Seat	Sat	D
No.	Set	

	M.S	c. (emester - I) (Nev	v) (NEP CBCS) ZOOLOGY	Examination: Oct/Nov-2023	
			Bio	systematic (23	09101)	
			iday, 05-01-2024 Il To 05:30 PM	,	Max. Marks:	60
Inst	ructio) All questions are c 2) Figure to right indi			
Q.1	A)	Ch (1)	ose the correct alte is the term gire a) Isotype c) Holotype		specimen of original type.	80
		2)	Name the organizati a) IBM c) ICN		rules for naming animals ICBN ICZN	
		3)	Checklist, monogrape a) Publication c) Identification	b)	lated with taxonomic Classification Nomenclature	
		4)	involves the of a) Purification c) Typification		menclature type for a name. Classification Centrifugation	
		5)	Speciation is also ca a) Cladogenesis c) Gametogenes	alled b) is d)	•	
		6)	Parsimony and likeli a) Progeny c) Population	hood are methods b) d)	of estimating the Phylogeny Genes	
		7)	In panmictic species a) Fertilized egg c) Cloning	offspring develop b) d)		
		8)	The first step in taxo a) Classification c) Collection	onomy is b) d)	Identification Publication	
	B)	Fill 1) 2) 3) 4)	is called The taxonomic keys type is used	iding organisms wi s are used in the id to describe particu	th appropriate and distinct names entification of	04
		٦)	parts of an organism		o identity drivinown apodies of	

Q.2	Ans a) b) c) d) e) f) g) h)	Define biosystematics and taxonomy. Define cytotaxonomy and chemotaxonomy. ICZN. Which are the two methods of phylogenetic tree construction. Difference between panmictic and apomictic species. Significance of taxonomic characters. Holotype and syntype. Curetting.	12
Q.3	Ans a) b) c) d)	Give an account of biosystematics in biology. Explain historical resume of systematics. Preservation and curating. Neotype.	12
Q.4	Ans a) b) c)	Give an account on theories of biological classification. Describe recent trends in taxonomy. Explain systematic publication.	12
Q.5	Ans a) b) c)	swer the following. (Any Two) Explain difference between panmictic and apomictic speciation. Describe procedure and key in taxonomy. Explain process of typification.	12

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Seat	Cot	D
No.	Set	

	WI.SC	. (Se	rester - i) (New) (NEP CBCS) Examination: Oct/Nov-2023 ZOOLOGY	
			Cell and Molecular Biology (2309102)	
_			day, 07-01-2024 Max. Marks: 6 o 05:30 PM	0
Instr	uctio		All questions are compulsory. Figure to right indicate full marks.	
Q.1	A)	Cho (1)	se the correct alternative When two kinds of molecules moves across cell membrane in same direction while diffusion is called	8
			a) Uniport b) Active antiport c) Antiport transportation d) Symport	
		2)	is the major biological component of cell membrane. a) Carbohydrates b) Lipids c) Sterols d) Vitamins	
		3)	The core of microfilament is formed of a) Actin filament b) Tubulin filament c) Microtubule d) Intermediate filaments	
		4)	n eukaryotes protein uptake is carried out in cell organelles. a) Mitochondria b) Endoplasmic reticulum c) Golgi bodies d) Plastids	
		5)	The Metastasis is a characteristic feature of cell. a) Cancer b) Epithelial c) Gastric d) Germ	
		6)	Connexons are associated with a) Gap junction b) Desmosomes c) Tight junction d) Intermediate filaments	
		7)	Cyclin is associated with a) Glycolysis b) Glycogenesis c) Mitosis d) Protein uptake	
		8)	A single type of globular protein called tubulin is core component of a) Microtubule b) Microfilament c) Intermediate filament d) Desmosomes	
	B)	Write 1)	true /false When two molecules move in opposite direction across the cell nembrane is called Antiport transportation.)4
		2) 3)	Mitochondrial matrix provides site to Kreb cycle. Uncontrolled cell growth spreads other parts of body is a symptom of cell cycle.	
		4)	Sorting and trafficking of protein in the cell is carried out by ribosomes.	

			3LK-E3-2
Q.2	a) Stab) Drac) Disd) Whe) Draf) Whg) Dis	r the following (Any Six) ate the functions of cell membrane. aw neat labelled diagram of mitochondria. accuss the properties of cancer cell. at is the active transportation? aw neat labelled diagram of microtubule. at is gap junction? accus the desmosomes. ate the functions of mitochondria.	12
Q.3	a) Desb) Wric) Dis	r the following (Any Three) scribe the structure and function of Golgi bodies. ite a note on morphology of cancer cell scuss the different treatment of cancer. ite a short note on cell cycle.	12
Q.4	a) Giv	r the following (Any Two) ve an account of transportation across the cell membrane. scribe the different causes of cancer. ite a note on biogenesis of mictochondria.	12
Q.5	a) Exp	r the following. (Any Two) plain in detail post transcriptional modification in protein synthe scribe the structure of Nucleus with neat labelled diagram.	12 esis.

Give an account on biological component of plasma membrane.

Set	Sat	D
No.	Set	

	M.Sc	c. (Se		CBCS) Examination: Oct/Nov-2023 LOGY	}
			Techniques in E	Biology (2309107)	
•			esday, 09-01-2024 l To 05:30 PM	Max. Mark	s: 60
nstr	uctio) All questions are compulsory) Figure to right indicate full m		
Q.1	A)		ose correct alternative. (MC Technique used to separate electrical charge is called as a) Electrophoresis c) PCR	biomolecules based on their size and	08
		2)	a) Avogadro Number	lture has been recultured is known as b) Passage Number d) Poisson Number	<u>.</u> .
		3)	Maxam and Gilbert method (a) Cryopreservation c) Chilling	of DNA sequence is known as b) Fermentation d) Chemical Degradation	
		4)	In cryopreservation storage a) Paraffin c) Liquid nitrogen	is done in b) Nitrogen gas d) Liquid hydrogen	
		5)	In microscopy electro a) Light c) SEM	on beam passes through sample. b) TEM d) Compound	
		6)	In the secondary culture, cel a) Primary culture c) Organ culture	lls are obtained from b) Organism d) Phenotypic culture	
		7)	 HPLC stands for a) High Pressure Liquid C b) High Performance Liquid C c) Highly Placed Liquid C d) Highly Positive Liquid C 	uid Chromatography hromatography	
		8)	Single layer of cells growing a) Bilayerc) Monolayer	on surface is called b) Trilayer d) Qudralayer	

	B)	Fill in the blanks OR write true/false.	04
		1) DMSO is added before cryopreservation to prevent ice crystal formation.	
		a) True b) False	
		In polymerase chain reaction Taq Polymerase used.	
		a) True b) False	
		3) Thin Layer chromatography is a type of partition chromatography.	
		a) True b) False	
		4) Electrophoresis technique is used to separate DNA, RNA and protein	
		molecules.	
		a) True b) False	
Q.2	Ans	swer the following. (Any Six)	12
	a)	PCR	
	b)	Paper chromatography	
	c)	Autoradiography	
	d)	Cryopreservation	
	e)	Centrifugation	
	f)	Types of cell culture	
	g)	Principle of NMR	
	h)	Electrophoresis	
Q.3	Ans	swer the following. (Any Three)	12
	a)	Write note on Cryotomy.	
	b)	Write types of PCR and its applications.	
	c)	Explain Sanger's method of DNA sequencing.	
	d)	Explain cell hybrids and its applications.	
Q.4	Ans	swer the following. (Any Two)	12
	a)	Explain freeze drying and freeze fractioning technique.	
	b)	Explain principle and working of Transmission Electron microscope- TEM.	
	c)	Describe NMR. Explain its principle and working.	
Q.5	Ans	swer the following. (Ant Two)	12
	a)	Explain design and functioning of tissue culture laboratory.	
	b)	Write note on culture media preparation.	
	c)	Explain the Radio label techniques in biology.	

Seat	Set	P
No.	Set	

M.Sc. (Semester - I) (New) (NFP CBCS) Examination: Oct/Nov-2023

	IVI.JC	(Se		•		1404-2023
			Economic Entomo		309108)	
-			esday, 09-01-2024 I To 05:30 PM		,	Max. Marks: 60
Instr	uctio) All Questions are compulsory.) Figure to right indicate full mark	ΚS.		
Q.1	A)	Cho 1)	ose correct alternative is known as Father of Ap	piculture.		08
			a) Thomas Adison c) Mendel	b) d)	Johann Dzierzon Lweis	
		2)	Honey bees shows type a) Chewing and biting c) Chewing and lapping		parts. Chewing only Grinding	
		3)	is the end product of the a) Pupa c) larvae	reeling ir b) d)	n sericulture. cocoon Silk	
		4)	Lac insect shows types of a) sap sucking c) grinding	of mouth b) d)		
		5)	Integrated pest management in a) chemical c) biological		pheromones all the a, b, c	
		6)	Lac is secreted by a) salivary gland c) dermal gland	b) d)	vaginal gland anal gland	
		7)	Honey is prepared by ca a) worker c) drone	ast. b) d)	queen larvae	
		8)	In Autocidal control involves a) only males c) both male and females	insec b) d)	cts. only females pupae	
	B)	Writ 1) 2) 3) 4)	te True / False. In artificial inoculation, lac bear Migration of honey bees is known Royal jelly is the food of drones In biological control all pollution	wn as swa s.	arming.	04 ac.

