लोकसभेत ——– सदस्य आहेत आणि ते प्रत्यक्ष पध्दतीने निवडले जातात. ब) 250 अ) 555 क) 288 ड) 543 23. सोलापूर शहर हे --- कार्यक्षेत्रात येते. अ) महानगरपालिकेच्या ब) ग्रामपंचायतीच्या क) नगरपरिषदेच्या ड) पंचायत समितीच्या 24. भारतातील स्थानिक स्वराज्य संस्थांमधील एक तृतीयांश जागा ---- राखीव असतात. अ) महिलांसाठी ब) मच्छिमारांसाठी क) स्थलांतरित मजुरांसाठी ड) बांधकाम मजुरांसाठी 25. महाराष्ट्र विधानसभेत --- सदस्य निवडून येतात. अ) 75 ब) 200 **ड) 388** क) 288 26. भारतातील शासन पध्दतीमध्ये ---- स्तर आहेत. ब) तीन अ) चार क) दोन ड) पाच 27. उत्तरदायित्व आणि पारदर्शकता ही दोन तत्वे --- याच्याशी संबंधित आहेत. अ) वाईट शासन ब) जुने शासन क) झुंडशाही ड) सुशासन 28. भारतीय नागरिकांना माहितीच्या अधिकाराद्वारे ---- माहिती मागविता येते. अ) खाजगी कंपन्यांकडून ब) सरकारी अधिकाऱ्यांकडून क) बहुराष्ट्रीय कंपन्यांकडून ड) यापैकी सर्व 29. शिक्षणाच्या अधिकाराद्वारे राजसंस्थेने --- या वयोगटातील बालकांना शाळेत नाव नोंदविले आहे याची खात्री करून घेणे आवश्यक बनले आहे. अ) 6 ते 14 ब) 1 ते 5 क) 15 ते 20 ड) यापैकी नाही

