SLR-GS-1

Seat No.	

Set P

M.Sc. (Semester - I) (New) (CBCS) Examination: Oct/Nov-2022
(ZOOLOGY)
Biosystematics

Day & Date: Monday, 13-02-2023 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

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 indicates full marks.

Q.1. a) Multiple Choice Questions **10**

1) _____ is the way to determine the relationship of organisms.
   a) Cladistics taxonomy b) Numerical taxonomy
   c) Molecular taxonomy d) Both a & b

2) In _____ kingdom Arcaea and nitrogen fixing organisms are classified.
   a) Plantae b) Fungi
   c) Animalia d) Moneria

3) Insects are preserved in _____ for longer time.
   a) Distilled water b) Normal water
   c) 70% alcohol d) Oil

4) In _____ International Congress of Zoology was organized an ICZN to formulate a set of rules, which would be binding for all taxonomical publications.
   a) 1840 b) 1964
   c) 1972 d) 2013

5) _____ is known as the "The Father of biological classification".
   a) Sibley in 1954 b) White 1975
   c) Aristotle d) Blackwelder 1967

6) The term "New Systematics" was introduced by _____.
   a) Bentham and hooker b) Linnaeus
   c) Julian Huxley d) A.P. Candolle

7) Phylogenetic classification is the one which is based on a _____.
   a) Over all similarities b) Utilitarian system
   c) Habits of animals d) Common evolutionary descent

8) _____ is not converted under taxonomy.
   a) Gamma taxonomy b) Beta taxonomy
   c) Alpha taxonomy d) Delta taxonomy

9) Organizing taxonomic information in biological classification is known as _____.
   a) Systematics b) Phonetics
   c) Phylogenetics d) Dendrogram

10) _____ is the best method for understanding study of amino acids and hormones.
   a) Cytotaxonomy b) Experimental taxonomy
   c) Numerical taxonomy d) Chemotaxonomy

b) Fill in the blanks. **06**

1) Family tree is represented by _____.
2) Ataxon which contains _____.
3) In homologous speciation's _____ are found in an organism.
4) International code for biological nomenclature is applicable to both _____.
5) Reproductively isolated, morphologically similar sympatric population is a _____.

Q.2 Answer the followings **16**

a) Describe in short apomixes.
b) Describe cladogram and give an example.
c) Describe various types of keys in taxonomy.
d) What is nucleic acid sequence and phylogeny explain by giving an example.

Q.3 Answer the followings **16**

a) Give an account on theories of biological classification.
b) Describe chemotaxonomy with suitable examples.

Q.4 Answer the followings **16**

a) Explain in detail ICZN rules of taxonomy.
b) What are the applications of biosystematics?

Q.5 Answer the followings **16**

a) Describe both evolutionary and biological speciations.
b) Explain different types of publications in biosystematics.

Q.6 Answer the followings **16**

a) Describe difference between panmictic and apomictic speciations.
b) Construct a phylogenetic tree.

Q.7 Answer the followings **16**

a) Describe parsimony method.
b) What are different methods of taxonomic collections and preservations.

SLR-GS-2

Seat No.	

Set P

M.Sc. (Semester - I) (New) (CBCS) Examination: Oct/Nov-2022
(ZOOLOGY)
Tools and Techniques in Biology

Day & Date: Tuesday, 14-02-2023 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

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) Choose correct alternative. (MCQ) **10**

1) The study of interaction between electromagnetic radiation and matter is known as _____.
   a) Spectroscopy b) Chromatography
   c) Blotting d) PCR

2) Numerical aperture is related to _____.
   a) Black hole b) Resolving power of microscope
   c) Digital data d) Size of sample for TEM

3) Polymerase used for PCR is extracted from _____.
   a) *Escherichia coli* b) *Homo sapiens*
   c) *Thermus aquaticus* d) *Saccharomyces cerevisiae*

4) The growth of animal cells in vitro in a suitable culture medium is called _____.
   a) Gene expression b) Transgenesis
   c) Plant tissue culture d) Animal cell culture

5) The process of preservation of cells for later use by freezing stocks in liquid nitrogen is referred to as _____.
   a) Fermentation b) Chilling
   c) Canning d) Cryopreservation

6) If a radiolabel is used to tag a DNA molecule, the technique used to localize would be _____.
   a) X-ray crystallography b) Autoradiography
   c) Fluorescence microscopy d) Electron microscopy

7) Which of the following is a spectroscopic technique used to observe local magnetic fields around atomic nuclei?
   a) Optical spectroscopy b) Atomic spectroscopy
   c) Mass spectroscopy d) NMR spectroscopy

8) The chemical nature of agarose used in electrophoresis is _____.
   a) Glycoprotein b) Polysaccharide
   c) Polypeptide d) Glycolipid

9) A key technique for separating and analyzing the various elements of a cellular homogenate is known as _____.
   a) Centrifugation b) Hybridization
   c) Chromatography d) Electrophoresis

10) The process of nucleic acid blotting technique which detect specific mRNA molecules is known as_____.
a) Southern blotting b) Northern blotting
c) Western blotting d) Eastern blotting

B) Fill in the blanks OR Write true/false. **06**

1) In luminescence-based cell viability test Luciferase enzyme is used.
a) True b) False

2) Affinity chromatography would be best to separate a protein that binds strongly to its substrate.
a) True b) False

3) In Fourier Transform Infrared (FTIR) spectrometer, size has increased over the years.
a) True b) False

4) The study of interaction between electromagnetic radiation and matter is known as chromatography.
a) True b) False

5) Cell line is defined as the sub culturing of primary cell culture.
a) True b) False

6) The most commonly used gel for cell immobilization is Alginate
a) True b) False

Q.2 Answer the following. **16**

a) Autoradiography
b) Cell viability testing methods
c) PCR
d) Cryopreservation

Q.3 Answer the following. **16**

a) Electron microscope- TEM
b) X Rays in biology

Q.4 Answer the following. **16**

a) Culture medium preparation
b) Modem advances in cell culture techniques

Q.5 Answer the following. **16**

a) Cell hybrids and its applications
b) Fusions in different cell cycles phases

Q.6 Answer the following. **16**

a) Freeze drying and freeze fractioning techniques
b) Cryotomy

Q.7 Answer the following. **16**

a) What is radioactivity and explain its measurement techniques?
b) Define centrifuge and add subcellular fractionation.

SLR-GS-3

Set No.	