Q.2	Answer the following. (Any Six) a) Importance of lac insect b) Species of silkworms c) Autocidal control d) Propolis of bees e) Caste of honey bees f) Define IPM in pest control. g) Role of the feromones h) Functions of worker bees	12
Q.3	 Answer the following. (Any Three) a) Describe economic importance of lac. b) Describe diseases of honey bees. c) Describe importance of silk. d) Hand prickiling method in pest control. 	12
Q.4	 Answer the following. (Any Two) a) Describe life cycle of silkworm bombaxmorii. b) Describe structure of artificial bee hive. c) Explain process of lac culture. 	12
Q.5	 Answer the following. (Any Two) a) Describe in detail IPM in pest management. b) Explain process of silk formation from cocoon. c) How pure lac is obtained raw lac. 	12

Seat				Set	P
M.Sc.	•	ZOC	DLOGÝ	Examination: Oct/Nov-202	
	F	Research Meth	odology	y (2309103)	
•	e: Thursday, 1 00 PM To 05:30			Max. Marks	s: 60
Instructio	, .	tions are compuls to the right indicat	•	rks.8	
Q.1 A)	1) is	categorical variab		determining the association Mode	80
	c) Medi	an	d)	Chi-square Test	
	2) A phenome a) Sam c) Sub-	na. ole	anation o b) d)	r interpretation of one or more Fact Theory	
	show & c a) Histo	chart, the circle is rganize data as po gram chart		nto a series of segments to e of whole. Pie-Chart Bar Diagram	

variable is also called as response variable and is often the

b)

b)

d)

b)

In research _____ is a complete set of elements with a standard

d)

b)

d)

The condition of not being influenced by personal experiences,

value judgments, or preconceived notions is called as

__ is called as subset of the population.

d)

Dependent variable

Population

Trial

Validity

Sample

Quadrat

Generability

Non-autonomous variable

4)

5)

6)

7)

focus of the research.

a) Sample

c) Individuals

a) Replicability

c) Sampling frame

c) Objectivity

parameter?
a) Population

a) Independent variable

c) Autonomous variable

		SLR-ES	-5						
		8) is a reference management tool. a) NCBI b) BLAST c) Zotero d) GenBanK							
	B)	 Fill in the blanks or write true or false Generability is the extension of research findings and conclusions from study conducted on a sample population to the population at large. Google Scholar is a plagiarism detection tool. Random errors are the result of unpredictable changes. Dependent variable are variables which are manipulated or controlled or changed. 	04 a						
Q.2	Ans a) b) c) d) e) f) g) h)	Null hypothesis Impact Factor (IF) Frequency table Sample size Qualitative variable Dependent variable Generalization Sampling Error	12						
Q.3	Ans a) b) c) d)	Swer the following. (Any Three) Discuss the characteristic of good sample. Write on the qualitative and quantitative research. Elaborate on deductive and inductive theory. Discuss univariate and bivariate analysis.	Discuss the characteristic of good sample. Vrite on the qualitative and quantitative research. Elaborate on deductive and inductive theory.						
Q.4	Ans a) b) c)	Swer the following. (Any Two) Discuss the reference management software like Zotero and Mendeley. Give a detailed account on the research process. Give an account on the concept of theory and add a note on its benefits with suitable example.	12						
Q.5	Ans a) b) c)	wer the following. (Any Two) Write an account on layout of research paper. Explain types of sampling methods-Random, stratified & systematic sampling Give a detailed account on levels of measurement such as nominal,	12 g.						

ordinal, interval & ratio.

Seat	Set	D
No.	Set	

	M	.Sc.	Semester	· - I) (Old) (CBCS) ZOOLO		mination: Oct/Nov-2023	
				Biosystematics (C31101)	
-			lay, 05-01-2 To 06:00 Pl		•	Max. Marks:	: 80
Insti	ructio	2	Attempt an	and. 2 are compulsory y three questions fror ght indicate full marks	n Q. N	No. 3 to Q. No. 7	
Q.1	A)	Cho (1)	Systematic and all rela	tionships among then aeus	n was	inds and diversity of organisms described by Simpson Lamark	10
		2)	a) Interb) Interc) Inter	and ICZN; IC stands national code national board national organization national trades	for		
		3)	a) Panr	ere is no fusion of ma nictic nictic	b)	d female gametes in reproduction. Parthenogenesis Sexual reproduction	•
		4)		ens are species cies	b) d)	Genetic drift Order	
		5)	Certain inverse a) Form c) Xyle		ved in b) d)	Eosin Amino acid	
		6)	a) Yoke		tifyin(b) d)	g an unknown organism. Polyclave Parral	
		7)	a) Publ	monograph are the telications lenclature	rms re b) d)	elated with taxonomic Classifications Identification	
		8)	a) Purif	lves the designation of ication of ication signification.	of a no b) d)	omenclature type for a name. Typification Centrifugation	
		9)	a) Phyl	and likelihood are me ogeny ulation	ethods b) d)	s of estimating the Progeny Genes	
		10)	a) Clas	ep in taxonomy is sification ection	b) d)	Identification Publications	

