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Fourth Semester B.E./B.Tech. Degree Examination, June/July 2026

Structural Biology and Biophysical Techniques

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M: Marks, L: Bloom's level, C: Course outcomes.*



Module – 1			M	L	C
Q.1	a.	Give an account of the Peptide geometries. Add a note on the importance of dihedral angles.	10	L3	CO1
	b.	Briefly discuss the various forces that determine Protein Structures.	10	L2	CO1
OR					
Q.2	a.	Give an account of the various Secondary Structures of Proteins.	10	L3	CO1
	b.	Write short notes on: i) Structure of I _g G ii) Protein folds	10	L2	CO1
Module – 2					
Q.3	a.	Explain the Watson Crick model of DNA double helix with a neat diagram.	10	L2	CO1
	b.	Write short notes on: i) Ribose puckering ii) Structure of Adenine nucleotide	10	L1	CO1
OR					
Q.4	a.	What is Signal Transduction? Briefly explain the various types of Signal Transduction.	10	L2	CO1
	b.	Write short notes on: i) Integral proteins ii) G protein linked receptors	10	L1	CO1

Module – 3

Q.5	a.	Give an account of the principle and construction of an analytical ultracentrifuge.	10	L3	CO2
	b.	What is Atomic Force Microscopy? Briefly explain the principle and construction of AFM with a neat diagram.	10	L2	CO2

OR

Q.6	a.	With a neat schematic diagram, discuss the principle of Mass Spectrometry. Add a note on its applications.	10	L3	CO2
	b.	Write short notes on: i) Patch Clamp ii) Flow Cytometry	10	L2	CO2

Module – 4

Q.7	a.	What is X-Ray Diffraction? Discuss the process involved in Structure Determination via Single Crystal Diffraction.	10	L1	CO2
	b.	Discuss the principle and construction of UV Spectrometry with a diagram.	10	L2	CO2

OR

Q.8	a.	What is NMR Spectroscopy? Discuss the principle and construction of NMR Spectroscopy.	10	L1	CO2
	b.	Write short notes on: i) CD ii) ESR	10	L2	CO2

Module – 5

Q.9	a.	Give an account of the principle and construction of Vertical Gel Electrophoresis.	10	L3	CO3
	b.	Apply the principle of immunoelectrophoresis and explain the processes involved in immunoelectrophoresis.	10	L3	CO3

OR

Q.10	a.	Give an account of the principle and construction of TLC.	10	L3	CO3
	b.	Highlighting the principles of Chromatography, explain the principle and process involved in adsorption chromatography.	10	L3	CO3

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