Seat No.	

Set | P

M.Sc. (Zoology) (Semester – I) (New) (NEP CBCS) Examination: March/April - 2026
Bio systematics (2309101)

Day & Date: Friday, 17-04-2026 Max. Marks: 60
Time: 03:00 PM To 05:30 PM

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

Q.1 A) Choose correct alternative. **08**

1) Molecular taxonomy studies _____.
   a) Habitat preference
   b) Behavioral traits
   c) DNA and protein sequence data
   d) Body symmetry

2) Which term refers to the science of naming, describing, and classifying organisms?
   a) Phylogenetics b) Taxonom
   c) Genetics d) Evolution

3) Which of the following is the correct sequence in taxonomy?
   a) Preservation → Collection → Curation → Identification
   b) Collection → Preservation → Curation → Identification
   c) Identification → Preservation → Collection → Curation
   d) Collection → Identification → Preservation → Curation

4) The similarity in amino acid sequence of hemoglobin between man and chimpanzee indicates _____.
   a) Convergent evolution
   b) Close evolutionary relationship
   c) Parallel evolution
   d) Artificial selection

5) Pressing and drying method is used for preservation of _____.
   a) Amphibians b) Plants
   c) Birds d) Molluscs

6) Closely related species show _____.
   a) Higher differences in amino acid sequences
   b) More similarity in nucleic acid sequences
   c) No similarity in DNA
   d) No relation in protein structure

7) For long-term preservation of animal tissues for molecular studies, the best method is _____.
   a) Freezing at -80°C b) Pinning and drying
   c) Formalin solution d) Glycerin preservation

8) The importance of biosystematics in biology is to _____.
   a) Identify and name organisms based on morphology alone
   b) Understand the evolutionary processes and relationships
   c) Limit the study of genetic diversity
   d) Classify species based on a single gene

B) Fill in the blanks OR Write True/False. **04**

1) Taxonomy deals with the _____.
2) Insects can be preserved by the method called _____.
3) The International Code that governs animal nomenclature is called _____.
4) Organisms that share a common evolutionary ancestor and form a clade are called _____.

Q.2 Answer the following. (Any Six) **12**

a) What is meant by a panmictic population?
b) Define the term phylogenetic tree.
c) Define Cytotaxonomy.
d) Define Binomial nomenclature.
e) What is Genetic Incompatibility?
f) Define Typification.
g) Define reproductive isolation.
h) Define Apomixia.

Q.3 Answer the following. (Any Three) **12**

a) Describe the role of International Code/Commission of Zoological Nomenclature (ICZN).
b) What is Chemotaxonomy? Give an example of its application.
c) Describe importance and applications of biosystematics.
d) Describe how taxonomic key useful for classification.

Q.4 Answer the following questions. (Any Two) **12**

a) Describe mechanism of speciation.
b) Describe the hierarchy of categories in taxonomy.
c) Write an account on different kinds of systematic publications.

Q.5 Answer the following questions. (Any Two) **12**

a) How to Construct Phylogenetic Trees based on Parsimony Method.
b) Explain different kinds of taxonomic characters with examples.
c) Write a detailed note on methods of taxonomic preservation and their significance.

Seat No.	

Set **P**

M.Sc. (Zoology) (Semester - I) (New) (NEP CBCS) Examination: March/April - 2026
Cell and Molecular Biology (2309102)

Day & Date: Monday, 20-04-2026 Max. Marks: 60
Time: 03:00 PM To 05:30 PM

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

Q.1 A) Choose correct alternative. **08**

1) According to the fluid mosaic model, cell membrane mainly composed of _____.
   a) Glycoproteins b) Phospholipids
   c) Steroids d) Carbohydrates

2) Transport of large molecules like proteins into the cell through vesicles is known as _____.
   a) Exocytosis b) Endocytosis
   c) Osmosis d) Facilitated diffusion

3) _____ organelle is responsible for protein synthesis.
   a) Ribosome b) Golgi complex
   c) Lysosome d) Peroxisome

4) _____ cell organelle having the function of packaging and secretion.
   a) Nucleus b) Golgi apparatus
   c) Lysosome d) Ribosome

5) _____ molecule carries amino acids to the ribosome during protein synthesis.
   a) mRNA b) tRNA
   c) rRNA d) DNA

6) _____ are the organelle that regulates cell division by forming spindle fibres.
   a) Nucleus b) Centriole
   c) Ribosome d) Endoplasmic reticulum

7) _____ is a second messengers involved in many signalling pathways.
   a) cAMP b) ATP
   c) DNA d) RNA

8) Cyclins and cyclin-dependent kinases (CDKs) are important for _____.
   a) DNA repair
   b) Regulation of cell cycle progression
   c) Protein synthesis
   d) Cytokinesis

B) Write True/False. **04**

1) Lysosome is a cell organelle contains hydrolytic enzymes.
2) Glycoproteins and glycolipid of cell membrane involved in Cell recognition and signaling.
3) Apoptosis is a programmed cell generation process.
4) Clathrin is mainly involved in Plasma membrane/endosome trafficking.

Q.2 Answer the following. (Any Six) **12**

a) What is meant by selective permeability of plasma membrane?
b) Define cell cycle.
c) What are the functions of Ribosome?
d) What is a polysome?
e) What are the functions of lysosomes?
f) What is endocytosis? Give one example.
g) Define apoptosis.
h) Define the term cell signaling.

Q.3 Answer the following. (Any Three) **12**

a) Explain the fluid mosaic model of plasma membrane.
b) Explain the function of Golgi apparatus in protein modification and trafficking.
c) Explain the roles of cyclins and cyclin-dependent kinases (CDKs) in cell cycle regulation.
d) Write properties of cancer cell.

Q.4 Answer the following. (Any Two) **12**

a) Explain the mechanism of apoptosis and its importance.
b) Explain the structure and functions of Mitochondria.
c) Describe the structure of ribosomes and state differences between free and membrane bound polysomes.

Q.5 Answer the following. (Any Two) **12**

a) Explain types and treatments of cancers.
b) Describe the structure of microtubule.
c) Explain the mechanisms of biogenesis of mitochondria.