30. महात्मा गांधी राष्ट्रीय ग्रामीण रोजगार योजना म्	इणजे —— कायद्यातील
तरतुदींची अंमलबजावणी करण्यातील एक पाऊल	ा आहे.
अ) माहितीचा अधिकार ब) शिक्ष	ण ·
क) राजगार ड) स्वा	तत्र्य
31. महाराष्ट्रातील सदस्य प्रत्यक्ष लोकांकडून	नेवडले जातात.
अ) विधानसभा ब) राज्य	ग्सभा
क) विधानपरिषद ड) ग्राम	सभा
32. —— हे ग्रामीण स्थानिक स्वराज्य संस्थेचे उदाह	उरण आहे.
अ) ग्रामपचायत ब) पचा	यत समिती
क) जिल्ही परिषद ड) याप	का सव
33 खेडरगतील गामसभेमध्ये समाविष्ट असताव	Ŧ
अ) सर्व नोंदणीकत मतदार ब) सर्व	लोक
क) फक्त पुरूष मतदार ड) फक	त महिला मतदार
	मलभत वैशिष्टय आहे
अ) असमान सहभाग ब) हिंस्	त्र सहभाग
क) समान सहभाग ड) यापै	की नाही
35 भारतात माहितीचा अधिकार हा कायदा य	वर्षी मंजर झाला
अ) 2005 ब) 194	7
क) 1950 ड) 202	0
36. खालीलपैकी कोणता अधिकार भारतात मुलभुत अ	अधिकार नाही?
अ) स्वातंत्र्याचा अधिकार ब) संपर्	तीचा अधिकार
क) समतेचा अधिकार ड) धामि	कि स्वातंत्र्याचा अधिकार
37. —— यांच्या मते लोकशाही म्हणजे लोकांचेच, त	नोकांनी केलेले, लोकांसाठी
राज्य होय.	
अ) जॉन वूड ब) अब्रा	हाम लिंकन
क) मदर तेरेसा ड) डोन	ाल्ड ट्रम्प
38 लोकशाहीमध्ये नागरिक राज्यसंस्थेच्या का	रभारात थेट सहभागी होत
होते आणि नगर राज्यांच्या शासनात त्यांना अधि	
	מוע פותו.
अ) अप्रत्यक्ष ब) प्रत्य	कार हाता. क्ष
अ) अप्रत्यक्ष ब) प्रत्य क) भारतीय ड) यापै	की नाही
 अ) अप्रत्यक्ष ब) प्रत्य क) भारतीय ड) यापै 39. डेमोक्रसी (लोकशाही) हा इंग्लिश शब्द डिमॉस अ 	कार हाता. क्ष की नाही आणि क्रॅटो्स या ग्रीक
 अ) अप्रत्यक्ष ब) प्रत्य क) भारतीय ड) यापै उ9. डेमोक्रसी (लोकशाही) हा इंग्लिश शब्द डिमॉस द शब्दांपासून तयार झाला. डिमॉस म्हणजे द 	कार होता. क्ष की नाही आणि क्रॅटोस या ग्रीक आणि क्रॅटोस म्हणजे ———
 अ) अप्रत्यक्ष ब) प्रत्य क) भारतीय ड) यापै डेमोक्रसी (लोकशाही) हा इंग्लिश शब्द डिमॉस द शब्दांपासून तयार झाला. डिमॉस म्हणजे द होय. वोक आणि राज्य 	कार हाता. क्ष की नाही आणि क्रॅटोस या ग्रीक आणि क्रॅटोस म्हणजे ———
 अ) अप्रत्यक्ष क) भारतीय अ) भारतीय अ) भारतीय व) यापै अ) लोकशाही) हा इंग्लिश शब्द डिमॉस द शब्दांपासून तयार झाला. डिमॉस म्हणजे द होय. अ) लोक आणि राज्य ब) प्रार्ण क) देव आणि संत 	कार हाता. क्ष की नाही आणि क्रॅटोस या ग्रीक आणि क्रॅटोस म्हणजे ——— ो आणि देव की नाही
 अ) अप्रत्यक्ष ब) प्रत्य क) भारतीय ड) यापै 39. डेमोक्रसी (लोकशाही) हा इंग्लिश शब्द डिमॉस इं शब्दांपासून तयार झाला. डिमॉस म्हणजे दं होय. अ) लोक आणि राज्य ब) प्रार्ण क) देव आणि संत ड) यापै 	कार हाता. क्ष की नाही आणि क्रॅटोस या ग्रीक आणि क्रॅटोस म्हणजे ——— ो आणि देव की नाही
 अ) अप्रत्यक्ष ब) प्रत्य क) भारतीय ड) यापै 39. डेमोक्रसी (लोकशाही) हा इंग्लिश शब्द डिमॉस ड शब्दांपासून तयार झाला. डिमॉस म्हणजे द होय. अ) लोक आणि राज्य ब) प्रार्ण क) देव आणि संत ड) यापै 40. सार्वजनिक कल्याण आणि पुनर्वाटप तसेच सामा करण्याचे उद्देश असलेली फटत म्हणजेच 	कार हाता. क्ष की नाही आणि क्रॅटोस या ग्रीक आणि क्रॅटोस म्हणजे ——— ो आणि देव की नाही जिक असमानता कमी होय
 अ) अप्रत्यक्ष ब) प्रत्य क) भारतीय ड) यापै 39. डेमोक्रसी (लोकशाही) हा इंग्लिश शब्द डिमॉस ड शब्दांपासून तयार झाला. डिमॉस म्हणजे द होय. अ) लोक आणि राज्य ब) प्रार्ण क) देव आणि संत ड) यापै 40. सार्वजनिक कल्याण आणि पुनर्वाटप तसेच सामा करण्याचे उद्देश असलेली पध्दत म्हणजेच अ) नोकरशाही ब) महा 	कार हाता. क्ष की नाही आणि क्रॅटोस या ग्रीक आणि क्रॅटोस म्हणजे ——— ो आणि देव की नाही जिक असमानता कमी होय. जनशाही