B)	FIIII										06
	1)	Arist	totle was	the father	r of Taxon	omy.					
		a)	True			b)	False				
	2)		•	•		•				what	
			•	d genetica	ally differe			est of the	group.		
	- \	,				,					
	3)			brates are	e preserve						
	4)	,		· · ·	1.	,					
	4)					tnat	represe	nts evolu	tionary		
		a)	True	_		b)	False				
	5)				ons are ar	y for	m like p	amphlets	, journal	,	
		a)	True			b)	False				
	6)	In IC	ZN, N m	neans natu	ural'.	•					
		a)	True			b)	False				
				vstematic	s in biolog	IV					16
•				,		, , .					
c)	•		•	s of taxon	omic keys	;					
ď)											
Ans	wer th	ne fol	llowina								16
			_	n theories	of biologic	cal cla	assificat	tion.			. •
b)					•						
Ans	wer th	ne fol	llowina								16
a)			_	resume o	f systema	tics.					
b)	Desc	ribe c	hemotax	konomy.	•						
Ans	wer th	ne fol	llowing								16
a)	-					and a	pomicti	c speciati	on.		
b)	Desc	ribe r	nethods	in phyloge	eny.						
Ans			_								16
a)				•							
b)	Expla	aın ap	plication	of biosys	tematics.						
			_								16
a)				•			ss of ide	ntification	۱.		
D)	Give	an ac	count of	nucleic a	cia bhylog	jeny.					
	Ans a) b) Ans a) b) Ans a) b) Ans a) b) Ans	3) 4) 5) Answer tl a) Impo b) Cytol c) Merit d) Phylo Answer tl a) Give b) Expla Answer tl a) Desc b) Desc Answer tl a) Desc b) Expla b) Desc Answer tl a) Desc b) Expla b) Desc Answer tl a) Desc b) Desc Answer tl a) Desc b) Expla	1) Arist a) 2) Subse physic a) 3) Cert a) 4) A physic relat a) 5) In tal artic a) 6) In IC a) Answer the foll a) Importance b) Cytotaxone c) Merits and d) Phylogene Answer the foll a) Give an ac b) Explain IC Answer the foll a) Describe of b) Describe of Answer the foll a) Describe of comparison of the foll b) Describe of comparison of the foll b) Describe of comparison of the foll a) Describe of comparis	a) True 2) Subspecies in physically and a) True 3) Certain verted a) True 4) A phylogener relationships a) True 5) In taxonomy articles, book a) True 6) In ICZN, N ma) True 6) In ICZN, N ma) True Answer the following a) Importance of Bios b) Cytotaxonomy c) Merits and demerited) Phylogenetic tree Answer the following a) Give an account or b) Explain ICZN rules Answer the following a) Describe historical b) Describe chemotaxing a) Explain difference b) Describe methods Answer the following a) Explain difference b) Describe taxonomic b) Explain application Answer the following a) Describe taxonomic b) Explain application Answer the following a) Describe collection and application by Explain application and answer the following a) Describe collection and answer the following answer the following and answer the following and answer the following and answer the following answer the following answer the following answe	1) Aristotle was the fathe a) True 2) Subspecies is a group physically and genetica a) True 3) Certain vertebrates are a) True 4) A phylogenetic tree is a relationships among of a) True 5) In taxonomy, publication articles, books. a) True 6) In ICZN, N means natu a) True Answer the following a) Importance of Biosystematic b) Cytotaxonomy c) Merits and demerits of taxon d) Phylogenetic tree Answer the following a) Give an account on theories b) Explain ICZN rules of taxonom Answer the following a) Describe historical resume ob b) Describe chemotaxonomy. Answer the following a) Describe methods in phyloge Answer the following a) Explain difference between p b) Describe taxonomic publication b) Explain application of biosys Answer the following a) Describe collection and pres	1) Aristotle was the father of Taxon a) True 2) Subspecies is a group within a s physically and genetically differe a) True 3) Certain vertebrates are preserve a) True 4) A phylogenetic tree is a diagram relationships among organisms. a) True 5) In taxonomy, publications are ar articles, books. a) True 6) In ICZN, N means natural'. a) True Answer the following a) Importance of Biosystematics in biolog b) Cytotaxonomy c) Merits and demerits of taxonomic keys d) Phylogenetic tree Answer the following a) Give an account on theories of biologic b) Explain ICZN rules of taxonomy. Answer the following a) Describe historical resume of systema b) Describe chemotaxonomy. Answer the following a) Explain difference between panmictic and b) Describe methods in phylogeny. Answer the following a) Describe taxonomic publications. b) Explain application of biosystematics. Answer the following a) Describe collection and preservation p	1) Aristotle was the father of Taxonomy. a) True b) 2) Subspecies is a group within a specie physically and genetically different from a) True b) 3) Certain vertebrates are preserved in the analysis and an arrue b) 4) A phylogenetic tree is a diagram that relationships among organisms. a) True b) 5) In taxonomy, publications are any formaticles, books. a) True b) 6) In ICZN, N means natural. a) True b) Answer the following a) Importance of Biosystematics in biology. b) Cytotaxonomy c) Merits and demerits of taxonomic keys d) Phylogenetic tree Answer the following a) Give an account on theories of biological clab by Explain ICZN rules of taxonomy. Answer the following a) Describe chemotaxonomy. Answer the following a) Explain difference between panmictic and a by Describe methods in phylogeny. Answer the following a) Describe taxonomic publications. b) Explain application of biosystematics. Answer the following a) Describe toollowing a) Describe toollowing a) Describe toollowing b) Explain application of biosystematics.	1) Aristotle was the father of Taxonomy. a) True b) False 2) Subspecies is a group within a species that he physically and genetically different from the real True b) False 3) Certain vertebrates are preserved in eosin. a) True b) False 4) A phylogenetic tree is a diagram that represe relationships among organisms. a) True b) False 5) In taxonomy, publications are any form like particles, books. a) True b) False 6) In ICZN, N means natural'. a) True b) False Answer the following a) Importance of Biosystematics in biology. b) Cytotaxonomy c) Merits and demerits of taxonomic keys d) Phylogenetic tree Answer the following a) Give an account on theories of biological classificates b) Explain ICZN rules of taxonomy. Answer the following a) Describe historical resume of systematics. b) Describe chemotaxonomy. Answer the following a) Explain difference between panmictic and apomictic b) Describe methods in phylogeny. Answer the following a) Describe taxonomic publications. b) Explain application of biosystematics. Answer the following a) Describe collection and preservation process of idea.	1) Aristotle was the father of Taxonomy. a) True b) False 2) Subspecies is a group within a species that has becon physically and genetically different from the rest of the a) True b) False 3) Certain vertebrates are preserved in eosin. a) True b) False 4) A phylogenetic tree is a diagram that represents evolu relationships among organisms. a) True b) False 5) In taxonomy, publications are any form like pamphlets articles, books. a) True b) False 6) In ICZN, N means natural'. a) True b) False Answer the following a) Importance of Biosystematics in biology. b) Cytotaxonomy c) Merits and demerits of taxonomic keys d) Phylogenetic tree Answer the following a) Give an account on theories of biological classification. b) Explain ICZN rules of taxonomy. Answer the following a) Describe historical resume of systematics. b) Describe chemotaxonomy. Answer the following a) Explain difference between panmictic and apomictic speciation b) Describe methods in phylogeny. Answer the following a) Describe taxonomic publications. b) Explain application of biosystematics. Answer the following a) Describe collection and preservation process of identification	1) Aristotle was the father of Taxonomy. a) True b) False 2) Subspecies is a group within a species that has become some physically and genetically different from the rest of the group. a) True b) False 3) Certain vertebrates are preserved in eosin. a) True b) False 4) A phylogenetic tree is a diagram that represents evolutionary relationships among organisms. a) True b) False 5) In taxonomy, publications are any form like pamphlets, journal articles, books. a) True b) False 6) In ICZN, N means natural'. a) True b) False Answer the following a) Importance of Biosystematics in biology. Cytotaxonomy c) Merits and demerits of taxonomic keys d) Phylogenetic tree Answer the following a) Give an account on theories of biological classification. b) Explain ICZN rules of taxonomy. Answer the following a) Describe historical resume of systematics. b) Describe chemotaxonomy. Answer the following a) Explain difference between panmictic and apomictic speciation. b) Describe methods in phylogeny. Answer the following a) Describe taxonomic publications. b) Explain application of biosystematics. Answer the following a) Describe tollowing a) Describe collection and preservation process of identification.	1) Aristotle was the father of Taxonomy. a) True b) False 2) Subspecies is a group within a species that has become somewhat physically and genetically different from the rest of the group. a) True b) False 3) Certain vertebrates are preserved in eosin. a) True b) False 4) A phylogenetic tree is a diagram that represents evolutionary relationships among organisms. a) True b) False 5) In taxonomy, publications are any form like pamphlets, journal, articles, books. a) True b) False 6) In ICZN, N means natural'. a) True b) False Answer the following a) Importance of Biosystematics in biology. Cytotaxonomy c) Merits and demerits of taxonomic keys d) Phylogenetic tree Answer the following a) Give an account on theories of biological classification. b) Explain ICZN rules of taxonomy. Answer the following a) Describe historical resume of systematics. b) Describe chemotaxonomy. Answer the following a) Explain difference between panmictic and apomictic speciation. b) Describe taxonomic publications. b) Explain application of biosystematics. Answer the following a) Describe taxonomic publications. b) Explain application of biosystematics. Answer the following a) Describe taxonomic publications. b) Explain application of biosystematics.

Seat	Set	D
No.	Set	F

M.Sc. (Semester - I) (Old) (CBCS) Examination: Oct/Nov-2023 ZOOLOGY

			To	200L0G ools and Techniques in E	=	(MSC31102)	
			unda	ay, 07-01-2024 0 06:00 PM		Max. Marks	s: 80
Insti	uctio	2	2) At	. Nos.1 and 2 are compulsory. ttempt any Three questions fro gures to the right indicate full r		.3 to Q.No.7.	
Q.1	A)	Cho 1)	The cer bio	e correct alternatives. e study of molecular structure, tain types of kinetic investigati logical field. PCR NMR		•	10
		2)		adow casting is used in micros TEM Phase contrast	copy b) d)	SEM Fluorescence	
		3)	a) b) c)	animal cell culture transformati Phenotypic modification Release of genetic informatio Uptake of new genetic materi Both a and b	n	ns	
		4)	cry	ezing to lower the freezing poir stals. Dimethyl sulfoxide (DMSO)	nt and po	added to the cells prior to revent formation of ice Sulphuric acid (H ₂ SO ₄) Ethyl alcohol (C ₂ H ₅ OH)	
		5)	Ho a) b) c) d)	w is the wavelength controlled By a Michelson Interferomete By a computer By a laser By calibration with a standard	er	·	
		6)		key technique for separating ar a cellular homogenate is know centrifugation chromatography	-	zing the various elements hybridization electrophoresis	
		7)	into unt	final cryopreservation procedur o a storage container whitil required for use. ammonia alcohol		ozen vials are transferred ls can be stored and frozen liquid oxygen liquid nitrogen	
		8)	In s is _ a) c)	spectrophotometer the light so Deuterium Both a and b	urce mo b) d)	stly used for visible range Hydrogen Tungsten	

		a) Transmission b) Fluorescence c) Radioactivity d) Absorbance	
		 10) In hybridoma techniquechemical is used as fusing agent. a) Poly lactic-glycolic acid b) Poly glycolic acid c) Poly lactic acid d) Polyethylene glycol 	
	B)	 Fill in the blanks OR write true/false. Trypan blue dye exclusion is most common, easy and rapid method to interpret viability of cells in culture system. (True/ False) ELISA is used for Identify specific proteins. (True/ False) Due to the short wavelength of electrons, the resolving power of the electron microscope is very high. (True/ False) The cell lines with limited culture life spans are referred to as infinite cell line. (True/ False) Ribonuclease is a proteolytic enzyme and is used for dissociating the tissue into single cells during the primary culture. (True/ False) The term chromatography describes the migration of a charged particle under the influence of an electric field. (True/ False) 	06
Q.2	a) b)	wer the following. Types of culture and its uses. Cell characterization. Hybridoma X Ray in biology	16
Q.3	Ans a) b)	ewer the following. Electron microscope- TEM Proteomics	16
Q.4	Ans a) b)	cwer the following. Cell viability testing Cell transformation	16
Q.5	Ans a) b)	wer the following. Cell hybrids and its applications. Fusions in different cell cycle phases and its applications.	16
Q.6	Ans a) b)	wer the following. Cryotomy. Cryopreservation of organs and organisms.	16
Q.7	Ans a) b)	wer the following. Define centrifuge and add a note on different type of centrifuge. Electrophoresis and its types.	16

