

A-0997

Total Pages : 3

Roll No.

MCH-603

M.Sc. Chemistry (MSCCH)

Natural Product/Enzyme and Biogenesis

Examination February, 2026

Time : 2:00 Hrs.

Max. Marks : 35

Note :- This paper is of Thirty Five (35) marks divided into Two (02) Sections 'A' and 'B'. Attempt the questions contained in these Sections according to the detailed instructions given therein. *Candidates should limit their answers to the questions on the given answer sheet. No additional (B) answer sheet will be issued.*

Section-A

(Long Answer Type Questions) (2×9½=19)

Note :- Section 'A' contains Five (05) Long-answer type questions of Nine and Half (9½) marks each. Learners are required to answer any *two* (02) questions only.

A-0997

(1)

P.T.O.

1. Explain the biosynthetic pathway of prostaglandins with specific examples.
2. Discuss the classification of vitamins with examples. Explain the structural characteristics, physiological roles, and deficiency symptoms of fat-soluble vitamins (A, D, E, and K).
3. What is enzyme catalysed reaction ? Explain the concepts of the induced-fit model, and the role of active site residues in catalysis.
4. Explain in detail the general methods of extraction and purification of alkaloids from plant materials. Illustrate your answer with specific examples.
5. Describe the shikimic acid pathway for the biosynthesis of aromatic compounds.

Section–B

(Short Answer Type Questions) (4×4=16)

Note :– Section ‘B’ contains Eight (08) Short-answer type questions of Four (04) marks each. Learners are required to answer any *four* (04) questions only.

1. What is the primary biological activity associated with rotenoids ?

2. Describe the key enzyme responsible for the activation of fatty acids before β -oxidation.
3. How do enzymes increase the rate of biochemical reactions without being consumed ?
4. Define the chemical structure of morphine and discuss its functional groups, ring system present in the structure of morphine.
5. Describe the basic structure of a porphyrin and what is the primary biological function of porphyrins in hemoglobin and chlorophyll ?
6. Describe the acetate/molonate pathway of biosynthesis of aromatic compounds.
7. Outline the structural features of proteins and state one key role it plays in human physiology.
8. Describe the basic structural components of a cholesterol molecule and two important functions of cholesterol in the human body.