41. प्रत्यक्ष लोकशाहीलाच —— लोकशाई	। असेही म्हणतात.	
अ) सहभागी	ब) प्रातिनिधीक	
क) नवीन	ड) नकारात्मक	
42. लोकशाहीमध्ये विधिमंडळ, मंत्रिमंडळ अ सोडविण्यासाठी ——— हे तत्व वापरता	गणि इतर समितीमधील प्रश्न त.	
अ) अल्पमताचे नियम	ब) बहुमताचा नियम	
क) नेतृत्व	ड) हुकूमशाही	
43. डॉ.आंबेडकर यांनी लोकशाहीचा	पुरस्कार केला.	
अ) प्रत्यक्ष	ब) सामाजिक	
क) प्राचीन	ड) आधुनिक	
44. महाराष्ट्र गांधी राष्ट्रीय ग्रामीण रोजगार उदाहरण आहे.	र हमी कायदा हे योजनेचे	
अ) राजकीय	ब) सामाजिक कल्याण	
क) लोकप्रिय	ड) निवडणूक	
45. खालीलपैकी कोणते लोकशाहीचे तत्व	नाही?	
अ) सहमतीने शासन	ब) सार्वजनिक उत्तरदायित्व	
क) कायद्याचे राज्य	ड) हुकूमशाही	
46. भारतात खुल्या आणि न्यायपूर्ण निवडप ——— हे वर्ष अपवाद होते. अ) 2014	गूक सातत्याने घेतल्या गेल्या. याला	
ब) 1976		
क) 1967		
ड) 2000		
47. बलवंतराय मेहता आणि अशोक मेहता घटकाशी संबंधित आहेत.	समिती या भारतातील —— या	
अ) जी.एस.टी	ब) संसद	
क) राज्य सरकारे	ड) पंचायती राज्य संस्था	
48. अर्थशास्त्र या प्राचीन भारतीय ग्रंथात र अर्थशास्त्राचा लेखक कोण?	मुशासनाची तत्वे सांगितली आहेत.	
अ) रामचंद्रन	ब) कौटिल्य	
क) मंडन मिश्र	ड) कालिदास	
49. स्वातंत्र्य, समता आणि बंधुता हा ——–	- राज्यक्रांतीचा नारा होता.	
अ) इंडोनेशियन	ब) फ्रेंच	
क) अमेरिकन	ड) रशियन	
50.—— हे अधिकार पारदर्शकता आणि	उत्तरदायित्वाचे उदाहरण आहे.	
अ) माहितीचा	ब) संपत्तीचा	
क) एकत्र येण्याचा	ड) धार्मिक	

					SLR-F	Z-600
Seat No.		Marks Obtained	Signatu of Exami	ner	Signature of Junior Superviso	r
В.	Sc. (Sen DEM	nester - II) (Ne OCRACY, EL	ew) (First Year) ECTIONS AND) Examinatio	n: Oct/Nov-/ ERNANCE	2022
Day & Time: 1	Date: Sun I2:00 PM f	day, 12-02-2023 to 02:00 PM			Max.	Marks: 50
Instruc	ctions: 1) 2)	All questions are Figures to the rig	e compulsory. ght indicate full ma	arks.		
Q.1 (1	Choose th) How ma Mahara a) 50% c) 25%	e correct option any seats are res shtra?	n and rewrite the served for women k	sentence. in Local self gov) 33%) 70%	A vernment in	nswer
2	i)i a) Sun c) K. U	s the present Ch il Arora Innikrishnan	ief Election Comn k	nissioner of India) Tamil Selvan I) Ramnath Kov	a. n vind	
3	 In India constitu a) Part b) Ame c) Part d) Sum 	, Fundamental R Ition. III endment 73 mary	lights are enshrine	ed in of th	ne 	
4	 Indirect a) bad c) negative 	Democracy is al ative	lso called as k	democracy.) representativ) positive	e	
5	 i) If the fustate, a a) Sup b) Parl c) Gov d) Gran 	ndamental rights ny citizen can mo reme Court & Hig iament ernment msabha	s in India are abrid ove the gh Courts	ged by any indiv	vidual or the	
6	i) Social c a) soci c) rich	democracy aims al justice people	to promotek k) bureaucracy) educated		
7	') How ma a) Six c) Ten	any fundamental	rights are include k	d in the Indian ()) One d) Twelve	Constitution?	
;	8) Casual as a) adva c) rulin	workers, Fisher f _ sections in Ind anced g	folks, Construction lia. k	n labourers are () marginalized l) all of these	considered	

