

S.C.No.—A/21/2005108

B. Sc. EXAMINATION, 2021

(First Semester)

CHEMISTRY

CH-103

Organic Chemistry

Time : 2 Hours

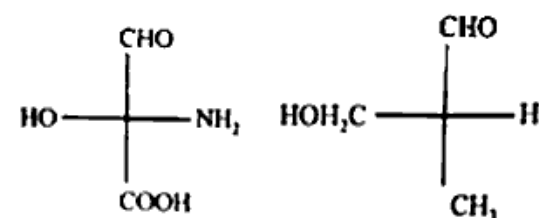
Maximum Marks : 29

Note : Attempt any *Four* questions. All questions carry equal marks.

1. (a) Arrange the following in decreasing order of $-I$ effect : 1½
-I, -F, -Br, -Cl
- (b) Classify the following as electrophile and nucleophile : 1½
 $\ddot{C}H_2$, SO_3 , $\ddot{N}H_3$, SO_3 , H_2O , $AlCl_3$
- (c) Assign R and S configuration to the

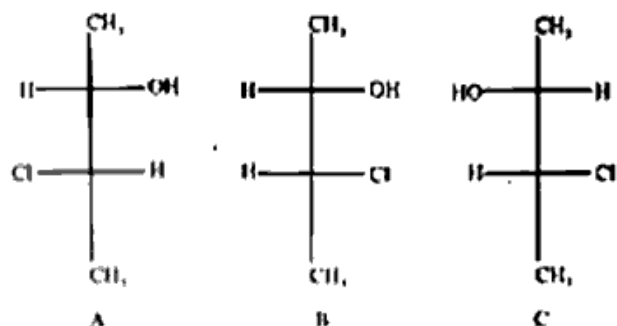
following compounds :

1½



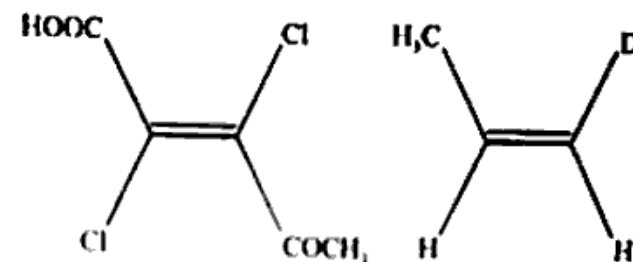
- (d) Which one has high boiling point and why : *n*-pentane or isopentane. 1½
 - (e) What is the state of hybridization of triplet nitrene ? 1½
2. (a) What is hyperconjugation ? Why is it called no bond resonance ? 2½
 - (b) Explain the following with examples : 5
 - (i) Plane of symmetry
 - (ii) Centre of symmetry
3. (a) Name which type of isomerism the following compounds have : 6
 - (i) Hexan, 2-Methyl pentane, 3-Methyl pentane.
 - (ii) Propan-1-ol, Propan-2-ol
 - (iii) Ethanoic acid, Methyl formate
 - (iv) Dimethyl ether, Ethanol

- (b) Find the relationship (enantiomer/diastereomer) between the following compounds : 1½



4. (a) Explain, why chair form of cyclohexane is more stable than boat form. 2½
- (b) Write Newman projection and saw-horse formula of different conformation of ethane. 2½
- (c) Explain axial and equatorial H-atom with examples. 2½
5. (a) Difference between configuration and conformation. 2½
- (b) Why methyl group at equatorial position of cyclohexane is more stable than in axial position ? 2½

- (c) Assign E and Z configuration to the following compounds : 2½



6. Arrange and explain the stability order of the following intermediates : 7½
- (a) $(\text{CH}_3)_2\dot{\text{C}}\text{H}$, $\text{CH}_3\dot{\text{C}}\text{H}_2$, $(\text{CH}_3)_3\dot{\text{C}}$
- (b) $\bar{\text{C}}\text{H}_3$, $\bar{\text{C}}_2\text{H}_5$, $\bar{\text{C}}\text{H}(\text{CH}_3)_2$, $\bar{\text{C}}(\text{CH}_3)_3$
- (c) $\text{C}_6\text{H}_5\dot{\text{C}}\text{H}_2$, C_6H_5^+ , $\text{CH}_2=\dot{\text{C}}\text{H}$,
 $\text{CH}_2=\text{CH}\dot{\text{C}}\text{H}_2$
7. (a) Write a short note on singlet and triplet carbene. 4
- (b) Why CH_3^+ is planar whereas CH_3^- is pyramidal ? 2
- (c) Write a short note on electrophile. 1½

8. (a) Write the following reactions : $4\frac{1}{2}$

(i) Kolbe reaction

(ii) Corey-House reaction

(iii) Cycloaddition reaction

(b) What is Baeyer's strain theory ? Explain the relative stability of ring compounds on the basis of Baeyer's strain theory. $2\frac{1}{4}$

9. (a) Explain Wurtz reaction with suitable example. $2\frac{1}{2}$

(b) Explain the trend of melting and boiling point of alkanes. $2\frac{1}{2}$

(c) Write products A, B and C in the following reactions : $2\frac{1}{4}$