Seat No.	

Set P

M.Sc. (Zoology) (Semester - I) (New) (NEP CBCS) Examination: March/April – 2026
Techniques in Biology (2309107)

Day & Date: Wednesday, 22-04-2026 Max. Marks: 60
Time: 03:00 PM To 05:30 PM

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

Q.1 A) Choose correct alternative. (MCQ) 08

1) What is the typical wavelength range for UV- is spectrophotometry?
   a) 10-400 nm b) 200-800 nm
   c) 700-1000 nm d) 1000-1500 nm

2) In differential centrifugation, particles are separated based on differences in _____.
   a) Size only b) Density only
   c) Both size and density d) Shape only

3) What is the role of cryoprotective agents (CPAs) in cryopreservation?
   a) To accelerate cell division
   b) To protect cells from damage during freezing and thawing
   c) To increase the rate of ice crystal formation
   d) To promote cell death

4) In agarose gel electrophoresis, what property of DNA fragments determines their migration speed?
   a) Molecular weight b) Shape
   c) Charge d) All of the above

5) Out of the following, identify the first and most vital step of PCR: _____.
   a) Annealing b) Denaturation
   c) Primer extension d) None of the above

6) Electron Microscope can give a magnification up to _____.
   a) 400,000X b) 100,000X
   c) 15000X d) 100X

7) Which law describes the relationship between absorbance, concentration, and path length in spectrophotometry?
   a) Beer's Law b) Lambert's Law
   c) Beer-Lambert Law d) Boyle's Law

8) What is the unit used to express the sedimentation coefficient in centrifugation?
   a) Dalton
   b) Svedberg (S)
   c) Grams (g)
   d) Meters (m)

B) Write true/false. **04**

1) Gas chromatography can be performed on plane surface.
2) Kary Mullis developed the PCR technique.
3) Condenser is use for light controlling in a light microscope.
4) Absorption is working principle of UV spectroscopy.

Q.2 Answer the following. (Any Six) **12**

a) Define: Primer.
b) Write application of lasers in biology.
c) Note on Cryotomy.
d) Define: Monolayer.
e) Types of Microscopes.
f) Principle of Spectroscopy.
g) Types of Chromatography.
h) Draw structure of Flow cytometry working.

Q.3 Answer the following questions. (Any Three) **12**

a) Write a note on NMR.
b) Write a note on TLC.
c) Write a note on SEM.
d) Write a note on Cryopreservation.

Q.4 Answer the following questions. (Any Two) **12**

a) Explain PCR and its applications.
b) Give an account of Sub-cellular fraction.
c) Explain: Electrophoresis and its uses.

Q.5 Answer the following questions. (Any Two) **12**

a) Explain types of DNA Sequencing and give detailed account on next generation sequencing method.
b) Explain in detail account on Radio-label techniques in biology.
c) Write a detail note on paper chromatography and its application.

Seat No.	

Set | P

M.Sc. (Zoology) (Semester - I) (New) (NEP CBCS) Examination: March/April – 2026
Economic Entomology (2309108)

Day & Date: Wednesday, 22-04-2026 Max. Marks: 60
Time: 03:00 PM To 05:30 PM

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

Q.1 A) Choose correct alternative. (MCQ) **08**

1) Apis dorsata is also called _____.
   a) Stone bee b) Rock bee
   c) Stingless bee d) Horn bee

2) Royal jelly is used in the treatment of _____.
   a) Asthma b) Tuberculosis
   c) Malaria d) Dengue

3) Amoebic disease in honey bees, caused by _____.
   a) Virus b) Pollutants
   c) Parasite d) Bacteria

4) Female lac insect is devoid of _____.
   a) Proboscis b) Head
   c) Abdomen d) Wings and leg

5) _____ is the largest lac producing country in world.
   a) India b) Pakistan
   c) Japan d) Srilanka

6) Silkworms produce _____ by feeding on mulberry leaves.
   a) Eggs b) Larvae
   c) Pupa d) Adult

7) Morus spp. is an scientific name of _____ plant.
   a) Kusum b) Alfalfa
   c) Tasar d) Mulberry

8) Biological control uses _____ to manage pests.
   a) Natural predators b) Fumigants
   c) Chemicals d) Sprays

B) Write True or False. **04**

1) Apis florea is a lac insect.
2) Propolis is a sticky, resinous "bee glue" from plant buds and bark, used to seal the hive.
3) Moriculture involves the cultivation of mulberry plants, whose leaves are used as Lac insect feed.
4) Techniques that control insects by reducing their reproduction potential are known as autocidal control.

Q.2 Answer the following (Any Six) **12**

a) Give morphological characters of Apis florea.
b) Draw a diagram of basic beehive.
c) What is composition of bee wax.
d) Write names of host plants of lac insect.
e) Egg of silkworm.
f) Uses of silk.
g) Define IPM.
h) Give an example of biological control method.

Q.3 Answer the following. (Any Three) **12**

a) Write a note on types of bees.
b) Wha are the uses of honey and wax.
c) Explain natural enemies of lac insect.
d) Describe the autocidal control.

Q.4 Answer the following. (Any Two) **12**

a) Describe the classification and morphological characters of lac insect.
b) Write the process of obtaining silk from cocoons.
c) Give an account on IPM.

Q.5 Answer the following. (Any Two) **12**

a) Describe the diseases of honey bee.
b) Give an account on management and economics of lac culture in business.
c) Explain the rearing of silkworms.

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Seat No.	

Set P

M.Sc. (Zoology) (Semester - I) (New) (NEP CBCS) Examination: March/April - 2026
Research Methodology (2309103)

Day & Date: Friday, 24-04-2026 Max. Marks: 60
Time: 03:00 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat diagram and give equations wherever necessary.

