

# C096

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## CHE-553

### Natural Products, Heterocyclic and Spectroscopy

M.Sc. CHEMISTRY(MSCCH)

2nd Year Examination, 2022 (June)

**Time : 2 Hours]**

**Max. Marks : 80**

**Note :** This paper is of Eighty (80) marks divided into two (02) Sections A and B. Attempt the questions contained in these sections according to the detailed instructions given therein.

### SECTION-A

#### (Long Answer Type Questions)

**Note :** Section 'A' contains Five (05) long answer type questions of Twenty (20) marks each. Learners are required to answer any Two (02) questions only.

(2×20=40)

1. Write a short note on four followings :

- (a) Lipogenesis.
- (b) Optical rotator dispersion studies (ORD).

- (c) Chemical shift.
  - (d) Spin-spin coupling.
  - (e) Cotton effect.
2. (a) What are alkaloids? Discuss the separation techniques of alkaloids.
- (b) Give the brief account of the synthesis of prostanoids highlight the clinical significance if any of this pathway.
3. (a) What are Enzyme-Inhibitors? Describe the various types of Inhibitors,
- (b) What are vitamins? Give the details of general properties of the vitamins.
4. Predict the structure of compound with molecular formula  $C_5H_{11}Cl$  &  $C_3H_4O_2Br_2$  on the basis of following  $^{13}C$ NMR data.
- (a)  $C_5H_{11}Cl$  ( $\delta$  13.9 q,  $\delta$  22.1 t,  $\delta$  29.2 t,  $\delta$  32.5 t,  $\delta$  44.9 t)
- (b)  $C_3H_4O_2Br_2$  ( $\delta$  173.6 s,  $\delta$  40.4 d,  $\delta$  28.8 t)
5. Write down the mechanism of the following name reaction :
- (a) Robinson-Gabriel synthesis.
  - (b) Claisen rearrangement.
  - (c) Dimroth Rearrangement.
  - (d) Diels-Alder reaction.

## SECTION-B

### (Short Answer Type Questions)

**Note :** Section 'B' contains Eight (08) short answer type questions of Ten (10) marks each. Learners are required to answer any Four (04) questions only. (4×10=40)

1. Write brief note on porphyrines.
2. What are the factors affecting the enzyme catalysis. Discuss briefly.
3. Write down the steps involved in fatty acid metabolism.
4. How do you distinguish carbonyl isomers of the molecular formula  $C_4H_8O$  by  $^{13}C$  NMR. Explain.
5. Write short note on application of octant rule.
6. Give the outline the biosynthesis of Shikmic acid.
7. Write brief on any two of the following :
  - (a) Octant Rule.
  - (b) DEPT  $C^{13}$  spectra.
  - (c) Homonuclear couplings.
8. Discuss the Nomenclature of Heterocyclic compound.

