Mode of Examination: Open Book Examination

Unique Paper Code	:	32231202_OC
Name of the Paper	:	Cell Biology
Name of the Course	:	B. Sc. (H) Zoology
Semester	:	II, CBCS
Duration	:	3 Hours
Maximum Marks	:	75

Instruction for Students

Write your Roll No., Name of the paper, Course, Semester, and Date of examination on the first page of answer sheet.

Attempt **ANY FOUR** questions. All questions carry equal marks.

Q1. Describe nucleosomal model of chromatin fiber organization and also explain the various levels of chromatin compaction.

Q2. What is co-translational transport? Describe in detail the process of cell secretion by signal hypothesis.

Q3. Enumerate in detail the process of generation of ATP by the power house of the cell-Mitochondria.

Q4. Describe the various models of plasma membrane which led to deduction of Fluid Mosaic model emphasizing the significance in its functioning.

Q5.What is polymorphism in Lysosomes? Mention the role of lysosomes in fertilization and metamorphosis.

Q6. What are the various phases in Cell cycle? Explain the role of cell cycle check points in regulating Cell cycle.

Mode of Examination: Open Book Examination (OBE)

Unique Paper Code : 32231403_OC
Name of the Paper : Biochemistry of Metabolic Processes
Name of the Course : B.Sc. (Hons) Zoology
Semester : IV, CBCS
Duration :3 hours
Maximum Marks :75

Instructions for Candidates

1. Write your Roll No., Name of the paper, Course, Semester, Unique paper code and Date of examination on the first page of the answer sheet.

2. Attempt **ANY FOUR** questions. All questions carry equal marks.

3. Substantiate your answer with diagrams wherever required.

Q.1 Discuss the amphibolic role of TCA cycle. Outline the role of TCA cycle in catabolism of carbon skeleton of alpha amino acids. (18.75 marks)

Q.2 Under what condition Ketogenesis occurs. Describe its pathway, regulation and importance? (18.75 marks)

Q.3 How is excess glucose stored in animal body. Name the process and explain it with the help of the diagram. Briefly discuss the coordinated regulation of both processes responsible for excess glucose storage and its breakdown. (18.75 marks)

Q.4 Use structural formulas to represent the reactions that convert NH_3, CO_2 and amide nitrogen of aspartate into urea and indicate the subcellular locations of the enzymes that catalyze the urea biosynthesis. (18.75 marks)

Q.5 Diagrammatically show the components of Electron Transport Chain and briefly discuss flow of electrons through them is responsible for synthesis of ATP in light of Chemiosmotic theory. (18.75 marks)

Q.6 Elucidate the metabolic pathway of biosynthesis of palmitic acid. How is fatty acid biosynthesis machinery (enzymatics) different from that of beta oxidation. (18.75 marks)

Mode of Examination: Open Book Examination (OBE)

Unique Paper Code : 32231403_OC
Name of the Paper : Biochemistry of Metabolic Processes
Name of the Course : B.Sc. (Hons) Zoology
Semester : IV, CBCS
Duration :3 hours
Maximum Marks :75

Instructions for Candidates

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3. Substantiate your answer with diagrams wherever required.

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Set - II
Mode of Examination: Online

Unique paper code : 32231401_OC
Name of the paper : Comparative Anatomy of Vertebrates
Name of course : B.Sc. (H) Zoology
Semester : IV, CBCS
Duration : 3 Hours
Maximum marks : 75

Instructions for Students

Write your Roll No., name of the paper, course, semester and date of examination on the first page of the answer sheet.

Attempt **ANY FOUR** questions. All questions carry equal marks.

Questions:

1. Modifications of Epidermal glands in vertebrates reflect adaptations for different environmental conditions on land. Discuss with examples.

2. Visceral skeleton was associated primarily with feeding and branchial respiration in jawed fishes. In Tetrapods the Visceral skeleton has become modified to perform new functions on land. Justify the statement.

3. Modifications in heart of vertebrates are correlated with the mode of respiration. The evolution of double – circuit heart from a single - circuit heart enabled the separation of oxygenated and deoxygenated blood. Explain with well labelled diagrams.

4. Teeth vary among Gnathostomes in number distribution position, with reference to summit of jaw, degree of permanence and shape. Dentition is correlated to the habits of an animal. Explain.