Q.1 A) Choose correct alternative. (MCQ) **08**

1) _____ is not a valid motivation for conducting research.
   a) To gain research degree
   b) To develop new scientific tools
   c) To satisfy intellectual curiosity
   d) To spread misinformation

2) The main purpose of exploratory research is _____.
   a) To test hypotheses
   b) To gain insights and understanding of a problem
   c) To describe characteristics of a population
   d) To publish paper

3) The final section of research is _____.
   a) Objectives b) Result
   c) Discussion d) Conclusion

4) Following _____ sampling is a probability sampling method.
   a) Convenience b) Purposive
   c) Simple random d) Quota

5) A case study is a _____ type of research method.
   a) Quantitative b) Qualitative
   c) Alternative d) Descriptive

6) The primary purpose of data analysis in research is _____.
   a) To collect data
   b) To conduct data
   c) To interpret and draw conclusion from data
   d) To conduct interviews

7) _____ involves presenting someone else's work or ideas as your own without proper credit.
   a) Plagiarism b) Duplication
   c) Malpractice d) Repetition

8) In Research “IF” stands for
   a) International factor b) Important factor
   c) Impact factor d) Isolated factor

B) Write True/False. **04**

1) Research is a systematic and organized efforts to investigate a specific problem.
2) The null hypothesis is always accepted at the end of a research study.
3) A publication is something made to communicate with the public.
4) Zotero is a free, open-source reference management tool used to collect, organize, cite, and share research sources, acting as a personal research assistant.

Q.2 Answer the following questions (Any Six) **12**

a) Define Research.
b) Define hypothesis in research methodology.
c) What is quantitative research?
d) Write difference between validity and reliability.
e) What is meant by sampling error?
f) Use of Chi-square test.
g) Write full form of ISSN and ISBN.
h) Write names of software for detection of Plagiarism.

Q.3 Answer the following (Any Three) **12**

a) Explain null hypothesis.
b) What is research design? Explain its importance in the research process.
c) Write in detail note on Research journal.
d) Write an account on Plagiarism.

Q.4 Answer the following. (Any Two) **12**

a) What is foundation of research? Explain its importance in research process.
b) Discuss the key characteristics of a good sample.
c) What are the major ethical issues involved in the publication of research.

Q.5 Answer the following. (Any Two) **12**

a) Describe hypothesis testing and test of significance in research.
b) Define sampling and discuss the differences between probability and non-probability sampling methods.
c) Write an account on uses of tools and techniques for research.

Seat No.	

Set **P**

M.Sc. (Zoology) (Semester - II) (New) (NEP CBCS) Examination: March/April - 2026
Embryology (2309201)

Day & Date: Thursday, 16-04-2026 Max. Marks: 60
Time: 11:00 AM To 01:30 PM

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

Q.1 A) Choose correct alternative. (MCQ) **08**

1) _____ part of the eggs lies close to the animal pole.
   a) Centriole b) Mitochondria
   c) Nucleus d) Cytoplasm

2) _____ is the example for alecithal eggs.
   a) Fishes b) Frogs
   c) Birds d) Mammals

3) _____ structure is formed first during gastrulation.
   a) Blastopore b) Neural tube
   c) Somite d) Yolk sac

4) _____ pathway help for bone formation during limb development.
   a) Notch b) Wnt
   c) Hedgehog d) BMP

5) During Fertilization, _____ prevent polyspermy.
   a) Zona pellucida b) Cortical reaction
   c) Acrosome reaction d) Sperm capacitation

6) If mouth develops from blastopore, the organism is called _____.
   a) Deuterostome b) Protostome
   c) Blastostome d) None of these

7) Double uterus is present in _____.
   a) Whale b) Elephant
   c) Marsupials d) Rat

8) Development of egg without fertilization is called _____.
   a) Parthenogenesis b) Gametogenesis
   c) Metagenesis d) Oogenesis

B) Write True / False. **04**

1) *C. elegans* reproduce near about 300 progenies via self-fertilization.
2) Drosophila and human development are homologous process.
3) In Development mechanism, the first stage is labile phase called induction.
4) During limb development Shh, Wnt and FGF pathway paly role.

Q.2 Answer the following questions. (Any Six) **12**

a) Define Apoptosis.
b) Write a note on Egg of Mammals.
c) Write a note on Blastula of frog.
d) Write a note on ovum.
e) Write a note on Sperm of Amphioxus.
f) Write a note on insect egg.
g) Define Potency.
h) Define Specification.

Q.3 Answer the following. (Any Three) **12**

a) Explain the Evolution of sexual reproduction in eukaryotes.
b) Explain detail structure of Chick Egg.
c) Describe capacitation and mechanism of fertilization.
d) Describe 33 hrs development of chick embryo.

Q.4 Answer the following. (Any Two) **12**

a) Describe process of gastrulation in Drosophila.
b) Explain Fate of three germ layers in Amphioxus.
c) Describe process of cleavage in frog.

Q.5 Answer the following. (Any Two) **12**

a) Give an account of development of limb in Mammals.
b) Describe process of gastrulation in frog.
c) Give an account on different types of eggs on the basis of amount and position of yolk with example.

Seat No.	

Set P

M.Sc. (Zoology) (Semester - II) (New) (NEP CBCS) Examination: March/April - 2026
Animal Physiology (2309202)

Day & Date: Saturday, 18-04-2026 Max. Marks: 60
Time: 11:00 AM To 01:30 PM

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

Q.1 A) Choose correct alternative (MCQ). 08

1) Tetanus is primarily caused by the bacterium _____.
   a) Staphylococcus aureus b) Escherichia coli
   c) Clostridium tetani d) Salmonella enterica

2) _____is the main symptom of Parkinson's disease.
   a) Loss of vision b) Seizures
   c) Muscle tremors d) Numbness

3) _____is the name of the procedure where a machine filters waste and excess fluids from your blood.
   a) Peritoneal dialysis b) Hemodialysis
   c) Kidney transplant d) Lithotripsy

4) Majority of nutrient absorption take place in _____.
   a) Mouth b) Stomach
   c) Small intestine d) Large intestine

5) The reason why tricuspid and bicuspid valves arc closed is _____.
   a) ventricular relaxation
   b) ventricular filling
   c) atrial systole
   d) attempted backflow of blood into the atria

6) The Myelin sheath is derived from the ____.
   a) Microglia b) Neuroglial cells
   c) Schwann cells d) Nerve cells

7) _____ is the main role of plasma in blood.
   a) Transporting oxygen
   b) Fighting infection
   c) Transporting nutrients and waste products
   d) Clotting blood

8) The exchange of gases between the external environment and the lungs _____.
   a) Respiration b) External respiration
   c) Cellular respiration d) Tissue respiration

B) Fill in the blanks OR Write True/False. **04**

1) Which ion is primarily responsible for establishing the resting membrane potential?
2) Which part of a neuron receives signals from other neurons?
3) The process of breathing is also called ____.
4) One cardiac cycle lasts approximately ____.

