

## FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

## Second Semester M.Sc Zoology Degree Examination, April 2023

## MZL2C04 – Molecular Biology

(2022 Admission onwards)

Time: 3 hours

Max. Weightage : 30

**I. Answer any eight questions (Weightage - 1)**

1. What is the significance of TATA box?
2. Write briefly on the active centres of ribosomes.
3. Explain the role of operons in the regulation of gene expression with one example.
4. What is Human Genome Project?
5. Define maternal inheritance with one example.
6. Differentiate the eukaryotic ribosome from the prokaryotic ribosome.
7. Write a note on petite mutants.
8. What are the applications of whole genome sequencing of humans?
9. Define oncogenes with any one example.
10. How does mitochondrial genetic code differ from nuclear genetic code?
11. Write a brief note on gene therapy for cancer.
12. What are the features of interrupted genes?

(8x1 = 8 weightage)

**II. Answer any four questions (Weightage - 3)**

13. Classify restriction enzymes and distinguish them based on their mode of action.
14. Discuss the Holiday model of recombination in DNA.
15. Differentiate the processes of protein synthesis in prokaryotes and eukaryotes.
16. Explain the reason for the formation of Okazaki fragments.
17. Write short notes on Junk DNA, Satellite DNA, and Selfish DNA.
18. Briefly discuss the concept of the evolutionary clock and its applications.
19. Define transposons and explain the mechanism of transposition.

(4x3 = 12 weightage)

**III. Answer any two questions (Weightage - 5)**

20. Explain different models of DNA replication. Enrich your answer with appropriate illustrations.
21. Discuss translational inhibition with at least six inhibitors as examples.
22. Explain gene editing using CRISPR-Cas system. Discuss its applications.
23. Discuss the characteristic features of RNA polymerases of phages, prokaryotes, and eukaryotes and add notes on their functions.

**(2x5 = 10 weightage)**



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FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Second Semester M.Sc Zoology Degree Examination, April 2023

MZL2C05 – Ecology & Ethology

(2022 Admission onwards)

Time: 3 hours

Max. Weightage : 30

**I. Answer any eight questions (Weightage - 1)**

1. Comment on resource partitioning.
2. Compare and contrast r-selection and K-selection strategies.
3. Explain the concept of climax
4. What is the primary focus of ethology as a field of study in understanding animal behavior, and how does it differ from other schools of study
5. Write notes on population growth curves
6. Comment on ecological foot print.
7. Differentiate Instinct and FAP
8. What are some innovative examples of green technology and their potential environmental benefits?
9. Comment on SLOSS?
10. What are the characteristics of Ecotones.
11. What experimental methods are used to demonstrate the genetic basis of behavior?
12. What is signal stimuli and stimulus filtering?

(8x1 = 8 weightage)

**II. Answer any four questions (Weightage - 3)**

13. Explain the concept of metapopulation.
14. Assess the ecological services of wetland and mangrove ecosystems.
15. Explain the different approaches on ecological modelling
16. Briefly discuss different types of species interaction
17. What are the major terrestrial biomes, briefly explain the characteristics
18. Explain the environmental influence on behaviour.
19. Illustrate and explain the Psycho hydraulic model of Lorenz

(4 x 3 = 12 weightage)

**III. Answer any two questions (Weightage - 5)**

20. Discuss the global environmental issues, Analyse the impacts of climate change on global biodiversity loss and ecosystem functioning.
21. Explain the major forest types of India, Explore the diverse flora and fauna associated with each forest types
22. Discuss the potential consequences of Anthropogenic impacts on the functioning and effectiveness of communication systems in animals. Provide specific examples to support your answer.
23. Analyse and compare popular species diversity indices. Mention the application of these diversity measures and their significance in ecological research and conservation efforts.

**(2x5=10 Weightage)**



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Second Semester M.Sc Zoology Degree Examination, April 2023

MZL2C06 – Developmental Biology & Endocrinology

(2022 Admission onwards)

Time: 3 hours

Max Weightage : 30

I Answer any *eight* questions.(Weightage-1)

1. What is pluripotency
2. Explain embryonic induction.
3. Define cell differentiation.
4. Comment on parturition.
5. What are environmental oestrogens.
6. What are teratogenic agents?
7. Comment on feedback control of hormone secretion.
8. What are cadherins?
9. Explain Hox code hypothesis.
10. Differentiate morpholaxis and epimorphosis.
11. Explain cell signalling.
12. Give an account on second messengers of hormone action.

(8x1=8)

II. Answer any *four* questions. (Weightage-3)

13. Explain the mechanism of action of peptide hormones
14. Describe molecular basis of cellular differentiation.
15. Briefly explain vulva formation in *Caenorhabditis elegans*.
16. Comment on physiological roles of androgens and estrogens.
17. Explain neuroendocrine pathophysiology.
18. Describe environmental regulation of normal development.
19. Write a brief note on cell surface molecules in sperm –egg recognition in animals.

(4x3=12)

**III. Answer any two questions. (Weightage-5)**

20. Write an essay on differential gene expression during development.
21. Elaborate basic concepts of development.
22. Brief account on the biosynthesis and metabolism of Ovarian hormones.
23. Describe the structure, physiological functions and control of secretion of thyroid hormones.

(2x5=10)