					SLR-SE-1
Sea No.	t				Set P
<u>No:</u>	M.Sc	:. (Se	emester - I) (New) (CBCS) BIOTECHN Microbiology	) Exa NOLC (MSC	mination: March/April-2023 DGY C33101)
Day Time Instr	& Da : 03:0 uctic	te: W 00 Pl <b>ons:</b>	/ednesday, 19-07-2023 M To 06:00 PM 1) Q. Nos.1 and 2 are compulso 2) Attempt any Three questions 3) Figures to the right indicate f	ory. from ull ma	Max. Marks: 80 Q.No.3 to Q.No.7. rks.
Q.1	A)	<b>Cho</b> 1)	The basic taxonomic group of a) Family c) Sub Species	<b>!)</b> bacte b) d)	10 rial taxonomy is Species Genus
		2)	<ul> <li>a) Asian Type Culture Collect</li> <li>b) American Type Culture Collect</li> <li>c) Agricultural Type Culture Collect</li> <li>d) Automatic Type Culture Collect</li> </ul>	tion ollectio Collec ollecti	on tion on
		3)	The micro-organisms that grov a) Alkalophiles c) Psychrophiles	w at hi b) d)	igh salinity are Osmophiles Halophiles
		4)	Bacteria which can grow in pro called a) Aerobic c) Facultative Anaerobic	esenc b) d)	e or absence of oxygen are Anaerobic Obligate Anaerobic
		5)	For isolation of microorganism used. a) Nichrome wire loop c) Cotton swab	n by sp b) d)	bread plate technique is Iron wire loop Forceps
		6)	In capsule staining by maneva prepared by using a mixture o a) Acetic acid c) Citric acid	al's me f acid b) d)	ethod, Maneval's solution is fuchsin and Carbolic acid Butyric acid
		7)	genus of algae lives ins algae. a) Characium c) Zooxanthellae	side th b) d)	e body of hydra in the Endozoic Zoochlorella Caphaleuros virescens

- 8) \_\_\_\_\_ is the name of fungal infection in human beings.
  - a) Fungosis

a) Omp

- b) Mucorsis
- c) Mycosis d) none of these
- 9) Influenza virus binds to \_\_\_\_\_ of the host cell membrane.
  - b) Glycoproteins
  - c) Polysaccharides d) Sialic acid

#### 10) A structural component that is found in all viruses is \_\_\_\_\_.

- a) The envelope b) DNA
- c) Capsid
- d) Tail fibers

#### Q.1 B) Write true/false.

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**08** 

- 1) Genus is a population derived from a pure culture of isolated organism.
- 2) The counter stain used in Grams staining is Safranine.
- 3) Hot air oven used for steam sterilization.
- 4) Some algae are used in production of single cell proteins.
- 5) The sterilization by U.V. radiation is also known as cold sterilization.
- 6) Virion particle contain only one type of nucleic acid i.e. DNA.

#### Q.2 Answer the following.

- a) Define the terms- Taxonomy, Classification, Species and Strain.
- b) Write the general characters of oxygenic and anoxygenic photosynthetic microbes.
- c) Define stain and describe various types of stains.
- d) Write the general properties of viruses.

#### Q.3 Answer the following.

a) Explain in detail reproduction in algae.
b) Discuss the replication of viruses.
08

#### Q.4 Answer the following.

- a) Explain in detail history and scope of Microbiology. **08**
- b) Write an essay on general characters of Extremophiles. **08**

### Q.5 Answer the following.

- a) Describe Principle, Mechanism and Procedure of cell wall staining.
- b) Explain in detail Pathogenesis and Industrial applications of slime molds **08** and protozoan's.

### Q.6 Answer the following.

- a) Write a note on Classification, Isolation, Cultivation and Enumeration of **08** Animal viruses.
- b) Discuss the general outline of numerical and polyphasic Taxonomy. **08**

### Q.7 Answer the following.

- a) Explain in detail applications of extremophiles and unculturable microbes. 08
- b) Describe the isolation of microorganisms by using various techniques. **08**

	WI.00	. (0	BIOTECH	NOLOG	iY
			Concept of Biocher	nistry (	MSC33102)
Day Time Inst	& Da e: 03: r <b>ucti</b> e	ate: T 00 Pl ons:	hursday, 20-07-2023 M To 06:00 PM 1) Q. Nos. 1 and 2 are compuls 2) Attempt any Three questions 3) Figures to the right indicate f	ory. s from Q. ull marks	Max. Marks: No.3 to Q.No.7.
Q.1	A)	<b>Cho</b> 1)	Dose the correct alternatives f Cellulose is different from amy linkage. a) Peptide c) alpha 1,4	f <b>rom the</b> ylose in h b) d)	<b>options.</b> naving the presence of Disulfide beta 1,4
		2)	Long chain Acyl COA traverse through shuttle mechan a) malate aspartate c) glyoxylate	es inner i nism. b) d)	mitochondrial membrane carnitine polynucleotide
		3)	In Ramchandran plot, the in C-N bond. a) psi c) gamma	angle b) d)	es represent the bond angles phi delta
		4)	Each cycle of $\beta$ - oxidation lib a) Acetyl c) Acyl	erates a b) d)	two carbon unit of CoA. Butyryl Malonyl
		5)	Dihydro-orotate and orotate a biosynthesis of a) Purines c) Peptones	re the rin b) d)	ng structures formed during Pyrimidines Histones
		6)	Glycolysis and gluconeogeneration of hormones a) estrogen and progesteror c) FSH and ACTH	sis are re ne b) d)	egulated mainly under the thyroxin and oxytocin insulin and glucagon
		7)	Macromolecules are construct to hierarchy of a) increasing structural comp b) decreasing structural complex c) without structural complex d) functional diversity	ted from plexity plexity kity	simple precursers according
		8)	The number of amino acids per a) 20.2	er turn of b)	an alpha helix is about 12.6

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M.Sc. (Semester - I) (New) (CBCS) Examination: March/April-2023

80

SLR-SE-2

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d) 3.6 c) 4.8

		9)	Elevated levels of is used as a diagnostic tool for pregnancy.a) GIHb) HCGc) TSHd) ADH							
		10)	The deficiency of enzyme HGPRT results in which is aninborn disorder							
	В)	Fill i 1) 2) 3) 4) 5) 6)	n the blanks. Branching in glycogen structure occurs by glycosidic linkage. Marasmus is an example of disorder of deficiency. RUBISCO enzyme catalyzes the carboxylation of In Obesity, negative effects on health are due to the excessive accumulation of Hormones by glands are ductless. The measurement of degree of randomness of a thermodynamic system is known as	06						
Q.2	Ans a) b) c) d)	<b>wer t</b> Draw Desc Defir Defir	wer the following.16Draw the biochemical pathway and energetics of TCA cycle.Describe levels of organization in the protein structure.Define the terms: Carbohydrate, Protein and Lipid.Define hormone. Give general classification of hormones.							
Q.3	Ans a) b)	wert Desc Desc	<b>wer the following.</b> 16 Describe reactions and energetics of beta oxidation of lipids. Describe the forces stabilizing protein and nucleic acid structure.							
Q.4	Ans a) b)	wer t Desc inhib Desc	<b>he following.</b> cribe mechanism of Oxidative phosphorylation. Comment on its bitors and uncouplers. cribe the disorders of Nucleic acid metabolism.	16						
Q.5	Ans a) b)	wer t Add phote Desc plot.	the following. an account on photosynthesis explaining cyclic and noncyclic ophosphorylation. cribe peptide bond with structure. Add a note on Ramchandran's	16						
Q.6	Ans a) b)	wert Desc Desc	the following. Cribe diabetes as a metabolic disorder. Cribe dark reactions of photosynthesis.	16						
Q.7	Ans a) b)	<b>wer t</b> Desc Add	t <b>he following.</b> Cribe hormonal control of menstrual cycle. an account on 'glycogen metabolism'.	16						

