QP Code: P25C001

Reg. No : ....

Name : ....

ST MARY'S COLLEGE (AUTONOMOUS), THRISSUR-20

III SEMESTER (CBCSS - PG) DEGREE EXAMINATION, OCTOBER 2025

M. Sc. Biology

BIO3C07 : CELL BIOLOGY AND GENETICS

2024 Admission Onwards

Time:3 Hours **Maximum Weightage:30**

Part A

*Short answer type questions: Answer **any four** questions. Weightage **2** for each question.*
(4x2 = 8 Weightage)

1. Describe the stages of the cell cycle and explain the function of checkpoints.
2. Briefly describe the structure and function of ribosomes.
3. Explain the importance of vesicular trafficking in transporting proteins to their correct destinations in eukaryotic cells.
4. Calculate expected genotype frequencies using Hardy–Weinberg equillibrium principle when $p = 0.7$ and $q = 0.3$.
5. Define cell signaling and distinguish between autocrine, paracrine, and endocrine signaling.
6. Analyze the role of integrins in mechanotransduction.
7. Analyze differences between numerical and structural chromosomal aberrations.

Part B

*Short essay-type questions: Answer **any four** questions. Weightage **3** for each question.*
(4x3 = 12 Weightage)

8. Trace the historical evolution of microscopy techniques and their role in understanding cell structure.
9. Explain about Non-Mendelian Inheritance and its significance.
10. Discuss molecular clocks and phylogenetic trees as tools to study evolutionary genetics.
11. Compare co-translational and post-translational protein import into organelles.
12. Evaluate the evolutionary and functional significance of sex-linked characteristics with human examples.
13. Discuss the role of caspases in the execution phase of apoptosis.

Turn Over

14. List the main cell organelles involved in protein synthesis and transport. Briefly state their primary functions.

Part C

Essay-type questions: Answer ***any two*** *questions. Weightage* ***5*** *for each question.*
(2x5 = 10 Weightage)

15. Write an essay on polygenic inheritance with suitable examples.
16. Describe the morphology and organization of eukaryotic chromosomes.
17. Discuss the different types of solute transport mechanisms across membranes.
18. Write an essay on extra-nuclear inheritance with examples.

****