A–0414

Total Pages : 3 **Roll No. .....**

MSCCH-603

M.SC. CHEMISTRY (MSCCH)

(Bio-Inorganic, Bio-Organic and Bio-Physical Chemistry)

Examination, June 2025

Time : 2:00 Hrs. Max. Marks : 70

Note* :–** This paper is of Seventy (70) 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 2×19=38

***Note* :–** Section 'A' contains Five (05) Long-answer type questions of Nineteen (19) marks each. Learners are required to answer any *two* (02) questions only.

1. What is the hemoglobin ? Explain the structure and function of haemoglobin in biological system.

2. Discuss chemical and biological catalysis transition state theory. How catalysts lower energy of activation-transition state theory ?

3. Write note on the following :

   (a) Mechanism of action of enzyme carboxypeptidase A

   (b) Enzyme catalyzed carboxylation and decarboxylation

4. What do you understand by enzymes ? Describe the various steps of large-scale production of enzymes.

5. What are carbohydrates ? Explain the structure, and stereochemistry of carbohydrates in detail.

Section–B

Short Answer Type Questions 4×8=32

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

1. What is nitrogen fixation ? Explain the mode of action of nitrogenase.

2. Discuss the structure of vitamin B_{12}. What is the impact of vitamin B_{12} deficiency in human body ?

3. What is proximity effect ? Explain with suitable example.

4. How will you determine the size of biopolymers ? Explain two methods.

5. Write short note on the synthesis of ATP.

6. What are essential and trace metals ? Discuss the role of trace metals in biological system.

7. What are cofactors ? Discuss the role of cofactors in coenzyme chemistry.

8. Explain the kinetics of enzyme action.

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