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## M.Sc. (Semester - I) (New) (CBCS) Examination: March/April-2023 BIOTECHNOLOGY Inheritance Biology (MSC33103)

Day & Date: Friday, 21-07-2023 Time: 03:00 PM To 06:00 PM

**Instructions:** 1) Question 1 and 2 are compulsory.

- 2) Attempt any Three questions from Q.3 to Q.7
- 3) Figures to the right indicate full marks.

### Q.1 A) Choose correct alternative.

- After cross fertilization of true breeding tall and dwarf plants, the F1 generation was self-fertilized. The resultant plants have genotype in the ratio \_\_\_\_\_.
  - a) 1:2:1 (homozygous tall: heterozygous tall: dwarf)
  - b) 1:2:1 (heterozygous tall: homozygous tall: dwarf)
  - c) 3:1 (Tall: Dwarf)
  - d) 3: 1 (Dwarf: tall)

# 2) Alleles of different genes that are on the same chromosome can occasionally be separated by a phenomenon called \_\_\_\_\_.

- a) Crossing over
- b) Continuous variationd) Pleitropy
- Lampbrush Chromosomes occur in
  - a) Oovtes

3)

c) epistasis

- b) Cancer cells
- c) Lymph glands
- d) Salivary glands
- 4) The following human diseases is least likely to be caused by aneuploidy \_\_\_\_\_.
  - a) Down syndrome
- b) Fragile X syndromed) Klinefelter syndrome
- c) Turner syndrome
- 5) DNA solution injected directly into the cell using micromanipulators is called \_\_\_\_\_.
  - a) Microinjection
  - b) Micromanipulator mediated DNA delivery
  - c) Micro faction
  - d) None of these

### 6) The following contain satellite RNAs \_\_\_\_\_

- a) Plant viruses b) Bacteriophages
- c) Prions d) Viroids
- 7) The  $p^2$  in the below mentioned Hardy Weinberg Equation indicate  $-(p+q)^2 = p^2 + 2pq + q^2$ .
  - a) individuals that are heterozygous dominant
  - b) individuals having a lethal allele
  - c) individual that are homozygous dominant
  - d) individuals that are homozygous recessive

Max. Marks: 80



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- 8) The number of linkage groups in the Drosophila \_\_\_\_\_.
  - a) Two b) Four
  - c) Eight d) Ten
- 9) The map of the chromosome which shows identifiable sites is called
  - a) gene expression b) genome sequencing
  - c) chromosome walking d) genome map
- 10) Introduction of DNA into cells by exposing to high voltage electric pulse is \_\_\_\_\_.
  - a) Electrofusion
- b) Electrolysis
- c) Electroporation d) None of these

### B) Fill in the blanks OR Write true/false.

- 1) \_\_\_\_\_ is a type of trait whose phenotype is influenced by more than one gene.
- 2) \_\_\_\_\_ number of factors affects the Hardy Weinberg principle.
- 3) \_\_\_\_\_ is the unit of a genetic map.
- 4) The number of linkage groups in Drosophila \_\_\_\_\_.
- 5) Colour blindness is a \_\_\_\_\_ linked recessive trait.
- 6) The number of contrasting characteristics of pea plant Mendel considered for his experiment \_\_\_\_\_.

#### Q.2 Answer the following.

- a) What are Gene Linkage and Gene Crossing over?
- b) What are autosomal and sex linkages?
- c) Difference between Heterochromatin and euchromatin.
- d) Define Genetic Transformation and explain any two artificial transformation method.

### Q.3 Answer the following.

- a) Describe in details the QTL mapping and Genome mapping. 10
- b) Explain about the Mendelian laws of segregation, independent assortment, 06 test and back cross.

### Q.4 Answer the following.

a)	What are Hypmorphy? And discuss about the mapping method for the							
	screening for mutations.							
b)	Describe in details chromosomal aberrations, deletion, duplication,	06						

 b) Describe in details chromosomal aberrations, deletion, duplication, inversion and translocation.

### Q.5 Answer the following.

- a) Explain in details the conjugation process, nature of donor strains and 10 compatibility.
- b) Describe the theories of evolution, Lamarckism, Darwinism, mutation, and 06 Neo-Darwinism.

### Q.6 Answer the following.

- a) Define Chromosomes? Explain the extra chromosomal inheritance. 10
- b) Describe in details about the matting type switching of Saccharomyces
   06 cerevisiae yeast model.

### Q.7 Answer the following.

- a) Discuss the significance of population genomics and Functional genomics. **10**
- b) Define Lampbrush chromosome and explain the structure of sex
   06 chromosomes and sex linked inheritance.

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Seat No.		Set P								
	M.Sc. (Semester - I) (New) (CBCS) Examination: March/April-2023 BIOTECHNOLOGY Biostatistics and Bioinformatics (MSC33108)									
Day 8 Time:	Day & Date: Saturday 22-07-2023 Max. Marks: 80 Time: 03:00 PM To 06:00 PM									
Instru	uction	<ul> <li>as: 1) Question 1 and 2 are compulsory.</li> <li>2) Attempt any Three from Q.3 to Q.7</li> <li>3) Figures to the right indicate full marks.</li> </ul>								
Q.1	<b>A)</b> 1)	Choose correct alternative. (MCQ)10The mean of the square deviation about mean is known asa)a)Meanb)Medianc)Varianced)Standard deviation								
	2)	Pulse rate or weight of patient is known asa) Nominal datab) Continuous datac) Discrete datad) Random variable								
	3)	If Chi-square test's calculated value is less than critical value then H <sub>o</sub> is always be a) Accepted and rejected both b) Accepted c) Rejected d) None of these								
	4)	When the distribution of data is skewed, one should ideally usea) Meanb) Medianc) Moded) ANOVA								
	5)	one the formula is used for df in chi-squire distribution.a) (row)(column)b) (row-column)c) (row-1)(column-1)d) (row-1)(column)								
	6)	a tree in which a special ("labeled") node is singled out.a) Unrooted treeb) Rooted treec) guide treed) dendrogram tree								
	7)	<ul> <li>algorithm is used by Global alignment.</li> <li>Needleman and Wunsch</li> <li>BLAST</li> <li>PAM</li> </ul>								
	8)	<ul> <li> database is a Microarray gene expression database studying in bioinformatics.</li> <li>a) SWISS-PROT</li> <li>b) GEO</li> <li>c) DDBJ</li> <li>d) EST</li> </ul>								
	9)	is a database that uses multiple alignments derived from the most conserved, ungapped regions of homologous protein sequences a) DOMAIN b) BLOCKS c) SMART d) SCOPE								
	10)	PAM matrix was developed by a) Margaret Dayhoff b) Paulin Hogeweg								

