

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Fifth Semester B.Sc Zoology Degree Examination, November 2025

BZL5B06 - Cell Biology & Genetics

(2022 Admission onwards)

Time: 2 ½ hours

Max. Marks : 80

SECTION A

I. Short answer questions. Each question carries *two* marks

1. Which cell organelles are referred to as power plants of the cell? Why?
2. What is Co-dominance? Give examples
3. Give the reason that leads to the metabolic disorder of Phenylketonuria.
4. What is Criss-cross inheritance? Give example.
5. What is double staining? Give examples.
6. What is Lyon hypothesis?
7. Give the genetic reason for occurrence of Turner's Syndrome.
8. What are the components of cytoskeleton?
9. Differentiate between Exocytosis and Endocytosis.
10. How are mutations induced?
11. What are Linkage groups?
12. Distinguish between Heterochromatin and Euchromatin.
13. Why are some rare individuals found as XX males or XY females?
14. What are the major significances of Apoptosis?
15. Discuss the concept of GERL.

(Ceiling 25 marks)

SECTION B

II. Paragraph questions. Each question carries *five* marks

16. Give an account on the special methods of specimen preparation for electron microscopy.
17. Discuss the main postulates of the chromosome theory of linkage?
18. Briefly explain the phenomenon of Multiple allelism with examples.
19. Discuss briefly the different types of chromosomal mutations.
20. Enumerate the major functions of Endoplasmic reticulum.
21. Explain the genetic disorder that causes Sickle-cell anaemia.
22. Give an outline of the role of Lysosomes in the cell.
23. Discuss the differences between light microscope and electron microscope.

(Ceiling 35 marks)

SECTION C

III. Essay Questions. Answer any *two* questions.

24. Write an essay on Non-allelic interactions with examples.
25. Describe the phases of a typical eukaryotic cell cycle in detail.
26. Explain the major mechanisms of membrane transport.
27. Discuss the various mechanisms of sex determination.

(2 × 10 = 20 Marks)

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE
Fifth Semester B.Sc Zoology Degree Examination, November 2025
BZL5B07 - Biotechnology, Microbiology & Immunology
(2022 Admission onwards)

Time: 2 ½ hours

Max. Marks : 80

Section A

I. Short answer questions. Each question carries 2 marks.

1. Define cloning vector?
2. What is HAT selection in hybridoma technology?
3. Mention two applications of molecular markers.
4. Differentiate between sterilization and disinfection.
5. Mention two types of culture media?
6. Define antigen.
7. What is active immunity?
8. Mention the role of macrophages in immunity.
9. Define monoclonal antibody.
10. What is HLA?
11. Mention one use of SNPs.
12. What is a bacterial artificial chromosome (BAC)?
13. Define ethical concerns related to cloning.
14. Define antiseptics.
15. What is a deep-freezing technique?

(Ceiling: 25 marks)

Section B

II. Paragraph questions. Each question carries 5 marks

16. Describe the process of recombinant DNA preparation.
17. Explain the concept and methods of transfection in animal cell culture.
18. Describe the structure of a typical bacterium.
19. Explain Gram staining procedure.
20. Discuss the applications of bacteriophages in medicine.
21. Differentiate between humoral and cell-mediated immunity.
22. Discuss the structure and function of Class I MHC molecules.
23. Explain the clinical course of HIV infection.

(Ceiling: 35 marks)

Section C

III. Essay questions. Answer any *two* questions.

24. Discuss the applications of biotechnology in medicine and industry
25. Explain the role of microorganisms in industrial microbiology with examples.
26. Describe the structure, classification and biological functions of immunoglobulins.
27. Explain the types of immunity and the role of MHC molecules.

(2x10 = 20 marks)

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FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Fifth Semester B.Sc Zoology Degree Examination, November 2025

BZL5B08 - Biochemistry and Molecular Biology

(2022 Admission onwards)

Time: 2 ½ hours

Max. Marks : 80

Section A — Short Answer Questions (2 marks each)

1. Explain hydrogen bonding with an example from biomolecules.
2. Define mutarotation.
3. Distinguish between reducing and non-reducing disaccharides.
4. Write the structural levels of proteins.
5. State the principle of affinity chromatography.
6. What are isoenzymes? Give one example.
7. Mention the role of FAD in metabolism.
8. What is gluconeogenesis?
9. Define codon and anticodon.
10. Differentiate monocistronic and polycistronic transcription units.
11. What are spliceosomes?
12. Name any two post-translational modifications.
13. What is selfish DNA?
14. Distinguish between lysogenic and lytic cycles of phages.
15. Define transposons.

