JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST -3 EXAMINATION- 2024
M.Sc.-Ist Semester (Biotechnology &Microbiology)

COURSE CODE (CREDITS): **20MS1BT111 (03)** MAX. MARKS: **35**
COURSE NAME: **Biochemistry**
COURSE INSTRUCTORS: **Dr. Jitendraa Vashistt** MAX. TIME: **2 Hours**

Note: (a) All questions are compulsory. (b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems.

Q. No.	Question	Marks
Q1.	Differentiate between the following. a) Synthase and synthetase b)thiamine and thymine	4.0
Q2.	Process of glycolysis produces NADH in the cytoplasm, however it can't pass into mitochondria from cytoplasm and therefore it requires a specialized mechanism. Define the shuttle mechanism for NADH into the mitochondria of liver cells and also calculate the ATP generated along with this process in reference to complete oxidation of glucose.	4.0
Q3.	Which molecule will give more energy; 1 glucose molecule of glucose and 1 molecule of palmitic acid? Calculate the amount of ATP generated after complete oxidation of both samples. Use: 1 NADH= 2.5 ATP and 1 FADH2= 1.5 ATP for calculations.	4.0
Q4.	In general, cholesterol is considered as bad molecule for human health. However, in general, we also know the term 'good cholesterol' also? Differentiate the good cholesterol and bad cholesterol on the basis of their molecular architecture. Also explain the inference of this architecture on plaques of atherosclerosis.	4.0
Q5.	How ammonia is produced in humans after amino acid metabolism? Explain the metabolic process by which detoxification of ammonia occurs in liver.	4.0
Q6.	You have an enzyme with K_M of 10 mM and velocity maximum attained by this enzyme is 2000 mmoles/s. You need to find out the substrate concentration at which the velocity of the enzymatic reaction will reached the level of 25% of the Vmax?	5.0
Q7.	Explain the biochemical pathway of ketogenesis and utilization of the molecules produced in ketogenesis by different cells. Also explain the clinical significance of ketoacidosis in uncontrolled diabetes mellitus.	5.0
Q8.	What is the primary precursor for purine synthesis and salvage pathway? Explain the relation of this precursor with 'Lesch-Nyhan' syndrome along with biochemical reactions and associated enzymes.	5.0