



Seat No. : _____

NF-131

November-2025

M.Sc., Sem.-III

CHE(O) 501 : Organic Chemistry (Natural Products and Biomolecules)

Time : 2:30 Hours]

[Max. Marks : 70

- Instructions :** (1) All questions are compulsory.
(2) Figures to right indicate marks.

1. Answer the following : 14

- (A) Prove the presence of double bond and position of the two angular methyl groups in cholesterol. 7
- (B) Outline the biosynthetic pathway of testosterone from cholesterol. Include the key enzymes and intermediates. 7

OR

- (A) Describe the partial synthesis of cortisone from progesterone. What is the key chemical transformations involved ? 7
- (B) Discuss the chemistry and physiological effects of gibberellins in plants. How do they influence seed germination and stem elongation ? 7

2. Answer the following : 14

- (A) What are disulphide linkages in peptides? Explain their role in protein stability and folding. 7
- (B) Discuss the acid-base properties of amino acids. How do these properties affect their behaviour in aqueous solutions and biological systems. 7

OR

- (A) Give one method each for sequential identification of amino acids from the N-terminus and C-terminus. 7
- (B) Explain the solid-phase process with the help of an example. 7

3. Answer the following : 14
- (A) What are glycosidic linkages ? Describe the different types of glycosidic bonds with examples. 7
- (B) Discuss the structure and composition of starch. How do amylose and amylopectin differ. 7
- OR**
- (A) Explain the chemical structure of glycogen. How is it adapted for energy storage in animals ? 7
- (B) What are disaccharides ? Describe the ring structure and glycosidic linkage in maltose and Sucrose. 7
4. Answer the following : 14
- (A) Compare and contrast the structure and function of DNA and RNA. How do their chemical differences affect their roles in the cell ? 7
- (B) Explain the nomenclature and function of nucleotides and nucleosides. 7
- OR**
- (A) What is the principle of the Polymerase Chain Reaction (PCR) ? Describe the steps involved in PCR. 7
- (B) Write a note on unsaturated fatty acids with examples. 7
5. Answer the following in short : (Any **Seven**) 14
- (1) What is the precursor molecule for steroid biosynthesis ?
- (2) Which organ synthesizes bile acids ?
- (3) Define electrophoresis.
- (4) Which synthesis method uses resin-bound amino acids ?
- (5) Which sulphur-containing amino acid forms disulphide bridges ?
- (6) Which linkage is found in cellulose ?
- (7) Which process converts unsaturated fats to saturated fats ?
- (8) Differentiate between saturated and unsaturated fatty acids with examples.
- (9) What is the difference between glycosidic and peptide linkage ?
- (10) What is Sanger reagent and what is its use ?
- (11) Which base is unique to RNA ?
- (12) What is invert sugar ? Give example.
- (13) Mention atleast two use of plant hormone Auxin.
- (14) What is RNA ? Give the names of the types of RNA.
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