	_	
Seat	Sat	D
No.	Set	

	IVI	.Sc.	ZOOLOGY	3
			Cell and Molecular Biology (MSC31103)	
•			day, 09-01-2024 Max. M o 06:00 PM	Marks: 80
Insti	uctio	2	Q. No. 1 and 2 are compulsory. Attempt any three questions from Q. No. 3 to Q. No. 7 Figure to right indicate full marks.	
Q.1	A)	Choques	the the most correct alternative for given multiple choice on. In simple diffusion, molecules cross the plasma membrane In against the concentration gradient In along the concentration In along the concentration gradient In along the concentration gradient	10
		2)	forms the cytoplasmic connections between plant cells. a) Gap junction b) Tight junction c) Desmosomes d) Plasmodesma	
		3)	ysosomes are present in all cell, except a) muscle cells b) acinal cells c) erythrocytes d) hepatocytes	
		4)	Cisternae are present in a) Cytoplasm b) Golgi bodies c) Lysosome d) Nucleus	
		5)	The kinesin is the motor molecules that are related to the a) Actin b) Intermediate filaments c) Microtubules d) Desmin	
		6)	acts as inhibitor of microfilament. a) Aspirin b) Cinchonine c) Colchicine d) Cytochalasin-B	
		7)	vesicle transport the secretory products from the <i>trans</i> Golg etwork to late endosome. a) Clathrin coated b) COP II b) Primary d) COP I	i
		8)	Proteins that are synthesized by free polysomes are transported to a) lysosomes b) outside cell c) nucleus d) ER membrane	
		9)	Angiogenesis contributes to cancer development by a) Providing nutrient and oxygen to tumor and by facilitating medic) Initiating a mutation in a gene that causes uncontrolled cell graph inhibiting apoptosis (PCD) d) Preventing the normal inhibition of growth that occurs between cells upon contact	rowth

		10)	Blas a) c)	stoma is a type of Bone Epithelial cell	f cancer associ	b)	with Connective tissue Embryonic tissue	
	B)	Fill ii 1) 2) 3) 4) 5)	The The and N-te to _	are connection a non-neuronal of	mediate filame e bound sac pr ns between two cell. Lys-Asp-Glu-L	ent is reser o nei _eu (Int in cell containing lytic enzyme urons or between a neuron KDEL) destinates the proteins	06
Q.2	Ans a) b) c) d)	What Give vesic Write	is ca an a les. a no	ollowing. ancer? Add a note count on sorting on actin bindire the transport across.	signals that di		ncer cell. proteins to specific transport	16
Q.3	Ans a) b)	Expla Expla	in ho in th		tions - adhesio		ancer with suitable example. Its, desmosomes, focal	08 08
Q.4	Ans a) b)	Give trans	the following. an account on post translational modification, sorting, assembly and sport of lysosomal proteins. t is cytoskeleton? Illustrate the role of cytoskeleton in cell movement.					
Q.5	Ans a) b)	Illustr Expla	er the following. ustrate in detail structural organization of nucleus and give its function. xplain in detail the structure of actin filament. Add a note on trade milling of ctin filament.					
Q.6	Ans a) b)	Desc	ribe i	llowing. in detail the mem in brief the treatm	•		other proteins in ER.	08 08
Q.7	Ans a) b)	Write With	an e neat	ollowing. essay on passive labelled diagram function.	•	rastr	ucture on mitochondria. Add a	10 06

Seat	Set P
No.	

M.Sc. (Semester-I) (Old) (CBCS) Examination: Oct/Nov-2023

	-		ZOOLO	GY	
			Population Genetics and		
•			ursday, 11-01-2024 To 06:00 PM		Max. Marks: 80
Instr	ructio	2	Question no. 1 and 2 are compo Attempt any three questions fro Figure to right indicate full mark	m Q	
Q.1	A)	Cho (1)	which of the following is not expectation? a) The ability of survive and results of the production competition d) Physical Strength	plain	ed by the theory of natural
		2)	The theory of use and disuse w a) Lamark c) Darwin	as gi b) d)	
		3)	What is the ultimater source of a) Selection c) Genetic drift	_	etic variability? Migration Mutation
		4)	Two animals considered of different c) Live in different d) Cannot interbreed	erent	species if they
		5)	The life originated about 3.6 bill a) Preacambrian c) Cambrian	ion y b) d)	years ago in the era. Silurian Mesozoic
		6)	The percentage of garnets in a	gene	e pool for a pair of alleles depend upon
			a) Mutation b) Recessive allele c) Genotypic frequencies of pa	areni	tal generation
		7)	 Sympatric speciation is	ecies of g	• •
		8)	Industrial melanic peppered mo a) Carbonaria c) Lepsima	oth is b) d)	called Glossina Coptoterms

		9)	a)	inder prind Charls Da Mayer an	arwin	•	b)	Lan	 nark go deve	ris			
		10)	dire a)	ectional se ection due Change Constant				ironn Unc		partic		rection.	
	B)	Fill ir 1) 2) 3) 4) 5) 6)	Two The prof Geo	e blanks o is the o animals of e altered co tein molect ographical e effect of princi	ultimate s considered odon leads ule during isolation is ma	source of diff so to inset translates the fire ay be c	of gent ertion ation the rst ste	spec of ar nis is p in _ red b	ies if the incorre called called y genet	ect ami specia ic drift.	tion.	d into	06
Q.2	a) b)	Natura	al se atric s n co	•									16
Q.3		Role o	of mu	ollowing. utation in e ohylogenet		logical	conce	pt of	speciat	ion.			08 08
Q.4	Ans a) b)	Explai	in Ha	ollowing. ady-Weinb he pattern	•	_	•					quation.	. 08
Q.5	Ans a) b)	Discus	ss et an ac	ollowing. ukaryotic e ccount on l s.					_		o acid		08 08
Q.6	Ans a) b)	Give a	an ac	ollowing. ecount on a					•	•	othesis	S.	08 08
Q.7	Ans a) b)	Give o	detai	ollowing. led accour e principle		_	force	S.					10 06

Coot		
Seat	Set	D
No.	Set	

	M.	Sc. (Sem		BCS) Exa	amination: Oct/Nov-2023	
				Developmental Developmental		MSC31201)	
-				18-12-2023 2:00 PM		Max. Marks	;: 80
Instr	uctio	2) Attei	os. 1 and. 2 are comp mpt any three question re to right indicate full	ns from Q. N	No. 3 to Q. No. 7	
Q.1	A)	Cho 1)	In re	orrect alternative. ptiles, birds, and mam involution into the archenteron gastrocoel		oderm is formed by invagination primitive streak amnion	10
		2)	The a) c)	gut or digestive tract o vegetal pole archenteron	of a vertebra b) d)	ite arises from the primitive streak somites	
		3)	The a) b) c) d)	•	ne amnion ir	nals n all animals producing it e umbilical cord in mammals	
		4)	In ch a) c)	nick heart formation ta 18 33	kes place dı b) d)	uring hrs of incubation. 24 48	
		5)	Deve a) c)	elopment of egg starts Fragmentation Regeneration	b) d)	 Clevage None of these	
		6)	Prog a) c)	rammmed cell death i Mitosis Lipolysis	is called as b) d)	Meiosis Apoptosis	
		7)	Ferti a) c)	lisation takes place in ovary uterus	 b) d)	Fallopian Tube vagina	
		8)	a) c)	is a Foetal membra Blastodisc Chalaza	ne. b) d)	Amnion Zonapellucida	
		9)	In m a) c)	eroblastic cleavage, c Placodes Trophoblast	leavage occ b) d)	curs only in the Blastodisc Yolk	
		10)	Ferti a) c)	lizin is a chemical sub mature eggs polar bodies	stance prod b) d)	luced from acrosome middle piece of sperm	

