

**FOURTH SEMESTER M.Sc. DEGREE [REGULAR/SUPPLEMENTARY]
EXAMINATION, APRIL 2022**

(CBCSS)

Zoology

ZOL 4E 12—CELLULAR PHYSIOLOGY

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

General Instructions

1. *In cases where choices are provided, students can attend all questions in each section.*
2. *The minimum number of questions to be attended from the Section/Part shall remain the same.*
3. *The instruction if any, to attend a minimum number of questions from each sub section / sub part / sub division may be ignored.*
4. *There will be an overall ceiling for each Section / Part that is equivalent to the maximum weightage of the Section / Part.*

Part A

I. Short Answer Questions. Answer any *four* questions. Each question carries 2 weightage :

- 1 Define cell polarity.
- 2 Differentiate endosome and lysosome.
- 3 Define oxidative stress and its effects.
- 4 Define neurodegeneration and its effects.
- 5 Give any *two* differences between the integral and peripheral membrane proteins.
- 6 Define cell adhesion molecules.
- 7 What are the stages of cell signaling ?

(4 × 2 = 8 weightage)

Turn over

Part B

II. Short Essay Questions. Answer any *four* questions. Each question carries 3 weightage :

- 8 Give a brief account of specialized cells in mammals.
- 9 Give a brief account of neuron physiology.
- 10 Give a brief account of the physiological process of membrane transport.
- 11 Give a brief account of endocrine signaling and its example.
- 12 Give a brief account of the categories of cell signaling with respect to ligands.
- 13 Give a brief account of viral infection which alter cell physiology.
- 14 Give a brief account of any six stress-related health issues.

(4 × 3 = 12 weightage)

Part C

III. Essay Questions. Answer any *two* questions. Each question carries 5 weightage :

- 15 Describe in detail the motor proteins in the cytoskeleton.
- 16 Describe in detail the structure of voltage-gated sodium channel.
- 17 Explain in detail the cell signaling and its forms.
- 18 How can the bacterial infection alter the cell physiology. Explain ?

(2 × 5 = 10 weightage)

**FOURTH SEMESTER M.Sc. DEGREE [REGULAR/SUPPLEMENTARY]
EXAMINATION, APRIL 2022**

(CBCSS)

Zoology

ZOL 4E 11—ADVANCED PHYSIOLOGY AND DEVELOPMENTAL BIOLOGY

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

General Instructions

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Part A

I. Short Answer Questions. Answer any *four* questions. Each question carries 2 weightage :

- 1 What are the differences between equilibrium and steady-state ?
- 2 Write a short note on low blood pressure.
- 3 Write the warning signs of emotional stress.
- 4 Write the causes of sleep disorders.
- 5 How does the cardiovascular system adapt to exercise ?
- 6 Define clonal analysis.
- 7 What are the applications of RT-PCR ?

(4 × 2 = 8 weightage)

Turn over

Part B

II. Short Essay Questions. Answer any *four* questions. Each question carries 3 weightage :

- 8 Write a detailed account of ECG.
- 9 Discuss the neurobiological effects of physical exercise.
- 10 Enumerate the elusive role of placental macrophages in the Hofbauer cell.
- 11 Write a brief note on Fluorescence In situ Hybridization.
- 12 Write a brief account of infertility.
- 13 Write a detailed account of Tissue engineering.
- 14 Write an overview of the mechanism and application of implantation.

(4 × 3 = 12 weightage)

Part C

III. Essay Questions. Answer any *two* questions. Each question carries 5 weightage :

- 15 Write the genome editing and CRISPR Cas 9.
- 16 Write a brief account of the process of muscle contraction.
- 17 Write a brief account of stress.
- 18 Write the role of hormones in lactation.

(2 × 5 = 10 weightage)

**FOURTH SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY)
EXAMINATION, APRIL 2022**

(CBCSS)

Zoology

ZOL 4E 12—HUMAN GENETICS-III : CANCER GENETICS AND GENETIC SERVICES
(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

General Instructions

1. *In cases where choices are provided, students can attend all questions in each section.*
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Part A

I. Answer any *four* of the following. Each question carries 2 weightage :

- 1 Inbreeding and consequences.
- 2 Epidemiology.
- 3 Genetic registries.
- 4 Vectors.
- 5 Chemotherapy.
- 6 Retinoblastoma.
- 7 Apoptosis.

(4 × 2 = 8 weightage)

Part B

II. Answer any *four* of the following. Each question carries 3 weightage :

- 8 Write note on gene amplification techniques.
- 9 Explain the steps in gene mapping.

Turn over

- 10 Comment on different types of lymphomas in human.
- 11 Explain the role of telomeres in genetic disorders.
- 12 Briefly explain different types of electrophoretic methods used in genetic engineering.
- 13 Comment on the outcome of the Human Genome Project and their applications.
- 14 Explain how Dermatoglyphics used in genetic disorders.

