54

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION-2025

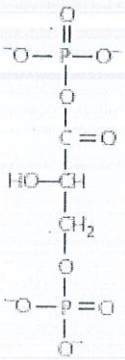
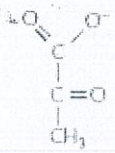
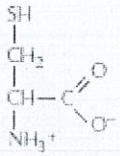
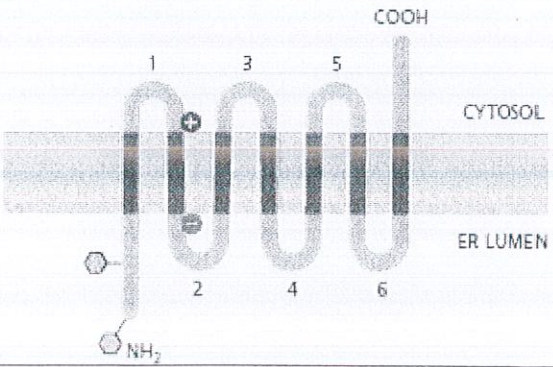
MSc-I Semester (BT)

Course Code(Credits): 20MS1BT112 (3) Max. Marks: 15

Course Name: Cell and Molecular Biology

Course Instructors:Dr. Abhishek Max. Time: 1 Hour

Note: *All questions are compulsory. Marks are indicated against each question in square brackets.*

Q.No	Question	Marks
Q1	a. The three molecules in Figure contain the seven most common reactive groups in biology. Most molecules in the cell are built from these functional groups. Indicate and name the functional groups in these molecules.	3.5 +2.5
	 1,3-bisphosphoglycerate  pyruvate  cysteine	
	b. Justify the statement that "Non-covalent Interaction Specify Both the Precise Shape of a Macromolecule and Its Binding to Other Molecules" Also list-out the various non covalent interactions in biological molecules.	
Q2	Examine the multipass transmembrane protein shown in Figure. What would you predict would be the effect of converting the first hydrophobic transmembrane segment to a hydrophilic segment? Sketch the arrangement of the modified protein in the ER membrane. (Blue hexagons represent covalently attached oligosaccharides. The positions of positively and negatively charged amino acids flanking the second transmembrane segment are shown) 	4

Q3	a. An understanding of the action of many drugs requires a knowledge of how the drug reaches the site of action in a cell. A detailed knowledge of the structure and function of cell membranes is often required to understand the transport of drugs across the plasma membrane. To obtain this information proteins must be isolated. The isolation and characterisation of cell membrane proteins usually requires the solubilisation of the membrane and a method of separation of the various membrane proteins and glycoproteins. Give mechanistic strategies for the separation of membrane protein using neat and clean diagram. b. Also explain, What is the fate of a protein with no sorting signal?	4+ 1