

B.Sc. Semester - 2 (NEP-2020) Examination

JUNE – 2024

BIT: Fundamental of Biochemistry (Multidisciplinary Course)

Time: 2:00 Hours

Marks: 50

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate marks.

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- Que.1 (1) Identify and explain the types of chemical bonds present in a water molecule. (05)
(2) Discuss the importance of buffers in maintaining stable pH levels in living organisms. (05)
- OR
- Que.1 (1) Explain how the properties of water contribute to its role as a solvent in biological systems. (05)
(2) Describe the process of a neutralization reaction and its significance in maintaining pH balance. (05)
- Que.2 (1) Classify enzymes based on their functions and provide examples for each class. (05)
(2) Explain the role of coenzymes and cofactors in enzyme function. (05)
- OR
- Que.2 (1) Analyze the role of acid-base catalysis and covalent catalysis in enzyme reactions. (05)
(2) Describe the physical properties of enzymes and their significance in catalysis. (05)
- Que.3 (1) Derive the Michaelis-Menten constant equation and explain its significance in enzyme kinetics. (05)
(2) Differentiate between irreversible and reversible enzyme inhibition mechanisms, providing examples of each. (05)
- OR
- Que.3 (1) Describe the linear transformation of the Michaelis-Menten equation and its application in enzyme kinetics studies. (05)
(2) Analyze the differences in enzyme regulation between prokaryotic and eukaryotic cells regarding covalent modifications. (05)
- Que.4 (1) Compare and contrast the sodium-potassium pump and the proton pump in terms of structure and function. (05)
(2) Explain the composition of cellular membranes and their architectural features. (05)
- OR
- Que.4 (1) Differentiate between passive and facilitated diffusion across cell membranes. (05)
(2) Analyze the significance of uniport, symport, and antiport mechanisms in cellular homeostasis and nutrient uptake. (05)
- Que.5 (1) Analyze the relationship between pH and the concentration of hydrogen ions in a solution. (05)
(2) Define enzymes and differentiate between biocatalysts and chemical catalysts. (05)
- OR
- Que.5 (1) Discuss the concept of allosteric regulation in enzyme function and its physiological implications. (05)
(2) Explain the concept of group translocation in cellular transport processes. (05)
