Roll No. .....

Total Pages : 4

795

GSE/D-19

CHEMISTRY

[Organic Chemistry (Theory)]

Paper : III

Time : Three Hours] [Maximum Marks : 32

Note : Attempt *five* questions in all, by selecting *two* questions from each section. Question No. 1 is compulsory.

Compulsory Question

1. (a) Which is permanent effect :

(i) Inductive effect.

(ii) Electromeric effect.

(b) Why all carbon-carbon bonds are equivalent in benzene ?

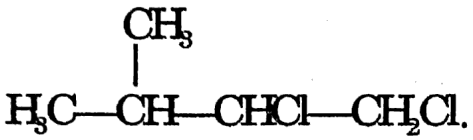
(c) Write the structure of optically active carboxylic acid having molecular formula $C_3H_6O_3$.

(d) Out of eclipsed and staggered conformation of ethane, which is more stable.

(e) Give the type of hybridisation and structure of alkyl carbanion.

(f) Give an example of plane of symmetry.

(g) Mark the secondary carbon atom in the following :



(h) Pick up electrophiles from the following :

ROH, H_3O^+, BF_3, CN^- (1×8=8)

SECTION-A

2. (a) Define resonance. Write the properties of resonance hybrid. 2

(b) What are localised and delocalised bonds ? Give examples. 2

(c) What is inductive effect ? Discuss the types citing suitable examples. 2

3. (a) Define electromeric effect. What is the main condition for this effect to occur ? 2

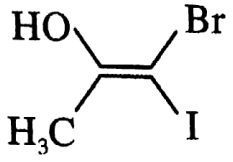
(b) What are functional isomers ? Give two examples. 2

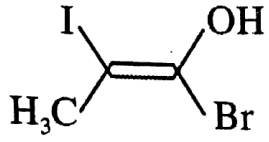
(c) What is hyperconjugation ? Why is it called no-bond resonance ? 2

4. (a) Explain the cause of optical activity. 2

(b) What are the axial and equitorial bonds in cyclohexane? 2

(c) Assign E and Z configuration

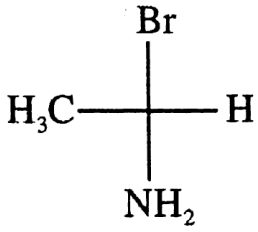
(i) 

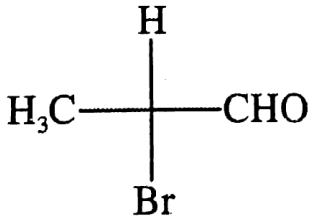
(ii) 

5. (a) Differentiate between configuration and conformation. 2

(b) What are meso compounds ? Give examples. Why are they optically inactive ? 2

(c) Assign R and S configuration.

(i) 

(ii) 

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SECTION-B

6. (a) What are free radicals ? Explain the order of stability of free radicals. 3

(b) What are carbenes ? Give their types and draw their structures. 3

7. (a) What are electrophiles ? Give their types with examples. 3

(b) Explain the following with suitable examples :

(i) Substitution reactions.

(ii) Elimination reactions.

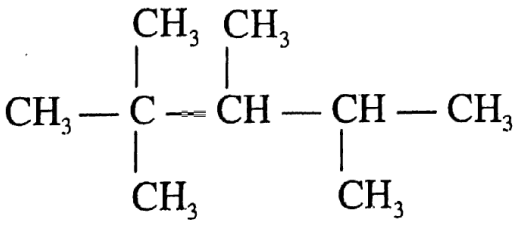
(iii) Addition reactions. 3

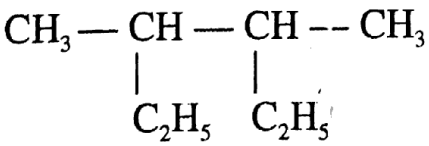
8. (a) Give preparation of alkanes by :

(i) Kolbe's reaction.

(ii) Carey House Reaction. 4

(b) Give IUPAC names of the following :

(i) 

(ii)  2

9. (a) Define and explain reactivity– selecting principle. 3

(b) Give *two* methods of preparation of cycloalkanes. 3