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- c) David Lipman
  - d) Stephen Altschul

	B)	<ul> <li>Fill in the blanks OR write true/false</li> <li>1) a bar graph-like representation of data that buckets a range of classes into columns along the horizontal x-axis.</li> <li>2) Student t-test is used when N</li> </ul>	)6
		<ul> <li>3) The most frequent occurring observation is</li> <li>4) a group of organisms believed to comprise all the evolutionary descendants of a common ancestor in a phylogenetic tree</li> </ul>	
		<ul> <li>5) The first biological database developed was</li> <li>6) was the first method used for protein secondary structure prediction</li> </ul>	۱.
Q.2	Ans a) b) c) d)	wer the following. Write a note on types of sampling. Describe DNA sequence databases. Explain in detail about BLAST with its variants. Explain protein secondary structures in detail.	16
Q.3	Ans a) b)	wer the following. Explain the diagrammatic representation of data. Write a note on probability.	10 D6
Q.4	Ans a) b)	wer the following. Explain different types of ANOVA with example. Describe the Hypothesis testing.	10 D6
Q.5	Ans a) b)	wer the following. Explain Composite Protein sequence databases. Write a note on different search engines in bioinformatics.	10 D6
Q.6	Ans a) b)	wer the following. What is local and global alignment? Explain FASTA program with its type. What is phylogeny? Explain phylogenetic analysis MEGA tool.	10 D6
Q.7	Ans a) b)	wer the following. Explain the different protein 3D structure visualization tools. Describe different protein 3-D structure validation servers.	10 06

M.So	c. (Se	mester - II) (New) (CE BIOTE Cell Biolo	CS) Exam CHNOLOG gy (MSC3	ination: March Y 3201)	/April-2023
Day & Da Time: 11:	ite: We 00 AM	dnesday, 19-07-2023 To 02:00 PM			Max. Marks
Instructio	ons: 1) 2) 3)	Q.No.1 and 2 are compu Attempt any three question Figures to the right indication	lsory. ons from Q.N ate full marks	lo.3 to Q.No.7.	
Q.1 A)	<b>Rew</b> 1)	rite the sentences using The zygotes divides in se structure called a) blastula c) gastrula	correct alte eries to produ b) d)	rnative given belo uce 8-16 celled cor morula fetal mass	<b>ow:</b> npact
	2)	a protein pigment strongly, but that also ab a) Phytochrome c) Phototropin	that absorbs sorbs blue lig b) Crypto d) Chloro	red and far-red lig pht. chrome phyll	ht most
	3)	The G protein-coupled re related proteins characte a) seven membrane-sp b) single membrane-sp	ceptors are s rized by anning $\alpha$ heli anning $\alpha$ heli	structurally and fur  ices ices	nctionally

- c) two membrane-spanning  $\alpha$  helices
- d) eleven membrane-spanning  $\alpha$  helices
- Metaphase arrest was induced by a cytoplasmic factor present in 4) the egg is called as
  - a) MPF b) cytostatic factor (CSF)
  - d) growth factor c) progesterone
- In active transport the energy for transport is obtained from \_\_\_\_\_. 5)
  - a) ATP b) Light
  - d) both a and b c) Kinases
- In  $Na^+ K^+$  ATPase mechanism, the transport mechanism is \_\_\_\_\_. 6)
  - a)  $2 Na^+ out; 3 K^+ in$ b)  $3 Na^+ out; 2 K^+ in$
  - c)  $3K^+$  out;  $2Na^+$  in d)  $2K^+$  out;  $3Na^+$  in
- 7) The sum total of all the chemical reactions taking place inside the cell, represent the cell's
  - a) Metabolism Catabolism b)
  - c) Anabolism d) Regulation

a) Nucleus

- Which of the following organelle do not contain DNA? 8)
  - b) Chloroplast
  - c) Peroxisome d) Mitochondria

ks: 80

SLR-SE-6

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Seat No.

									SLF	१-SE	-6
		9)	The a) c)	e gel like consis Collagen Polysaccharide	tency of e b) e d)	extra El Ac	acellular mat astin dhesion prot	rix is due eins	to the		
		10)	Wh cell a) c)	ich of the follow ? Nucleus Chloroplast	/ing cell or b) d)	rgai ) L ) N	nelles is call ₋ysosomes ∕litochondria	ed the po	werhouse	of the	
	B)	Write 1) 2) 3) 4) 5) 6)	The Gap des Lati divi It is onc The Cel	ae or False. approximate of p junctions are moglidinjs. itudinal plane of des egg into eco equally importa- ce per cell cycle polymorphic no l organelles Mit	liameter of constructe f cleavage qual halves ant to ensi- uclear stru tochondria	f m ed c e lie s. ure uctu	icrofilament of transmeml s on the anii that the ger ure is observ called a suic	is 7 nm. brane pro mal veget nome is re red in WB cidal bag.	teins called al axis and eplicated of Cs.	d 1 nly	06
Q.2	Ans a) b) c) d)	wer the following.16Write short note on Cell differentiationExplain in brief, Gap junctionsDescribe in brief, neurotransmittersWrite in brief on Regeneration in salamander limb							16		
Q.3	Ans <sup>.</sup> a) b)	<b>wer th</b> Write Expla	<b>ie fc</b> in d in ir	b <b>llowing.</b> letail Cell Struct n detail Ultrastru	ture and o ucture & fu	orga unct	nization of e tion of riboso	eukaryotic omes	cells		08 08
Q.4	Ans <sup>.</sup> a) b)	<b>wer th</b> Desci Expla and ir	ne fo ribe nin ir nterr	bllowing. in detail passiv detail structure mediate filamer	e transpor e and func its.	rt. ctior	ns of microtu	ıbules, mi	crofilamen	ıts	08 08
Q.5	Ans <sup>.</sup> a) b)	<b>wer th</b> Write Expla	an e an e	b <b>llowing.</b> essay on Cell C n brief Desmoso	Cycle Phas	ses He	of meiosis. midesmosor	nes.			10 06
Q.6	Ans <sup>.</sup> a) b)	wer the following.Write an essay on Calcium as an intracellular messenger.10Describe in brief Hedgehog pathway00							10 06		
Q.7	Ans <sup>a</sup> a) b)	wer th Write speci Expla	an o an o es s in ir	bllowing. essay on strate pecificity h brief regenera	gies for m	iono nar	ospermy and ia	l conserva	ation of		10 06

Max. Marks: 80

Set

## M.Sc. (Semester - II) (New) (CBCS) Examination: March/April-2023 BIOTECHNOLOGY Enzyme Technology (MSC33202)

Day & Date: Sunday, 23-07-2023 Time: 11:00 AM To 02:00 PM

### **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 the correct alternatives from the options.

- is the function of phosphorylase.
  - a) Transfer of inorganic phosphate
  - b) Transfer a carboxylate group
  - c) Use H2O2 as the electron acceptor
  - d) Transfer amino group
- \_\_\_\_ of the following reaction is catalyzed by Lyase. 2)
  - a) Breaking of bonds
  - b) Formation of bonds
  - c) Intramolecular rearrangement of bonds
  - d) Transfer of group from one molecule to another
- 3) is not a catalytic strategy for an enzyme to perform specific reaction.
  - a) Covalent catalysis
- b) Metal ion catalysis
- c) Michaelis constant
- d) Acid-base catalysis
- 4) \_\_\_\_ is an Isozyme.
  - a) Same structure, different function
    - b) Different structure, the same function
    - c) Same structure, the same function
    - d) Different structure, different function
- In competitive inhibition, inhibitors bears a close structural similarity 5) with the \_\_\_\_\_.
  - a) Co-enzyme b) Co-factor
  - c) Prosthetic group d) Substrate
- Diminished delivery of oxygen to tissues is termed as \_\_\_\_\_. 6)
  - a) Hypoxia

- b) Ischemia
- c) Homeostasis d) Metabolism

Seat No.

