

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 600 086
(For Candidates admitted during the academic year 2019 – 2020 & thereafter)

B.Sc. DEGREE EXAMINATION - NOVEMBER 2023
BRANCH VI A – ADVANCED ZOOLOGY & BIOTECHNOLOGY
FIFTH SEMESTER

COURSE : MAJOR CORE
PAPER : CELL AND MOLECULAR BIOLOGY
SUBJECT CODE : 19ZL/MC/CM54
TIME : 3 HOURS **MAX. MARKS: 100**

SECTION – A

ANSWER ALL QUESTIONS **(10 x 3 = 30)**

1. State the Endosymbiont Theory.
2. What are the primary functions of the endoplasmic reticulum (ER) in the cytoplasmic vacuolar system.
3. What are ribosomes composed of, and what is their primary function?
4. What is the nuclear envelope and how does it regulate the passage of molecules in and out of the nucleus?
5. How does membrane asymmetry contribute to the functioning of the cell membrane?
6. Define signal transduction and mention its significance.
7. Define protooncogenes and tumor suppressor genes.
8. Highlight the importance of the rolling circle model of bacterial replication.
9. List three DNA repair mechanisms.
10. How are genes organized in eukaryotic genomes?

SECTION – B

ANSWER ANY FIVE QUESTIONS **(5 x 6 = 30)**
(Draw diagrams where necessary)

11. Elucidate the Watson and Crick model of DNA.
12. Highlight the characteristics of a cancer cell.
13. Explain the Fluid Mosaic model of the cell membrane, highlighting its key components and functions.
14. Elaborate on Post transcriptional modifications.
15. Tabulate the differences between prokaryotic and Eukaryotic cells.
16. Describe polymorphism in lysosomes.
17. Explain the mechanism of RNA interference (RNAi) and its significance in regulating gene expression.

SECTION – C

ANSWER ANY TWO QUESTIONS **(2 x 20 =40)**
(Draw diagrams where necessary)

18. Explain the theta model of DNA replication with suitable diagrams.
19. Give the definition and significance of Apoptosis. Elaborate on the types of Apoptotic pathways.
20. Describe the structure and functions of Mitochondria.
21. Discuss the regulation of gene expression in Bacteria. Highlight the Lac Operon Model.
