

GSM/D-21**933****ORGANIC CHEMISTRY****Paper–X-CH-203**

Time Allowed : 3 Hours]

[Maximum Marks : 32

Note : Attempt **five** questions in all, selecting **two** questions from each Unit. Question No. **1** is compulsory. All questions carry equal marks.

Compulsory Question

1. (a) Give the IUPAC name of the following: 2
- (i)
$$\begin{array}{cccccc} \text{CH}_3 & -\text{CH} & -\text{CH} & -\text{CH} & -\text{CH} & -\text{CH}_3 \\ & | & | & | & | & \\ & \text{CH}_3 & \text{OH} & \text{C}_2\text{H}_5 & \text{OH} & \end{array}$$
- (ii)
$$\begin{array}{cccc} \text{CH}_3 & -\text{CH}_2 & -\text{C} & =\text{C} & -\text{OH} \\ & & | & | & \\ & & \text{CH}_2 & \text{CH}_3\text{OH} & \end{array}$$
- (b) The boiling point of Toluene is 384 K while that of Phenol is 455 K. Explain, why? 2
- (c) Are all the molecules of a substance that are exposed to a specific radiation excited? 1
- (d) Can a molecule undergo more than one electronic excitation? 1
- (e) Benzoic acid is a weaker acid than formic acid. Explain. 1
- (f) Why pure acetic acid is called glacial acetic acid? 1

UNIT-I

2. (a) Arrange $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{OH}$, $(\text{CH}_3)_3\text{COH}$, $(\text{CH}_3)_2\text{CHCH}_2\text{OH}$, and $\text{CH}_3\text{CHOHCH}_2\text{CH}_2$ in increasing order of solubility in water and explain. 2
- (b) Write the products obtained when primary, secondary and tertiary alcohols are passed over heated copper at 573 K. 2
- (c) What is the main product of dehydration of 3,3-dimethyl-2-butanol? Explain. 2

3. (a) Discuss physical properties of alcohols in brief. 2
 (b) How Victor Meyer's test is helpful in distinguishing between primary, secondary and tertiary alcohols. 2
 (c) Arrange Phenol, cyclohexanol, p-bromophenol and p-methoxyphenol in order of increasing acidity (weakest acid first). 2
4. What happens when phenol is treated with : 2+2+2=6
 (a) Bromine water
 (b) Carbon dioxide at 400 K, 5 atmospheric pressure in presence of alkali
 (c) Chloroform and aqueous Potassium hydroxide at 340 K.
5. What are epoxides? Discuss the chemical reactions with mechanism:
 (a) Acid catalysed ring cleavage of epoxides. 3
 (b) Base catalysed ring cleavage of epoxides 3

UNIT-II

6. (a) Explain the principle of UV spectroscopy. 2
 (b) On the basis of Woodward-Fieser rules, calculate λ_{\max} for the given compounds: 2
 (i) 2-methyl-1-acetylcyclopentene
 (ii) 3,4-dimethylpent-3-en-2-one
 (c) How will you distinguish between *cis*- and *trans*-isomers of 1,3,5-hexatriene? 2
7. How can UV spectroscopy be used to distinguish between the following:
 (a) $\text{CH}_3\text{CH}=\text{CHCOCH}_3$ and $\text{CH}_2=\text{CHCH}_2\text{COCH}_3$ 2
 (b) Homoannular and heteroannular dienes. 2
 (c) Linearly conjugated and cross conjugated dienes and diones. 2
8. (a) Arrange CH_3COOH , CCl_3COOH , CH_2ClCOOH and $\text{CH}_3\text{CHBrCOOH}$ in increasing order of their acid characteristics. 2

- (b) Why carboxylic acids do not give the characteristic reactions of carbonyl group? 2
- (c) Give two methods of preparation of carboxylic acids. 2
9. Write short notes on :
- (a) Nucleophilic acyl substitution. 3
- (b) Discuss esterification with mechanism taking some suitable example. 3