1)

		7)	Transmembrane proteins belong to class of proteins.a) Peripheral proteinsb) Lipid-anchored proteinsc) Extrinsic proteinsd) Integral membrane proteins					
		8)	<ul> <li> of the following proteins do not have alpha-helix in their transmembrane portion.</li> <li>a) Rhodopsin</li> <li>b) GPCRs</li> <li>c) Glycophorins</li> <li>d) Porins</li> </ul>					
		9)	Inhibition of invertase by sucrose falls into category ofinhibition.a) Substrate inhibitionb) Non-competitive inhibitionc) Product inhibitiond) Competitive inhibition					
		10)	<ul> <li> coined the word enzyme.</li> <li>a) Wilhelm Kuhne</li> <li>b) Alfred Russel</li> <li>c) Robert Koch</li> <li>d) Rosalind Franklin</li> </ul>					
	B)	<b>Writ</b> 1) 2)	te true/false The interior of beta-barrels in porins is hydrophilic. Uncompetitive inhibition is most noticeable at low substrate concentration and can be overcome at high substrate	06				
		3) 4) 5)	Product inhibition is a type of enzyme inhibition where the product of an enzyme reaction inhibits its production. Ribozymes are catalytically active RNA molecules or RNA-protein complexes, in which solely the RNA provides catalytic activity. An enzyme modulator is a type of drug which modulates substrate.					
Q.2	Ans a) b) c) d)	6) Swer 1 Activ SGF Spec SGC	Uncompetitive inhibition is also known as anti-competitive inhibition. <b>the following. Add a note on the following</b> ive centre and binding sites of enzymes. PT ecific activity of the enzyme OT	16				
Q.3	Ans a) b)	<ul> <li>Answer the following.</li> <li>a) Write a note on structural and functional properties of Lysozyme, ribonuclease, trypsin, carboxypeptidase and phosphorylase.</li> <li>b) Explain the kinetics and performance with particular emphasis on charge and hydrophobicity (pH, temperature and Km) of enzyme.</li> </ul>						
Q.4	Ans a)	swer f Dese enzy	the following. Scribe in detail Hill and Scatchard plots and kinetics of allosteric symes.	08				
	(a	⊏xpi	nam the types and applications of enzyme inhibition.	UÖ				

Ans a) b)	wer the following. Write a note on Factors affecting enzyme activity. Explain various methods of immobilization and its application.	08 08
Ans	wer the following.	
a)	What are biosensors? Explain in detail about the types of biosensors and their role in biomedical applications.	08
b)	What is multienzyme complex? Describe their properties, role and advantages.	80
Δns	wer the following	
a)	Add a note on the following: LDH isozymes, alpha amylase, SGPT and creatine kinase	08
b)	Explain in detail transition state theory and mechanisms of catalysis.	08
	Ans a) b) Ans a) b) Ans a) b)	<ul> <li>Answer the following.</li> <li>a) Write a note on Factors affecting enzyme activity.</li> <li>b) Explain various methods of immobilization and its application.</li> <li>Answer the following.</li> <li>a) What are biosensors? Explain in detail about the types of biosensors and their role in biomedical applications.</li> <li>b) What is multienzyme complex? Describe their properties, role and advantages.</li> <li>Answer the following.</li> <li>a) Add a note on the following: LDH isozymes, alpha amylase, SGPT and creatine kinase.</li> <li>b) Explain in detail transition state theory and mechanisms of catalysis.</li> </ul>

Set

Max. Marks: 80

10

## M.Sc. (Semester - II) (New) (CBCS) Examination: March/April-2023 BIOTECHNOLOGY Molecular Cell Processing (MSC33206)

Day & Date: Tuesday, 25-07-2023 Time: 11:00 AM To 02:00 PM

> a) PCR b) chromatography c) Cot curve d) DPA method 2) The numerical equation for linking number a) Ln = Tw - Wrb) Lk = Tr + Twc) Lk = Tw - Wrd) Lk = Tw + WrThe transcriptional gene control in eukaryotes is mediated by \_\_\_\_\_. 3) a) metabolites that bind to the cis-acting elements b) trans-acting factors failing to bind to cis-acting elements c) trans-acting factors binding to cis-acting elements d) repressor proteins that bind to operator sites \_\_\_ many histones are present in the core of a nucleosome. 4) a) 8 b) 6 c) 4 d) 2 of the following enzymes separates the two strands of DNA 5) during replication. a) Gyrase b) Topoisomerase c) Helicase d) DNA polymerase 6) DNA dependent RNA polymerase is involved in . a) DNA Replication b) Transcription c) RNA Replication d) Reverse Transcription inhibited by erythromycin. 7) a) Replication b) Transcription c) Translation d) Reverse transcription of the following codon translate as proline. 8) a) AGU b) CGA c) CCC d) AUG

Set No.

- **Instructions:** 1) Q. Nos. 1 and 2 are compulsory. 2) Attempt any three questions from Q. No. 3 to Q. No.7.
  - 3) Figure to right indicate full marks.

#### Q.1 A) Multiple Choice Questions choose correct alternative.

1) The amount of repetitive DNA in the genome was determined by

06

16

- 9) \_\_\_\_\_ is the correct definition of excision repair.
  - a) Repair of a single damaged nucleotide
  - b) Repair of a damaged oligonucleotide
  - c) Removal of a single damaged nucleotide
  - d) Removal of a damaged oligonucleotide
- 10) \_\_\_\_\_ protein is required for repair and maintenance of DNA.
  - a) Repase b) Gyrase
  - c) LexA d) RecA

#### B) Write true/false

- 1) The unpacked stretches of DNA are the extra chromosomal load found in the eukaryotic genome.
- 2) H3 and H4 histone pairs forms tetramers in solution.
- 3) Ribosome begins its translation at the 3' end of the mRNA in prokaryotes.
- 4) DNA polymerase III is used in prokaryotic replication.
- 5) The primer used for lagging strand synthesis in prokaryotes is an RNA primer.
- 6) Attenuator in the tryptophan operon is the leader sequence in the tryptophan mRNA coding for many tryptophan residues.