Q.2 Answer the following questions. (Any Six) **12**

a) What is Respiration?
b) What is the pacemaker of the heart?
c) What is Blood?
d) Draw neat labeled diagram of smooth muscle.
e) Which pump helps maintain the resting membrane potential?
f) What is the neuromuscular junction?
g) What are anticoagulants?
h) What causes epilepsy?

Q.3 Answer the following. (Any Three) **12**

a) Describe Cardiac cycle.
b) Explain about water soluble and insoluble Vitamins.
c) What is dialysis?
d) Discuss cardiovascular diseases with reference to cardiac arrest and coronary heart disease.

Q.4 Answer the following. (Any Two) **12**

a) Describe signs, symptoms and causes of kidney failure.
b) Describe Hormonal control of digestion.
c) Describe mechanism of blood clotting

Q.5 Answer the following. (Any Two) **12**

a) Describe Physiology of Stomach Ulcers. Explain signs, symptoms, causes and treatment of ulcers.
b) Describe Structure of heart. Explain conduction of heart beat.
c) Describe signs, symptoms and causes of Alzheimers disease, and Parkinsons disease.

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Set **P**

M.Sc. (Zoology) (Semester - II) (New) (NEP CBCS) Examination: March/April - 2026
Fishery Science (2309207)

Day & Date: Tuesday, 21-04-2026 Max. Marks: 60
Time: 11:00 AM To 01:30 PM

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

Q.1 A) Choose correct alternative. (MCQ) **08**

1) _____ scales are a type of bony fish scale characterized by their comb-like, or serrated, edges.
   a) Cycloid scales b) Ctenoid scale
   c) Placoid scales d) Ganoid scales

2) Zooplankton are primarily classified as _____.
   a) Primary producers b) Herbivores
   c) Consumers d) Decomposers

3) _____ hormones are commonly used for inducing breeding in fish.
   a) Insulin b) Thyroxine
   c) Gonadotropin d) Adrenaline

4) Following _____ is an example Zooplankton.
   a) BGA b) Daphnia
   c) Dianoflagellates d) Diatomes

5) The most commonly used method for preserving fish is _____.
   a) Freezing b) Drying
   c) Fermenting d) Smoking

6) Induced breeding is also known as _____ breeding.
   a) Natural b) Artificial
   c) Selected d) Clonal

7) Bioluminescence is the natural phenomenon in which living organisms produce and emit.
   a) Sound b) Colour
   c) Poison d) Light

8) Fish scales are smooth and circular in shape, commonly found in fishlike salmon and carp?
   a) Cycloid scales b) Ctenoid scale
   c) Placoid scales d) Ganoid scales

B) Write True or False. **04**

1) Isinglass is a fish product which is derived from the scale of certain fish.
2) All fish have the same type of scales.
3) All marine fish can survive in freshwater.
4) The light-producing organs in fishes are known as chromophores.

Q.2 Answer the following. (Any Six) **12**

a) Define Planktonic and Benthic fishes.
b) What are amazing fishes?
c) Define monoculture and polyculture.
d) Give examples of major carp species.
e) Function of fish scales.
f) Give examples of fresh water and marine water fishes.
g) Give any two applications of fish glue.
h) Draw a figure of cycloid scale.

Q.3 Answer the following. (Any Three) **12**

a) Describe general characters of fresh water fishes.
b) Describe role of plankton in fish culture.
c) Explain the hatching happa.
d) Give an account on coloration of fishes.

Q.4 Answer the following. (Any Two) **12**

a) Describe the Marine water ecosystem.
b) Describe the difference between cycloid scale and ctenoid scale.
c) Give an account on venomous glands in fishes.

Q.5 Answer the following. (Any Two) **12**

a) Describe in detail the fish products.
b) Give an account on identification of larval stages of major carps.
c) Describe general characters of phytoplankton and zooplankton.

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Seat No.		Set	P

M.Sc. (Zoology) (Semester - II) (New) (NEP CBCS) Examination: March/April – 2026
Applied Parasitology (2309208)

Day & Date: Tuesday, 21-04-2026 Max. Marks: 60
Time: 11:00 AM To 01:30 PM

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

Q.1 A) Choose correct alternative. (MCQ) **08**

1) _____disease is caused by a nematod.
   a) Amoebiasis b) Leprosy
   c) Filariasis d) Poliomyelitis

2) *Trypanosoma* belongs to which of the following group?
   a) mastigophora b) sarcodina
   c) sporozoa d) ciliate

3) Parasite that is also a vector host is _____.
   a) Ascaris b) Bug
   c) Fasciola d) House fly

4) Filarial larva can be collected from man's _____.
   a) peripheral blood at midnight
   b) smears of spleen
   c) smears of intestinal contents
   d) biopsy of liver

5) This does not accurately describe Lymphatic filariasis _____.
   a) intermediate vector is the mollusc
   b) mainly affects the lower limb
   c) Chyluria is the most common manifestation
   d) is caused by the parasitic worms *Wuchereria bancrofti* and *Brugiamalayi*

6) The disease caused by the Taeniasolium is called as _____.
   a) Cysticercosis b) Taeniasis
   c) Phyllobothrium d) Dysentery

7) One of the following belongs to cestodes _____.
   a) Liver Fluke b) Guinea worm
   c) Tapeworm d) Ascaris

8) A sexual reproduction of trematodes occurs in _____.
   a) Snail b) Vertebrates
   c) Molluscs d) Both a & c

B) Fill in the blanks OR Write True/False. **04**

1) *Ascaris lumbricoides* is transmitted by ingestion of eggs.
2) The principal site of gametocyte formation is the human gastrointestinal tract.
3) Liver fluke belongs to cestodes.
4) In an individual infected with ascaris, the larvae can be found in the intestine.

