

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT  
TEST -3 EXAMINATION-2022  
B.Tech-III Semester (BT)

COURSE CODE (CREDITS): **18B11BT312 (3)**

MAX. MARKS: **35**

COURSE NAME: **Biochemistry**

COURSE INSTRUCTORS: **Dr. Jitendraa Vashistt**

MAX. TIME: **2 Hours**

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

- Q1.a)** What will be the consequences in the metabolic cycles if thiamine pyrophosphate (TPP) and lipoic acid are not in adequate amount? **(3 marks)(COII)**
- b)** When a person does strenuous exercise, after sometime he experience fatigue and pain in muscles involved in the exercise. How will you define this in terms of biochemical event and what will be the fate of biochemical generated? **(3 marks)(COIII)**
- Q2.a)** What is the biological significance of double bonds in unsaturated fatty acids? **(3 marks)(COI)**
- b)** Although doughnuts, French fries and other fried food materials have a good taste, however these are usually considered as potential harmful. How do you define their unsafe nature on the basis of structural configurations of material utilized in preparations? **(3 marks)(CO V)**
- Q3.** On close examination, one may observe that degradation of fatty acids and Acetyl COA has similarity in metabolic steps. Explain the biochemical steps of these processes and their biological significance. **(3 marks)(COIII)**
- Q4.** Why glycogen phosphorylase enzyme may be suitable as one of the molecular target for maintaining the blood glucose levels? Is there any drug available for the above mentioned enzyme for treating hyperglycemic conditions? **(3 marks)(COV)**
- Q5.** Explain the metabolic steps which show the linkages between fatty acid metabolism and carbohydrate metabolism. **(3 marks)(COIII)**
- Q6.** How do you prove that sugars and amino acids are responsible for synthesis of nucleic acids? **(3 marks)(COIV)**
- Q7.** If a person has liver deformity/disease, then explain a biochemical event of detoxification which creates a life threatening condition in suffering individual. **(3 marks) (COV)**
- Q8.** There are two purified kinase enzyme isoforms 'a' and 'b' available for phosphorylation of glucose with the capability of catalyzing reaction with a velocity of 0.5  $\mu$ moles/min and 0.75  $\mu$ moles/min. Each of the purified enzymes has the equal amount of 1 mg and enzyme 'a' has high  $K_m$  as compared to enzyme 'b'. **(4 marks)(COV)**
- a)** How do you choose the best enzyme for reaction on the basis of high specific activity?
- b)** How do you choose the best enzyme for reaction if the saturation of enzyme with substrate is crucial and there is requirement of late saturation in presence of high substrate concentration?
- Q9.** If one usually eats the lipid rich diets, high amount of long chain fatty acids are liberated during digestion and these have to be present inside mitochondria for complete oxidation at cellular level. However, long chain fatty acid chains can't cross the membrane barrier of mitochondria. **(4 marks) (COII, COIII)**
- a)** How the fatty acid molecules get catabolized for energy production, despite of the membrane transport restriction?
- b)** Calculate the energy in terms of ATP generated by a fatty acid molecule with the carbon chain length of C-16.