	в)	The vertebrate nervous system is derived from Microlecithal eggs are the characteristics of Amphioxus The segmented blocks of tissue that develop on each side of the notochord are called the A fertilized egg is called a The Central fluid filled cavity of the blastula is known as Anterior end of neural groove forms future	06
Q.2	Ans a) b) c)	wer the following. Write a note on three germ layer formation in Amphioxus. Describe the process of binary fission in paramecium. Give an account on different types of eggs on the basis of amount of yolk with example.	16
Q.3	Ans a) b)	Regulation of limb development in chordates. Describe process of organogenesis.	08 08
Q.4	Ans a) b)	wer the following. Write a note on capacitation of sperm. Write in detail the process of Apoptosis.	08 08
Q.5	Ans a) b)	swer the following. Describe process of fertilisation in mammals. Describe the development of anteriority to posteriority in Drosophila.	08 08
Q.6	Ans a) b)	Give an account of neural tube formation in chick. Describe process of cleavage in frog.	08 08
Q.7	Ans a) b)	swer the following. Give an account on evolution of sexual reproduction in vertebrates. Describe Regulation of development in Drosophila.	08 08

Seat	Set	D
No.	Set	

M.Sc. (Semester - II) (New) (CBCS) Examination: Oct/Nov-2023 ZOOLOGY

					ZOOLOGY		
		G	ener	ral and Compara	ative Endoc	rinology (MSC31202)	
•				y, 19-12-2023 02:00 PM		Max. M	larks: 80
Instr	uctio	2) Atte	estion 1 and 2 are c empt any Three fror ure to right indicate	n Q.3 to Q.7.		
Q.1	A)	Choo 1)	a) c)	correct alternative. is known as fath Kelvin Candolle	` '	ology. Edward Addison	10
		2)	a)	hormone is not s PRH CRH	,		
		3)	a) c)	is not an endocr Adrenal Lacrimal	ine gland. b) d)	Pituitary Thyroid	
		4)	-	roid hormone belon Steroid Amino acid	ng tocla b) d)	ass of hormone. Protein Peptide	
		5)	a) c)	is gland located Adrenal Ovaries	superior to kid b) d)	dney. Pancreas Pituitary	
		6)		he pancreas alpha gamma	cells secrete i b) d)	nsulin. delta beta	
		7)	,	endocrine gland Thymus Parathyroid	b)	or body's circadian rhythm. Pineal Pituitary	
		8)	a) b) c) d)	hormone respor Epinephrine and r Insulin and Gluca Estrogen and Pro Thyroxin and mela	norepinephrine gon gesterone		
		9)	Cell a) c)	l surface receptors a Intracellular recep Nucleus receptors	tors b)	Nuclear receptors Plasma membrane receptors	
		10)	a) c)	is not a second cGMP Calcium	l messenger ir b) d)	n hormonal action. Sodium cAMP	

	B)	Fill	in the blanks OR write true/ false.	06
	•	1)	Nuclear receptors are intracellular receptors.	
			a) True b) False	
		2)	Testosterone is belonging to peptide class of hormone.	
		٥,	a) True b) False	
		3)	Growth hormone is secreted by gastrointestinal tract.	
		۸١	a) True b) False	
		4)	Hypersecretion of thyroid hormone causes 'Graves's disease'. a) True b) False	
		5)	a) True b) False Melatonin is also known as 'Dark Hormone'.	
		3)	a) True b) False	
		6)	Human Chorionic gonadotropin hormone also known as 'Pregnancy	
		0)	hormone'.	
			a) True b) False	
			,	
Q.2	Ans	wer	the following.	16
	a)	Writ	te the functions of Thyroid Hormone.	
	b)		lain the hormonal role in behaviour?	
	c)		te the functions of testosterone.	
	d)	Writ	te note on classification of hormones.	
	A		Ala a Callanda a	40
Q.3			the following.	16
	a) b)		lain hormonal control of implantation? lain role of insulin in diabetes?	
	D)	Lχρ	nain fole of insulin in diabetes:	
Q.4	Ans	wer	the following.	16
Ψ	a)		te note on biosynthesis of amino acid derivative hormones.	
	b)		lain types of hormonal receptors with diagram?	
	,	•		
Q.5	Ans	wer	the following.	16
	a)	Writ	te note on male reproductive system.	
	b)	Exp	lain hormonal role in gastrointestinal tract?	
	_			
Q.6			the following.	16
	a)		scribe the structure and function of steroid hormones.	
	b)	⊨xp	lain hormonal role in homeostasis?	
Q.7	Λnc	wor'	the following.	16
₩ .1	a)		lain in short causes of infertility, diagnosis, and its treatment?	10
	b)		lain mechanism of parturition and its hormonal regulation?	
	N/	$-^{\lambda}$	main modification of particularity and its normality distribution:	

Seat	Set	D
No.	Jet	

M.Sc. (Semester - II) (New) (CBCS) Examination: Oct/Nov-2023

		`		źòc	DLOGY		
			Env	rironmental Ph	ysiology	(MSC31206)	
•			ednesday, To 02:00	20-12-2023 PM			Max. Marks: 80
Instr	uctio	2 3) Attempt a) Draw nea	and. 2 are compu any three questions at labelled diagram right indicate full r	s from Q. I		
Q.1	A)	Mul i 1)	People liv a) mor b) have c) have	ce Questions. ving at high altitude e better digestive s e better phagocyto e increased immur e decreased oxyge	system pro sis nity	ocesses	10
		2)	a) Mot	, what sickness do on sickness raines	astronaut b) d)	s frequently experien Food poisoning Body pain	ce?
		3)	in the boo a) Exh	•	erceived/e b) d)	xperienced, this resp Adaption Resistance	onse occurs
		4)	human ho a) Env b) Env c) Eco	e of the following of ealth from environr ironment and Hum ironmental and Sc logical Protection (logical Science an	mental har an Health ientific Sci Organizati	ence on	cting
		5)	produce a a) inju	a response is a		it which causes the b phobia frustration	ody to
		6)	a) Wal	the first to describ ter B. Cannon nson Potter	_	nt or flight response" _. Sigmund Freud Mrunal Sengupt	·
		7)	a) Purl	these is known as kinje fibers o Auricular Node	•	naker of the heart? AVN Bundle of His	
		8)	a) Skir	•	regulating b) d)	g the body temperatu Kidney Bladder	re.
		9)	The astro		b)	weight. less	

		 10) Check list for Job Safety Analysis (JSA) consists of a) Work area, material, machine, tools b) Men, machine, material, tools c) Men, machine, work area, tools d) Men, work area, Material, tools 	
	B)	One sentence answer. 1) Define acclimatization. 2) Define homeostasis. 3) Define stress. 4) Define Fatigue.	06
Q.2	a) b)	wer the following. What are biological health hazards. What is black lung disease. Explain the structure of heart of fishes. Explain stressor.	16
Q.3	Ans a) b)	swer the following. Define cardiac output and describe cardiac cycle. Explain the nervous and chemical regulation of heart beat.	08 08
Q.4	Ans a) b)	swer the following. Explain the importance of Yoga in stress management. What is the vestibular system, and explain the effect of microgravity on vestibular system.	08 08
Q.5	Ans a) b)	Swer the following Describe in detail the process of haemopoesis. Explain environmental health hazards?	08 08
Q.6	a)	wer the following. What is blood pressure? Describe high and low pressure and their effects on the body.	08
	b)	What is motion sickness and why it is caused.	80
Q.7	Ans a) b)	swer the following. Describe physiological responses of body in Space. Describe the process of acclimatization with suitable example.	08 08

Seat No.	Set	Р

	М.	Sc. (S	Seme	ster - III) (New) (CBCS) ZOOLOG		nination: Oct/Nov-2023
				Molecular cytogenetic	cs (M	SC31301)
-				5-01-2024 2:00 PM		Max. Marks: 80
Instr	uctio	2)	Atten	os. 1 and. 2 are compulsory. npt any three questions from re to right indicate full marks.		. 3 to Q. No. 7
Q.1	A)	Choo 1)		ne correct alternative (MCQ sequencing method using the method	•	nical is generally called as
			a) c)	Sanger-Coulson Enzymatic	b) d)	Maxam-Gilbert Dideoxy
		2)	cDNA a) c)	A can be formed from RNA b Transcriptase Ligase	y enzy b) d)	me Reverse transcriptase DNAase
		3)	Gene a) c)	etically active areas of chrom Euchromatin allochromosome	osome b) d)	s are called Heterochromatin Telomere
		4)	The i a) c)	ntervening non coding nucle exons histones	otide s b) d)	equences in DNA are called codons introns
		5)	In Pro a) b) c) d)	okayotes Chromatin is forme nucleic acid and proteins nucleic acids and carbohyd nucleic acids and lipids only nucleic acids		
		6)		Polymerase I has Ligases Exonucleases	b) d)	Ribozymes Endonucleases
		7)	The pcalled a)	phage DNA when it is incorpo d as Temperate DNA Muton	b) d)	
		8)	Restr a) c)	riction endonuclease enzyme Transporter permease	es are a b) d)	also called as isomerase molecular scissor
		9)	The v a) c)	viruses which attack on bacte Animal virus Bacteriophage	eria are b) d)	
		10)		ryotic chromosome for most ensed region called Euchromatin Centromere	of the b) d)	part remain in the uncoiled allochromatin heterochromatin

	В)	 The DNA finger prints are In human the chromosome that determines the sex is consists of a very large arrays of tandemly repeated non coding sequences at telomere Genes for coded on the Y chromosome: A mutation caused by substitution of purine by purine is Tip of the chromosomes are called 	06
Q.2	Ans a) b) c) d)	wer the following Write a note on Euchromatin. Explain the principle and applications of FISH. Discuss causes and symptoms of PkU. Write a note on Morphology of Bacteriophage.	16
Q.3		wer the following Give an account on bacterial genome. Discuss sex determination in human.	16
Q.4	Ans a) b)	wer the following Give an account on chromosomal structural aberrations. Discuss salient features human genome based on the findings of Human Genome Project	16
Q.5	Ans a) b)	wer the following Explain the principle, procedure and applications of Northern blotting technique Give an account on human karyotype and basis for nomenclature of chromosomes.	16 ∋.
Q.6		wer the following Give a brief account on proteomics with significance.	16
	a) b)	Explain the cytogenetic effects of ionizing and non-ionizing radiations.	

