(Pages : 3) **T – 6409**

Reg. No. : .....

Name : .....

Second Semester M.Sc. Degree Examination, September 2024

Zoology

ZO 523 : CELL BIOLOGY, MOLECULAR BIOLOGY AND BIOINFORMATICS

(2023 Admission)

Time : 3 Hours Max. Marks : 75

I. Answer any **ten** of the following each in a paragraph. Each question carries **2** marks.

1. How do the components of ORS contribute to restoring electrolyte balance through membrane transport mechanisms?

2. Comment on alternative splicing.

3. Significance of Adenylate cyclase.

4. Give four examples of ribozymes.

5. What is the reason for C-value paradox?

6. Which mechanisms ensure the regulation of pH within lysosomes through the coordinated activity of transporters and channels?

7. Comment on SINEs and LINEs.

8. Write short notes on the significance of Wobble pairing.

9. Comment on Klenow fragment.

10. Ames test for identifying potential mutagens.

P.T.O.

11. Explain the significance of pathway tools provided by HumanCyc.

12. Distinguish between tight junctions and gap junctions.

13. What is FASTA format comment on its significance?

14. How lipid composition influences the fluidity of cell membrane?

15. Importance of Shine-Dalgarno sequence

(10 × 2 = 20 Marks)

II. Answer any **six** of the following each not exceeding a page. Each question carries **4** marks.

16. Describe rooted and un-rooted phylogenetic trees.

17. Role of Zinc-finger motif and Helix- loop-helix motif.

18. What is end replication problem and how it is resolved in eukaryotes?

19. Explain cell cycle check points.

20. Importance of DNA methylation in gene expression.

21. Comment on spliceosomes

22. Repetitive sequences in eukaryotic genome and their re-association kinetics.

23. How do endocytosis and exocytosis processes function in the transport of large molecules across the cell membrane?

24. Describe Sanger sequencing.

25. What is Protein Data Bank (PDB), comment on its significance?

(6 × 4 = 24 Marks)

III. Write short essay not exceeding **2** pages on any **three** of the following. Each question carries **7** marks.

26. Comment on post translational modification of proteins.

27. Explain pairwise and multiple sequence analyses tools.

28. Describe different types of DNA damage repair pathway.

29. Comment on the structure and function of telomerase.

30. Write an essay on RTK mediated signal transduction with special emphasis on MAP kinase cascade.

(3 × 7 = 21 Marks)

IV. Answer any **one** of the following not exceeding 4 pages. The question carries **10** marks.

31. Write an essay on translation in prokaryotes.

32. Describe the chromatin structure.

(1 × 10 = 10 Marks)

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