19. (a) Give an account of the overview of transcription and its importance.

Or

(b) Explain about RNA interference.

20. (a) Give an account of tumor viruses and oncogenes.

Or

(b) Discuss the role of oncogenic proteins in cancer.

PART C — (3 × 10 = 30)

Answer any THREE questions.

21. Explain the structure and function of Mitochondria in detail.

22. How does DNA maintain its fidelity during replication? Elaborate the process of DNA repair mechanisms.

23. Explain about small non-coding RNA and RNA interference.

24. Elaborate the process of transcription in prokaryotes.

25. Give a detailed account of new strategies (any 2 methods) for combating cancer.

(For candidates admitted from 2022-2023 onwards)

M.Sc. DEGREE EXAMINATION, NOVEMBER 2023.

Biotechnology

CELL AND MOLECULAR BIOLOGY

Time : Three hours Maximum : 75 marks

PART A — (20 marks)

I. (A) Multiple choice questions (5 × 1 = 5)

1. In plasma membrane, carbohydrate is present on the

(a) Both layers of lipid

(b) Only on cytoplasmic side of lipid bilayer

(c) Only on non-cytoplasmic side of lipid bilayer

(d) None of these

2. Golgi complex plays a major role in

(a) Transcription

(b) Glycosylation of lipids and proteins

(c) Removal of sulphate from the carbohydrate moiety of glycolipids

(d) Formation of secondary lysosomes

3. In peroxisome, during oxidation of fatty acids electrons and protons transferred to FAD and NAD^+, Reduced FAD finally transfer the electrons and protons to O_2, and forms

(a) H_2O (b) H_2O_2

(c) CH_3OH (d) none

4. Which one of the following transcription factors bind to TATA box?

(a) TFII D (b) TFII B

(c) TFIII A (d) TFII E

5. Proto-oncogenes are

(a) Oncogenes found in transforming retroviruses

(b) Oncogenes present in protozoa

(c) Genes coding oncogene related proteins in extinct organisms

(d) Cellular genes encoding proteins related to viral oncogenes

(B) Fill in the blanks. (5 × 1 = 5)

6. Activation of _____protein leads to tumour suppression.

7. The most abundant lipids in cell membranes are _____

8. _____requires no energy input by the cell.

9. _____ is the replicative polymerase in *E.coli.*

10. _____ is a complex of snRNA, protein and pre-mRNA in a eukaryotic cell.

II. Answer ALL questions. (5 × 2 = 10)

11. Okazaki fragments

12. Lipid rafts

13. Mismatch Repair

14. Microfilaments

15. Bidirectional Replication

PART B — (5 × 5 = 25)

Answer ALL questions, Choosing either (a) or (b).

16. (a) Discuss about Integral membrane proteins, its types and functions.

Or

(b) Define Faciliated Diffusion. Explain with an illustration.

17. (a) Write a short note on Golgi apparatus.

Or

(b) Explain about lysosome and its importance.

18. (a) Explain the three models put forth for DNA replication.

Or

(b) Elaborate the process of DNA replication in eukaryotes.