Set P

M.Sc. (Semester - I) (New) (CBCS) Examination: Oct/Nov-2022
(ZOOLOGY)
Cell and Molecular Biology

Day & Date: Wednesday, 15-02-2023 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

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) Choose the most correct alternative for given multiple choice question. **10**

1) The nature of membrane lipids is _____.
   a) Hydrophilic b) Hydrophobic
   c) Amphipathic d) Uncharged

2) _____ is present only in plants.
   a) Tight junctions b) Gap junctions
   c) Plasmodesmata d) Desmosomes

3) The Na^+/K^+ pump is the example of _____ ATPase.
   a) P-type b) V-type
   c) F-type d) ABC-type

4) Lysosomes are associated with _____.
   a) Synthesis b) Respiration
   c) Storage d) Digestion

5) The mitochondrial _____ regionis involved in oxidative phosphorylation.
   a) intermembrane space b) outer membrane
   c) Matrix d) inner membrane

6) The diameter of microfilament is _____.
   a) 25 nm b) 7 nm
   c) 10 nm d) 50 nm

7) During mitosis the spindle fibres are formed from _____.
   a) actin filament b) myosin filament
   c) Microtubule filament d) Intermediatary filament

8) A C-terminal peptide sequence with four amino acids, Lys-Asp-Glu-Leu (KDEL) directs to _____.
   a) Mitochondria b) endoplasmic reticulum
   c) Nucleus d) Peroxisomes

9) Ubiquitin marks the cytosolic proteins for degradation in _____.
   a) Proteasomes b) Lysosomes
   c) Endosomes d) Phagosomes

10) _____ cancer does not form a solid neoplasm.
   a) Brain b) Leukemia
   c) Blastoma d) Sarcoma

B) Fill in the blanks. **06**

1) _____ is lipid component of membrane which helps membrane fluidity in both high and low temperature.
2) _____ is called as the power house of the cell.
3) The motor protein associated with actin filament is _____.
4) Membrane proteins are synthesized on _____.
5) _____ is property of cancer cell in which malignant cell migrate from its primary site and invades another tissue and causes spread of cancer.
6) _____ produces free cytosolic connection between two adjacent cells in animals.

Q.2 Answer the following. **16**

a) Write a note of simple diffusion and facilitated diffusion.
b) With neat labelled diagram explain the structure of Golgi bodies.
c) Discuss in brief the biogenesis of mitochondria.
d) Explain the types of carcinogens.

Q.3 Answer the following.

a) Write an essay on molecular composition of biological membrane. **10**
b) Describe the structure and function of nucleus. **06**

Q.4 Answer the following.

a) Discuss in detail the uptake of protein into endoplasmic reticulum. **10**
b) Explain the structure and function of intermediate filament. **06**

Q.5 Answer the following.

a) Write an account on treatment of cancer. **10**
b) Describe the structure and function of endoplasmic reticulum. **06**

Q.6 Answer the following.

a) Explain the structure and dynamics of microtubule. **10**
b) Discuss the structure of collagen. Add a note on its types and role in cell matrix. **06**

Q.7 Answer the following.

a) Give an account on post translational modification of proteins. **10**
b) Write a note on gap junction and tight junction. **06**

SLR-GS-4

Seat No.	

Set P

M.Sc. (Semester - I) (New) (CBCS) Examination: Oct/Nov-2022
(ZOOLOGY)
Population Genetics and Evolution

Day & Date: Thursday, 16-02-2023 Max. Marks: 80
Time: 03:00 PM To 6:00 PM

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) Choose correct alternative. (MCQ) **10**

1) _____ is not explained by the theory of natural selection?
   a) The ability to survive and reproduce
   b) Prodigality of production
   c) Competition
   d) Physical strength

2) Which of the following is meant by the term Darwin Fitness?
   a) The ability to survive and reproduce
   b) Aggressiveness
   c) Healthy appearance
   d) Physical strength

3) The tendency of offspring to differ from parent is called _____.
   a) Variation b) Heredity
   c) Inheritance d) resemblance

4) The term evolution was given by_____.
   a) Lamark b) Mendel
   c) Darwin d) Herbert spencer

5) The effect of natural selection may be countered by _____.
   a) Gene flow b) Genetic Drift
   c) Mutation d) Inbreeding

6) What is the ultimate source of genetic variation?
   a) Selection b) Migration
   c) Genetic drift d) Mutation

7) Which of the following would cause deviation from the hardy Weinberg equilibrium?
   a) Small population
   b) Isolated
   c) Random
   d) Lack of selection pressure no mutation

8) Two animals considered of different species if they _____.
   a) A geographically isolated b) look different
   c) Live in different d) cannot interbreed

9) Which of the following is the first step in allopatric speciation?
   a) Genetic drift b) Hybridization
   c) Geographical isolation d) Polyploidy

10) Darwin's finches are example of _____.
a) Reproductive isolation b) Post zygotic isolation
c) Adaptive radiation d) pre zygotic isolation

B) Fill in the blanks OR Write True/False **06**

1) The theory of use and disuse was given by Darwin.
2) _____ is the equation of hardy Weinberg equilibrium.
3) Mating with relatives is called _____.
4) Genetic drift is also called _____.
5) Sympatric speciation occurs most commonly in Plants.
6) The present day epoch is _____.

Q.2 Answer the following. **16**

a) Genetic drift
b) Parapatric model of speciation
c) Reproductive isolation
d) Hardy Weinberg law

Q.3 Answer the following. **16**

a) Ecological significance of molecular variation
b) Role of mutation in evolution

Q.4 Answer the following. **16**

a) Describe in detail migration.
b) Explain the principle of Lamarckism.

Q.5 Answer the following. **16**

a) Discuss eukaryotic evolution based on different gene families.
b) Describe patterns and mechanism of reproductive isolation.

Q.6 Answer the following. **16**

a) What is speciation? Describe models of speciation.
b) Give an account on Adaptation

Q.7 Answer the following. **16**

a) Give an account on neo Darwinism
b) Give detailed account of destabilizing forces.

SLR-GS-6

Seat No.	