9) In representative democracy the process government and the people.	of links the
a) corruption I c) election d) dictatorship) economics
10) Direct democracy was started in ina) Indiac) Athens	3 rd century B.C.) England) U.S.A.
11)Which one of the following is the fundame	ntal right in Indian
a) Right to Education I c) Right to Property	 Right to Strike Right to Revolt
 12) is miniature of the Parliament of In a) Loksabha c) Gramsabha 	dia at the grassroots level.) Vidhanparishad) Rajysabha
 13) is necessary for the good governation a) Centralization c) Public Participation 	nce.) Privatization) Riot Control Police
 14) Indian voters directly elect the members a) Rajysabha c) Vidhan Parishad 	of) Loksabha) Election Commission
15) The 73 th and 74 th constitutional amendme	nts are related to the
a) central l c) state) national
16) Democracy is also considered as the con means government by rather than	stitutional government which
a) forceb) whims and fancies of the ruler) law) dictator
17) Public Accountability means the representation	tative must remain to
a) opposite I c) answerable of) irresponsible () all of these
18) Freedom, equality and fraternity are the c	pre values of
a) Old I c) Social d) Greek
 19) The political process by which the admini responsibilities are transferred from centr government is known as a) Decentralization b) Controlization 	strative authority and al government to the local
c) Centralizationc) Dictatorshipd) Interference	
20) Criminalization of politics is the basic	_ before the democracy in
a) need l c) qualification) challenge

21)The opportunities for political participation	on are minimal to in	
a) women c) rich people	b) leadersd) none of these	
22) Loksabha has members which a people.	re directly elected by the	
a) 555 c) 288	b) 250 d) 543	
23)Solapur city comes under the jurisdictioa) Municipal Corporationc) Municipal Council	n of b) Village Panchayat d) Panchayat Samiti	
24)In the local governments of India one th	ird of the seats are reserved	
a) women c) migrated workers	b) fisher folksd) construction workers	
 25)There are elected members in Ma a) 75 c) 288 	aharashtra Vidhansabha. b) 200 d) 388	
26) There are tiers of Indian governm	nent.]
a) Four c) Two	d) Five	
27) The principles of accountability and transitient the	sparency are related to	
a) bad governance c) mobocracy	b) old governanced) good governance	
28)Indians can seek information from	under the Right to	
a) private companiesc) multinational companies	b) government officialsd) all of these	
29) The Right to Education makes it manda that all children of the age group a) 6 to 14	tory for the state to ensure enroll themselves in schools. b) 1 to 5	
c) 15 to 20	d) none of these	
 30) Mahatma Gandhi National Rural Emploi (MGNREGA) is one step towards imple a) Right to Information c) Right to Work 	yment Guarantee Act menting the provision of b) Right to Education	
31) The members of Maharashtra ar	e directly elected by the	
a) Vidhansabha c) Vidhan Parishad	b) Rajysabha d) Gramsabha	
32) is the example of rural local self	government.]
c) Zilla Parishad	d) All of these	
33)Gram Sabha comprised of in the	village.	 1
a) all the registered votersc) only male voters	b) all the peopled) only female voters	

