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Roll No.....

CHE-553

Natural Products, Heterocyclic and Spectroscopy

M.Sc. Chemistry (MSCCH-12/13/16/17)

Second Year, Examination 2019

Time: 3:00Hr

MM: 80

Note: This paper is of **eighty** (80) marks containing **three** (03) sections A, B and C. attempt the questions contained in these sections according to the detailed instructions given therein.

Section - A

(Large answer type questions)

Note: Section 'A' contains four (04) long answer type questions of nineteen (19) marks each. Learners are required to answer two (02) questions only.

- Q.1. What are prostaglandins? Discuss synthesis of PGE_{2α} and PGE₂ with their physiological significances. 19
- Q. 2. What are alkaloids? How they are categorized? Discuss the synthesis of morphine. 19
- Q.3. Write explanatory note on:
- C¹³-NMR and its explanation. 7
 - Metabolism of fatty acids. 6
 - Purine and xanthine bases, 6

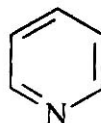
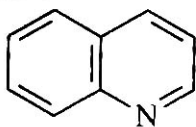
- Q.4. Explain the importance of heterocyclic compounds as antibacterial, antibiotics and antipyretics. Discuss synthesis of any two heterocyclic compounds possessing these biological activities. 19

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 four (04) questions only.

- Q.1 What are enzymes? How they are categorized? Discuss their mode of action,
- Q.2. Discuss the synthesis and uses of following heterocyclic compounds.



- Q.3. Explain why F^{19} and P^{31} nuclei are considered to be highly NMR sensitive after H^1 while C^{13} is most insensitive?
- Q.4. Describe following in brief:
- Cotton effect
 - Rotenoids
- Q.5. What are three, four and five membered heterocyclic compounds? Write the structures of each group of compounds and discuss their basic characters.
- Q.6. Discuss systematic synthesis of porphyrin ring.

- Q.7. What are vitamins? Discuss synthesis of vitamin C.
- Q.8. What is NOE? How this experiment is useful in NMR? Discuss with suitable example.

Section - C

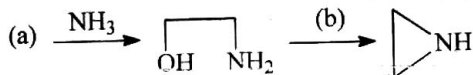
(Short answer type questions)





Note: Section 'C' contains ten (10) objective type questions of one (01) mark each. All questions of this section are compulsory.

Choose/tick the correct option:

- i. Which of the following is not an example of enzyme ?
- A. Acetyl COA B. NAD
C. Riboflavin D. xanthane
- ii. Which of the following nuclei have Gyromagnetic ratio close to H¹?
- A. C¹³ B. P³¹
C. F¹⁹ D. N¹⁵
- iii. Thiirane is:
- A. Sulphur containing three membered heterocyclic compound
B. Oxygen containing three membered heterocyclic compound
C. Nitrogen containing three membered heterocyclic compound
D. Sulphur containing five membered heterocyclic compound

iv. The missing reagent/condition a and b are: B



- A.  and H_2SO_4 B.  and H_2SO_4
C.  and H_2SO_4 D.  and H_2SO_4

v. Which reagent is used to identify alkaloids?

- A. Braddy reagent B. Barford reagent
C. Molish reagent D. Dragon droff reagent

vi. ORD technique is used to study.

- A. Optical behaviour of proteins
B. 3D structures of proteins
C. Study of biosynthetic pathways
D. Degradation of alkaloids

vii. Which of the following alkaloid is isolated from *Rauwolfia serpentine*?

- A. Reserpine B. Morphine
C. Ergotamine D. Quinine

viii. Which term is related to NMR spectroscopy?

- A. Zeeman effect B. Skewing effect
C. Ortho effect D. Both A and B.

ix. Which one represent prostaglandins?

- A. PGE_2 B. PE_2G
C. $\text{PGE}_{2\alpha}$ D. A and C

x. Which one is related to alkaloids?

- A. Hoffman degradation
B. Beckmann rearrangement
C. Zeisel's method
D. A and C