(4 × 3 = 12 weightage)

Part C

III. Answer any *two* of the following. Each question carries 5 weightage :

- 15 Write an essay on the steps in genetic counseling. Add note on the psychological aspects in genetic counseling.
- 16 Explain the steps in making gene libraries.
- 17 Give an account on the role of immune system in diseases. Add note on autoimmune diseases.
- 18 Comment on the role of protooncogenes in cancer.

(2 × 5 = 10 weightage)

FOURTH SEMESTER M.Sc. DEGREE [REGULAR/SUPPLEMENTARY]
EXAMINATION, APRIL 2022

(CBCSS)

Zoology

ZOL 4E 12—FISHERY SCIENCE—III : HARVESTING, POST-HARVESTING
TECHNOLOGY AND MARKETING

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

General Instructions

1. *In cases where choices are provided, students can attend all questions in each section.*
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Part A

I. Answer any *four* of the following. Each question carries 2 weightage :

- 1 What are brail nets ?
- 2 What is the significance of using RSW in post-harvest technology ?
- 3 What is catch per unit effort ?
- 4 Briefly explain the commercial importance of ising glass.
- 5 What is accelerated freeze drying ?
- 6 What are the activities of FSI ?
- 7 What is dry ice ?

(4 × 2 = 8 weightage)

Turn over

Part B

II. Answer any *four* of the following. Each question carries 3 weightage :

- 8 Discuss different types of underwater fish detection devices.
- 9 Explain the preparation of fish oil for dietary applications.
- 10 Explain the significance of chlorination in pre-processing technology.
- 11 Discuss the principles of fisheries extension.
- 12 Give an account on different varieties of pre-processed shrimp.
- 13 Describe the protein composition of fish muscle.
- 14 Explain labeling rules and identification marks of seafood packages.

(4 × 3 = 12 weightage)

Part C

III. Answer any *two* of the following. Each question carries 5 weightage :

- 15 Explain the steps involved in canning method of fish preservation.
- 16 Discuss different types of encircling gears and their method of operation.
- 17 Discuss the current scenario and future prospects of Indian seafood in international market.
- 18 Write an essay on fish spoilage and quality assessment.

(2 × 5 = 10 weightage)

**FOURTH SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY)
EXAMINATION, APRIL 2022**

(CBCSS)

Zoology

ZOL 4E 12—ENTOMOLOGY—III : AGRICULTURAL, MEDICAL AND FORENSIC
ENTOMOLOGY

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

General Instructions

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Part A

I. Answer any *four* of the following. Each question carries 2 weightage :

- 1 Give an account of spotted ball worms of cotton.
- 2 Explain microbial control of crop pests.
- 3 What is male sterile technique ?
- 4 Write the damages caused by any two major pests of banana. Add a note on their control measures.
- 5 Give a brief account of insects related to myiasis.
- 6 Comment on insect growth regulators and their role in pest control.
- 7 What are synthetic pyrethroids ?

(4 × 2 = 8 weightage)

Part B

II. Answer any *four* of the following. Each question carries 3 weightage :

- 8 Write an account of major pests of sugarcane.
- 9 Briefly describe the methods involved in pest surveillance and forecasting of pest outbreak.
- 10 Explain physical control methods of insect pests.
- 11 Classify insecticides based on their mode of action.
- 12 Give an account of major stored grain pests and their control.
- 13 Write an account of insects employed in forensic entomology.
- 14 Describe the morphological adaptations of insect vectors:

(4 × 3 = 12 weightage)

Part C

III. Answer any *two* of the following. Each question carries 5 weightage :

- 15 Describe different types of damages to plants by insect pests.
- 16 Write an essay on the major pests of paddy.
- 17 Discuss the different methods of mosquito control.
- 18 Write an essay on Integrated Pest Management.

(2 × 5 = 10 weightage)

**FOURTH SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY)
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Zoology

ZOL 4E 11—HUMAN GENETICS II : DIAGNOSTIC GENETICS

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

General Instructions

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Part A

I. Answer any *four* of the following. Each question carries 2 weightage :

- 1 SKY.
- 2 FISH.
- 3 Porphyrias.
- 4 RFLP.
- 5 CASA.
- 6 Microchip.
- 7 Comet assay.

(4 × 2 = 8 weightage)

Turn over

Part B

II. Answer any *four* of the following. Each question carries 3 weightage.

- 8 Write note on non-invasive techniques in prenatal diagnosis.
- 9 Give an account on the preparation of probes and their classification.
- 10 Write note on blotting techniques.
- 11 Write briefly on role of pre-implantation technique in genetic diagnosis.
- 12 Write note on the inheritance of genetic disorders.
- 13 Explain briefly on gonadal differentiation in human.
- 14 Write briefly on disorders of nucleic acid metabolism .

(4 × 3 = 12 weightage)

Part C

III. Answer any *two* of the following. Each question carries 5 weightage :

- 15 Write an essay on common birth defects in human.
- 16 Comment on carbohydrate metabolism disorders with examples.
- 17 Write an account on human embryo development.
- 18 Give an account on gene sequencing. Add note on its applications.