#### Q.2 Answer the followings.

a)	Give	an	acco	ount on	euch	non	natin	and	heterochromatin.
•	-								

- **b)** Describe the DNA replication inhibition.
- c) Describe the role of rec BCD pathway in E. coli.
- d) Give an account on Prokaryotic and eukaryotic ribosome

#### Q.3 Answer the followings.

a)	Explain different forms of DNA.	08
b)	Explain the repetitive DNA and unique sequences	08

#### Q.4 Answer the followings.

a)	Describe in detail the enzymes involved in prokaryotic DNA replication.	08
b)	Write a note on DNA proof reading and DNA methylation.	08

#### Q.5 Answer the followings.

a) Explain in detail the structure and subunits of prokaryotic RNA
 08 polymerase.
 b) Discuss in detail about Reverse transcription.
 08

# **b)** Discuss in detail about Reverse transcription.

#### Q.6 Answer the followings.

a) Explain in detail post translational modification of proteins.
b) Explain in detail the genetic code
08

#### Q.7 Answer the followings.

- a) Write a note on Holiday intermediate and Proteins involved in
   08 Recombination.
- b) Explain in detail the mutagens and DNA Repair by Photoreactivation. 08

Set P

Max. Marks: 80

No. \_\_\_\_\_ M.Sc. (Semester - III) (New) (CBCS) Examination: March/April-2023 BIOTECHNOLOGY

## Industrial and Environmental Biotechnology (MSC33301)

Day & Date: Monday, 10-07-2023

Time: 11:00 AM To 02:00 PM

1)

Seat

Instructions: 1) Q. Nos. 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 the correct alternatives from the options.

- 10
- Stirred Bioreactors are better because they have \_\_\_\_\_.
- a) better aeration and mixing properties
- b) foam control system
- c) better temperature and pH control systems
- d) All of the above
- 2) An open operation system with continuous addition and discharge of the solution in the system.
  - a) Batch b) fed batch
  - c) Continuous d) solid state
- Fermentation to produce alcohol by yeast saccharomyces is due to \_\_\_\_\_.
  - a) Zymase c) Trysaccharide
- b) Galactose d) Saccharide
- 4) Citric acid find application in \_\_\_\_\_.
  - a) ink making b) printing
  - c) soft drinks d) mineral water
- 5) Heat killing of all microrganism is done in the process called \_\_\_\_\_.
  - a) Immunization b) Sterilization
  - c) Pasteurization d) Mineralization
- 6) Anaerobic respiration of yeast produces \_\_\_\_\_.
  - a) alcohol
  - b) carbon dioxide
  - c) alcohol, carbon dioxide and other
  - d) O<sub>2</sub>
- 7) A molecule that must combine with an endogenous protein to elicit reaction is called \_\_\_\_\_.
  - a) Antibody b) Hapten
  - c) Biotechnology d) Molecule

06

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- 8) \_\_\_\_\_ antagonism occurs when two chemicals counterbalance each other by producing opposite effect.
  - a) Functional b) Receptor
  - c) Complex
- d) Chemical
- The region of dose response relationship for essential nutrient is commonly referred as \_\_\_\_\_.
  - a) Genotypic b) Deficiency
  - c) Toxicity d) Response
- 10) \_\_\_\_\_ substance that contains microbes, which helps in promoting the growth of plants and trees by increasing the supply of essential nutrients to the plants.
  - a) Biopesticides

b) Chemical pesticides

d) Compost

- c) Biofertilizer
- B) Fill in the blanks
  - 1) An antifungal drug is obtained from \_\_\_\_\_.
  - 2) \_\_\_\_\_ is a pressure-driven separation process that employs a membrane for both mechanical and chemical sieving of particles and macromolecules.
  - 3) Vitamin B12 is also known \_\_\_\_\_
  - 4) The process of collecting, treating, and disposing of solid material is called as \_\_\_\_\_.
  - 5) Intracellular storage lipids comprising of triacyglycerols are called as \_\_\_\_\_.
  - 6) By \_\_\_\_\_ solar energy can be converted into biomass which in turn can be stored and used as fuel.

#### Q.2 Answer the following.

- a) Describe the fluidized bed bioreactor.
- **b)** Explain the process of acetic acid production.
- c) Describe the separation method of flocculation.
- d) Write a note on biosorption

#### Q.3 Answer the following.

- a) Explain the process of formulation fermentation medium and the 10 sterilization process industrial fermenter.
- b) Write a note on various kinds of cell lysis methods involved in protein **06** extraction.

#### Q.4 Answer the following.

- a) Write a note on different types of fermentation processes. 10
- **b)** Explain why world needs the environmental protection and conservation. **06**

Q.5	Ans a) b)	wer the following. Write note on types and applications of biological indicators. Describe the process of biotreatment of textile effluent, xenobiotics.	10 06
Q.6	Ans a) b)	wer the following. What is heavy Metal Pollution? Explain its impact on environment. Write a note on biosensors in assessment of pollution.	10 06
Q.7	Ans a) b)	wer the following. Explain in detail about the role of biotechnology in creating the clean environment. Describe various measurement and control systems of fermenter.	10 06

				S	SLR-SE-	11
Seat No.					Set	Ρ
M.Sc	:. (Se	emester - III) (New) ( BIOT Genetic Eng	CBCS ECHN jineer	) Examination: March/ NOLOGY ing (MSC33302)	April-2023	3
Day & Da Time: 11 Instructi	ate: T :00 A <b>ons:</b>	uesday, 11-07-2023 M To 02:00 PM 1) Q. Nos.1 and 2 are co 2) Attempt any Three qu 3) Figures to the right inc	mpulso estions dicate f	ory. from Q.No.3 to Q.No.7. ull marks.	Max. Marks	: 80
Q.1 A)	<b>Cho</b> 1)	<b>Dose correct alternative</b> The technique used to a) Autoradiography c) Cell fractionation	detect b) d)	the labelled molecules is Phase contrast microscop Tissue culture	 УУ	10
	2)	Annealing temperature a) Taq polymerase c) template DNA	in PCF b) d)	R depends on Primer Buffer		
	3)	is used in constr a) aDNA c) cDNA	uction b) d)	of genomic library. bDNA zDNA		
	4)	are labelled in b a) DNA c) Membrane	lotting t b) d)	echnique. Probe Buffer		
	5)	An example for plasmic a) M13 c) BAC	d vector b) d)	r is pBR322 YAC		
	6)	The DNA inserted with a) cDNA c) rDNA	the ger b) d)	ne of interest is called as bDNA zDNA	·	
	7)	VNTR are used in a) DNA fingerprinting c) AFLP	tech b) d)	nique. RAPD RFLP		
	8)	Di-dNTPs are major co a) RAPD c) Electroporation	mpone b) d)	nts of technique. DNA sequencing blotting		
	9)	is one of the sel	ectable	marker gene in plasmid ve	ctor.	