5. Although the gills of Cartilagenous and bony fishes exhibits the same basic pattern, yet they are different. How? Also explain the significance of swim bladder in fishes.

6. The caudal end of the oviduct in Therian mammals serves various functions in the preparation of egg and development of the embryo. Explain with suitable diagrams.

Mode of Examination: Open Book Examination (OBE)

Unique Paper Code	: **32237906**
Name of the Paper	: Parasitology
Name of the Course	: B.Sc. (H) Zoology
Semester	: VI CBCS
Duration	: 3 hours
Maximum Marks	: 75

Instruction for Students

Write your Roll No., Unique paper code (UPC), Name of the paper, Course, Semester, and Date of examination, Signature on the first page of answer sheet.

Attempt **ANY FOUR** questions. All questions carry equal marks (18.75 X 4 = 75).

SET – 4

Q1. It is considered that initial mutual interaction between two different animals get converted into a parasitic adaptation for one of the partners. The same has been reported in certain vertebrate animals which have been causing nuisance to human as well as extensive damage to livestock animals. Justify this statement with suitable examples and also put some light on other reported vertebrate animals belonging to different classes that are considered as parasites to human being.

Q2. What is *Trypanosoma gambiense*? Why is it a cause of concern? Discuss the life cycle of the parasite.

Q3. A group of teenagers spent an hour on one weekend swimming in a village pond. After a few days most of them complained inflammation in their urinary tracts, obstruction and pain in voiding the urine. As a student of parasitology find out the possible parasite involved. With well-labeled illustrations give an account on the various larval forms of the parasite. Discuss the habitat, preventive and control measures to eradicate the parasite.

Q4. Draw a well labelled diagram and explain the life cycle of *Trichinella spiralis*.

Q5. A laterally flattened, wingless insect with long hind legs adapted for jumping was found attached to hairs of its rodent host. Which acts as vector for disease causing etiological agents. On inspection this wingless insect is associated with the historical "the black death" considered to be the world's first pandemic. Identify the disease and classify with respect to its symptoms. What are epizootic and enzootic cycles? Discuss also the vector, its biology and enumerate the diagnostic and preventive strategies.

Q6. Do you support the statement, "The vertebrates have not done very good job at becoming parasites?" Describe one parasitic avian parasite and one parasitic mammalian parasite.

Mode of Examination: Open Book Examination

Unique Paper Code	:	32231601
Name of the Paper	:	Developmental Biology
Name of the Course	:	B.Sc. (Hons) Zoology-CBCS
Semester	:	VI
Duration	:	3
Maximum Marks	:	75

Instruction for Students

Write your Roll No., Name of the paper, Course, Semester, and Date of examination on the first page of answer sheet.

Number all pages and sign at the bottom of each page.

Attempt **ANY FOUR** questions. All questions carry equal marks.

Support your answers with neat labelled diagrams wherever these are required.

01. What are extra embryonic membranes? How are they evolutionary significant? Discuss their development in chick with the help of suitable diagrams. Add a note on their functions.

02. Define fate map. Explain different methods of preparing a fate map. Draw well labelled diagrams of fate map of frog and chick blastula.

03. Enumerate different morphogenetic movements involved in gastrulation. Explain the process of gastrulation in frog. How does it differ from chick gastrulation?

04. Describe the mechanism of fertilization in detail. How does sea urchin egg safeguard itself from polyspermy?

05. Describe the steps involved in the procedure of IVF. Enumerate different types of stem cells. Add a note on embryonic stem cells and their significance in regenerative medicine.

06. What are the different patterns of regenerations exhibited in animals? Describe the mechanism of limb regeneration in salamander. Briefly discuss the polarity of regeneration.

Mode of Examination: Online

Unique Paper Code	: 32231602
Name of the Paper	: Evolutionary Biology
Name of the Course	: B.Sc. (H) Zoology (CBCS)
Semester	: VI
Duration	: 3 Hours
Maximum Marks	: 75

Instructions for Students

Write your Roll No., Name of the paper, Course, Semester, and Date of examination on the first page of the answer sheet.

Attempt **ANY FOUR** questions. All questions carry equal marks.