Set P

M.Sc. (Semester - II) (New) (CBCS) Examination: Oct/Nov-2022
(ZOOLOGY)
Developmental Biology

Day & Date: Monday, 20-02-2023 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

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) Fill in the blanks by choosing correct alternatives given below. **10**

1) Centrolecithal eggs are the characteristics of _____.
   a) Placental mammals b) Insects
   c) Birds d) Reptiles

2) An egg that is fully developed and mature is called _____.
   a) Oocyte b) Oogonium
   c) Ovum d) Haploid

3) The hydrolytic enzymes of spermatozoa are located at _____.
   a) Flagellum region b) Acrosome
   c) Head region d) Neck region

4) The developmental stage which immediately follows Cleavage is _____.
   a) Gastrulation b) fertilization
   c) Blastulation d) Growth

5) Blastulation results in _____.
   a) A decrease in the zygote total mass
   b) No change in the total zygote mass
   c) A non-specific change in the total zygote mass
   d) An increase in the zygote total mass

6) Neurons develop from _____.
   a) Neuroblasts b) Ependymal cells
   c) Ependymal cells d) Diocoele

7) In chick, retinoic acid is involved in the formation of _____.
   a) Brain b) Limbs
   c) Heart d) Eyes

8) Anterior end of neural groove forms future.
   a) Liver b) Spinal cord
   c) Heart d) Brain

9) Which of the following is not a part of unfertilized egg of frog?
   a) Acrosome b) Vitelline membrane
   c) Animal hemisphere d) Vegetal pole

10) Number of pairs of somites present in 26 hrs chick embryo is _____.
   a) 4 b) 6
   c) 8 d) 5

B) Fill in the blanks OR Write true/false **06**

1) Amphimixis is the fusion of egg and sperm nuclei.
   a) True b) False
2) Polyspermy is penetration of one sperm into an ovum.
   a) True b) False
3) Acrosin is an enzyme produced by the acrosome that dissolves zona pellucida of the ovum.
   a) True b) False
4) Albumen is a glycoprotein which serves as food and also provides wet environment to embryo.
   a) True b) False
5) The solid mass of cells formed as a result of cleavage is known as Gastrula.
   a) True b) False
6) The transformation of the spermatogonia into spermatozoon is called spermiogenesis.
   a) True b) False

Q.2 Answer the following **16**

a) Acrosome reaction
b) Prevention of polyspermy
c) Vitellogenesis
d) Cleavages in Frog

Q.3 Answer the following **16**

a) Meiosis/oogenesis and evolution of sexual reproduction
b) Types of eggs on the basis of distribution of yolk

Q.4 Answer the following **16**

a) Capacitation
b) Formation of three germ layers in Frog

Q.5 Answer the following **16**

a) Development of limbs in mammals.
b) Patterns of apoptosis in birds.

Q.6 Answer the following **16**

a) Fertilization in Drosophila
b) Gastrulation in Drosophila

Q.7 Answer the following **16**

a) The gap genes in Drosophila.
b) How anterior - posterior axis is specified in Drosophila?

SLR-GS-7

Seat No.	

Set P

M.Sc. (Semester - II) (New) (CBCS) Examination: Oct/Nov - 2022
(ZOOLOGY)
General and Comparative Endocrinology

Day & Date: Tuesday, 21-02-2023 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

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) Fill in the blanks by choosing correct alternatives given below. 10

1) _____ is known as father of Endocrinology.
   a) Thomas Addison b) Edward
   c) kelvin d) Adward

2) The term _____ was suggested by Startling in Endocrinology.
   a) enzyme b) hormone
   c) saliva d) blood

3) Hypothyroidism in children causes _____.
   a) cretinism b) myxedema
   c) gigantism d) dwarfism

4) Hypoparathyroidism leads to _____.
   a) osteoporosis b) goiter
   c) tetany d) myxeodema

5) Hyposecretion of adrenal cortex leads to _____.
   a) Adissons disease b) goiter
   c) diabetes d) myxeodema

6) Over secretion of GH of pituitary gland leads to _____.
   a) dorphism b) gigantism
   c) diabetes d) all the above

7) Under secretion of GH hormone of pituitary gland is responsible for _____.
   a) cushing b) cretinism
   c) dwarfism d) goiter

8) Duodenum secretes _____ as a gastrointestinal hormone.
   a) relaxin b) LH
   c) estrogen d) cholecystokinine

9) _____ is secreted by gastrointestinal tract.
   a) secretin b) PTH
   c) GH d) GNRH

10) Sexual behavioural character is controlled by _____ hormone.
   a) ADH b) GnH
   c) TH d) PTH

B) Fill in the blanks OR Write true/false **06**

1) _____ introduced the term new systematics.
2) _____ often referred the father of taxonomy.
3) _____ spaces inhabiting different types of geographical areas.
4) In sympatric species occupies same geographical area.
5) The sibling species show different species.
6) Monotype expresses contains a single sub spacing.

Q.2 Answer the following **16**

a) Hormonal role in colour change.
b) Functions of Leydig cell.
c) Explain functions of hormone testosterone.
d) Functions of hormone Oxytocin.

Q.3 Answer the following **16**

a) Explain hormonal role in behaviour.
b) What is the role of hormones in metabolism?

Q.4 Answer the following **16**

a) Describe hormonal role in implantation.
b) Describe various types of hormones in gastrointestinal tract.

Q.5 Answer the following **16**

a) Enlist the hormones involved in gestation and pregnancy.
b) Describe structure and functions of steroid hormones.

Q.6 Answer the following **16**

a) Explain hormonal role in differentiation of gonads genital duct and genitalia.
b) What is the role of hormones in metamorphosis in insects?

Q.7 Answer the following **16**

a) Hormones involved in homeostasis.
b) Hormonal role in secretion, transportation and degradation.

SLR-GS-8

Seat No.	

Set P

M.Sc. (Semester - II) (New) (CBCS) Examination: Oct/Nov - 2022
(ZOOLOGY)
Environmental Physiology

Day & Date: Wednesday, 22-02-2023 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

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) Fill in the blanks by choosing correct alternatives given below. **10**

1) Blood is called blood tissue due to presence of _____.
   a) Blood cells b) Platelets
   c) Antibodies d) Both a and b

2) "Lub" sound is produced when the _____.
   a) Ventricles are fully contracted
   b) Ventricles start to relax
   c) Bicuspid and tricuspid valves suddenly closed
   d) Semilunar valves are closed

3) Which of the following plays the biggest role in maintaining Homeostatic?
   a) The liver
   b) The gall bladder
   c) The pancreas
   d) The pancreas and gall bladder are tied

4) QRS-complex occurs during which phases?
   a) A trial depolarization b) Ventricular depolarization
   c) A trial repolarization d) Isovolumetric systole

5) During acclimatization to high altitude all the following take place except _____.
   a) Increase in minute ventilation
   b) Increase in the sensitivity of central chemoreceptors
   c) Increase in the sensitivity of carotid body to hypoxia
   d) Shift in the oxygen dissociation curve to the left

