(T) Roll No. .....

ID—2033

B. Sc. (Pass Course)

EXAMINATION, 2022

(First Semester)

ORGANIC CHEMISTRY

Code : CH-103

Chemistry-III

Time : 3 Hours *Maximum Marks : 29*

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt any *Five* questions. *All questions* carry equal marks. Use of calculator (Scientific / Simple) / Algorithm table is allowed in the examination centre.

1. (a) What is the other name of 'No bond resonance' ?

(b) –COOH group in benzoic acid will show + R or – R effect. Give reason.

(c) Why alkynes do not show geometrical isomerism ?

(d) What is the hybridisation of central atom in triplet carbene ?

(e) If both propane and cyclopropane were equally available and equally priced; which is better fuel and why ? 1×5=5

Section A

2. (a) Give four important points of difference between localised and delocalised chemical bond.

(b) What are meso compounds ? Give examples.

(c) Define diastereomers with example. 2,2,2

3. (a) List four important points of difference between resonance and tautomerism.

(b) Why aromatic amines are less basic ?

(c) Define retention of configuration using example. 2,2,2

Section B

4. (a) Why alkynes and alkanes do not show geometrical isomerism ?

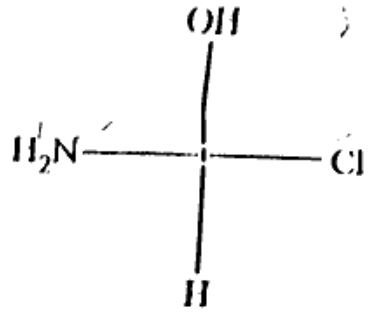
(b) Define cis- and trans-isomers with an example. What is the limitation of cis- and trans-isomerism ?

(c) Draw chair and boat conformation of hexane. Which is more stable and why ? 2,2,2

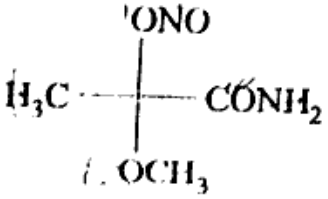
5. (a) Draw fully eclipsed and Gauche conformations of *n*-butane. Also give the order of stabilities of different conformations of *n*-butane.

(b) Assign R and S configuration to the following :

(i)



(ii)



(c) Draw fully eclipsed and Gauche conformations of *n*-butane. Give the order of stabilities of different conformations of *n*-butane. 2,2,2

Section C

6. (a) Give two important points of difference between transition state (or activated complex) and reactive intermediate.

(b) Give the orbital structure of singlet and triplet carbenes.

(c) Explain the order of stability of 1°, 2° and 3 carbocations on the basis of +I effect. 2,2,2

7. (a) Give four points of difference between carbocation and carbanion.

(b) Give two methods of formation of carbenes.

(c) Write short note on substitution reaction. 2,2,2

Section D

8. (a) Write all the postulates of Baeyer's strain theory.

(b) Give preparation of cycloalkanes by photo chemical (2 + 2) cycloaddition reaction.

(c) Discuss the melting point of alkanes with increase of molecular mass. 2,2,2

9. (a) Write short note on Kolbe's reaction.

(b) How will you prepare cycloalkanes by pyrolysis of calcium salt of dicarboxylic acids ?

(c) Why the branched chain isomers of alkanes have lower boiling points than the straight chain isomers ? 2,2,2