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[Roll No.]

CHE-553

**M.Sc. (Chemistry) IInd Year
Examination Dec., 2023**

**NATURAL PRODUCT, HETEROCYCLIC
AND SPECTROSCOPY**

Time : 2 Hours]

[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 there in. 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.

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(1)

P.T.O.

1. Write the chemical synthesis of morphine.
2. Discuss the structure of cholesterol.
3. Discuss the reaction mechanism of following :
 - (a) Paterno-Buchi reaction
 - (b) Dimiroth rearrangement
4. What are enzyme inhibitors ? Discuss the types of enzyme inhibitors.
5. Discuss the following spectra with at least one example
 - (a) Proton decoupled ^{13}C -NMR
 - (b) COSY

Section–B

(Short Answer Type Questions) $4 \times 8 = 32$

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 are prostaglandins ? Write the synthesis of $\text{PGE}_{1\alpha}$ prostaglandin.
2. Discuss the factors affecting the enzyme catalysis.
3. Write the applications of ^{19}F -NMR and ^{31}P -NMR.

4. Write the short note on the steps involved in glycolysis.
5. Write any one method of synthesis of pyridazines. What is the product of pyridazine with organometallic reagent ($\text{KNH}_2/\text{Liq. NH}_3$) ?
6. Explain the factors affecting the chemical shift of ^{13}C NMR.
7. What are vitamins ? Discuss the classification of vitamins by giving suitable example.
8. Discuss the Diels-Alder reaction of oxazole with acetylenes and alkenes.
