

**2nd Semester Examination, 2022**

*Time : 3 hours*

*Full Marks : 60*

Answer from **all** the Parts as per direction

*The figures in the right-hand margin indicate marks*

*Candidates are required to answer in their own words  
as far as practicable*

**(ORGANIC CHEMISTRY-I)**

**PART – I**

**1. Answer all questions :**

1 × 8

(a)  $-\text{NO}_2$  groups exhibits \_\_\_\_\_ inductive effect.

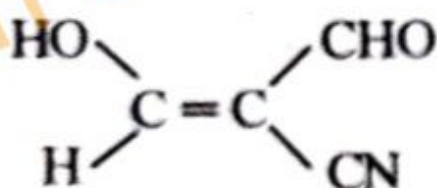
(b) Addition of HBr to  $\text{CH}_3-\text{CH}=\text{CH}_2$  is an example of \_\_\_\_\_ type addition reaction.

( Turn Over )

( 2 )

(c) Dipole moment of trans -2, 3-dichloro-2-butene is \_\_\_\_\_

(d) Assign E or Z notation to the following compound.



(e) Which is aromatic amongst the following ?



(f)  $-\text{NO}_2$  group in aniline \_\_\_\_\_ directing in nature for the second incoming electrophile.

(g) Which is less stable between  $(\text{CH}_3)_2\text{C}=\text{C}(\text{CH}_3)_2$  and  $(\text{CH}_3)\text{CH}=\text{CH}(\text{CH}_3)$  ?

(h) From amongst  $\text{CH}_3-\text{C}\equiv\text{C}-\text{CH}_3$ ,  $\text{CH}_3-\text{C}\equiv\text{CH}$  and  $\text{HC}\equiv\text{CH}$ , which can not be alkylated ?

PART – II

2. Answer any *eight* of the following :  $1\frac{1}{2} \times 8$

(a) Which is more acidic between  $C_6H_5-COOH$  and  $C_2H_5COOH$  and why ?

(b) Which is more basic between  $C_6H_5-NH_2$  and  $C_2H_5-NH_2$  and why ?

(c) What is resonance effect ? Give one example each of groups showing positive and negative resonance effect.

(d) How can you get  $CH_2=CH_2$  from  $C_2H_5OH$  ? Give equation.

(e) What is Wurtz-Fitting reaction ? Give an example with equation.

(f) What is chiral carbon ? Give two examples of compound possessing chiral carbon.

(g) Explain syn-anti isomerism of benzaldehyde oxime.

- (h) Explain ozonolysis reaction of propene.
- (i) Explain why methyl group in toluene is ortho/para directing in nature.
- (j) Draw the chair, boat and twist boat conformations of cyclohexane.

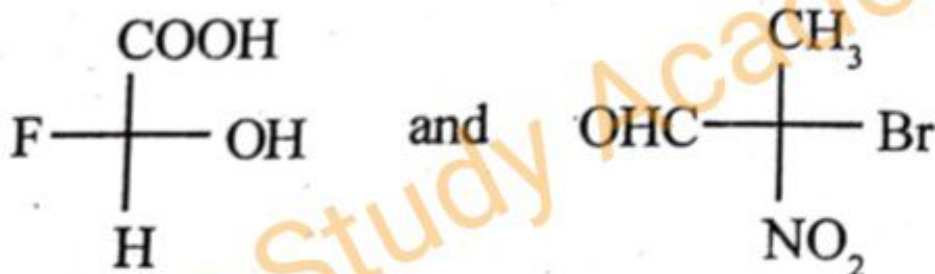
## PART – III

3. Answer any *eight* questions : 2 × 8

- (a) What are homolytic and heterolytic fissions ?  
Give example for each.
- (b) Define nucleophile and electrophile. Give examples for each.
- (c) Distinguish between  $\sigma$ - $\pi$  and  $\sigma$ -p type hyperconjugation giving one example for each.
- (d) How can  $C_3H_8$  be prepared by Wurtz reaction ?

( 5 )

(e) Assign R or S notation to the following :



- (f) Explain optical isomerism of Lactic acid.
- (g) Explain Diels-Alder reaction giving at least one example.
- (h) What happens when  $\text{HC}\equiv\text{CH}$  is allowed to react with ammoniacal silver nitrate solution ?
- (i) Give the mechanism of nitration in benzene.
- (j) Explain why Pyrrole shows aromatic character.

#### PART – IV

Answer all the following questions as directed :  $6 \times 4$

( 6 )

4. (a) Give reasons for following stability order of carbocations : 6



Or

- (b) Write notes on : 2 + 4

(i) Wurtz reaction

(ii) Chlorination of methane.

5. (a) Write notes on :

(i) Geometrical isomerism in maleic and fumaric acid 2

(ii) Optical isomerism of tartaric acid. 4

Or

- (b) Explain the following :

(i) Resolution of racemic mixture by chemical method. 4

(ii) Assignment of D/L notation to chiral compounds. 2

6. (a) Explain how alkenes can be obtained by  $E_1$  and  $E_2$  reactions giving mechanisms. 3 + 3

Or

(b) Explain the following : 3 + 3

(i) Baeyer's strain theory.

(ii) Oxymercuration-demercuration of Alkene.

7. (a) Give mechanisms of Friedel-Craft's alkylation and acylation of benzene. 3 + 3

Or

(b) Explain aromaticity and Hückel's rule. Give reasons for aromatic character of cyclopentadienyl anion. 4 + 2