Seat	Sat	D	
No.	Set		

	IVI.	SC. (Semester - m) (New) (CBCS) ZOOLOG		ammation: Oct/Nov-2023	
			Biochemistry (M	SC	31302)	
•			nday, 07-01-2024 I To 02:00 PM		Max. Marks: 80	Э
Instr	uctio	2) Q. Nos. 1 and 2 are compulsory.) Attempt any three questions from) Figure to right indicate full marks.	Q. N	No. 3 to Q. No. 7	
Q.1	A)	Cho 1)	ose correct alternative. The storage lipid triacylglycerol is a) kidney c) adipose tissue		brain	D
		2)	is a disaccharide present ir a) Maltose c) Sucrose		k. Lactose Trehalose	
		3)	The biochemical reaction in which to form complex molecule is called a) anabolism c) metabolism		·	
		4)	is an example of uncouplea) Cyanidec) Oligomycin A	er of b) d)	oxidative phosphorylation. Rotenone Ionophore	
		5)	pathway is required for the a) Glycolysis c) Pentose phosphate		thesis of NADPH in the cell. TCA Gluconeogenesis	
		6)	The transamination reaction is sai a) anergonic c) endergonic	b)	reaction. exergonic exothermic	
		7)	The net gain of ATP from β -oxidates) 106 c) 7	tion b) d)	135	
		8)	amino acids are requireda) Aspartate and alaninec) Alanine and Arginine	b)	ynthesis of pyrimidine. Glutamine and Arginine Aspartate and Glutamine	
		9)	Ribozymes are the autocatalytic _ a) RNA c) DNA	b) d)	molecules. Protein Carbohydrates	
		10)	Modification of metabolic pathway science, cell biology, biochemistry a) protein engineering c) metabolic engineering	•		

	B)	Fill in the blanks.	06
		1) The enzyme increases the rate of reaction by lowering the energy reaction.	of
		 2) acts as connecting bridge between glycolysis and TCA cycle. 3) First law of thermodynamics states that total energy of universe remains is referred as 'animal starch' as it is storage polysaccharide in animal enzyme helps in hydrolysis of triacylglycerol. 5) is most common coenzyme used in amino acid metabolism. 	 als.
Q.2	Ans	swer the following.	16
•	a)	Write a note on Salvage pathway for nucleotide biosynthesis.	
	b)	Draw the structure of cAMP. Give its any two functions.	
	c)	What is hydrogen bonding? Explain two different types of hydrogen bonds present in biomolecules.	
	d)	State the Michaelis-Menten equation. Add a note on significance of K <i>m</i> and	
	,	Vmax.	
Q.3	Ans	swer the following.	
	a)	Explain different methods of site directed mutagenesis. Give its applications.	10
	b)	Discuss in detail biosynthesis pathway for cholesterol.	06
Q.4	Ans	swer the following.	
	a)	Describe in detail general reactions of amino acid metabolism.	80
	b)	Explain in detail electron transport chain of oxidative phosphorylation.	80
Q.5		swer the following.	
	a)	Explain the structure, properties and function of sucrose, lactose and starch.	10
	b)	Write a note on concept of free energy. Add a note on coupled reactions.	06
Q.6		swer the following.	
	a)	Explain in detail the reactions of pentose phosphate pathway. Give its significance.	10
	b)	Describe in detail biosynthesis of triacylglycerol. Add a note of breakdown of	06
	,	triacylglycerol.	-
Q.7	Ans	swer the following.	
	a)	Discuss in detail the various methods of regulation of enzyme activities.	10
	b)	Write a note on mRNA, tRNA and rRNA.	06

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Seat	Set	D
No.	Set	

M.Sc. (Semester - III) (New) (CBCS) Examination: Oct/Nov-2023

		. (, , , , ,	OLOGY
				l Physiology (MSC31306)
			esday, 09-01-2024 I To 02:00 PM	Max. Marks: 80
Instr	uctio	2) Q. Nos. 1 and. 2 are comp) Attempt any three question) Figure to right indicate ful	ns from Q. No. 3 to Q. No. 7
Q.1	A)	Cho 1)		MCQ) ontrolled by a group of cell in the em b) brain stem d) Hypothalamus
		2)	a) Amylase, Trypsinoge	
		3)	The blood pigment preser a) Haemoglobin c) Chlorocurin	b) Haemocyanin
		4)	Night blindness is caused a) Hypermetropia c) Defective cornea	by: b) Myopia d) Deficiency of rhodopsin
		5)	is the largest endo a) Thyroid c) Parathyroid	crine gland. b) Pancreas d) adrenal
		6)	Which of the following cor a) circulatory system c) respiratory system	ntrols involuntary action b) autonomic nervous system d) excretory system
		7)	What is myosin? a) Muscle fibres c) myocardium	b) myofibrils d) myofilament
		8)	Hibernation in Frog takes a) winter c) summer	place during b) spring d) autumn
		9)	Amonotelism type of excrea) Birds c) Mammals	etion is found in b) Fishes d) Reptile
		10)	Light band have of a) Myosin c) myosin and actin	filament protein. b) actin d) lysine

	B)	Fill in the blanks OR Write true/false.	06
		 Pushing forward the food that has been chewed is the function of the stimulates the production of gastric juice in the stomach. 	·
		3) Muscle fatigue is due to the accumulation of	
		4) In the human eye, the photosensitive compound is composed of	
		5) Multiple forms of the same enzyme is referred to as	
		6) A set of three tiny in the middle part of ear passes on sound vibrations from the eardrum to the liquid in the cochlea.	
Q.2		swer the following.	16
	a)	Feeding mechanism and its regulation in paramoecium.	
	p)	Respiratory pigments.	
	c) d)	Define thermoregulation with suitable examples. Acoustic organ.	
0.0			
Q.3		swer the following.	08
	a) b)	Sketch and label hemoglobin molecule. Describe molecular mechanism of muscle contraction.	08
	IJ)	Describe molecular mechanism of muscic contraction.	00
Q.4		swer the following.	
	a)	Describe Physiology of light reception.	80
	b)	Describe physiology of Bioluminescence explain with examples.	80
Q.5	Ans	swer the following.	
	a)	Describe in brief Circadian rhythm.	08
	b)	Describe Physiology of hearing. Discuss on hearing aids.	80
Q.6	Ans	swer the following.	
	a)	Describe reproductive cycle in mammals. Discuss role of hormones in	80
		mammals.	
	b)	Describe osmoregulation in freshwater and marine fishes.	08
Q.7	Ans	swer the following.	
	a)	Describe role of isoenzymes in cardiac physiology.	80
	b)	Describe physiology of excretion.	80

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Seat	Sat	D
No.	Set	

M.Sc. (Semester - III) (New) (CBCS) Examination: Oct/Nov-2023

		. (ZOOLOG	
			Economic Entomolog	
-			esday, 09-01-2024 To 02:00 PM	Max. Marks: 80
Instr	uctio	2	Q. Nos. 1 and. 2 are compulsory. Attempt any three questions from Figure to right indicate full marks.	n Q. No. 3 to Q. No. 7
Q.1	A)	Cho (1)	ose correct alternative. (MCQ) Honey bees are belongs to family a) Apidae c) Flaviviridae	b) Floridae d) Hemiptera
		2)	Indian visceral leishmaniasis is ca a) L. Donovani c) L. Tropica	aused dew to parasite. b) L. Mexicana d) Apicomplexa
		3)	Silk contain protein secrete a) Pectin c) Keratin	ed by silkworm. b) Sericin d) Caesein
		4)	Filaria disease is caused by a) Wuchereria bancrofti c) L.lacca	
		5)	Honey bees are also knowna) Apis melliferac) Apis dorsata	vn as Rock bees b) Apis Indica d) Apis floria
		6)	Malaria disease caused due to a) Plasmodium vivax c) Aedes	parasite. b) Culex d) L.donovani
		7)	Lac is separated from insec a) Apis dorsata c) Earthworm	
		8)	Sleeping sickness is also known a a) Leishmaniasis c) Malaria	as b) Trypanosomiasis d) Dengue
		9)	is largest silk producer stat a) Assam c) Karnataka	te in India b) Maharashtra d) UP
		10)	Silk is obtained from of silk a) Egg c) Pupa	kworm. b) Larva d) Cocoon

