Roll No. ------------------

**CHE-553**

**Natural Product, Heterocyclic and Spectroscopy**

M.Sc. Chemistry (MSCCH)

2nd Year Examination 2024 (Dec.)

**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 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**

**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. (2×19=38)**

1. Describe in brief on the following:

(i) Metabolism of proteins

(ii) Synthesis of isoquinoline and its uses

(iii) Optical behavior of proteins

1. Write short notes on the following:
2. COSY test
3. Off resonance
4. DEPT
5. Chemical shift scale in 1H NMR
6. First and second order spectra
7. What are prostaglandins? Discuss the biological role of prostaglandins along with the synthesis of PG E2 and PGE2x.
8. Describe in brief:
9. Discuss the ring synthesis of coumarins.
10. Synthesis of isoquilonene and its uses.
11. Metabolism of proteins
12. Kreb‟s cycle
13. (a) Draw the structures of Haemoglobin and Myoglobins. Explain their difference and functions.

(b) Pyrrole is much more acidic than s-allylamine. Why?

**SECTION – B**

**Short – answer – type questions**

**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. (4×8=32)**

1. What are alkaloids? Discuss their classifications and uses.
2. Write short notes on the following:
3. F19 NMR
4. Rotenoids
5. Discuss synthesis and uses of the following:
6. Resertine
7. Piperidine
8. Discuss the ORD curves with cotton effects.
9. Discuss medicinal importance and chemistry of benzofurans and quinoline.
10. Discuss synthesis and uses of the following:
11. Pyrazine
12. Oxirane
13. How do enzymes differ from catalyst? Discuss the mode of action of enzymes.
14. (a) Explain the key and lock model and induced fit model for the mechanism of enzymes.

(b) Describe the basicity order of furan, thiophene and pyrrole?