- a) Ori C c) LacZ MCS Amp<sup>r</sup> b)
  - d)

		10)	Res a) c)	striction enzymes b Nuclease Gyrase	elongs t b) d)	to the class of enzymes. Polymerase Ligase	
Q.1	B)	Fill i 1) 2) 3) 4) 5) 6)	n th M1 The  The An	e blanks. 3 is an example of e sealing of DNA nic are called as r plasmid is used e blotting technique example of insect r	vck is doo nolecula for gen used fo esistant	rector. ne by enzyme. ar scissors. e transfer in plants. or the detection of proteins is plant is	06 
Q.2	<ul> <li>Answer the following.</li> <li>a) Add a note on classification of restriction endonucleases.</li> <li>b) Write a note on BAC and YAC with structure.</li> <li>c) Write a brief account molecular probes.</li> <li>d) Write a note on applications microarray technology.</li> </ul>						
Q.3	Ans a) b)	wert Write Add	i <b>he f</b> e a r a no	<b>ollowing.</b> note on DNA manup ote on types of viral	oulting e vectors	enzymes. with advantages.	16
Q.4	<b>Ans</b> a) b)	<b>wer t</b> Expl Add	i <b>he f</b> ain t an a	<b>ollowing.</b> he construction and account on RAPD te	d screer echnique	ning of genomic library. e with applications.	16
Q.5	<b>Ans</b> a) b)	<b>wer t</b> Add Write	: <b>he f</b> a no e a r	<b>ollowing.</b> ote on methods of D note on types of ger	NA seq ne trans	juencing. fer techniques.	16
Q.6	<b>Ans</b> a) b)	<b>wer t</b> Expl Write	: <b>he f</b> ain r e a r	<b>ollowing.</b> methods for screeni note PCR and its typ	ing of re bes.	combinant cells.	16
Q.7	<b>Ans</b> a) b)	<b>wer t</b> Expl Add	: <b>he f</b> ain t a no	<b>ollowing.</b> he technique of DN ote on production of	A finge	rprinting. binant insulin.	16

### M.Sc. (Semester - III) (New) (CBCS) Examination: March/April-2023 BIOTECHNOLOGY Plant Biotechnology (MSC33306)

Day & Date: Wednesday, 12-07-2023 Time: 11:00 AM To 02:00 PM

Seat

No.

**Instructions:** 1) Question no. 1 and 2 are compulsory.

- 2) Attempt any three questions from Q. No. 3 to Q. No. 7.
- 3) Figure to right indicate full marks.

#### Q.1 A) Choose correct alternative.

- \_ is a polysaccharide derived from certain algae, and commonly 1) used as a gelling agent in tissue culture media.
  - a) Sucrose **Macronutrients** b)
    - c) Micronutrients d) Agar
- is a macroelement required for plant nutrition. 2)
  - a) Nitrogen
  - c) Manganese d) Copper
- A nonsexual developmental process that produces a bipolar embryo with 3) a closed vascular system from somatic tissues of a plant is called .

b)

Zinc

- a) embryo culture somatic embryogenesis b) organ culture
- c) somaclonal variation d)
- 4) is one of the reasons proposed for the escape of the meristem from virus invasion.
  - a) Absence of the vascular system in the meristem
  - b) Meristem forms antibodies against viruses
  - c) Absence of auxin in the meristem
  - d) Low metabolic rale in meristematic cells
- 5) has been the most favorite source of plant protoplasts.
  - a) Shoot Root b)
  - c) Leaf d) Zygote
- are substances added to freezing mixtures to protect cells from 6) effect of freeze-drying.
  - a) Plasmolyticum b) Osmoticum
  - c) Cryoprotectants d) Fusagens
- The use of a modified shotgun to accelerate small (1-4  $\mu$ m) metal 7) particles into plant cells at a velocity sufficient to penetrate the cell wall (~250 m/s) is known as
  - a) Electroporation
  - b) Chemical mediated gene transfer
  - c) Microinjection
  - d) Particle bombardment
- 8) complex is sometimes dubbed as the firecracker complex.
  - a) T-DNA + VirB T-DNA + VirD b)
  - T-DNA +VirD2 + VirE2 c) Host DNA + histones d)

SLR-SE-12



Max. Marks: 80

- 9) vaccine is when the antigen is expressed in the edible part of the plant.
  - a) Covax
  - Polio b) c) Attenuated Edible d)
- Plants producing recombinant antibodies are known as \_\_\_\_\_. 10)
  - a) Plantibodies b)
  - c) MABs

#### B) Write True or False.

- 1) Boron element complexes with mannitol, mannan, polymannuronic acid, and other constituents of cell walls and also involved in cell elongation and nucleic acid metabolism.
- 2) The process of embryo development is called embryogenesis.
- Gametoclonal variation is a variation in phenotype, either genetic or 3) epigenetic, expressed by gametoclones.
- Complete Ti plasmid is transferred from the Agrobacterium to the 4) infected plant at the wound site.
- Golden rice is a variety of rice produced through genetic engineering 5) to biosynthesize betacarotene.
- Neomycin phosphotransferase expressed by *nptll* gene is a one of 6) the reporter genes used for plant transformation.

#### Q.2 Answer the following

- a) Initiation and Maintenance of Suspension culture
- b) Shoot tip culture
- c) Symmetric and Asymmetric hybrids
- d) Particle bombardment

#### Q.3 Answer the following.

Q.4

<ul> <li>a) Vector less or direct DNA transfer - Particle bombardment, electroporation</li> <li>b) Protoplast isolation and culture</li> </ul>	08 08
Answer the following. a) Principle and application of Somatic Embryogenesis.	08
<ul> <li>b) Purification strategies - oleosin partitioning technology.</li> </ul>	08

#### Q.5 Answer the following.

a) Functions & Deficiency, diseases of plant nutrients. 80 b) Basics of Tumor formation and mechanism of T-DNA transfer. 80

#### Answer the following. Q.6

- a) Mechanism of Action Auxin.
- b) Pollen culture for production of Haploid Plants

## Q.7 Answer the following.

a) Lab setup of Plant Tissue Culture laboratory

<ul> <li>b) Metabolic engineering in Plants</li> </ul>	
--	--

- Anti-bodies
- d) Edible vaccines

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Page 2 of 2

Seat	t					Set	Ρ
 N	M.Sc	:. (S	emester -	· IV) (New) (CE	SCS	) Examination: March/April-20	23
	Δr	nima	l Biotech	BIOTE(	CHN tom	IOLOGY Cell Technology (MSC33401)	
Day 8	& Dat	te: M	onday, 10-	07-2023	lem	Max. Ma	rks: 80
Time	: 03:0	00 PI	M To 06:00	PM			
Instr	uctio	ons:	1) Q.No.1 a 2) Attempt 3) Figures t	and 2 are compuls any three questio to the right indicat	sory. ns fr æ ful	om Q.No.3 to Q.No.7. I marks.	
Q.1	A)	Cho	ose the co	orrect alternative	s fro	om the options.	10
		1)	a) Sheer c) Fish	inimal used for tra D	ansge b) d)	enesis was Mouse Pig	
		2)	In the gen	e, The los	s of t	function occurs in transgenic animals	
			a) Recor c) Knocł	mbination cout	b) d)	Therapy Targetting	
		3)	Oncomou	se is the animal n	node	l for	
			a) Cance c) Diabe	er etes	b) d)	Hypertension None of these	
		4)	MCTS sta a) Multic b) Multic c) Multic d) None	nds for ellular tumor sper ellular Transgenic ellular Transfer S of these	roids c So seque	urce ence	
		5)	The ideal	pH for animal cel	l cult	ure is around	
			a) 7 c) 6.8		b) d)	6.4 7.4	
		6)	a) Visco c) Hemo	used for cell coun meter ocytometer	ting. b) d)	Stalgmometer All of these	
		7)	abnormal a) Differ c) Apopt	one method the bo cells. entiation cosis	ody ( b) d)	uses to get rid of unneeded or Totipotency Determination	
		8)	Mesenchy a) Unipo c) Multip	vmal stem cells ar itent potent	re b) d)	stem cells. Totipotent Pluripotent	

