

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

CLASS: MSc.
BRANCH: BIOTECHNOLOGY

SEMESTER : II
SESSION : SP/2025

SUBJECT: BT421 PROTEOMICS

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.

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Q.1(a)	Explain that protein structure is influenced by the involvement of various forces.	[5] 1	5
Q.1(b)	Describe the characteristics of molten globule structure with respect to its secondary structures and energy.	[5] 1	6
Q.2(a)	Diagrammatically describe the detailed steps for the isolation and purification of proteins from control and diseased tissue.	[5] 2	6
Q.2(b)	Describe the detailed steps for the separation, staining, imaging and analysis of proteins isolated from control and diseased tissue using 2D IEF SDS-PAGE.	[5] 2	6
Q.3(a)	Describe the impact of protein aggregation and its characterization from the control and diseased tissue.	[5] 3	6
Q.3(b)	Explain about Differential Scanning Calorimetry based characterization of proteins isolated from control and heat-treated leaf sample.	[5] 3	5
Q.4(a)	Explain diagrammatically about X-ray crystallography-based protein structure determination of cloned and expressed Rubisco protein.	[5] 3	6
Q.4(b)	Give an experimental sketch showing hexokinase protein isolation, purification and its NMR based structure determination.	[5] 3	6
Q.5(a)	Give a diagrammatic representation for designing new Rubisco protein and its validation having desired ligand-target protein characteristics.	[5] 4	4
Q.5(b)	Explain a strategy to alter the specific amino acid of Amylase protein using site-directed mutagenesis.	[5] 4	6

::::::02/05/2025::::::E