

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2023

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: (a) All questions are compulsory.

(b) Marks are indicated against each question in square brackets.

(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

1. Although the lipid bilayer provides the basic structure of biological membranes, the membrane proteins perform most of the membrane's specific tasks and therefore give each type of cell membrane its characteristic functional properties. Describe the 8 different ways in which proteins associate with the lipid bilayer. It also observed that in some cell 25% of the membrane mass is protein while in other type of cells more than 70% of the membrane mass is protein. Justify it. [5]
2. Plasma membranes act not only as a barrier, but also as a gatekeeper. It must allow needed substances to enter and cell products to leave the cell, while preventing entrance of harmful material and exit of essential material. In other words, plasma membranes are selectively permeable—they allow some substances through but not others. Using the above information's, explain which molecule among the following cross the membrane through simple diffusion or which one required protein transporter/ channel and why? .[The concentrations of these entire molecules are high on the outside of the cell] [5]
(a) Glucose (b) Pentose (c) Ethane (d) Iso-propane (e) Na⁺
3. An understanding of the action of many drugs requires 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 characterization of cell membrane proteins usually requires the solubilisation of the membrane and a method of separation of the various membrane proteins and glycoprotein's. Detail out your strategies to solubilise membrane protein from plasma membranc. [5]