


# Chemistry (Theory) Paper-I

Attempt FIVE Questions in all. Section-A is Compulsory. Select TWO Questions from Section-B and TWO Questions from Section-C.

## SECTION-A

1- Write short answers of any Eight:

1x8

- Why m-nitrophenol is weaker acid than p-nitrophenol?
- Why ionic species  is more stable than  $\text{CH}_2^+ - \text{CH} = \text{CH}_2$ ?
- Define and explain Chirality.
- Explain Markovnikov's rule with one example.
- Why pyridine has little tendency for electrophilic substitution reactions?
- What should be the product by the hydration of propyne explain by writing the chemical equation.
- Why dipole moment of cis -1, 2 - dichloroethene ( $\text{Cl HC} = \text{CHCl}$ ) is greater than that of its trans isomer?
- Why pyrrole is weak than pyridine?
- Draw the structure of different conformations of cyclohexane.
- Explain the term "Tautomerism".

## SECTION-B

2- a) Resonance hybrid structure of benzene ( $\text{C}_6\text{H}_6$ ) is like neither of the contributing structures. Justify it.

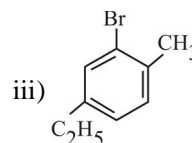
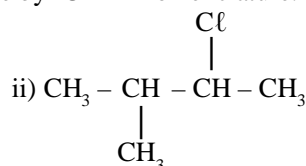
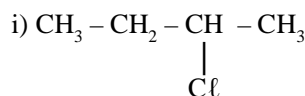
3

b) How 1-propylbromide can be synthesized from propene?

2

c) Write down the name of following structure by IUPAC nomenclature:

1,1,1



3- a) Differentiate between enantiomers and diastereomers.

1 1/2, 1 1/2

b) How benzene can be prepared from acetylene?

2

c) How alkenes can be synthesized by Wittig reaction.

3

4. a) What is the difference between conformational and configurational isomerism? Explain by suitable examples.

3

b) Discuss the limitation of Friedel-Craft alkylation reaction of benzene.

2

c) Discuss the reaction of alkyne with ozone. Explain the importance of reaction with suitable examples.

3

5- a) Complete the following reactions:

5

i) Acetylene  $\rightarrow$  propyne

ii) Propene  $\rightarrow$  1 - Bromopropane

iii) 1, 3- butadiene  $\rightarrow$  Cyclohexane

iv) Benzene  $\rightarrow$  O-nitrotoluene

v) Benzene  $\rightarrow$  m-bromobenzene sulfonic acid

b) Explain the optical activity in the molecules having no chiral carbon atom with suitable example.

3

## SECTION-C

6. a) Discuss the mechanism of  $\text{S}_\text{N}1$  reaction. Also discuss the nature of substrate for efficient reaction and the role of solvents.

3

b) Draw different resonating structures of pyrrole and pyridine.

2

c) Differentiate between pri, sec and tert alcohol by chemical testing.

3

7- a) What are carboxylic acid derivatives. Also discuss their syntheses from carboxylic acid?

4

b) What is Grignard reagent? Discuss its synthetic application.

1,3

8- a) Why pyrrole is more reactive than pyridine towards electrophilic substitution reactions?

2

b) Explain aldol condensation with suitable examples.

3

c) Write down the structural formulas of the following compounds:

1,1,1

i) Resorcinol

ii) Catechol

iii) Quinol

9. a) How phenol can be prepared by aniline and chlorobenzene?

2

b) Explain, why nucleophilic substitution takes place preferable at position "2" of the pyridine.

2

c) Write notes on the following reactions:

i) haloform reaction

ii) Cannizzaro reaction

2,2