34) by all the members of society is t	the basic feature of good	
a) Unequal participation c) Equal participation	b) violent participationd) none of these	
35)The Right to Information was passed ina) 2005c) 1950	India in the year b) 1947 d) 2020	
36)Which of the following is not the fundama) Right to Freedomb) Right to Propertyc) Right to Equalityd) Right to Freedom of Religion	nental right?	
 37)According to Democracy is government people and for the people a) John Wood c) Mother Teresa 	ernment of the people, by the b) Abraham Lincon d) Donald Trump	
 38)In democracy, citizens participate directly and had a say in the governance a) Indirect c) Indian 	ed in the affairs of the state e of the city state b) Direct d) none of these	
 39) The word democracy is derived from the Kratos. The meaning of Demos is a) people and rule c) God and Saints 	e Greek words Demos and _ and Kratos means b) animal and God d) none of these	
 40) A system of welfare and redistribution a inequalities is called a) Bureaucracy c) Democracy 	imed to narrow social b) Aristocracy d) Technocracy	
 41)Direct democracy is also known as a) Participatory c) New 	democracy. b) Representative d) Negative	
42)In democracy all issues in legislature, carcommittees are resolved through the praim a) minority rulec) leadership	abinet, executive and other inciple of b) majority rule d) dictatorship	
43)Dr. Babasaheb Ambedkar strongly advo a) Directc) Ancient	ocated democracy. b) Social d) Modern	
44) The Mahatma Gandhi National Rural Er the example of the largest schen a) political c) populist	mployment Guarantee Act is ne of its kind in the world. b) social welfare d) election	
45)Which among the following is not the pra) Government by consentc) Rule of Law	inciple of democracy? b) Public Accountability d) Dictatorship	

 46) The free and fair elections were conduct except in a) 2014 b) 1976 c) 1967 d) 2000 	ted, at regular interval, in India
 47)Balwantrai Mehta and Ashok Mehta con India. a) G.S.T. b) Parliament c) State Governments d) Panchayati Raj institutions 	nmittee are related to in
48) The ancient Indian book Arthshastra hig Governace. Who is the author of Arthsha a) Ramchandranc) Mandan Mishr	hlighted the principle of Good ashtra? b) Kautilya d) Kalidas
49) "Freedom, Equality and Fraternity" was revolution.a) Indonesianc) American	the battlecry of the b) French d) Russian
50) The Right to is the example of transitiona) Informationc) Assembly	nsparency and accountability. b) Property d) Religion

Seat No.				Set	Ρ
	B.Sc. (Semes	ter - IV) (CBCS) Ex Environmental	amination: Oct/Nov-20 Studies	022	
Day & Time: (Date: Sunday, 12-02 03:00 PM To 05:00 P	2-2023 PM	r	Max. Marks	: 40
सूचना	: 1) सर्व प्रश्न अनिवार 2) उजवीकडील अंक	र्य आहेत. पूर्ण गुण दर्शवितात.			
प्र.1 ख 1	वालील दिलेले योग्य प) 'पर्यावरण' हा शब्द	र्याय निवडून गाळलेल्या इ.—— भाषेतून आला आ	जागा भरा. हे.		08
	अ) फ्रेंच क) लॅटिन	ब) ड)	रोमन ग्रीक		
2)) —— येथे पहिली अ) मुंबई क) लंडन	जागतिक पर्यावरण परिष ब) ड)	द भरली होती. स्टॉकहोम टोकिओ		
3) सहारा हे ——– प अ) सागरी क) जंगल	रिसंस्थेचे उदाहरण आहे. ब) ड)	गवताळ प्रदेश वाळवंटी		
4) ऊर्जेचा प्राथमिक र अ) जलविद्युत क) सूर्य	म्त्रोत —— हा आहे. ब) ड)	सागरी लाटा वारा		
5) भारतात वन्यजीव र अ) 1971 क) 1974	संरक्षण कायदा ——– सा ब) ड)	ली संमत झाला. 1972 1976		
6) ——— या प्रूषणामूळे अ) भूमी क) जल	ठे सागरीजीव धोक्यात येत ब) ड)	ात. हवा ध्वनी		
7) भारतातील ––– ह अ) पश्चिम हिमात क) पूर्व हिमालय	हा प्रदेश जैवविविधतेने स लय – अरवली ब) – पश्चिम घाट ड)	मृध्द आहे. अजिंठा – अरवली पूर्व घाट – कोरोमंडळ		
8)) ——— या दिवशी (अ) 16 जून क) 16 ऑगस्ट	आंतरराष्ट्रीय ओझोन दिन ब) ड)	' साजरा केला जातो. 16 जुलै 16 सप्टेंबर		