(2 × 5 = 10 weightage)

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Zoology

ZOL 4E 11—FISHERY SCIENCE-II : CAPTURE AND CULTURE FISHERIES

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

General Instructions

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Part A

I. Answer any *four* of the following. Each question carries 2 weightage :

- 1 What is mother of pearl ?
- 2 Briefly explain the significance of polyculture practice.
- 3 What are the major anesthetics used during fish transportation ?
- 4 Give a brief account on prawn filtration.
- 5 What is a cultch material ?
- 6 What are monk sluices ?
- 7 What is an alevin ?

(4 × 2 = 8 weightage)

Part B

II. Answer any *four* of the following. Each question carries 3 weightage :

- 8 Discuss the role of hormones in sex reversal among fishes.
- 9 Comment on the water quality parameters of marine aquaria.

Turn over

- 10 Explain different types of fertilizers used in aqua farms.
- 11 Enumerate the steps involved in the cryopreservation of fish gametes.
- 12 Explain the eradication methods employed for predatory and weed fishes.
- 13 Discuss the merits and demerits of cage farming.
- 14 Explain the nutritional composition of artificial fish diets.

(4 × 3 = 12 weightage)

Part C

III. Answer any *two* of the following. Each question carries 5 weightage :

- 15 Write an essay on the major fish diseases of viral and bacterial origin.
- 16 Explain the culture methods of economically important seaweeds of India.
- 17 Write an essay on the present status of sardine fisheries of India. Add notes on its prospects and challenges.
- 18 Explain the culture methods of Indian major carps.

(2 × 5 = 10 weightage)

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(Pages : 2)

Name.....

Reg. No.....

**FOURTH SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY)
EXAMINATION, APRIL 2022**

(CBCSS)

Zoology

ZOL 4E 11—ENTOMOLOGY-II : ANATOMY AND PHYSIOLOGY

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

General Instructions

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Part A

I. Answer any *four* of the following. Each question carries 2 weightage :

- 1 Give a brief account of the histology of insect integument.
- 2 What are juvenile hormones ?
- 3 Give an account of viviparity in insects.
- 4 What is diapause ? Mention the types.
- 5 Explain the digestion of wood in insects.
- 6 Describe the histology of malpighian tubules in Lepidoptera.
- 7 Write an account of neuromuscular junctions in insects.

(4 × 2 = 8 weightage)

Part B

II. Answer any *four* of the following. Each question carries 3 weightage :

- 8 Describe the structure of reproductive system in insects.
- 9 Explain different types of parthenogenesis in insects.

Turn over

- 10 Give an account of sound production in insects.
- 11 Give an account of cellular elements of insect haemolymph.
- 12 Describe the histomorphology of insect muscles.
- 13 Explain the synthesis of uric acid and formation of excreta in insects.
- 14 Write an account of nutritional requirements in insects.

(4 × 3 = 12 weightage)

Part C

III. Answer any *two* of the following. Each question carries 5 weightage :

- 15 Write an essay on the anatomy and physiology of photoreceptors in insects.
- 16 Describe the structure and modifications of insect wings.
- 17 Explain the structure of respiratory system of insects. Add a note on the process of ventilation.
- 18 Describe nerve impulse transmission and synaptic transmission in insects.

(2 × 5 = 10 weightage)

**FOURTH SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY)
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Zoology

ZOL 4C 10—BIOTECHNOLOGY AND MICROBIOLOGY

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

General Instructions

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Part A

I. Answer any *four* of the following. Each question carries 2 weightage :

- 1 Southern blotting.
- 2 PCR technique.
- 3 RAPD.
- 4 Nutritional types.
- 5 Antisense RNA.
- 6 RNA viruses.
- 7 Alcoholic fermentation.

(4 × 2 = 8 weightage)

Turn over

Part B

II. Answer any *four* of the following. Each question carries 3 weightage :

- 8 Write a note on international obligations on intellectual property rights.
- 9 Differentiate gram positive and negative bacteria. Explain the mechanism of gram staining.
- 10 Write on the methods used in the study of microbial growth.
- 11 Explain the methods used in microbial analysis of drinking water. Add a note on the role of bioremediation in ensuring the safety of drinking water.
- 12 Give an account on social acceptance issues of transgenic products.
- 13 Explain the various methods in animal tissue culture.
- 14 Write an account on the construction of cDNA library.

(4 × 3 = 12 weightage)

Part C

III. Answer any *two* of the following. Each question carries 5 weightage :

- 15 Write an essay on the different methods used to control microorganisms.
- 16 Give an account on DNA sequencing techniques.
- 17 Explain different cloning procedures adopted in genetic engineering. Add a note on the shortcomings of these techniques.
- 18 Write an account on different types of molecular markers. Add a note on their applications in different fields.

(2 × 5 = 10 weightage)