

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST -2 EXAMINATION-2022

M.Sc.-I Semester (Biotechnology)

COURSE CODE (CREDITS): 20MS1BT111 (3)

MAX. MARKS: 25

COURSE NAME: Biochemistry

COURSE INSTRUCTORS: Dr. Jitendraa Vashistt

MAX. TIME: 1 Hour 30 Min

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

- Q1. Glucose is stored as glycogen in liver as well as in muscles, however when there is requirement of glucose at the organism level, only liver contributed majorly to maintain blood glucose levels at all tissues. Why these biological differences occur and what is the fate of stored glycogen in muscles? (3 marks)
- Q2. If you are supplied an enzyme which has the capability of catalyzing a reaction with a velocity of 0.25 micro moles/min, how do you calculate its specific activity in terms of units/mg, if it is done at the level of 1 microgram concentration? (3 marks)
- Q3. What will be the biological implication on the enzyme catalyzed reaction if a structural analogue of substrate is present in the reaction mixture? How one can overcome from the above mentioned situation? (3 marks)
- Q4. "DNA and RNA are the basic molecules of genetic information, however their origination is due to the amalgam of carbohydrates and proteins."
a) How do you prove above mentioned statement? (3 marks)
b) Why nature has influenced the presence of thymine over uracil base in DNA?
- Q5. There are three proteins a, b and c are located at external to membrane, integral to membrane and cell cytoplasm, respectively. Which of the protein will extract at the last with difficulty? Justify your answer with the sequence of experimental approach. (3 marks)
- Q6. A 45 year person observed that whenever he eats the meal rich in carbohydrate, there is elevation of levels of glucose in blood and it remain for longer period of time. Even the blood glucose levels are more than 120mg/dl in the morning time (overnight fasting). How do you correlate this condition with the defect in the specific organ and the possible biochemistry of above mentioned symptoms? (3 marks)
- Q7. If you are required to deliver a hydrophilic anticancer drug inside the cell and it has to be protected from degradation from different degrading enzymes near cellular environment, what would be the method of delivery? Also explain the structural features of the delivery system. (3 marks)
- Q8. Cholesterol is always considered by majority of population as harmful molecule in humans. However it is invariably present in all human cells. (4 marks)
a) If it is so harmful molecule, then why it is been placed in human cells?
b) How do you differentiate between the terms "good cholesterol" and "bad cholesterol"?