

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)**

**CLASS: M.SC./PRE-PH.D.
BRANCH: BIOTECHNOLOGY**

**SEMESTER : VIIth
SESSION : MO/2023**

SUBJECT: BT401 MOLECULAR CELL BIOLOGY

TIME: 3 HOURS

FULL MARKS: 50

INSTRUCTIONS:

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
-

		CO	BL
Q.1(a)	Describe any five important function of cell membrane.	[5] 1	3
Q.1(b)	Highlight specific features that distinguish prokaryotes with eukaryotes.	[5] 1	2
Q.2(a)	Describe both the similarities and differences between mitochondria and chloroplasts.	[5] 2	2
Q.2(b)	Set up FRAP experiment and list its important applications in molecular Biology.	[5] 2	5
Q.3(a)	Explain the primary functions of the cytoskeleton in eukaryotic cells. Differentiate microtubules, Microfilaments, and intermediate filaments.	[5] 3	1
Q.3(b)	Explain the structural differences between tight junctions and gap junctions. How do these junctions contribute to the overall integrity and communication between cells in tissues.	[5] 3	3
Q.4(a)	Illustrates how GPCRs, through the activation of G proteins and subsequent signaling cascades, can lead to the activation of calmodulin and modulation of downstream cellular processes.	[5] 4	4
Q.4(b)	Provide an overview of the signaling pathway of proteolysis through the ubiquitin-proteasome system. Describe its significance in cell signaling.	[5] 4	2
Q.5(a)	Discuss the importance of three primary checkpoints in the cell cycle.	[5] 5	1
Q.5(b)	Evaluate the significance of p53 as a tumor suppressor gene in cancer.	[5] 5	4

:::::23/11/2023 E:::::