

2022
B.A./B.Sc.
Third Semester
 CORE – 6
CHEMISTRY
Course Code: CHC 3.21
 (Organic Chemistry – II)

Total Mark: 70

Pass Mark: 28

Time: 3 hours

Answer five questions, taking one from each unit.

UNIT-I

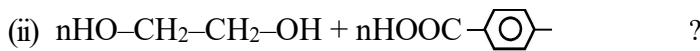
1. (a) How will you prepare alkyl halide 1½×3=4½
 - (i) by direct halogenation of alkene?
 - (ii) from alkene?
 - (iii) by halogen exchange?
- (b) What is S_N2 reaction? Give its mechanism by taking example and discuss its stereochemical aspects. 6
- (c) Discuss the effect of solvent on nucleophilic substitution reactions. 3½

2. (a) Give any three points of difference between elimination and substitution reactions? 6
- (b) How will you prepare 2×3=6
 - (i) bromobenzene by Sandmeyer reaction?
 - (ii) chlorobenzene by Gattermann reaction?
 - (iii) fluorobenzene by Balz-Schiemann reaction?
- (c) Vinyl chloride is less reactive towards nucleophilic substitution reaction. Explain. 2

UNIT-II

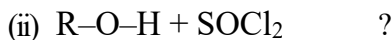
3. (a) Compare the reactivity of ethyl alcohol, isopropyl alcohol and tertiary butyl alcohol towards dehydration reaction. 4½

(b) Complete the following reactions: 2×3=6

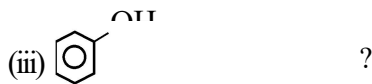


(c) The boiling point of *n*-butyl alcohol is higher than that of *tert*-butyl alcohol. Give reason. 1½

(d) Complete the following reactions: 1+1=2



4. (a) Complete the following reactions: 1×4=4



(b) How will you prepare phenol from 2×3=6

(i) chlorobenzene (Dow's process)?

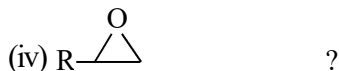
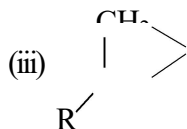
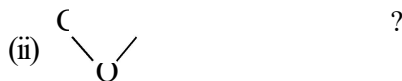
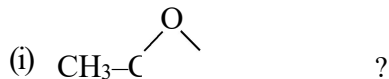
(ii) benzene sulphonic acid?

(iii) cumene?

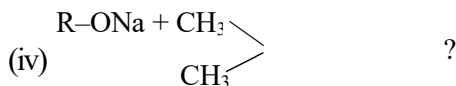
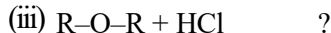
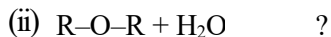
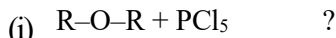
(c) What is Claisen rearrangement? Give its mechanism. 4

UNIT-III

5. (a) Complete the following reactions: 1×4=4

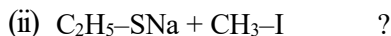
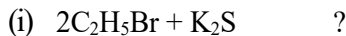


(b) Complete the following reactions: 1×4=4

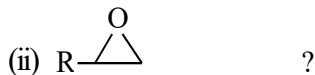
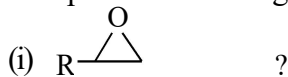


(c) What is thiols? Give any two methods of preparation of ethanethiol. 3

(d) Complete the following reactions: 1×3=3



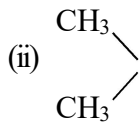

6. (a) Complete the following reactions: 1×4=4






- (b) Give any two methods of preparation of: 2×2=4
- (i) ethoxy ethane
 - (ii) ethyl sulphonic acid
- (c) Why is Williamson's method of synthesis of ether a preferred method and why must sodium alkoxide be secondary or tertiary for this method? 6

UNIT-IV

7. (a) Give reason with one example for the following statements: 2×2=4
- (i) Aldehydes are more reactive than ketones towards nucleophilic addition reaction.
 - (ii) Aldehydes are easily oxidised by mild oxidising agents like Tollen's reagent whereas ketones are not oxidised by it.
- (b) Explain the following reactions with their mechanism: 4×2=8
- (i) Claisen-Schmidt reaction
 - (ii) Perkin reaction
- (c) Complete the following reactions: 2×1=2
- (i) $\text{CH}_3\text{CHO} + \text{HCN} \quad ?$
 - (ii)  ?
8. (a) Explain the following reactions with their mechanism: 4×3=12
- (i) Cannizzaro reaction
 - (ii) Wittig reaction
 - (iii) Michael addition
- (b) Complete the following reactions: 2×1=2
- (i) $\text{R}_2\text{CH}-\text{OH} \quad ?$
 - (ii)  ?

UNIT-V

9. (a) The boiling point of carboxylic acid is much higher than that of phenol. Give reason. 2
- (b) Explain the following reactions with one example: 2×3=6
- (i) Claisen condensation
 - (ii) Dieckmann reaction
 - (iii) Reformatsky reaction
- (c) Complete the following reactions: 1×4=4
- (i) $R-COOH + NH_3$?
 - (ii) $CH_3COONa + NaOH$?
 - (iii) $CH_3COOH + PCl_5$?
 - (iv) $CH_3COCl + NH_3$?
- (d) What is Hell Volhard-Zelinsky reaction? Give an example. 2
10. (a) Complete the following reactions: 1×4=4
- (i)  ?
 - (ii) $\begin{array}{c} H-C \quad COOH \\ || \quad \quad \quad \\ H-C \quad COOH \end{array}$?
 - (iii) $\begin{array}{c} H-C \quad COOH \\ || \quad \quad \quad \\ H-C \quad COOH \end{array}$?
 - (iv) $\begin{array}{c} CH_3COOH \\ || \quad \quad \quad \\ CH_3COOH \end{array}$?
- (b) Give any one method of preparation of the following compounds: 2×4=8
- (i) Fumaric acid
 - (ii) Maleic acid
 - (iii) α -hydroxy propionic acid
 - (iv) Succinic acid
- (c) What is esterification? Give an example. 2