	B)	fill in the blanks OR write true/false.	06
		Honey bees belongs to family Bombycidae.	
		a) True b) False	
		2) Sleeping sickness is caused due to Leishmania donovania.	
		a) True b) False	
		3) Worker bees are also known as nurse bees.	
		a) True b) false	
		4) Rice weevil belongs to family Riccinidae.	
		a) True b) False	
		5) Honey, silk, lac are secretary substances of plants.	
		a) True b) False	
		6) Mulberry' silkworm is known as Tasar silkworm. a) True b) False	
		a) True b) Faise	
0.2	Δne	wer the following.	16
Q.2	a)	Describe dengue disease	
	b)	Describe economic importance of lac	
	c)	Describe products of Apiculture	
	ď)	Enlist types of parasites	
	•	•	
Q.3	Ans	wer the following.	16
	a)	Describe rearing of non-mulberry silkworm.	
	b)	Describe life cycle of apiculture and give its economic importance.	
	_		
Q.4		wer the following.	16
	a)	Describe malaria disease in detail.	
	b)	Describe types of honey bees and describe structure of honey comb.	
Q.5	۸ne	wer the following.	16
Q.5	a)	Describe the mode of transmission and control on Leishmaniasis.	10
	b)	Describe life cycle of lac insect.	
	ω,	Boothise ine cycle of the inecot.	
Q.6	Ans	wer the following.	16
	a)	Describe the types of parasites in detail.	
	b)	Describe the life cycle of Bombyx mori and give its economic importance.	
Q.7		wer the following.	16
	a)	Explain biological pest control with examples.	
	b)	Describe parasitic adaptations in detail.	

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Seat	Cot	D
No.	Set	F

	М.	Sc. (S	Semester - IV) (New) (CBCS ZOOLO	-	amination: Oct/Nov-2023	
			Animal Biotechnolog		MSC31401)	
-			nday, 18-12-2023 To 06:00 PM		Max. Mark	s: 80
Instr	uctio	2	Q. Nos. 1 and. 2 are compulsory Attempt any three questions fron Figure to right indicate full marks	n Q. I	No. 3 to Q. No. 7	
Q.1	A)	Cho 1)	detect RNA in tissue sample. a) Northern blotting	b)	nolecular biology research to Southern blotting All the above	10
		2)	DNA sequencing method using to called as method. a) Sanger c) Enzymatic	he ch b) d)	-	
		3)	In eukaryotes, transcription is ini a) RNA polymerase I c) RNA polymerase III	b)	RNA polymerase II	
		4)	The lac operon concept in E.coli a) H.G. Khorana c) Jacob and Monad	b)	Watson and Crick	
		5)	Bacterial RNA polymerase has _ a) three c) five	b) d)	sub-units. four six	
		6)	DNA only transposons possess (a) Transposease c) Transcriptase	genes b) d)		
		7)	contamination in cell culturalFungalMycoplasmal	re is b) d)	difficult to control. Bacterial All of the above	
		8)	Platelets are the cell fragments, from a a) macrophage c) erythrocytes	lackir b) d)	ng a nucleus, that breaks off megakaryocyte monocyte	
		9)	is the rapid method of D a) PCR c) GISH	NA cl b) d)	oning without host cell. FISH Blotting	
		10)	What are the basic units from what an Kidney cells c) Stem cells	nich h b) d)	uman cells can be repaired: Heart cells Nerve cells	

	в)	1) Protein sequencing was discovered by 2) Genetically active areas of chromosomes are called 3) is the process of DNA synthesis from DNA. 4) The coding nucleotide sequences in DNA are called 5) AUG is initiation codon codes for amino acid. 6) is the rapid method of DNA cloning without host cell.	06
Q.2	a) b)	wer the following. Write a note of cell clones. Give a note on RNA processing. Discuss in brief haploidy. Explain the types of somatic embryogenesis.	16
Q.3	Ans a) b)	wer the following. Write an essay on transgenic animals and their application. Describe the stemcell disorder with a note on stem cell therapy.	10 06
Q.4	Ans a) b)	swer the following. Discuss in detail the regulation of gene expression. Give a brief explanation on ethical issues in human cloning.	10 06
Q.5	Ans a) b)	wer the following. Write an account on micropropagation of plants. Describe green house management.	08 08
Q.6	Ans a) b)	Explain the diversification in early embryo. Add a note on haematopoitic stem cells. Differentiate mechanism of transcription of prokaryotic and eukaryotic cells.	08 08
Q.7	Ans a) b)	swer the following. Give an account on post translational modification of proteins. Write a note on mechanisms of gene transfer.	10 06

Set	Sat	D
No.	Set	P

	M.	Sc. ((Semester - IV) (New) (CBCS) Exan ZOOLOGY	nination: Oct/Nov-2023
			Applied Zoology (MSC3	1402)
			uesday, 19-12-2023 M To 06:00 PM	Max. Marks: 80
Instr	uctio	2	1) Q. Nos. 1 and. 2 are compulsory. 2) Attempt any three questions from Q. No. 3) Figure to right indicate full marks.	3 to Q. No. 7
Q.1	A)	Mul 1)	Itiple Choice Questions- The gametes (both eggs and sperm) are fallopian tubes using a surgical procedur a) Spectroscopy b) c) Microscopy d)	e called
		2)	In IVF, a human egg is fertilized with spe implanted into a a) Ovary b) c) Uterus d)	rm in a laboratory then Oviduct Vasdeference
		3)	is traditionally considered as the particle. a) Louis Pasteur b) c) Alexander Flemming d)	= = = = = = = = = = = = = = = = = = = =
		4)	Currently, the most common method of ca) Use of copper T b) c) Use of Pills d)	contraception in India is Female sterilization All
		5)	Lymphocyte production of antibodies is a a) Humoral immunity b) c) Intimate immunity d)	an example of Cellular immunity All
		6)	Major histocompatibility complex (MHC) pivotal role in the adaptive branch of the a) Excretory b) c) Reproductive d)	system.
		7)	The first vaccine to be developed through against a) COVID-19 b) c) Hepatitis B d)	n genetic engineering was Plague AIDS
		8)	ELISA test used for detection of d a) HIV b) c) Diabetes d)	isease. Dengue Chicken gunia
		9)	Bacteria, viruses, fungi, and biological to a) Biological welfare b) c) Biodiversity conservation d)	Biological warfare

		10)	tren belo	natodes (roundworms) natodes(flatworms) are ongs to Protozoans Helminthes	,	'nc	<i>,</i> ,	
	B)	Writ 1) 2) 3) 4) 5) 6)	Two ava Inna Imm bon Hen bloc Veri was	emarrow. natological tests can he od- clotting disorders, a	nd vitrification wn as genetic attibodies are elp diagnose and leukemia. Iral process vitructures into	i. gl ai wh	or natural immunity. lycoproteins produced by nemia, infection, hemophilia, nereby Tape worms convert	06
Q.2	Ans a) b) c) d)	Amni IVF s Scop	er the following. Amniocentensis VF sterility and its treatment Scope of Immunology Manager of Vermiculture					16
Q.3	Ans a) b)	Desc	ribe	ollowing. collection and cryopres ccount on surrogate pr				08 08
Q.4	Ans a) b)	Desc	ribe (ollowing. common methods of bi ccount on veterinary pa	•	ar	e.	10 06
Q.5		Desc	ribe l	ollowing. HLA system in human. ccine? Explain DNA va				08 08
Q.6	Ans a) b)	Give	an a	ollowing. ccount on blood bank p ccount on vermitechno				08 08
Q.7	Ans a) b)	Desc	ribe	ollowing. cell mediated immunity ccount on Blood cell R		of	blood for hepatitis and ELISA	08 08