- 9) The classic source of hematopoitic stem cells is \_\_\_\_\_.
  - a) Bone marrow b) Liver
  - Kidney c) Pancreas d)
- 10) Embryonic stem cells are derived from \_\_\_\_\_.
  - a) Egg b) Embryo
  - c) Fetus d) Mature organs

#### Q.1 B) Write True or False.

- Use of laminar flow cabinets minimizes possibility of contamination 1) by air borne microbes.
- Suspension cultures cannot be scaled up from a flask to a deep tank stirrer. 2)
- The behavior of cell is a function of both the state of its internal 3) machinery and local environment.
- Primary culture when subcultured becomes Adherent culture. 4)
- Serum is the most commonly used biological fluid. 5)
- Pig is a favourite animal for harvesting human organs. 6)

#### Q.2 Answer the following.

- Define: a)
  - i) Monoclonal antibodies
  - ii) Cryopreservation
- Explain the role of serum in culture media. b)
- Write a note on Balanced Salt Solution. C)
- Write note on Mesenchymal stem cells. d)

Q.3	Answer	the fo	llowing.
-----	--------	--------	----------

a) Write in details the types of stem cells in gastrointestinal gland. **08** Write in details about organ culture. 80 b)

#### Q.4 Answer the following.

a) Write note on common cell contaminants. **08** Write note on maintenance of cell line 08 b)

#### Q.5 Answer the following.

- Write in brief about Knock out Mice. 10 a) Explain in brief transgenic animal technology with the help of example. 06 b) Q.6 Answer the following. Explain in brief the bioprinting of tissues. 08 a)
- Explain briefly 3D cell culture. 08 b) Q.7 Answer the following.
  - Explain in brief 'Scaling up the cell culture to large scale'. 08 a) **08**
  - Explain in brief the Hybridoma technology. b)

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Seat No.				Se	et P
М.	Sc. (Se	emester - IV) (New) (CBC Biotec	S) Exa	amination: March/April-202	23
		Advanced analytical T	echni	ques (MSC33402)	
Day & I Time: 0	Date: We 3:00 AM	ednesday, 12-07-2023 To 06:00 PM		Max. Ma	rks: 80
Instruc	tions: 1 2 3	) Question no. 1 and 2 are co ) Attempt any three questions ) Figure to right indicate full m	mpulsor from Q arks.	y. . No. 3 to Q. No. 7.	
Q.1 A	) Cho	ose correct alternative.		10	
	1)	<ul><li> microscopy makes us</li><li>a) Electron</li><li>c) Fluorescence</li></ul>	e of sec b) d)	condary electrons. con focal Raman	
	2)	Time of Flight is a principle of a) IR c) MALDI	of b) d)	technique. XRD CD	
	3)	The type of IR radiation whic a) Near IR c) Far IR	h deals: b) d)	with rotational energy is Mid-IR All IR	
	4)	Scintillation counting is the n a) Emission c) Excitation	nethod b b) d)	based on Absorption Transmission	
	5)	a) SDS PAGE c) IEF	detect m b) d)	olecular weight of proteins. Native PAGE 2D PAGE	
	6)	The stain used to trace the n a) Ethidium Bromide c) Commissive Brilliant Blu	nobility ( b) ie d)	of DNA in gel is Bromophenol blue Bromo cresol purple	
	7)	Amino benzyloxymethyl filter	r paper i	s commonly used for transfer in	
		a) Western blotting c) Northern blotting	b) d)	Southern blotting Dot blotting	
	8)	The collection of samples at is called a) Elution c) termination	tached t b) d)	o solid phase in chromatography Emulsion tagging	
	9)	The protein separation techr	nique ba	sed on charge neutralization is	
		a) SDS-PAGE c) IEF	b) d)	Native PAGE Chromatography	
	10)	The atom used for radio labe a) Carbon c) Phosphorus	əlling in b) d)	DNA molecule Hydrogen Nitrogen	

	B)	<ul> <li>Fill in the blanks.</li> <li>1) Magnification power is used in</li> <li>2) The sample holder in visible spectroscopy is called as</li> <li>3) GLC stands for</li> <li>4) The gel material used for vertical gel electrophoresis is</li> <li>5) The DNA blotting technique was developed by</li> <li>6) Mass to charge ratio is used in technique.</li> </ul>	06					
Q.2	An a) b) c) d)	swer the following Add a note on principle of light microscopy. Write a note on applications of HPLC. Write a brief account on principle of electrophoresis. Write a note on Spectro-fluorimetry.	16					
Q.3	An a) b)	<b>swer the following.</b> Write a note on Phase contrast Microscopy. Write the principle and working of Gel filtration chromatography.	16					
Q.4	An a) b)	<b>Iswer the following.</b> Explain the principle and procedure of SDS-PAGE. Add an account on Northern blotting technique with applications.						
Q.5	An a) b)	swer the following. Add a note on types of electromagnetic waves with mode of interaction Explain the principle and instrumentation of NMR spectroscopy.	16					
Q.6	An a) b)	swer the following. Explain the instrumentation and applications of Colorimetry Add a note on principle and applications of Iso electric focusing.	16					
Q.7	An a) b)	swer the following. Add a note on types and applications of centrifugation technique. Define radioactivity. Add a note on preparation and detection of radio	16					

isotopes.

				Bi	otechr	nolo					
<b>Res</b> Day	<b>searc</b> & Da	<b>ch Me</b> te: Fric	e <b>thc</b> day,	odology and Inte	llectua	al Pr	operty Rights (	IPR) (MSC33403) Max. Marks: 80			
Time	e: 03:	00 PM	То	06:00 PM							
Insti	ructio	2) (2 (3)	) Qu ) Att ) Fig	estion no. 1 and 2 a empt any three ques jure to right indicate	re comp stions fro full mar	oulsor om Q ks.	y. . No. 3 to Q. No. 7				
Q.1	A)	Multiple Choice Questions choose correct alternative.									
		1)	a) c)	is the purpose of To identify problem To publish book	f doing r າ	esea b) d)	rch. To publish paper To utilize chemic	als			
		2)	The a) b) c) d)	e data of research is Only quantitative Semi Qualitative Qualitative & Quan Aimless	s						
		3)	<ul> <li>Sampling error can be reduced by</li> <li>a) Non-probability sampling</li> <li>b) Increasing the population</li> <li>c) Decreasing the sample size</li> <li>d) Increasing the sample size</li> </ul>								
		4)	<ul> <li>Plagiarism can be avoided by</li> <li>a) Copying the work of others accurately</li> <li>b) Paraphrasing the author's text in your own words</li> <li>c) Cut and pasting from the Internet</li> <li>d) Quoting directly without revealing the source</li> </ul>								
		5)	<ul> <li>A result is called "statistically significant" whenever</li> <li>a) The null hypothesis is true</li> <li>b) The alternative hypothesis is true</li> <li>c) The p-value is less or equal to the significance level</li> <li>d) The p-value is larger than the significance level</li> </ul>								
		6)	exp a) c)	part of a research periment was planne Results Introduction	n report ed and c	conta condu b) d)	iins details descrip cted. Design Method	lion of			
		7)	The cor a) c)	e technology mpany. Personal Intramural	r transfe	er can b) d)	be done within an private extramural	institution or			
		8)	lf a cha a) c)	a plant variety is clea aracteristic is said to Novel Uniform	rly distir be	nguisl  b) d)	hable by at least or distinct stable	ne essential			

M.Sc. (Semester - IV) (New) (CBCS) Examination: March/April-2023

## C

Seat

No.