(Ceiling: 25 marks)

Section B – Paragraph (5 marks each)

16. Describe the structure and biological importance of starch and glycogen.
17. Explain different types of protein denaturation.
18. Briefly describe the steps of glycolysis.
19. Explain the process of β -oxidation of fatty acids.
20. Write short notes on the structure and types of RNA polymerases.
21. Describe the mechanism of wobble hypothesis.
22. Explain the regulation of the trp operon.
23. Briefly describe specialized transduction in bacteria.

(Ceiling: 35 marks)

Section C – Essay (10 marks each, answer any two)

24. Explain the mechanism of DNA replication with emphasis on Okazaki fragments.
25. Discuss the structure and functions of lipids. Add a note on clinical significance of lipid profile.
26. Explain in detail the process of translation in eukaryotes.
27. Describe the organization of the human genome and explain the C-value paradox.

(2×10 = 20 marks)

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE
Fifth Semester B.Sc Zoology Degree Examination, November 2025
BZL5B09 - Methodology in Science, Biostatistics & Bioinformatics
(2022 Admission onwards)

Time: 2 ½ hours

Max. Marks : 80

Section A

Short answer questions. Each question carries 2 marks.

1. Comment on the Interdisciplinary approach of science.
2. Differentiate between Inductive and deductive reasoning.
3. Explain the significance of peer review
4. Comment on types of experiments
5. Explain the criteria for selecting test animals for experimental research.
- 6 Differentiate between laboratory experiments and field experiments
7. Differentiate qualitative and quantitative variables with examples.
8. Define molecular docking and state its primary objective.
9. What is the t-test?
10. Define bioinformatics and mention any two of its applications..
11. Give the full forms of EMBL, DDBJ, and PDB..
12. What is a patent? Give an example.
13. Mention any two metabolite databases and their importance..
14. What is the importance of bioinformatics in drug discovery?
15. What is sequence submission? Which platform is commonly used for it?

(Ceiling: 25 marks)

Section B

Paragraph questions. Each question carries 5 marks

16. Explain different steps in scientific methods
17. Differentiate between primary, secondary, and tertiary scientific information sources
18. Explain the importance of statistics in designing and analyzing biological experiments.
19. . Comment on Features and classification of biological Databases in Bioinformatics
20. Find the mean and sd for the following data:?

x 2 4 6 8

f 3 5 4 2

21. Comment on the steps involved in testing of hypothesis.
22. Write a note on nucleotide sequence databases.
23. Explain the principle and steps of Sanger capillary sequencing

(Ceiling: 35 marks)

Section C

Essay questions. Answer any *two* questions. Each question carries 10 marks

24. Write on the different steps involved in designing an experiment.
25. Describe the process of constructing a phylogenetic tree using molecular data.
26. Explain graphical and diagrammatic methods used for the presentation of data.
27. Describe the applications of proteomics in biological science.

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE
Fifth Semester B.Sc Zoology Degree Examination, November 2025
(Open Course)
BZL5D01 - Reproductive health and sex education
(2022 Admission onwards)

Time: 2 hours

Max. Marks : 60

SECTION A

I. Answer the following questions. Each question carries *two* marks.

1. Comment on Trichomonal Vaginitis.
2. What is Chorionic Villus Sampling?
3. Name two natural contraceptive methods.
4. Distinguish between combination pills and sequential pills.
5. What is Barr Body? Write down its significance.
6. What do you mean by gender discrimination?
7. Explain ICSI.
8. What is POCSO Act 2012?
9. How is Gonorrhoea transmitted?
10. Comment on Freemartin in cattle.
11. What is MTP?
12. What is meant by child abuse?

(Ceiling: 20)

SECTION B

II. Answer the following questions in a paragraph. Each question carries *five* marks.

13. Discuss various sex determination mechanisms in animals.
14. Explain any two chromosomal anomalies in human beings.
15. Briefly describe the various fertility control methods.
16. Differentiate between invasive and non-invasive prenatal diagnostic methods.
17. Explain the causes, symptoms, transmission and diagnosis of AIDS.
18. Explain reproductive rights of a female.
19. With a labelled diagram, explain the structure of a Graafian follicle.

(Ceiling: 30)

SECTION C

III. Essay questions. Answer *any one* question.

20. Explain female sexual cycle and its hormonal control in human beings.
21. Write an essay on in-vitro fertilization and embryo transfer.

(1x10 = 10 marks)