JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST -3 EXAMINATIONS- 2023
M.Sc.-I[st] Semester (BT)

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

Note: (a) All questions are compulsory. (b) Marks are indicated against each question in brackets. (c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

Q1a). Can it be possible that cytosine nucleotide convert into Uracil nucleotide? Justify your answer with suitable structural elucidations? **(3 marks)**

Q1b). How do you classify DNA in terms of its polarity; hydrophilic or hydrophobic? Justify your answer with suitable structural elucidations? **(3 marks)**

Q2. Why there is a huge market of Biotin supplements? Define the significance of this molecule in human metabolism. **(3 marks)**

Q3. Some people do dieting to control their overweight, with a common practice by avoiding all carbohydrates in their diet. Is it a correct practice? Justify your answer. **(3 marks)**

Q4. There is a common practice in houses as well as in restaurants that cooking oil used repeatedly by reheating. What is the major ill-effect by reheating any cooking oil in terms of the structural changes? **(3 marks)**

Q5a). Calculate the number of acetyl COA and ATPs generated by a fatty acid in which length of carbon atoms is 20 (C20) and define the role of carnitine shuttle in fatty acid metabolism. **(3 marks)**

Q5b). How do you calculate the pH of a Sodium acetate buffer, if sodium acetate and acetic acid are equimolar and pKa is 4.75? **(3 marks)**

Q6. How two biochemical processes 'glycolysis' and 'gluconeogenesis' are interlinked with each? Also explain the three crucial steps and their alternate reactions by which glucose gets synthesized back from pyruvate **(4 marks)**

Q7. How ammonia is produced in humans and why it is toxic to human body? Explain the metabolic process by which detoxification of ammonia occurs in liver. **(5 marks)**

Q8. Calculate the Michaelis-Menten constant (MM) for an enzymatic reaction which has K_1 constant of Enzyme+ Substrate to form Enzyme: substrate is $1X10^9M^{-1}sec^{-1}$, K_{-1} constant of reverse reaction is $1X10^6M^{-1}sec^{-1}$. When the reaction proceeds to form product and dissociation of enzyme from substrate occur, the K_2 constant of Enzyme + Product is $1X10^9M^{-1}sec^{-1}$. **(5 marks)**