Roll No. ..... Total Pages : 5

GSE/D-20 **795**

ORGANIC CHEMISTRY
Paper–III CH-103

Time : Three Hours] [Maximum Marks : 32

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

Compulsory Question

1. (a) Represent orbital diagram of 1, 3-Butadiene is having delocalized bond. 1

(b) What do you mean by absolute configuration ? 1

(c) Write product of the reaction $2CH_2=CH_2 \xrightarrow{hv}$. 1

(d) Write formula for specific angle of rotation and name all the terms present in this formula. 1

(e) Give *two* examples of compound having functional isomerism. 1

(f) Define transition state with suitable example. 1

(g) What is orientation meaning for halogenation of alkanes ? 1

(h) Give effect on physical properties of hydrocarbon due to Van der Waal's intractions. 1

SECTION–I

2. (a) Describe conformational isomers of n-butane and give graphical representation of variation of energy with angle of rotation. 2

(b) What is resonance effect ? Give its applications. 2

(c) Explain the following with examples :

(i) Localized covalent bond.

(ii) Sterogonic centre.

(iii) Configuration.

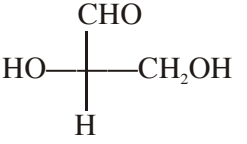
(iv) Effect of branching on the Boiling point of isomeric alkanes. 2

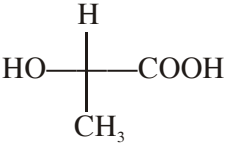
3. (a) What is hyper conjugation effect ? Explain stabilitz of alkenes on the basis of hyper conjugation effect. 2

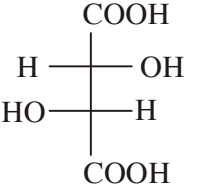
(b) Differentiate inductive effect and electromeric effect. 2½

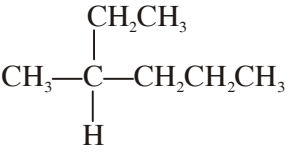
(c) Explain Van der Interaction and give applications of these forces. 1½

4. (a) Determine R/S configuration of the following molecules :

(i) 

(ii) 

(iii) 

(iv)  2

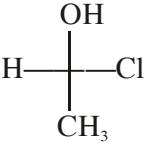
(b) Define diasteroisomerism and compare with enantiomerism. 3

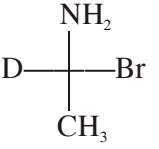
(c) Write conditions for geometrical isomerism. 1

5. (a) Alkyl halides gives nucleophilic substitution reaction easily but vinyl halide do not give this reaction why ? 2

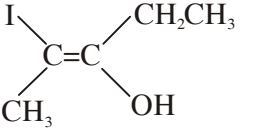
(b) What are symmetry elements ? Explain centre of symmetry. 2

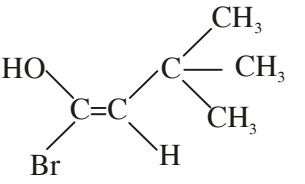
(c) Assign R and S configuration

(i) 

(ii) 

Assign E and Z configuration

(iii) 

(iv)  2

SECTION–II

6. (a) Give methods for preparation of cycloalkane and alkanes using following methods :

(i) Wurtz reaction.

(ii) Calcium salt of fatty acid.

(iii) Kolbe's electrolysis method.

(iv) Dehalogenation of dihalide compounds. 2

(b) Define reaction intermediate. Explain formation, structure and types and stability of carbene. 3

(c) What is orientation ? 1

7. (a) Discuss energy profile diagram for

(i) Reaction involving intermediate.

(ii) Reaction involving transition in state. 2

(b) (i) Describe collision theory of reaction. 1½

(ii) Define electrophiles and nucleophiles give examples of each types. 2

(iii) Write name and formula of electrophile during sulphonation of benzene. ½

8. (a) Define the following :

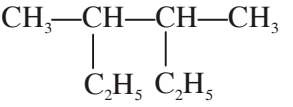
(i) Selectivity

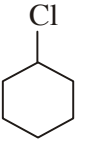
(ii) Reactivity

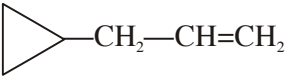
(iii) Heterolytic cleavage

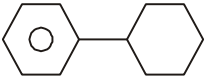
(iv) Homolytic cleavage. 2

(b) Write IUPAC names of the following compounds :

(i) 

(ii) 

(iii) 

(iv)  2

(c) Define Baeyr's Strain theory. 2

9. (a) Give mechanism of free radical halogenation of alkanes. 2½

(b) Calculate % of n-propyl chloride and isopropyl chloride during chlorination of propane. (Given reactivity order of 3° : 2 : 1 : for Hydrogen is 5 : 3.8 : 1). 2½

(c) Write variation in meeting points of alkanes. 1