Q.2 Answer the following questions. (Any Six) **12**

a) Definitive host
b) Host parasite interaction
c) Parasite Periodicity
d) Secondary host
e) Classification of Cestodes
f) Geographical distribution of *Taenia saginata*
g) Vector
h) Mutualism

Q.3 Answer the following (Any three) **12**

a) Explain Pathogenicity of *Trypanosoma*.
b) Write an account on Types of parasites.
c) Describe pathogenicity, laboratory diagnosis and prophylaxis of *Dracunculus medinensis*.
d) Discuss control measures of *Plasmodium vivax*.

Q.4 Answer the following (Any two) **12**

a) Give general account on parasitic protozoans.
b) Explain Classification of parasitic nematode.
c) Give a detail account on laboratory diagnosis and prophylaxis *Trichuristrichura*.

Q.5 Answer the following (Any two) **12**

a) Explain life cycle *Enamoeba histolytica*.
b) Describe Life cycle *Taenia saginata*.
c) Give detail account on signs, symptoms and causes of Bird flu.

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Set | P

M.Sc. (Zoology) (Semester - III) (New) (NEP CBCS) Examination: March/April- 2026
Biochemistry (2309301)

Day & Date: Friday, 17-04-2026 Max. Marks: 60
Time: 11:00 AM To 01:30 PM

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

Q.1 A) Choose correct alternatives: **08**

1) _____ carry the genetic blue print of a cell and carry instructions for the functioning of cell.
   a) Nucleic acid b) Proteins
   c) Lipids d) Carbohydrates

2) The number of base pair present in Z-form of DNA per turn is _____.
   a) 11 b) 10
   c) 12 d) 9

3) Oxidative phosphorylation occurs in the inner _____ membrane of eukaryotic cells.
   a) Ribosomal b) Mitochondrial
   c) Lysosomal d) Nuclear

4) Acetyl CoA generate during _____ cycle.
   a) Ornithine b) TCA
   c) Beta Oxidation d) Cell cycle

5) _____ is a purine base.
   a) Cytocine b) Uracil
   c) Thymine d) Guanine

6) The primary cellular response to hypoxia is _____.
   a) Increased oxidative phosphorylation
   b) Decreased glycolysis
   c) Activation of hypoxia inducible factor
   d) Increased fatty acid oxidation

7) Examples of enzymatic activators are _____.
   a) Coenzyme b) Hormones
   c) Minerals d) Water

8) Enzymes are classified into six functional groups by the _____ based on the type of reaction they catalyze.
   a) IAS b) lUB
   c) IUCN d) IMP

B) Write True/False. **04**

1) Simple carbohydrates are broken down quickly by the body to be used as energy.
2) ATP is an energy rich compound.
3) Purines and Pyrimidines are enzymes.
4) In eukaryotic cells, the beta oxidation of fat takes place in the nucleus.

Q.2 Answer the following questions. (Any Six) **12**

a) Function of Micro RNA
b) What is the purpose of Oxydative phosphorylation?
c) What is the Bioenergetics? Why it is important in cellular metabolism?
d) How the first law of Thermodynamics apply to biological system?
e) What are allosteric enzymes?
f) Where inter conversion of hexoses and pentoses occur?
g) What is metabolic engineering?
h) Give examples of hydrolases.

Q.3 Answer the following. (Any three) **12**

a) State the role of nucleic acid.
b) Describe the TCA cycle.
c) Describe biosynthesis of fatty acids.
d) Explain the regulation of enzyme activity by non genetic mechanisms.

Q.4 Answer the following. (Any two) **12**

a) Describe the structure of carbohydrate.
b) Describe the Biosynthesis of purines and pyrimidines.
c) Write a detail note on hypoxia.

Q.5 Answer the following. (Any two) **12**

a) Give an account on Glycolysis.
b) Describe Beta oxidation of lipid.
c) Explain classification of enzyme .

SLR-PS-11

Seat No.	

Set P

M.Sc. (Zoology) (Semester - III) (New) (NEP CBCS) Examination: Mach/April - 2026
Comparative Animal Physiology (2309302)

Day & Date: Monday, 20-04-2026 Max. Marks: 60
Time: 11:00 AM To 01:30 PM

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

Q.1 A) Choose correct alternative. **08**

1) Which feeding type is seen in sponges?
   a) Deposit feeding b) Filter feeding
   c) Fluid feeding d) Raptorial feeding

2) Which protein forms the thick filament in skeletal muscle?
   a) Actin b) Myosin
   c) Troponin d) Tropomyosin

3) Communication in honeybees about food source is mainly through: ____.
   a) Sound b) Waggle dance
   c) Smell only d) Aggression

4) General anesthetics mainly act on _____.
   a) Liver b) Central nervous system
   c) Kidneys d) Pancreas

5) Uricotelism is found in: _____.
   a) Mammals b) Amphibians
   c) Birds and reptiles d) Crustaceans

6) Bioluminescence in vertebrates is mainly due to: _____.
   a) Hemoglobin b) Luciferin-luciferase reaction
   c) Melatonin secretion d) ATP hydrolysis only

7) The hormone that synchronizes circadian rhythm in mammals is__ .
   a) Oxytocin b) Melatonin
   c) Cortisol d) Thyroxine

8) Which muscle type is striated and involuntary?
   a) Skeletal b) Cardiac
   c) Smooth d) Both skeletal and smooth

B) Fill in the blanks OR write true/false. **04**

1) The pH of human blood is maintained around _____.
2) Myosin heads bind to _____ during muscle contraction.
3) Hibernation is usually seen in _____ seasons.
4) Which enzyme catalyzes the light-producing reaction in bioluminescent organisms?

