

M.Sc.(Chem.) Semester - 4 (CBCS) Examination
March/April - 2025 (As Per Syllabus Year June-2019)
Chemistry of Biomolecules(Elective-1)

Time: 2:30 Hours**Marks: 70****Instructions:**

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

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- Que-1(A)** Explain the D and L configurations of amino acids with a suitable diagram. **(04)**
- Que-1(B)** Answer any two question out of three. **(10)**
- (1) What is a peptide bond? Explain its formation with a chemical equation.
 - (2) Explain how hydrogen bonding stabilizes the secondary structure of proteins.
 - (3) What is protein denaturation? Explain two factors that can cause it.
- Que-2(A)** Explain the mechanism of enzyme action using the lock-and-key model. **(04)**
- Que-2(B)** Answer any two question out of three. **(10)**
- (1) What is enzyme inhibition? Differentiate between competitive and non-competitive inhibition with diagrams.
 - (2) Explain the biological role of Coenzyme A (CoA) in metabolic reactions.
 - (3) Compare the roles of NAD⁺ and FAD in redox reactions.
- Que-3(A)** Differentiate between purines and pyrimidines with their structures. **(04)**
- Que-3(B)** Answer any two question out of three. **(10)**
- (1) What is the significance of the melting temperature (T_m) of DNA? How is it determined?
 - (2) Describe Watson and Crick's model of the DNA double helix.
 - (3) Explain the role of mRNA, tRNA, and rRNA in protein synthesis.
- Que-4(A)** How does chain length and degree of unsaturation affect the physical properties of fatty acids? **(04)**
- Que-4(B)** Answer any two question out of three. **(10)**
- (1) What are prostaglandins? Explain their role in physiological functions.
 - (2) Discuss the structure and biological roles of cholesterol.
 - (3) Differentiate between glycolipids and phospholipids based on structure and function.
- Que-5(A)** Classify carbohydrates based on their structure and give an example for each type. **(04)**
- Que-5(B)** Answer any two question out of three. **(10)**
- (1) What is mutarotation? Explain it using the example of D-glucose.
 - (2) Discuss the biological significance of polysaccharides with examples.
 - (3) How do aldehyde and ketone groups in carbohydrates participate in chemical reactions?