6) Sound which has Jarring effect on ears is _____.
   a) Noise b) music
   c) pleasant sound d) soul music

7) The volume of air breathed in and out during effortless respiration is referred to as _____.
   a) Vital volume b) Residual volume
   c) Tidal volume d) Ideal volume

8) Who was the first to describe the "fight or flight response"?
   a) Walter B. Cannon b) Sigmund Freud
   c) Atkinson Potter d) Mrunal Sengupta

9) Breathing rate above normal is called as _____.
   a) Bradypnoea b) Orthopnea
   c) Eupnea d) Tachypnoea

10) During acclimatization to high altitude all of the following take place except: _____.
   a) Increase in minute ventilation
   b) Increase in the sensitivity of central chemoreceptors
   c) Increase in the sensitivity of carotid body to hypoxia
   d) Shift in the oxygen dissociation curve to the left

B) Fill in the blanks OR Write true/false **06**

1) Sulphur ions control heart beats.
   a) True b) False
2) Hearing loss is an occupational disease.
   a) True b) False
3) Cardiac cycle is completed within 15 min.
   a) True b) False
4) In case of warm blooded animals body temperature changes according to the environmental temperature.
   a) True b) False
5) Adrenaline and cortisol hormones are stress hormones.
   a) True b) False
6) “Dub” sound is produced when the _____.

Q.2 Answer the following **16**

a) Effects of occupational stress
b) Levels of adaptation
c) Industrial health
d) Fatigue

Q.3 Answer the following **16**

a) Describe the organ system adaptation.
b) Describe the industrial health hazards.

Q.4 Answer the following **16**

a) Explain the Causes of stress.
b) Write an account on concept of homeostatic.

Q.5 Answer the following **16**

a) Describe neural and chemical regulation of heartbeat.
b) Describe man machine and environmental system.

Q.6 Answer the following **16**

a) Environmental stress due to toxins.
b) Describe Cardiac cycle.

Q.7 Answer the following **16**

a) Describe ECG.
b) Describe acclimatization.

SLR-GS-10

Set No.	

Set P

M.Sc. (Semester - III) (New) (CBCS) Examination: Oct/Nov - 2022
(ZOOLOGY)
Molecular Cytogenetics

Day & Date: Monday, 13-02-2023 Max. Marks: 80
Time: 11:00 AM To 2:00 PM

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) Choose correct alternative. **10**

1) _____ was awarded Nobel Prize twice for sequencing of DNA and protein.
   a) Friedrich Meischer b) Fredrick Sanger
   c) Erwin Chargaff d) James Watson

2) Down syndrome results from three copies of chromosome number _____.
   a) 11 b) 21
   c) 18 d) 22

3) The first transposable genetic element discovered in bacteria are called as _____.
   a) R-elements b) Q-elements
   c) T-elements d) IS elements

4) Much of the bacterial DNA replication is catalyzed mainly by _____.
   a) DNA Polymerase-I b) DNA Polymerase-II
   c) DNA Polymerase-III d) DNA Polymerase-IV

5) _____ are absent in the genome of prokaryotes?
   a) Terminators b) Promoters
   c) Organizer d) Introns and histone proteins

6) The genome size of *Homo sapiens* is _____.
   a) 3 x 10% b) 1.5×10^{10}bp
   c) 6.8×10^{11}bp d) 10×3^{9}%

7) Individuals afflicted by sickle cell anemia have a mutant _____ of hemoglobin-A.
   a) β-chain b) α-chain
   c) θ-chain d) ω-chain

8) A condition in which one or few chromosomes are added or deleted from the chromosome number is called _____.
   a) Non-disjunction b) Euploid
   c) Dicentry d) Aneuploid

9) The haploid DNA content of individual species is called as _____?
   a) H-value b) C-value
   c) D-value d) 2N-value

10) In bacteria, the host cell factors that are produced in response to viral infection are called _____.

a) Enhancers b) Restriction Factors
c) Repressors d) Cloning Factors

B) Fill in the blanks. **06**

1) X-chromosome inactivation is also called as _____.
2) In humans, ____ is the most abundant SINE family in the genome.
3) _____ technique detects unique DNA segments known as RFLP.
4) A virus that infects bacteria is called as _____.
5) In Q banding technique _____ chemical use for staining of chromosomes.
6) Yeast Genome completed in the year _____.

Q.2 Answer the following. **16**

a) Write a note on heterochromatin.
b) Explain the principle and applications of FISH.
c) Discuss causes and symptoms of thalassemia.
d) Write a note on Morphology of T4.

Q.3 Answer the following. **16**

a) Give an account on DNA amplification and rearrangement with suitable examples.
b) Discuss salient features human genome based on the findings of Human Genome Project.

Q.4 Answer the following. **16**

a) Explain the principle, procedure and applications of Southern blotting technique.
b) Give an account on human karyotype and basis for nomenclature of chromosomes.

Q.5 Answer the following. **16**

a) Give a brief account on genomics and proteomics with significance.
b) Explain the cytogenetic effects of ionizing and non-ionizing radiations.

Q.6 Answer the following. **16**

a) Give an account on the mitochondrial genome.
b) Define and discuss transposable genetic elements with suitable examples.

Q.7 Answer the following. **16**

a) Give an account on the Yeast genome.
b) Define and discuss sex determination with reference to Drosophila.

SLR-GS-11

Seat No.	

Set P

M.Sc. (Semester - III) (New) (CBCS) Examination: Oct/Nov - 2022
(ZOOLOGY)
Biochemistry

Day & Date: Tuesday, 14-02-2023 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

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) Choose the most correct alternative for given multiple choice question **10**

1) The molecular weight of glucose is _____
   a) 150 b) 180
   c) 120 d) 210

2 _____ is a type of RNA, which is involved in gene silencing mechanism.
   a) miRNA b) rRNA
   c) tRNA d) mRNA

3) The hydrolysis of one ATP molecule yields _____ kcal/mol energy.
   a) -7.5 b) -30.5
   c) +7.5 d) +30.5

4) The _____ law of thermodynamics states that total energy of universe is constant.
   a) zeroth b) first
   c) second d) third

5) Glycogenin is_____
   a) Uncoupler of oxidative phosphorylation
   b) Protein primer for glycogen synthesis
   c) Polymer of glycogen molecules
   d) Intermediate in glycogen breakdown