Q.2 Answer the following questions. (Any Six) **12**

a) What is osmoregulation?
b) Define actin and myosin.
c) Name two respiratory pigments other than hemoglobin.
d) What is ammonotelism?
e) Name the two major stages of sleep.
f) What are neurotransmitters?
g) Define homeostasis.
h) Differentiate between voluntary and involuntary muscles.

Q.3 Answer the following. (Any three) **12**

a) What are the mechanisms involved in the digestion of food?
b) What are the types of neurotransmitters? Give examples.
c) Explain the mechanism and functions of bioluminescence.
d) Describe Communication in Honey Bees.

Q.4 Answer the following. (Any two) **12**

a) Explain the physiology of contractile elements.
b) Explain the Circadian Cycle, its regulation, and physiological significance.
c) Describe Major Sense Organs and Receptors.

Q.5 Answer the following. (Any two) **12**

a) Explain the role of LDH isoenzymes in cardiac physiology.
b) Explain the different types of feeding mechanisms in animals and their adaptations for processing food.
c) Explain the physiology of sleep including REM and non-REM stages.

Seat No.	

Set **P**

M.Sc. (Zoology) (Semester - III) (New) (NEP CBCS) Examination: March/April – 2026
Biostatistics (2309306)

Day & Date: Wednesday, 22-04-2026 Max. Marks: 60
Time: 11:00 AM To 01:30 PM

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

Q.1 A) Choose the correct alternative: **08**

1) Which of the following is a positional average?
   a) Mean b) Median
   c) Standard deviation d) Variance

2) Range is defined as: _____.
   a) Maximum value + Minimum value
   b) Maximum value - Minimum value
   c) Mean - Median
   d) Sum of deviations

3) The value of correlation coefficient 'r' can be: _____.
   a) Less than -1 b) Between -1 and $+1$
   c) Greater than $+1$ d) Between 0 and ∞

4) In regression equation, $if\ Y = a + \mathrm{bX}$, then b is _____.
   a) Y-intercept b) Regression coefficient
   c) Correlation coefficient d) Mean value

5) In binomial distribution, if p is probability of success, q is _____.
   a) $1 - p$ b) p
   c) p^2 d) $1/p$

6) In hypothesis testing, the probability of rejecting a true null hypothesis is called _____.
   a) Type I error b) Type II error
   c) Power of the test d) Level of significance

7) For a symmetrical distribution _____.
   a) Mean = Median = Mode b) Mean > Median > Mode
   c) Mean < Median < Mode d) Mean = Mode but ≠ Median

8) The total variation in ANOVA is divided into ____.
   a) Regression and Residual
   b) Between groups and Within groups
   c) Observed and Expected
   d) Mean and Variance

B) Fill in the blanks. **04**

1) _____ correlation is used when data is qualitative in nature.
2) _____ is the middle value when the data is arranged in order.
3) Variance of binomial distribution is _____.
4) _____ test is used to check goodness of fit.

Q.2 Answer the following questions (Any Six) **12**

a) Define correlation.
b) What is normal distribution?
c) What is alternative hypothesis?
d) What is Type I error?
e) Write the addition theorem of probability.
f) Define quartile deviation.
g) What is regression coefficient?
h) Write the formula for standard deviation.

Q.3 Answer the following. (Any three) **12**

a) Write a short note on goodness of fit test.
b) Differentiate between positive and negative correlation.
c) Explain scatter diagram with an example.
d) State and explain classical definition of probability with an example.

Q.4 Answer the following. (Any two) **12**

a) Write a note on different measures of dispersion with examples.
b) Explain Karl Pearson's correlation coefficient with formula, steps, and interpretation.
c) Explain procedure of Student's t-test with an example.

Q.5 Answer the following. (Any two) **12**

a) Describe one-way ANOVA with assumptions and applications.
b) Discuss Type I and Type II errors with examples.
c) Describe the merits and demerits of mean, median, and mode.

Seat No.		Set	P

M.Sc. (Zoology) (Semester - III) (New) (NEP CBCS) Examination: March/April – 2026
Bioinformatics (2309307)

Day & Date: Wednesday, 22-04-2026 Max. Marks: 60
Time: 11:00 AM To 01:30 PM

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

Q.1 A) Choose correct alternative. (MCQ) 08

1) Simulation and visualization of molecular structures is part of _____.
   a) DNA sequencing b) protein purification
   c) molecular modelling d) cellular transportation

2) Homology modelling is used for predicting _____ from amino acid sequence.
   a) Protein 3D structure
   b) DNA double helix length
   c) Molecular weight of enzymes
   d) Rate of chemical reactions

3) _____ software is widely used in molecular docking studies.
   a) AutoDock b) PyMOL
   c) SPSS d) MS Excel

4) Study of proteins, their structures and functions is known as _____.
   a) proteomics b) genomics
   c) biostatistics d) DNA editing

5) _____ is an analytical tool used in proteomic for identification, characterization, and quantification of proteins.
   a) Mass Spectroscopy b) SONAR
   c) PCR d) BLAST

6) Java was developed by _____.
   a) Bjarne Stroustrup b) James Gosling
   c) Dennis Ritchie d) Guido van Rossum

7) The field that studies entire sets of proteins in an organism using bioinformatics is called as _____.
   a) Transcriptomics b) Proteomics
   c) Genomics d) Metabolomics

8) The primary sequence database of nucleotides maintained by _____.
   a) SWISS-PROT b) Gen Bank
   c) PDB d) KEGG

B) Write true/false. **04**

1) AutoDock software is commonly used for molecular docking.
2) DNA sequencing technique is a part of genomics.
3) Genomics is the large-scale study of proteins, their structures, and functions.
4) Gel electrophoresis is used to separate proteins on the basis of their isoelectric point and molecular weight.

Q.2 Answer the following questions (Any Six) **12**

a) What is the molecular modelling?
b) Define the term genome.
c) Write any two importance of cheminformatic.
d) What is full form of JDBC?
e) Define the primary structure of proteins.
f) Which software's are used in molecular modelling?
g) What is molecular docking?
h) What is Gen Bank?

