

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATIONS-2022

M.Sc.-I Semester (Biotechnology and Microbiology)

COURSE CODE (CREDITS): 20MS1BT111 (3)

MAX. MARKS: 15

COURSE NAME: Biochemistry

COURSE INSTRUCTOR: Dr. Jitendraa Vashistt

MAX. TIME: 1 Hour

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

- Q1. Which came/arise first: DNA, RNA or proteins? Define the biochemical sequence of event with respect to origin of life on earth. (2 marks)
- Q2. Is it possible that H^+ ions present in the solution of 0.1M solution of sodium hydroxide (NaOH)? If yes, then justify your answer with calculating the H^+ concentration. (Note: Ion product of water $K_w = 1 \times 10^{-14} M^2$) (2 marks)
- Q3. What are the medical conditions occur, if acid-base homeostasis disrupted in human blood? Can pH of blood be maintained with the help of proteins? Justify your answer with suitable example. (2 marks)
- Q4. Although, peptide bond is a covalent linkage, however it shows a peculiar structural property which provides a higher stability in primary structure of a protein. Define the molecular details of this structural feature of peptide bond. (2 marks)
- Q5. What is the biological significance of peptide sequence "KFERQ"? How it is related with the tissue specific biological phenomenon? (2 marks)
- Q6. Define the fate of different proteins after completion of their cellular functions. How molecular pathways control their fate in a cellular environment? (2 marks)
- Q7. You are supplied with the protein mixture of five cellular proteins. The molecular weight range of these proteins is 10-100 KDa (a;10KDa, b; 20 KDa, c; 30 KDa, d;38KDa and e;40KDa).The proteins 'a' and 'e' have same charge property which is antagonistic to proteins 'b', 'c' and 'd'. Design a strategy to purify protein 'e' of molecular weight 40 KDa with high amount of arginine and lysine in its primary sequence. (3 marks)