

M. Sc. DEGREE END SEMESTER EXAMINATION - NOVEMBER 2025**SEMESTER 1 : BOTANY****COURSE : 24P1BOTT04 : CELL BIOLOGY***(For Regular - 2025 Admission and Improvement/Supplementary 2024 Admission)*

Time : Three Hours

Max. Weights: 30

PART A**Answer any 8 questions****Weight: 1**

1. Give an account of microtubules. (U)
2. Differentiate apoptosis and necrosis. (U, CO 2, CO 3, CO 4)
3. What is the role of enzyme flippases? (R)
4. Histone proteins are rich in arginine and lysine aminoacids. Why? (A, CO 3)
5. Briefly describe the chemical structure of sphingomyelin. (R, CO 1)
6. Prepare a graph showing the activity of Cyclins at different stages of the cell cycle. (A)
7. Give an account on dystrophin. (R)
8. What is dynein? Give its functions. (U)
9. What is meant by an effector in signalling pathway? (U)
10. What are permeases? (R, CO 1)

(1 x 8 = 8)

PART B**Answer any 6 questions****Weights: 2**

11. What are the different proteins involved in cell to cell interactions? Explain briefly (An)
12. Differentiate adaptor proteins and docking proteins. Give an example for each. (A)
13. Explain the structure and function of Muk BEF complex. (R, CO 3)
14. Explain the mechanism of protein transport into peroxisome. (R)
15. Explain the structure of kinesin and dynein. (U)
16. What is the role of formation of caspase containing complexes in the process of apoptosis? (R)
17. What are the different types of lipid-anchored proteins? (A, CO 1)
18. Explain the stages of cancer development. (A, CO 1, CO 3, CO 5)

(2 x 6 = 12)

PART C**Answer any 2 questions****Weights: 5**

19. Describe the receptor tyrosine kinase (RTK) signaling pathway, emphasizing its molecular mechanisms and role in cellular processes. (A)
20. Explain the process of transport of cargo proteins in and out of nucleus. (U)
21. What is the active transport mechanism? Explain the mechanisms and pumps involved in active transport. (A, CO 1)

22. Explain the mechanism of cell cycle regulation.

(A, CO 1, CO
3, CO 5)
(5 x 2 = 10)

OBE: Questions to Course Outcome Mapping

CO	Course Outcome Description	CL	Questions	Total Wt.
CO 1	Explain the structures and purposes of basic components of prokaryotic and eukaryotic cells, especially macromolecules, membranes, and organelles.	U	5, 10, 17, 18, 21, 22	16
CO 2	Understand how the cells interact among themselves and with the environment through signal molecules.	U	2	1
CO 3	Explain about cytoskeleton, endomembrane system, protein trafficking and cell cycle.	R	2, 4, 13, 18, 22	11
CO 4	Understand the molecular mechanisms of cancer.	U	2	1
CO 5	Develop basic knowledge to prepare for competitive examinations in life science.	A	18, 22	7

Cognitive Level (CL): Cr - CREATE; E - EVALUATE; An - ANALYZE; A - APPLY; U - UNDERSTAND; R - REMEMBER;