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Seat		Set	D
No.		Set	

M.Sc. (Semester - IV) (New) (CBCS) Examination: Oct/Nov-2023

		`		ŹÒOLO	ĠΥ		
		Er	nvir	onmental Biology and		icology (MSC31403)	
-				sday, 20-12-2023 06:00 PM		Max. Marks:	80
Instr	uctio	2)) Atte	estion no. 1 and 2 are compu empt any three questions fro ure to right indicate full mark	m Q.		
Q.1	A)	Choo 1)	Wh gree a) b) c)	enhouse effect? Absorption and re-emission Absorption and re-emission	of ul	ason for producing the atmospheric traviolet radiations by the atmospher frared radiations by the atmosphere sible light by the atmosphere	10
		2)	of w a)	cherichia coli is used as an in vater with: Heavy Metals Fecal matters	b) d)	or organism to determine pollution Industrial Effluents Pollen of aquatic plants	
		3)	a)	ich of the following is an exa DDT Chlordane	mple b) d)	of a natural pesticide? Heptachlor Rotenone	
		4)	a)	Temperate grasslands	b)	in which type of ecosystem? Agro ecosystems Wet deciduous forests	
		5)	the a)	following gases?	4 was b) d)	o due to the leakage of which of DDT Dioxins	
		6)	Pho a) c)	otosynthesis and respiration Nitrogen cycle Phosphorus cycle	are c b) d)	entral to which cycle? Carbon cycle Sulfur cycle	
		7)	a)	ere do we find reservoir for s Land Earth's crust	edim b) d)	ientary type nutrient cycling? Sea Atmosphere	
		8)		word "Limne" mean? Stream Pond	b) d)	Lake All of above	
		9)		e three mile island is famous it hosted the Kyoto protocol it was the site of a large oil it was a site of nuclear accid	spil	·	

d) it hosted the earth summit

		10) How many methods of rainwater harvesting are there? a) One b) Two	
		c) Three d) Four	
	B)	Fill in the blanks. 1) Damage to leaf structure by air pollutants causes 2) Threshold of pain to human ears is 3) CO has affinity for haemoglobin times more than oxygen. 4) work as bio indicator of environmental pollution. 5) Largest ecosystem of the earth is 6) pesticides affect the nervous system by disrupting the enzyme.	06
Q.2	a) b) c)	swer the following. Explain Minamata disease? Explain physical and chemical properties of metals? Describe Waste water management? Explain characteristics of population ecology?	16
Q.3	a)	swer the following. What is pesticides? Explain its types in brief. Discuss effects and control of water Pollution.	08 08
Q.4	a)	swer the following. What is dynamics of ecosystem, explain aquatic ecosystem in detail. Write a note on legislation and Indian standards of pollution levels.	08 08
Q.5	a)	swer the following. Briefly describe the causes, effects and control of radioactive pollution. Describe Management of Green House.	08 08
Q.6	a)	swer the following. What is toxic agent? Give its Classification and also describe modes of toxic agents. Describe the biological indicators of pollution.	08 08
Q.7	An: a) b)	swer the following. Give an account on rain water harvesting with diagram. What is ecosystem? Describe its types also write a note on: i) Savannas ii) Arctic tundra	08 08

Set No.	Set	Р
NO.		

M.Sc. (Semester - IV) (New) (CBCS) Examination: Oct/Nov-2023

		(ZOOLOGY	
		Zoo	keeping and Animal House Management (MSC31406)	
-			nursday, 21-12-2023 Max. M M To 06:00 PM	larks: 80
Instr	uctic	2	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)	Cho 1)	oose correct alternative. In a national park, protection is provided to a) flora and fauna b) entire ecosystem c) fauna only d) flora only	10
		2)	Conservation in the natural habitat is a) in situ b) ex situ c) zoo d) botanical garden	
		3)	The important character of Cobra is a) Presence of hood b) Small scales on head c) Rounded tail d) None of these	
		4)	It is difficult to keep King Cobra in a Zoo because a) Food of king cobra is snakes only b) King cobra refuses to feed in captivity c) King cobra needs a suitable partner d) With other animals it becomes lethargic	
		5)	Cryopreservation involves storage of gamets in liquid nitrogen at a) -296 0C b) 159 0C c) -196 0C d) 100 0C	
		6)	Red data book provides data on a) Red flowered plants b) Red colored fishes c) List of plant and animals d) endangered plants and animals	
		7)	One of the first acts in taxonomy is a) Identification b) Description c) Naming d) Classification	
		8)	Which of the following is the smallest bird? a) Pigeon b) Parrot c) Humming bird d) House sparrow	
		9)	It is the largest living bird on Earth a) Emu b) Albatross c) Siberian Crane d) Ostrich	
		10)	Animals that are routinely infected with a protozoan or parasite are termed as a) definitive host b) intermediate host c) reservoir host d) parasitic host	

	B)	Fill i	Whi a) b) c)	e blanks OR write true ch two animals are thr Elephant's ivory Rhino horns and Ele Ibex Horns Crocodile and Cheeta	eaten by po	ac	hers and traders?	06
		2)	a)	nmalians and birds are carnivores warm-blooded	b) d)		cold-blooded herbivores	
		3)	a) c)	National Park was Jim Corbett Kaziranga)	nal park of India. Nanda Devi Jaldapara	
		4)	mor a)		ent and futu b)	re)	ecological integrity of one or generations is known as Bioreserves National Parks	_•
		5)	a) b) c)	Bird Flu or Avian Influ	_	rds	s causing a mass extinction?	
		6)	a)	nmon pests of a zoo bi Avian flea Mosquito	rds areb) d)	,	Head louse Wasp	
Q.2	Ans a) b) c) d)	Beha Ethic Avia	vior o al iss n Dise	llowing. of Land birds ues of Zoo eases areness programs in a	Z 00			16
Q.3	Ans a) b)	Expl	ain Ho	llowing. ousing and feeding bel anagement of Rodents		co	odiles.	08 08
Q.4	Ans a) b)	Give	an a	llowing. ccount on Managemer ccount ex-situ Conserv		nt.		08 08
Q.5	Ans a) b)	Desc	ribe I	llowing. Management of grain eccount on Veterinary s		cro	ocodiles in zoo.	08 08
Q.6	Ans a) b)	Give Wha	an ad t is ta	Ilowing. ecount on first aid to th xidermy? Give its impo fish mounts?			and visitors. axidermist prepares head,	08 08
Q .7	Ans a) b)	Ident	ificati	llowing. on of Snakes.	nt of aquatic	bii	rds	08 08

Set No.	Set	Р

	IVI.	3 C. (Sem	ester - IV) (Ne	ZOOLOGY		mination: Oct/Nov-2025					
				Fishery	Science (M		1407)					
Day & Date: Thursday, 21-12-2023 Max. Time: 03:00 PM To 06:00 PM												
Insti	uctio	2	2) Atte	Nos. 1 and. 2 are empt any three qu ure to right indica	estions from C	Q. No.	3 to Q. No. 7					
Q.1	A)	Cho 1)		correct alternation hbay duck is Marine Estuarian		b) d)	Freshwater Brackish	10				
		2)	are	uper class pieces collectively called Holocephali Placoderms		b) d)	are completely extinct and Dipnoi Elasmobranchi					
		3)	•	noi arefish Lung Extinct	es.	b) d)	Gill Warm blooded					
		4)	Juv a) c)	enile fish is a Adult Larvae	stage in fis	h. b) d)	Egg Sterile					
		5)		which losses larv d Egg Caterpillar	/al characters i	s like b) d)	a miniature adult and is Toad Fingerlings					
		6)	Fisher called a) c)	_		water b) d)	to sea or vice versa is Anadromous Potadromous					
		7)	a) c)	by products is Fish blue Liver oil	prepared from	n skin b) d)	, fins and bones of fishes. Fish oil Issin glass					
		8)	Pho a) c)	tophores are Sound Electric	producin	-	ans in fishes. Light Egg					
		9)	Cat a) c)	la, rohu, mrigal ar Indian minor ca Exotic carps		called b) d)	as Indian major carp Chinese carp					
		10)		pedo fish have Light Flying	orga	ns. b) d)	Sound Coloration					

	в)	1)	In fis	s blanks OR Wr shes kidney is m True		b)	False	06		
		2)	Heterocercal and homocercal are terms related with gills. a) True b) False							
		3)	Catla, rohu and mrigal are Chinese carps. a) True b) False							
		4)		ling, smoking, fr True	izzing and dryin	g are b)	processes of preserva False	tion.		
		5)	Issir a)	n glass is prepar True	ed from air blad	lder c b)	of fish. False			
		6)	Biolo a)	uminescence is True	not found in fish	nes. b)	False			
Q.2	a) b) c)	Desc Give Anad	wer the following. Describe general characters of Class Osteichthyes. Give an account on polyculture. Anadromous migration. Give an account on amazing fishes.							
Q.3	a)	swer the following. Describe role of plankton in fisheries. Explain light producing organs in fishes.								
Q.4	a)	swer the following. Give an account on conventional methods in fishery. Give an account on by-products of fishes.								
Q.5		swer the following. Give an account on craft and gears. Describe venom and venomous gland in fishes.								
Q.6	a)	swer the following. Describe freshwater ecosystem and faunal diversity of it. Describe types of fish culture.								
Q.7	a)	Desc	ribe t	llowing. Types of hatchericcount of identifi		on, ne	ekton and benthos.	08 08		