प्र.2	2 खालीलपैकी कोणत्याही चार प्रश्नांची थोडक्यात उत्तरे लिहा.						
	अ) पर्यावरण अभ्यासाची व्याख्या लिहा.						
	ब) वाळवंटी परिसंस्थेतील जैविक घटक						
	क) नैसर्गिक साधनसंपत्तीचे प्रकार लिहा.						
	ड) जैवविविधता संवर्धनाचे प्रकार लिहा.						
	इ) वायू प्रदुषणाचे कारणे लिहा.						
	ई) ओझोन क्षयाची कारणे लिहा.						
प्र.3	खालीलपैकी कोणत्याही दोन प्रश्नांची उत्तरे लिहा. अ) पर्यावरण अभ्यासाचे महत्व लिहा.	08					
	a) प्राची कारणे लिहा.						
Я.4	खालीलपैकी कोणत्याही दोन प्रश्नांची उत्तरे लिहा. अ) जल प्रदूषणाची कारणे व परिणाम स्पष्ट करा. ब) जैवविविधता म्हणजे काय? जैवविविधता प्रकाराचे वर्णन स्पष्ट करा. क) वन्यजीव संरक्षण कायदा स्पष्ट करा.	08					
प्र.5	खालीलपैकी कोणत्याही एका प्रश्नाचे उत्तर लिहा. पर्यावरण अभ्यासाचे स्वरुप व व्याप्ती स्पष्ट करा. किंवा	80					
	लोकसंख्या वाढीचा पर्यावरणावर होणारा परिणाम स्पष्ट करा.						

Seat No.						:	Set	Ρ		
B.Sc. (Semester - IV) (CBCS) Examination: Oct/Nov-2022 Environmental Studies										
Day & Date: Sunday, 12-02-2023 Time: 03:00 PM To 05:00 PM							Max. Marks: 40			
Instru	uction	ns: 1) All question 2) Figures to t	s are compulsory he right indicate f	ull mark	S.					
Q.1	Cho 1)	ose the correct a The word 'Envirc a) French c) Latin	Iternatives from nment' is derived	the opt I from b) d)	ions. language. Roman Greek			08		
	2)	First World Envir a) Mumbai c) London	onmental confere	ence was b) d)	s held at Stockholm Tokyo					
	3)	Sahara is a exar a) Marine c) Forest	nple of e	ecosyste b) d)	em. Glassland Desert					
	4)	The primary sour a) Hydal energ c) Sun	rce of energy is _ y	b) d)	Tidals Wind					
	5)	The 'Wildlife Pro a) 1971 c) 1974	tection Act' was p	bassed ir b) d)	n the year 1972 1976	_ in India.				
	6)	Marine life is in c a) Land c) Water	langer due to	Pollu b) d)	ition. Air Noise					
	7)	In India a) Western Hin b) Ajantha – Ar c) Eastern Him d) Eastern Gha	region is rich in b nalaya – Aravali avali alaya -Western G t – Koromandal	biodivers Shat	sity.					
	8)	International Ozo a) 16 th June c) 16 th August	one Day is celebra	ated on b) d)	day. 16 th July 16 th September					
Q.2	Atter 1) 2) 3) 4) 5)	mpt any four of t Write a definition Biological compose Write the types of Write the types of write the causes of	he following que of environmental nents of desert ec natural resource biodiversity cons of air pollution.	estions. studies. cosysten s. servatior	ns. 1.			08		

6) Write the causes of ozone depletion.
| Q.3 | Attempt any two of the following questions. 1) Write the importance of environmental studies. 2) Energy flow in the ecosystem 3) Write down the reasons for the flood. | 08 |
|-----|---|----|
| Q.4 | Attempt any two of the following questions. 1) Explain the causes and effects of water pollution. 2) What is biodiversity? Explain the type of biodiversity. 3) Explain the Wildlife Conservation Act. | 08 |
| Q.5 | Attempt any one of the following questions. 1) Explain the nature and scope of environmental studies. 2) Explain the impact of population growth on the environment. | 08 |