6) The co-enzyme required for the amino acid metabolism is _____.
   a) Thiamine pyrophosphate b) NADPH
   c) Tetra hydrofolate d) Pyridoxal phosphate

7) After synthesis of sixteen carbon chain further long chain fatty acid synthesis takes place in _____.
   a) Nucleus b) Mitochondria
   c) Peroxisomes d) smooth endoplasmic reticulum

8) _____ is nucleotide form required during synthesis of phospholipids.
   a) ATP b) GTP
   c) CTP d) TTP

9) _____ method is used for immobilization of cells.
   a) Cross linking b) Entrapment
   c) Covalent binding d) Occlusion

10) The enzyme increase the rate of reaction by lowering the ____ of reaction.
   a) binding energy b) activation energy
   c) free energy d) Gibb's free energy

B) Fill in the blanks **06**

1 _____ is non-reducing disaccharide.
2) Total number of base pairs present in B-form DNA is _____.
3) Chemiosmotic hypothesis is explained by _____.
4) The reactions of glycolysis take place at _____ of eukaryotic cell.
5) After excessive fatty acid breakdown, excess acetyl CoA instead TCA cycle enters in _____.
6) The second digit in enzyme commission number represents _____.

Q.2 Answer the following. **16**

A) Explain in detail secondary structure of proteins.
B) Discuss the metabolic regulation during hypoxia.
C) Write a note on glycogen breakdown.
D) What is isoenzyme? Illustrate with one example.

Q.3 Answer the following **16**

A) Describe the isomerism properties of monosaccharide with examples. Add a note on glycosidic bond
B) Explain the components and mechanism of electron transport chain of oxidative phosphorylation.

Q.4 Answer the following **16**

A) Explain in brief the reactions of TCA cycle. Add a note on its energetics.
B) Discuss the outline of de novo biosynthesis of purines.

Q.5 Answer the following **16**

A) Explain in detail the reactions of glycolysis. Add a note on its regulation.
B) Derive an equation of Michaelis-Menten for enzyme kinetics.

Q.6 Answer the following **16**

A) Discuss in detail the various methods of enzyme immobilization.
B) Give the physiological roles of Vitamin A, Vitamin D and Vitamin E.

Q.7 Answer the following **16**

A) What is metabolism? Discuss the coordinated regulation of metabolism with suitable example.
B) Write a note on biosynthesis of fatty acids.

SLR-GS-12

Set No.	

Set P

M.Sc. (Semester - III) (New) (CBCS) Examination: Oct/Nov-2022
(ZOOLOGY)
Comparative Animal Physiology

Day & Date: Wednesday, 15-02-2023 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

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) Choose correct alternative. **10**

1) The enzymes present in pancreatic juice are _____.
   a) Amylase, Trypsinogen. Peptidase. Rennin
   b) Trypsinogen, Lipase, Amylase, Procarboxypeptidase
   c) Peptidase, Pepsin, Amylase, Rennin
   d) Maltase, Amylase, Trypsinogen, Pepsin

2) Humans use haemoglobin to carry oxygen in their blood. Similarly, mollusks and crustaceans use _____ to carry oxygen in their blood.
   a) Hemovanadin b) Hemerythrin
   c) Haemoglobin d) Hemocyanin

3) Night blindness is caused by _____.
   a) Hypermetropia b) Myopia
   c) Defective cornea d) Deficiency of rhodopsin

4) When the near objects are to be focused by our eye then the _____.
   a) Ciliary muscles are relaxed and lens is flattened to have maximum focal length
   b) Ciliary muscles are contracted and lens becomes maximum convex
   c) Ciliary muscles are relaxed and the lens becomes maximum convex
   d) Ciliary muscles are contracted and the lens becomes flattened

5) Aqueous humor keeps the eye ball _____.
   a) Hard b) Soft
   c) Firm d) Delicate

6) Which of the following controls involuntary action?
   a) circulatory system b) autonomic nervous system
   c) respiratory system d) excretory system

7) What is myosin?
   a) Muscle fibres b) Myofibrils
   c) Myocardium d) Myofilament

8) Hibernation in Frog takes place during _____.
   a) Winter b) Spring
   c) Summer d) Autumn

9) The circadian rhythm is controlled by a group of cell in the _____.
   a) Central nervous system b) brain stem
   c) Pituitary gland d) Hypothalamus

10) Light band have _____ of filament protein.
   a) Myosin b) Actin
   c) Myosin and actin d) Lysine

B) Fill in the blanks. **06**

1) _____ stimulates the production of gastric juice in the stomach.
2) Muscle fatigue is due to the accumulation of _____.
3) The least toxic excretory material is _____.
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 Answer the following. **16**

a) Feeding mechanism and its regulation in Amoeba
b) Myogenic heart
c) Define thermoregulation with suitable examples.
d) Visual impairment

Q.3 Answer the following.

a) Describe patterns of nitrogen excretion among different animal groups. **08**
b) Describe molecular mechanism of muscle contraction. **08**

Q.4 Answer the following.

a) Describe Physiology of Sleep discuss on sleep wave cycle. **08**
b) Describe physiology of Bioluminescence explain with examples. **08**

Q.5 Answer the following.

a) Describe Circulation of body fluids. **08**
b) Describe Physiology of hearing. Discuss on hearing aids. **08**

Q.6 Answer the following.

a) Describe reproductive cycle in mammals. Discuss role of hormones in mammals. **08**
b) Name the respiratory pigments in different animal groups explain it with suitable examples. **08**

Q.7 Answer the following.

a) Describe role of isoenzymes in cardiac physiology. **08**
b) Describe Physiology of light reception. **08**

SLR-GS-13

Set No.	

