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Question Paper Code:R3B05

B.E./B.Tech. DEGREE EXAMINATION, NOV 2024

First Semester

Biomedical Engineering

R21UBM105– FUNDAMENTALS OF BIOCHEMISTRY

(Regulations R2021)

Duration: Three hours

Maximum: 100 Marks

Answer All Questions

PART A - (10x 2 = 20 Marks)

1. Explain first law of thermodynamics with example. CO1- U
2. Give an example of how the third law of thermodynamics can be applied to our daily lives. CO1- U
3. Explain monosaccharides with example. CO1- U
4. Define the term solubility. CO1- U
5. Draw the structure of RNA. CO1- U
6. Comparative analysis of secondary and quaternary structure of protein. CO1- U
7. Explain oxidoreductase reaction with example. CO1- U
8. List the structural classification of enzymes. CO1- U
9. Write the application of gel electrophoresis in protein studies. CO1- U
10. Explain Gas chromatography. CO1- U

PART – B (5 x 16= 80 Marks)

11. (a) Briefly explain bioorganic chemistry and biophysical chemistry. Examine the three major biomolecules. CO1 -U (16)
OR
(b) Review the laws of thermodynamics and examine their application with some examples. CO1 -U (16)
12. (a) Investigate the glycogen synthesis pathway for energy storage in liver cells and examine the steps involved in the breakdown of glycogen. CO3- An (16)

OR

- (b) Analyse the different pathways of carbohydrate metabolism and the role of transporters for glucose entry into the cell and examine glycolysis and its outcomes in healthy cells. CO3-An (16)

13. (a) Summarize different types of proteins based on their structure. Investigate the transamination and deamination of amino acids with an example. CO1 -U (16)

OR

- (b) Why DNA or RNA function as genetic material. How do you analyze the structure of DNA using the Watson and Crick model with a neat diagram? CO1 -U (16)

14. (a) Give a brief note on enzyme and its properties. Explain enzyme - application and diagnostic importance of Enzymes. CO1 -U (16)

OR

- (b) Explain the physical and chemical properties of Lipids. CO1- U (16)

15. (a) Summarize the mechanism of carbon fixing in plant from carbon dioxide and apply nitrogen cycle and nucleotides cycle to fix nitrogen in the environment. CO2-Ap (16)

OR

- (b) Review the working principles of various types of electrophoresis and apply gel electrophoresis concepts and their mechanism to study protein. CO2-Ap (16)