Total Printed Pages :08 Roll No……

CHE-502

Natural Products, Heterocyclic and Spectroscopy

Organic Chemistry

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

First Year, Examination 2017-18

Time: 3:00Hr **Max. Marks : 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.

1. What are Stereoisomers? Discuss in detail with examples? The different types of configurational and conformational isomers. Why the knowledge of stereochemistry is essential. 19

2. What are terpenoids? How they are biosynthesized? Discuss classification and uses of terpenoids with examples. 19

3. What is Aromaticity? Discuss with examples the term aromatic, ant-aromatic non aromatic, benzenoid and non benzoid aromatic compounds. How NMR spectroscopy provides the evidence of aromaticity? 19

4. Write short note of: (3+4 +3 +3 +3+3)

   a. Azulenes.

   b. Resolution

   c. N.G.P.

   d. Baker and Nathan effect

   e. Molecular dissymmetry

   f. Epimer

Section-B

(Short Answer Type Questions)

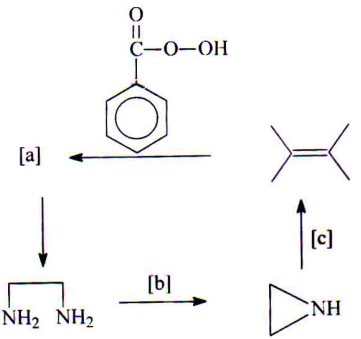
Note: Section 'B' contains eight (08) short answer type questions of eight (08) marks each. Learners are required to answer four (04) questions only.

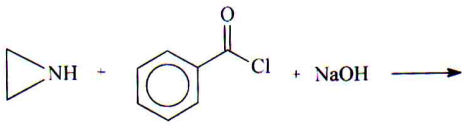
1. Discuss the factors effecting nucleophilic reactions.

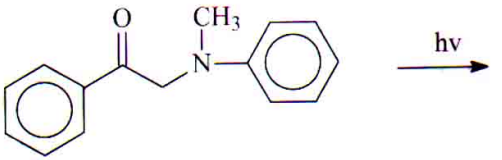
2. What is element of symmetry ? Discuss various types of elements of symmetry with suitable examples. Why its knowledge is essential

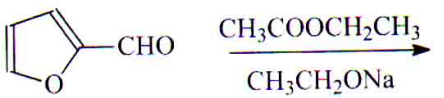
3. Discuss in detail the Shikimic acid pathways.

4. Complete the following reactions :

1. 

2. 

3. 

4. 

5. What different methods/ procedure for isolation and characterization of alkaloids. Explain with examples,

6. Discuss some important reactions with suitable examples related to electrophilic addition to carbon -carbon double bonds

7. Write short note on:

   a. Optical activity in allenes and spiranes.

   b. Classification uses and physiological actions of alkaloids.

8. Write synthesis and one industrial applications of the following compounds :

   a. Quinoline

   b. carbazole

   c. Isoquinoline

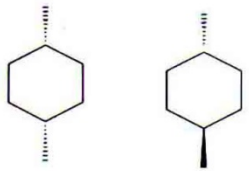
   d. acridine

Section – C

(Short Answer Type Questions)

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

i. Explain why the two stereoisomers of 1,4-dimethylcyclohexane are achiral?



A. because they are identical

B. because they are enantiomers

C. because they both have the same absolute configuration

D. because there are no stereocenters present in either molecule

ii. The glycosidic linkage between two glucose molecules in isomaltose is:

A. α_1 - 4 B. $\beta_1 - 4$

C. $\alpha_1 - 4$ D. $\beta_1 - 6$

iii. Identify the odd one among the following.

A. Morphine B. Reserpine

C. α-Humulene D. Quinine

iv. Which of the following reacts by the E1 mechanism in ethanol most readily?

A. $CH_3CH_2CH_2CH_2Br$

B. $CH_3-\underset{\displaystyle CH_3}{\overset{|}{C}}H-CH_2Br$

C. $CH_3-\underset{\displaystyle CH_3}{\overset{\displaystyle CH_3}{\overset{|}{\underset{|}{C}}}}-Br$

D. $CH_3-CH_2-\underset{\displaystyle Br}{\overset{|}{C}}H-CH_3$

v. Who discovered pyderconjugation ?

A. Baker and Nathan

B. Cahn Ingold and Prelog

C. Friedal Craft

D. Stepnenson

vi. ORD technique is used to study.

A. Optical behavior of proteins

B. 3D structures of proteins

C. Study of biosynthetic pathways

D. Degradation of alkaloids

vii. Which of the following is separation technique?

A. Resolution

B. D and L configuration

C. R and S configuration

D. d (+) and l(-)-form

viii. Which term is related to C^{13}-NMR spectroscopy?

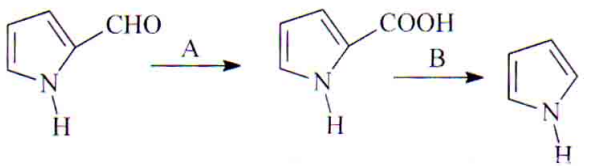
A. NOE

B. Skewing effect

C. Ortho effect

D. Both A and B.

ix. What are A and B in following reaction?



A. A = aq $KMnO_4$, B = 200°C

B. A = aq Na_2CO_3, B = 150°C

C. A = aq $KMnO_4$, B = 60°C

D. A = Alco. $KMnO_4$, B = 200°C

x. Which one is not related to carbohydrate?

A. Kiliani method

B. Alkaline β- naphthol reagent

C. Fehling reagent

D. Dragandroff reagent

*****