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**Question Paper Code: R1C05**

B.E./B.Tech. DEGREE EXAMINATION, DEC 2025

First Semester

Biotechnology

R21UBT105- PRINCIPLES OF BIOORGANIC CHEMISTRY

(Regulations R2021)

Duration: Three hours

Maximum: 100 Marks

Answer All Questions

PART A - (5 x 1 = 5Marks)

- ..... is the first person started bioriented organic projects CO1- U  
(a) F. H Westheimer (b) D.S. Kemp (c) E.J. Corey (d) H. B. Kagan
- An essential amino acid CO1- U  
(a) Histidine (b) Methionine (c) Leucine (d) All of these
- Activation energy for enzyme catalysis is..... when compared to chemical catalysis. CO1- U  
(a) more (b) less (c) equal (d) zero
- Enzyme models are..... molecules CO1- U  
(a) biological (b) synthetic (c) natural (d) none of these
- Metal ions contribute to \_\_\_\_\_% of human body weight. CO1- U  
(a) 5 (b) 2 (c) 3 (d) 6

PART – B (5 x 3= 15 Marks)

- Predict the importance of bioorganic chemistry in biotechnology CO1-U
- Briefly discuss the importance of inhibitor CO1-U
- A scientist treats a cell sample with ribonuclease before conducting protein synthesis analysis. Justify this step based on the enzyme's mechanism. CO3-App
- If bromine water is added to an alkene, how can you apply the concept of addition to explain the disappearance of the brown color? CO3-App

10. Briefly explain the effect of immobilization on enzyme activity CO1-U
- PART – C (5 x 16= 80 Marks)
11. (a) What is aminoacids and describe the methods of synthesis of aminoacids. CO1-U (16)
- Or
- (b) Summarize molecular recognition, highlighting with an example. CO1-U (16)
12. (a) How would you apply knowledge of chemical and biological catalysis to compare their use in industrial and biological processes? CO2-App (16)
- Or
- (b) How would you utilize the chemical principles observed in living cells to design a functional bioorganic model? CO2-App (16)
13. (a) If you are a researcher, how will you identify the impact of enzyme inhibitors. CO1- U (16)
- Or
- (b) Explain the chemical basis of inhibition. CO1- U (16)
14. (a) A researcher introduces ribonuclease into a cell extract containing RNA. Predict the outcome of this experiment and the mechanism by which ribonuclease acts on RNA molecules. CO3- App (16)
- Or
- (b) How would you apply knowledge of pyridoxal phosphate's versatility to explain its role in amino acid metabolism and predict the impact of its deficiency on cellular processes? CO3- App (16)
15. (a) Break down the different methods used for enzyme immobilization and analyze how each process affects enzyme stability and activity CO4- Ana (16)
- Or
- (b) Investigate how enzymes function in various industrial processes such as food production, brewing, cheese making, syrup formulation, and synthetic chemistry, and analyze the impact of their catalytic roles on efficiency and product quality. CO4- Ana (16)