Set P

M.Sc. (Semester - III) (New) (CBCS) Examination: Oct/Nov-2022
(ZOOLOGY)
Economic Entomology

Day & Date: Wednesday, 15-02-2023 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

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) Choose correct alternative. (MCQ) **10**

1) _____is a field of science, which involves the study of insects that benefit or harm humans, domestic animals, and crops.
   a) Economic entomology b) Entomology
   c) Industrial entomology d) Economic biology

2) Silk contains a protein known as.
   a) Casein b) Fibroin
   c) Sericin d) Both (b) and (c)

3) Honey, silk and lac are _____.
   a) Artificial elements
   b) Secretory substance of plants
   c) Secretary substance of insects
   d) Cosmetic material

4) _____ and _____ are the two main producer of silk.
   a) China, Japan b) China, Burma
   c) China, India d) China, Brazil

5) Pebrine is the _____ disease of B. mori?
   a) Viral b) Bacterial
   c) Fungal d) Protozoan

6) In the word univoltine, voltine stands for _____.
   a) Brood frequency b) Cocoon frequency
   c) Worm frequency d) Silk frequency

7) In electric industry _____ is used as a good insulator.
   a) Honey b) Lac
   c) Resin d) Wax

8) Pyrilla is the pest of_____.
   a) Sugarcane b) Cotton
   c) Pomegranate d) Rice

9) The HAT causing by _____.
   a) P. vivax b) T. gambiense
   c) W. bancrofti d) P. falciparum

10) Parasites are parasitic when there is opportunity for parasitic life are called _____ parasites.
   a) Intercellular b) Intracellular
   c) Facultative d) Temporary

B) Write true /false. **06**

1) Tasar silk is generated by the silkworm Antheraea mylitta.
2) Apis dorsata is used to refer to Indian bee.
3) United states banned the use of DDT in 1972.
4) Leishmaniasis is caused by a vector House fly.
5) Predation is a one sided relationship where one partner is benefited at the expense of the other.
6) Female anopheles mosquitoes spread dengue to people through bites.

Q.2 Answer the following. **16**

a) Economic importance of silk
b) Life cycle of Tasar silkworm
c) Cockroach as a household pest
d) Symptoms of Dengue

Q.3 Answer the following. **16**

a) Give an account on mechanization in sericulture.
b) Describe life cycle of Honey bee.

Q.4 Answer the following. **16**

a) Describe the veterinary pest.
b) Explain biological control of pest.

Q.5 Answer the following. **16**

a) Describe mode of transmission and control of malaria.
b) Describe mode of transmission and control of Kala azar.

Q.6 Answer the following. **16**

a) Describe types of honey bee and write a note on bee product.
b) Describe types of parasites.

Q.7 Answer the following. **16**

a) Describe the life cycle of lac insect and write a note on Lac product.
b) Give an account on chemical control of pest.

SLR-GS-14

Seat No.	

Set P

M.Sc. (Semester - IV) (New) (CBCS) Examination: Oct/Nov-2022
(ZOOLOGY)
Animal Biotechnology

Day & Date: Monday, 20-02-2023 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

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) Fill in the blanks by choosing correct alternatives given below. **10**

1) The gene transfer technique involves a tiny needle that used to inject DNA into a cell lacking that DNA sequence is termed as _____.
   a) electroporation b) liposome transfer
   c) microinjection d) particle bombardment

2) _____ is a biological phenomenon by which an organism produces one or more biochemicals that influence the germination, growth, survival, and reproduction of other organisms.
   a) Allelopathy b) Induction
   c) Regression d) Commitment

3) DNA sequencing method using the chemical is generally called as _____ method.
   a) Sanger-Coulson b) Maxam-Gilbert
   c) Enzymatic d) Dideoxy

4) _____ is a laboratory method used to detect specific protein molecules from among a mixture of proteins.
   a) Western blot b) Northern blot
   c) Southern blot d) Eastern blot

5) Genetically inactive areas of chromosomes are called _____.
   a) Euchromatin b) Heterochromatin
   c) Allochromosome d) Telomere

6) The process of gene regulation by attenuation is observed in _____ operon.
   a) Lactose (*Lac*) b) Tryptophan *(Trp)*
   c) Galactose *(Gal)* d) Arabinose *(Ara)*

7) Which of the following is stop codon?
   a) UUC b) AUG
   c) UAG d) GUG

8) In eukaryotic cell transcription, RNA splicing and RNA capping take place inside the _____.
   a) dictyosomes b) nucleus
   c) endoplasmic reticulum d) ribosomes

9) The golden rice is able to produce _____ in their endosperm.
   a) insulin b) beta-carotene
   c) polygalactorunidase d) somatostatin

10) Two bacteria found to be very useful in Genetic Engineering experiments are _____.
a) *Nitrobacter & Azotobacter* b) *Rhizobium & Diplococcus*
c) *Nitrosomonas & Klebsiella* d) *Escherichia & Agrobacterium*

B) Fill in the blanks. **06**

1) Sporophytes are characterized by_____ set of chromosomes.
2) In eukaryotes protein-coding genes and some small nuclear RNA (snRNA) genes are transcribed by _____.
3) The enzyme used to cut the DNA within a specific sequence is called as _____.
4) Cdc28 mutants in Yeast restricts the cell cycle progression at _____ phase.
5) In capping of mRNA 5'-end is chemically modified by the addition of a _____ residue.
6) Hematopoietic stem cells obtain their microenvironment for hematopoiesis by _____ in bone marrow.

Q.2 Answer the following **16**

a) Write a note of protoplast fusion.
b) Explain in brief about cot curve.
c) Discuss the structure of operon
d) Describe the structure of m-RNA.

Q.3 Answer the following **16**

a) Write an essay on principles and methods of genetic engineering.
b) Discuss in detail somatic hybridization.

Q.4 Answer the following **16**

a) Explain in detail Sanger's dideoxy method of DNA sequencing.
b) Illustrate the mechanism of attenuation for regulation of operon with suitable example.

Q.5 Answer the following **16**

a) Discuss in detail the process of protein synthesis in prokaryotes.
b) Write a note on Ethical issues in human cloning.

Q.6 Answer the following **16**

a) Explain in detail the mechanism of transcription of prokaryotic cell.
b) Write a note on process of haematopoiesis.

Q.7 Answer the following **16**

a) What is regulatory sequence? Explain in detail different regulatory sequences.
b) Write a note of check point proteins of cell cycle progression.