Q.3 Answer the following (Any three) **12**

a) Discuss the importance of molecular modelling in modern drug discovery.
b) Explain term DNA sequencing and its applications.
c) Differentiate between genomics and proteomics with suitable examples.
d) Describe the role of chaperone proteins in protein folding.

Q.4 Answer the following (Any two) **12**

a) Write the applications of Bio JAVA.
b) Explain the concept and scope of cheminformatics in drug discovery.
c) Write a note on JDBC.

Q.5 Answer the following (Any two) **12**

a) Explain the four levels of protein structure with examples.
b) Explain the features and applications of NCBI.
c) Write a note on applications of bioinformatic in relation to human diseases.

Seat No.		Set	P

M.Sc. (Zoology) (Semester - IV) (New) (CBCS) Examination: March/April - 2026
Animal Biotechnology (2309401)

Day & Date: Thursday, 16-04-2026 Max. Marks: 60
Time: 03:00 PM To 05:30 PM

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

Q.1 A) Choose correct alternative. (MCQ) **08**

1) In tissue culture, during protoplast fusion the cell wall in plant cells can be removed by _____.
   a) Lipase b) Cellulase
   c) Chitinase d) Lysozyme

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

3) The hormone (factor) responsible for new blood cell formation from stem cell in bone marrow is _____.
   a) hematopoietic b) thyroxine
   c) insulin d) melantoin

4) The DNA polymerase enzyme used in polymerase chain reaction is obtained from _____.
   a) *E. coli* b) *Agrobacterium tumefaciens*
   c) *Thermus aquaticus* d) *Homo sapiens*

5) The stem cell which can differentiate into any cell from restricted group of cell types is called _____.
   a) Totipotent b) Pluripotent
   c) Monopotent d) Unipotent

6) From the following the stop codon is _____.
   a) AUG b) UUA
   c) UAG d) GAG

7) The key enzyme in genetic engineering is _____ which is called as molecular scissor.
   a) DNA ligase b) RNase
   c) DNA polymerase d) Restriction endonuclease

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

B) Fill in the blanks **04**

1) First licensed drug produced through genetic engineering is _____.
2) _____ subunits of RNA polymerase is required to initiate transcription.
3) Genetically inactive areas of chromosomes are called as _____.
4) The cells which are genetically identical are termed as _____.

Q.2 Answer the following questions. (Any Six) **12**

a) Define the terms:
   i) FISH
   ii) GISH
b) Give reason - After transcription in eukaryotes the RNA processing is required.
c) Draw the structure on eukaryotic mRNA.
d) What is gene targeting?
e) What is allelopathy? Give its significance.
f) Explain the viral vector mediated in gene transfer method.
g) What is Polymerase chain reaction? Give its requirements.
h) Why biosafety is important?

Q.3 Answer the following. (Any Three) **12**

a) Describe the concept of Lac operon.
b) Discuss the properties of genetic code.
c) Explain the applications of genetic engineering in health and medicine.
d) Write a note on micropropagation.

Q.4 Answer the following. (Any Two) **12**

a) Explain the steps involved in genetic engineering.
b) What is western blotting? Explain its method.
c) Give a brief account on bone marrow transplant.

Q.5 Answer the following. (Any Two) **12**

a) Write a note on protein sequencing method.
b) Discuss the process of transcription in eukaryotes.
c) What is transgenic animal? Explain the applications of transgenic animal model.

Seat No.		Set	P

M.Sc. (Zoology) (Semester - IV) (New) (CBCS) Examination: March/April - 2026
Zoo Keeping and Animal house Management (2309402)

Day & Date: Saturday, 18-04-2026 Max. Marks: 60
Time: 03:00 PM To 05:30 PM

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

Q.1 A) Choose correct alternative. **08**

1) Where is the headquarters of CZA, India?
   a) Mumbai b) Chennai
   c) Delhi d) Kolkata

2) Tuberculosis is caused by _____.
   a) *Mycobacterium tuberculosis*
   b) *Bacillus tuberculosis*
   c) *Clostridium perfringens*
   d) *Bacillus bovis*

3) Which of the following is Venomous snake?
   a) Common Wolf Snake b) Indian Python
   c) Common Krait d) Banded kukri

4) Raptorial birds are _____.
   a) Birds of Prey b) Water birds
   c) Shoreline birds d) Canopy birds

5) Preparing, stuffing, and mounting an animal for display or study is called as _____.
   a) Taxonomy b) ex situ conservation
   c) Taxidermy d) In situ conservation

6) The process of protecting an endangered species of plant or animal outside its natural habitat is called as _____
   a) In situ conservation b) ex situ conservation
   c) Cloning d) Farming

7) _____ research and development organization produces anti-venom in India.
   a) Haffkine b) Cipla
   c) Lupin d) Dr. Reddy

8) The zoo located in Solapur is named as _____.
   a) Mahatma Gandhi Zoo b) Jawaharlal Nehru Zoo
   c) Rajiv Gandhi Zoo d) Rani Laxmi Bai Zoo

B) Fill in the blanks OR Write True or False. **04**

1) The chairman of CZA is the environment minister.
2) BNHS controls Zoo's in India.
3) Gharial is a crocodilian species found in India.
4) Milking of venom without permission is an illegal activity in India.

Q.2 Answer the following. (Any Six) **12**

a) Define: Ex-situ conservation.
b) Define: Ungulates.
c) Enlist 4 examples of Birds of Prey.
d) What is Animal House Management?
e) Enlist the essential criteria for Enclosure of Crocodiles.
f) Enlist 4 flightless birds.
g) How is the disinfection procedure done in Zoo's?
h) What is significance of Zoo's in research?

Q.3 Answer the following questions. (Any Three) **12**

a) Write a note on: Housing of Snakes in zoo's.
b) Write a note on: Antivenom
c) Write a note on: Flightless birds
d) Write a note on: Animal House Management

Q.4 Answer the following questions. (Any Two) **12**

a) Write a detailed note on identification of Venomous and Non-Venomous snakes.
b) Write a detailed note on: Housing and feeding of Monkeys in zoo's
c) Enlist the Rules and Regulations for visitors in Zoo's.