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80

80

- Plant breeders right becomes effective\_\_\_\_\_ after registration of a 9) variety. a) 1 year
  - b) 2 years
  - c) 6 months d) immediately
- 10) one of the following statements is false.
  - a) The maximum duration for an unregistered design right is 15 years
  - b) A registered design right only applies to 3 dimensional objects
  - c) A registered design right may cover 2 dimensional and 3 dimensional objects
  - d) The maximum duration for a registered design right is 25 years

#### B) Write true or false.

- Patent can be infringed by selling without permission (True/False). 1)
- An unrecorded speech would not gain copyright protection 2) (True/False).
- The priority date of patent means b. the date on which you first 3) receive a grant to your patent in respect of your invention (True/False).
- Scopus is a journals database (True/False). 4)
- A short summary of technical report is called Publication (True/False). 5)
- The MSWord document tool is a best for calculation with the help of 6) formula (True/False).

#### Q.2 Answer the following.

- a) Describe the terms impact factor, journal indexing, h-index, i10 index, ISSN and ISBN.
- **b)** Describe types of ANOVA with its limitations.
- c) Explain the detail guidelines for writing introduction in manuscript.
- d) Write a note on patent infringement.

#### Q.3 Answer the following.

a) Explain the conditions for obtaining protection for new plant variety. 80 **b)** Write a note on advantages and disadvantages of plant breeders' rights. **08** 

#### Q.4 Answer the following.

- a) Describe in detail the PCT procedure to obtain patent.
- b) Discuss in detail the patent case study with respect to Basmati rice and 80 Neem.

#### Q.5 Answer the following.

- a) Write a note on research design.
- b) Discuss in detail the use of audio and visual aids in research. **08**

#### Q.6 Answer the following.

- a) What is Sample Size? Describe in detail the types Steps in Sampling. 08
- b) Explain in detail the Chi-square test with example and its applications. **08**

### Q.7 Answer the following.

- a) Write a note on selection and formulation of research problem. 80
- **b)** Explain in detail characteristics of research and formulation of hypothesis. 08

## Set Ρ M.Sc. (Semester - IV) (New) (CBCS) Examination: March/April-2023 BIOTECHNOLOGY Medical Biotechnology and Bionanotechnology (MSC33406) Max. Marks: 80 Instructions: 1) Q. Nos. 1 and 2 are compulsory. 2) Attempt any Three guestions from Q.No.3 to Q.No.7. 3) Figures to the right indicate full marks. Choose the correct alternatives from the options. 10 In glucose electrode, glucose oxidase has been coupled to an a) Ferrocene derivatives b) Urease

c) Polyacrylamide d) Biochips

#### 2) The size of nanoparticles is between nm.

a) 100 to 1000 b) 0.1 to 10 c) 1 to 100 d) 0.01 to 1

#### 3) \_\_\_\_\_ antibiotic has a beta-lactam ring.

a) Cephalosporin

electrode by \_\_\_\_\_.

Seat

Q.1 A)

Day & Date: Sunday, 16-07-2023

Time: 03:00 PM To 06:00 PM

1)

No.

c) Tetracycline d) Streptomycin

#### The origin and development of a disease is called \_\_\_\_\_. 4)

- a) Pathogenesis c) Peptides
- b) Transgenic d) Pharmcogenetics

b) Penicillin

- The assessment of hundreds, thousands or even millions of 5) molecule samples is called
  - a) Screening b) Medicine
  - c) Vaccine d) Immunity

#### 6) \_\_ does not represent a human disease caused by fungi.

- a) Ring worm b) Cryptococcosis
- c) Malaria d) Jock itch
- 7) Staphylococcus spp produces \_\_\_\_\_ enzyme.
  - a) Proteases b) Lipase
  - c) Hyaluronidase d) Coagulase
- The colour of the nano gold particles is \_\_\_\_\_. 8)
  - a) Yellow b) Orange
  - c) Red d) Variable

		9)	A n dim a) c)	naterial with one dimens nensions are large is cal Micro-material Quantum well	ion in the ledI	e N  c) d)	lano range and the other two Quantum wire Quantum dot		
		10)	The a) c)	e first talk about nano-te Albert Einstein Gordon E. Moore	chnology I	/ W c) d)	as given by Newton Richard Feynman		
	B)	Writ 1) 2) 3) 4) 5) 6)	rite true/falseMajority of antigens are proteins.The Fab fragment of antibody is where antigen binds.The correct order for the basic features of a mass spectrometer isionisation, acceleration, deflection and detection.Nanospheres and nanocapsules are some of the Biomedicalapplication of nanoparticles.Nano shells are used in the treatment of Alzheimer's disease.The silver metal is used with nanoparticles for antibiotic delivery.						
Q.2	Ans a) b) c) d)	<ul> <li>Answer the following.</li> <li>a) Write a note on the Pathogenesis of HIV.</li> <li>b) Describe the diagnosis method involved in parasitic infection.</li> <li>c) What are the Problems of drug resistance?</li> <li>d) Write a short note on Vaccines.</li> </ul>							
Q.3	Ans a) b)	<ul> <li>Answer the following.</li> <li>a) Give a detailed account of Phages in therapeutics.</li> <li>b) Write a short note on Gene therapy.</li> </ul>							
Q.4	Ans a) b)	<ul> <li>Answer the following.</li> <li>a) What are the applications of Nanotechnology?</li> <li>b) Write a note on the chemical method for synthesis of nanoparticles.</li> </ul>							
Q.5	Ans a) b)	<ul> <li>Answer the following.</li> <li>a) Write a note on Recent trends in Nanobiotechnology.</li> <li>b) Give a brief account of the Pathology of <i>Candida spps.</i></li> </ul>							
Q.6	Ans a)	<b>Swer the following.</b> Discuss the epidemiology study and pathogenesis of <i>Escherichia coli</i> disease.							
	b)	Expl	ain i	in detail of methods invo	lved in th	ne (	diagnosis of diseases.	80	
Q.7	Ans a)	swer f Defi suita	t <b>he f</b> ne cl able	<b>following.</b> hemotherapy. Explain th example.	ne mode	ofa	action of the antibiotic with	08	
	b)	<ul> <li>Define Biosensors. Note on applications of biosensors in medical and industrial uses.</li> </ul>							