SLR-GS-15

Set No.		Set	P

M.Sc. (Semester - IV) (New) (CBCS) Examination: Oct/Nov-2022
(ZOOLOGY)
Applied Zoology

Day & Date: Tuesday, 21-02-2023 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

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) Choose correct alternative. (MCQ) **10**

1) Which of the following cells is involved in cell-mediated immunity?
   a) Leukaemia b) T cells
   c) Mast cells d) Thrombocytes

2) An open neural tube defect _____ which can be detected by amniocentesis.
   a) Down's syndrome b) Spina bifida
   c) Turner syndrome d) All above

3) Humoral immunity was first demonstrated by _____.
   a) Von Behring and Kitasato b) Kohler and Milstein
   c) Joseph Meister d) Karl Landsteiner

4) Which of the following diseases are caused by poxviruses in humans? Choose at least one answer.
   a) Monkey pox b) Cow Pox
   c) *olluscumcontagiosum* d) Anthrax

5) Most antigenic molecules are _____.
   a) Proteins b) Nucleic acids
   c) Carbohydrates d) Lipids

6) Vermicompost is a/an _____.
   a) toxic material b) organic biofertilizer
   c) inorganic fertilizer d) synthetic fertilizer

7) The most physiologically significant blood group for transfusions is _____.
   a) MNS system b) ABO system
   c) Kell system d) Kidd system

8) An example of recombinant vaccines is _____.
   a) Hepatitis B vaccine b) Herpes simplex vaccine
   c) Polio vaccine d) Sabin and Salk vaccine

9) The most stable of all vaccine types are _____.
   a) Attenuated vaccines b) Inactivated vaccines
   c) DNA vaccines d) Subunit vaccines

10) Disease caused by taeniasolium is:
   a) *Taeniasis* b) Ascariasis
   c) Planariasis d) All of the above

B) Fill in the blanks. **06**

1) The amoebic dysentery is caused by _____.
   a) *Entamoebahistolytica* b) Giardia lamblia
   c) T. tropica d) T. cruzi
2) The protein _____ is primarily responsible for stimulating platelet Clumping.
   a) Fibrinogen b) Globulin
   c) albumin d) Keratin
3) Malaria fever is caused by _____.
   a) Faul air b) Plasmodium
   c) Mosquito d) House fly
4) Which one of the following species is recommended for vermicomposting?
   a) *Eudriluseugeniae* b) A. lumbricoides
   c) Phytonematodes d) Meloidogyne
5) A child produced in laboratory method is known as _____.
   a) Test-tube baby b) Natural baby
   c) Siamese twins d) None of the above
6) Most antigenic molecules are _____.
   a) Proteins b) Nucleic acids
   c) Carbohydrates d) Lipids

Q.2 Answer the following. **16**

a) Give an account on Routine tests of blood for hepatitis and ELISA.
b) What is Cryopreservation? Add a note on Cryopreservation of gametes.
c) Note on Zoonotic diseases.
d) Note on Surrogate pregnancy and gestational carrier.

Q.3 Answer the following.

a) Give an account on vermitechnology. **08**
b) Give an account on T lymphocytes. **08**

Q.4 Answer the following.

a) Describe in detail Innate immunity, Humoral immunity. **08**
b) Describe the Ovulation induction. **08**

Q.5 Answer the following.

a) Give an account on fertility control. **08**
b) Describe in detail Resistance mechanism against biological warfare. **08**

Q.6 Answer the following.

a) Give an account on Semen analysis. **08**
b) Describe in detail: Class I and II molecules. **08**

Q.7 Answer the following.

a) Give an account on genetically engineered vaccines. **08**
b) Give an account on IVF sterility and its treatment. **08**

SLR-GS-16

Seat No.	

Set P

M.Sc. (Semester - IV) (New) (CBCS) Examination: Oct/Nov-2022
(ZOOLOGY)
Environmental Biology and Toxicology

Day & Date: Wednesday, 22-02-2023 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

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) Choose correct alternative. **10**

1) Which of the following is Not a characteristic of population?
   a) sex ratio b) Natality
   c) Mortality d) stratification

2) "The pyramid of energy is always upright" states that _____.
   a) The energy conversion efficiency of herbivores is better than carnivores
   b) The energy conversion efficiency of carnivores is better than herbivores
   c) Producers have the lowest energy conversion efficiency
   d) Energy conversion efficiency is the same in all trophic levels

3) In an ecosystem, the energy flow is always _____.
   a) Always multidirectional b) Always bidirectional
   c) In any direction d) Always unidirectional

4) The process of vernalization is practiced in _____.
   a) Cold countries
   b) Hot countries
   c) Only in sub-tropical countries
   d) Only in tropical countries

5) Allelopathy refers to _____.
   a) Inhibition of growth of one species by another by the production of toxins
   b) Inhibition of sporulation of pathogen by the host
   c) Altering the reproductive cycle of one organism by another
   d) Inhibition of growth of one species by another by preventing reproduction

6) Which of the following is not a fossil fuel?
   a) Coal b) Natural gas
   c) Petroleum d) Uranium

7) The bottom area where production is less than respiration in a pond ecosystem is termed as _____.
   a) Profundal zone b) Tidal zone
   c) Benthic zone d) Limnetic zone

8) Which of the following lake zones has phytoplanktons in abundance?
   a) Benthic b) Profundal
   c) Limentic d) Littoral

9) The eggshell of birds becomes thin by the pollution from pesticides due to the interference in the activity of _____.
   a) Calmodulin b) MgATPase
   c) CaATPase d) Calcium

10) Which of the following statements is true about the composition of Calcium Carbonate (CaCo3) in soft water?
   a) 0 to 30 milligrams of CaCO3 per litre
   b) 30 to 60 milligrams of CaCO3 per litre
   c) 60 to 90 milligrams of CaCO3 per litre
   d) 90 to 120 milligrams of CaCO3 per litre

B) Fill in the blanks. **06**

1) Dioxins are produced from _____.
2) _____ gas is useful as well as harmful to human beings.
3) _____ requires maximum energy in an ecosystem.
4) Sound unit is _____.
5) _____ of Earth surface is covered by water.
6) 0.0390% of atmosphere is of _____.

Q.2 Answer the following. **16**

a) Energy flow
b) Pesticides
c) Food Additives
d) Minamata disease

Q.3 Answer the following. **16**

a) Rain water harvesting.
b) Carcinogens used in industries.

Q.4 Answer the following. **16**

a) Describe classification of toxicants.
b) Explain solid waste management.

Q.5 Answer the following. **16**

a) Describe radiation and thermal pollution.
b) Explain limnology with examples.

Q.6 Answer the following. **16**

a) Describe greenhouse effect.
b) Explain sources of water pollution.

Q.7 Answer the following. **16**

a) Explain Carbon cycle
b) Explain mode of action of toxicants.

SLR-GS-17

Seat No.	