Q.5 Answer the following questions. (Any Two) **12**

a) Explain Housing, Feeding and Breeding of Tortoises in Zoo's.
b) Explain Housing and Feeding of Water Birds in Zoo's.
c) Write a detailed note on Common Diseases in Zoo Animals.

Seat No.	

Set | P

M.Sc. (Zoology) (Semester - IV) (New) (CBCS) Examination: March/April - 2026
Conservation Biology (2309405)

Day & Date: Tuesday, 21-04-2026 Max. Marks: 60
Time: 03:00 PM To 05:30 PM

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

Q.1 A) Choose correct alternative. (MCQ) **08**

1) The concept of 'Gamma Diversity' refers to ____.
   a) Local diversity b) Regional diversity
   c) Genetic mutations d) Species evenness

2) Which international agreement is specifically known as the "Convention on Biological Diversity"?
   a) CITES b) CBD
   c) RAMSAR d) MAB

3) The loss of genetic diversity due to a sudden reduction in population size is a part of ____.
   a) Allee effect b) Carrying capacity
   c) Extinction vortex d) Succession

4) Which ecosystem service includes "Water and Soil protection"?
   a) Consumptive b) Non-consumptive
   c) Educational d) Scientific

5) The study of the "Latitudinal Gradient" shows that species richness usually ____.
   a) Increases toward poles
   b) Decreases toward the equator
   c) Increases toward the equator
   d) Remains constant

6) Which of these is an example of "Ex-situ" conservation?
   a) Biosphere Reserve b) National Park
   c) Seed Bank d) Wildlife Sanctuary

7) "MVP" stands for ____.
   a) Maximum Variable Population
   b) Minimum Variable Population
   c) Most Vital Population
   d) Modern View Population

8) The "Red Data Books" are maintained by ____.
   a) WWF b) IUCN
   c) UNESCO d) CITES

B) Write True/False. **04**

1) Human-wildlife conflict management is a part of Applied Field Conservation.
2) The intrinsic value of nature is a core ethical principle of conservation biology.
3) Habitat fragmentation increases the core area of a forest.
4) The Simpson index is used to measure genetic mutations only.

Q.2 Answer the following. (Any Six) **12**

a) Define "Traditional Ecological Knowledge".
b) What is "Environmental Stochasticity"?
c) Define "Metapopulation".
d) Name two Marine Protected Areas in India.
e) What is "Rewilding"?
f) State the role of "CITES".
g) Define "Species Richness".
h) What are "Habitat Corridors"?

Q.3 Answer the following. (Any Three) **12**

a) Explain the multidisciplinary nature of Conservation Science.
b) Differentiate between Alpha and Beta diversity.
c) Discuss the impact of "Invasive Species" on native biodiversity.
d) Write a note on "Satellite Tracking" in animal monitoring.

Q.4 Answer the following questions. (Any Two) **12**

a) Describe the "Ethical Principles of Conservation Biology".
b) Explain "Ecological Economics" with a case study of Western Ghats.
c) Discuss the concepts of "De-extinction" and "Reintroduction".

Q.5 Answer the following questions (Any Two). **12**

a) Explain "Population Viability Analysis (PVA)" and its application.
b) Discuss "International Agreements" (CBD, UNFCCC, and Ramsar Convention).
c) Describe "Principles of Reserve Design" for protected areas.

Seat No.	

Set | P

M.Sc. (Zoology) (Semester - IV) (New) (CBCS) Examination: March/April - 2026
Environmental biology and toxicology (2309406)

Day & Date: Tuesday, 21-04-2026 Max. Marks: 60
Time: 03:00 PM To 05:30 PM

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

Q.1 A) Choose the most correct alternative for given multiple choice question. **08**

1) Which type of ecosystem is a lake?
   a) Terrestrial b) Lentic
   c) Lotic d) Agricultural

2) What does Minamata disease result from?
   a) Lead poisoning b) Mercury poisoning
   c) Pesticide exposure d) Thermal pollution

3) Chernobyl is associated with which type of pollution?
   a) Thermal b) Radiation
   c) Noise d) Water

4) Which of the following is a greenhouse gas?
   a) Ozone b) Carbon dioxide
   c) Nitrogen d) Sulfur dioxide

5) What is the main source of energy in an ecosystem?
   a) Wind b) Water
   c) Sunlight d) Soil

6) Which of the following is a renewable resource?
   a) Coal b) Natural gas
   c) Solar energy d) Petroleum

7) Which of the following substances is considered a pollutant in the air?
   a) Nitrous oxide b) Ozone
   c) Hydrogen d) Sodium chloride

8) Which of the following is a major source of thermal pollution?
   a) Factories b) Automobiles
   c) Power plants d) All of the above

B) Fill in the blanks. **04**

1) Greenhouse management involves the control of _____.
2) _____ refers to the legislative control of pollution levels.
3) Carcinogens are substances that can cause _____.
4) FDA standards are related to the regulation of _____.

Q.2 Answer the following. (Any Six) **12**

a) Describe the concept and dynamics of an ecosystem.
b) Discuss the productivity.
c) M ineral cycle in aquatic ecosystems.
d) Implications of thermal pollution.
e) Explain the management of greenhouse.
f) Aquatic ecosystems.
g) Biological control in population ecology.
h) Environmental issues caused by industrial pollution.

Q.3 Answer the following questions. (Any Three) **12**

a) Discuss the legislation and Indian standards for pollution control.
b) Explain in detail the causes, effects, and control measures for water pollution.
c) Give an account of the carbon credits system in urban trash management.
d) What are the different types of toxic agents? Discuss their effects on the human body.

Q.4 Answer the following questions. (Any Two) **12**

a) Explain the role of soil toxicants in agriculture and household environments.
b) Importance and Methods of rainwater harvesting in natural resource conservation.
c) Describe the role of FDA standards in controlling food additives and carcinogens.

Q.5 Answer the following questions. (Any Two) **12**

a) Explain Solid Waste Management.
b) Explain food additives in the form of food colors and Preservatives.
c) Explain distribution and impact of environmental factors on the aquatic biodata.