Q1. Describe the environmental conditions that would have allowed origin of life on Earth. Explain how simple chemical compounds in the early environment gave rise to basic biomolecules. Discuss the chemical reactions that resulted in formation of macromolecules from simple organic molecules. Give evidence to support the RNA World hypothesis. **18.75**

Q2. Describe Darwin's concept of Natural Selection and its modification during subsequent years in the light of modern knowledge of genetics. **18.75**

Q3. Describe Geological time scale and the major evolutionary events associated with different periods. Add a note on K-T mass extinction event. **18.75**

Q4. A population evolves into two separate species while living in the same geographic region. How do you explain it? How is it different from evolution of populations separated by geographical barriers, into new species? Explain with examples. Describe other modes of speciation you are familiar with. **18.75**

Q5. What explanations have been propounded to explain the increase in ground-dwelling apes during the Miocene epoch? Describe the major fossil lineages of the Hominins. Explain how mitochondrial DNA can be used to track the origins and migrations of *Homo sapiens*? **18.75**

Q6. Describe the various features of a phylogenetic tree. Distinguish between rooted and unrooted phylogenetic tree. Describe any phenetic method of construction of a phylogenetic tree. **18.75**

Mode of Examination: Open Book Examination

[This question paper contains 1 printed page]

Sr. No. of Question Paper …… **Roll No. ……...**

Unique Paper Code	**:**	**32235907_OC**
Name of the Paper	**:**	**GE- Human Physiology**
Name of the Course	**:**	**B.Sc./B.Com/B.A. Zoology**
Semester	**:**	**II, CBCS**
Duration	**:**	**3 Hour**
Maximum Marks	**:**	**75**

Instruction for Students

- Attempt **ANY FOUR** questions. All questions carry **EQUAL MARKS**
- Write your Roll No., Name of the paper, Course, Semester, and Date of examination on the first page of answer sheet.
- *Draw* neat and well labelled diagrams wherever necessary.

Q1. What are the distinct characteristics of alveolar membrane that facilitates oxygen transport across it? Discuss the role of various muscles involved in ventilation with the help of suitable diagrams/illustrations.

Q2. Differentiate the action potential conduction in cardiac muscle from that in skeleton muscles. Briefly explain the various phases of action potential in ventricular contractile fibers with the help of suitable graph. Discuss the role of different valves in cardiac cycle.

Q3. Give an account of Juxtaglomerular apparatus with suitable diagram. What is the purpose of renin-angiotensin-aldosterone (RAAS) system? How is it accomplished? Discuss in detail.

Q4. After eating a fat-rich diet, a person experienced a burning sensation in his chest (heartburn) and trouble in swallowing. Investigate the cause. Describe the structure and function of a mixed gland in the digestive system.

Q5. Give an account of ion channels present in neurons. What are the factors that contribute to the resting membrane potential? Discuss the mechanism of propagation of nerve impulse with the help of diagrams.

Q6. How is hypothalamus related to pituitary gland? Describe the histology of anterior pituitary with reference to the types of cells and their hormonal secretion, function and control.

Unique Paper Code	:	32237903
Name of the Paper	:	DSE – Animal Biotechnology
Name of the Course	:	B.Sc. (H) Zoology
Semester	:	VI
Duration	:	3 hours
Maximum Marks	:	75 Marks

Instructions for Candidates

Write your Roll No., Name of the paper, Course, Semester, and Date of examination on the first page of answer sheet.

Attempt **ANY FOUR** questions. **All questions carry equal marks**.

Illustrate your answers with appropriate diagrams wherever necessary.

SET 2

Q1. In a biotechnology laboratory, students are routinely performing various techniques like PCR, DNA sequencing, construction of DNA libraries and various blotting techniques. Enlist the various enzymes used in this laboratory and their role in these techniques.

Q2. Explain the ways of stopping the expression of a gene in an organism by genetic manipulations. Also justify the statement "Mammary glands act as bioreactors".

Q3. What gene manipulation strategies can be adopted for generating herbicide-resistant plants? Elaborate the strategy that was used for creating Roundup Ready crops that were resistant to glyphosate.

Q4. Identify a lethal autosomal disorder which is commonly a result of deletion of phenylalanine at position 508 in chloride ion channel protein. Discuss the diagnostic tools that can be employed for its detection at genetic level.

Q5. With the help of a well-illustrated diagram explain how high capacity cloning vectors can be used for the construction of genomic libraries. Suggest any two methods for screening a DNA library for detecting lipase encoding gene.

Q6. How is genetic recombination different from recombinant DNA? How has recombinant DNA technology been helpful in treating dwarfism using recombinant Growth Hormone?