Set P

M.Sc. (Semester - IV) (New) (CBCS) Examination: Oct/Nov-2022
(ZOOLOGY)
Zookeeping and Animal House Management

Day & Date: Thursday, 23-02-2023 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

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) Choose correct alternative. (MCQ) - 10

1) Rabies is a zoonotic _____ disease which infects domestic and wild animals.
   a) Viral b) Bacterial
   c) Hematic d) Helminth

2) Transmittable diseases from wild birds to poultry and to the human being is _____.
   a) SARS b) Influenza
   c) Rabies d) Typhoid

3) Visceral leishmaniasis (VL), also known as _____.
   a) Kala azar b) Sleeping sickness
   c) Bird flu d) Mad cow disease

4) A natural area designated to protect the ecological integrity of one or more ecosystems for present and future generations is known as _____.
   a) Wildlife Sanctuaries b) Bioreserves
   c) Botanical Gardens d) National Parks

5) The elephants are found in the hot-wet forests of _____.
   a) Punjab and Haryana
   b) Assam and Karnataka
   c) West Bengal and Jharkhand
   d) Rajasthan and Gujarat

6) Indian courser are the main bird species. Peafowl occurs in some areas of _____.
   a) Cholistan b) Thal
   c) Thar d) None of these

7) Which of the following is the smallest bird?
   a) Pigeon b) Parrot
   c) Humming bird d) House sparrow

8) Identification of missing zoo tiger in wild can be done with _____.
   a) Pug marks
   b) dentition
   c) Band pattern and a photograph
   d) Fingerprints

9) Whose skin colour does not change _____.
   a) Chameleon b) Horse
   c) Garden lizard d) Two of the above

10) Largest number of birds are located in _____ Zoo.
   a) Tiruvanantpuram b) Baroda
   c) Mumbai d) Ahmedabad

B) Fill in the blanks. **06**

1) Visceral leishmaniasis (VL), also known as _____.
   a) kala azar b) Sleeping sickness
   c) Bird flue d) Mad cow disease

2) World Wildlife Fund is headquartered in _____.
   a) The Hague, Netherlands
   b) Geneva, Switzerland
   c) Avenue du Mont-Blanc
   d) London, United Kingdom

3) In India crocodile breeding centre is located in _____.
   a) Kolkata b) Chennai
   c) Chilica lake d) Tiruvanantpuram

4) Ethogram is a _____.
   a) pictorial catalogs of the behavioural patterns of an organism or a species.
   b) Graphical representation of behaviour
   c) Statistical representation of behaviour
   d) All of above

5) Taxidermy is a technique of _____
   a) Skinning the wild animal
   b) Skinning and stuffing the wild animal
   c) Preparing wild animal duplicates
   d) Arranging bones of wild animals in order

6) A crocodile can be differentiated from alligator by _____.
   a) Prominent protruding fourth tooth in upper jaw
   b) Broad snout
   c) Short Jaw
   d) Smaller size

Q.2 Answer the following. **16**

a) Write a note on Visitor rules and regulation in Zoo.
b) Write a note on Conservation of Crocodiles.
c) Write a note on Taxidermy and its application.
d) Give an account on Nutritional requirements for Reptiles in Zoo.

Q.3 Answer the following. **16**

a) Give an account on prevent of avian infections.
b) Give an account on Eco-Tourism.

Q.4 Answer the following. **16**

a) Write note on Cryopreservation of Gametes.
b) Give an account on Behaviour in crocodile.

Q.5 Answer the following. **16**

a) Discuss housing practices is common zoo reptiles. What special precautions are to be taken in keeping snakes in Zoo.

b) Give an account on Small mammal management in Zoo.

Q.6 Answer the following. **16**

a) Give account on In-situ conservation.

b) Give an account on Antihelminthic drugs.

Q.7 Answer the following. **16**

a) Discuss role of illumination in laboratory rodents, with special reference to albino rats.

b) Describe quarantine procedures to be undertaken to accept wild mammals from canine families in Zoo.

SLR-GS-18

Seat No.	

Set P

M.Sc. (Semester - IV) (New) (CBCS) Examination: Oct/Nov - 2022
(ZOOLOGY)
Fishery Science

Day & Date: Thursday, 23-02-2023 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

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) Fill in the blanks by choosing correct alternatives given below. **10**

1) Fish that are spend some or their entire life in the lakes and rivers are called _____ fish.
   a) Marine water b) Fresh water
   c) Brackish water d) Estuarine water

2) Following _____ is an example of marine fish.
   a) Bombay duck b) Wallogoattu
   c) Catlacatla d) Labeorohita

3) Larval stage of major carp is called _____.
   a) Tadpole b) Catter pillar
   c) Maggot d) Juvenile fish

4) The photic zone of any aquatic ecosystem is based on _____.
   a) Waves of water b) Penetration of sunlight
   c) Type of plankton d) Salt concentration

5) _____ are living organisms that are able to swim and move independently.
   a) Plankton b) Benthos
   c) Nekton d) Phytoplankton

6) Induced breeding is a technique where by ripe fish breeders are stimulated by _____ hormones.
   a) Pituitary b) Thyroid
   c) Adrenal d) Pineal

7) The culture of trout, tilapia, catfish, and carps are typical examples of _____.
   a) Monoculture b) Polyculture
   c) Aquaculture d) Pearl culture

8) Chilling, freezing and canning are the methods of _____.
   a) Fish preservation b) Fish migration
   c) Fish culture techniques d) Fish byproduct

9) Isinglass is a substance obtained from the dried _____ of fish.
   a) Fin b) Scales
   c) Liver d) Swim bladder

10) Following _____ fish have a electric organ.
   a) Torpedo b) Saw fish
   c) Shark d) Scoliodon

B) Write true/false **06**

1) Cartilaginous fishes belong to class Chondrichthyes.
2) The benthos is comprised of all the organisms that live at the bottom of a body of standing or running water.
3) Monosex culture refers to the culture of all male and female populations of fishes.
4) Catadromous fishes migrate to fresh water to breed.
5) Fish glue is a good adhesive obtained from trimming, bones and skin of fishes.
6) In some fishes luminous organ play role in the production of light.

Q.2 Answer the following **16**

a) Describe the general characters of fresh water fishes.
b) What is fish culture? Explain the role of plankton in fish culture.
c) Describe the techniques of fish preservation.
d) Give an account on fish migration.

Q.3 Answer the following **16**

a) Describe identification keys of larval stages of major carps.
b) Describe the characteristics of fresh water ecosystem.

Q.4 Answer the following **16**

a) Give an account on the identification of plankton and nekton.
b) Describe the types of fish culture.

Q.5 Answer the following **16**

a) Describe the economic importance of fishes.
b) Give an account on the coloration in fishes.

Q.6 Answer the following **16**

a) Describe the induced breeding in fishes.
b) Give an account on fish gears and crafts.

Q.7 Answer the following **16**

a) Describe general characters of marine water fishes.
b) Give an account on types of hatcheries in fishes.