

Bachelor of Science (B.Sc.) Semester—III

Examination

CHEMISTRY

CH-302 : Organic Chemistry

Paper—II

Time—Three Hours]

[Maximum Marks—50

N.B. :— (1) All **FIVE** questions are compulsory.

(2) Write chemical equations and draw diagrams wherever necessary.

1. (a) What are activating and deactivating group ?
Explain OP-directive influence of $-OH$ group in phenol for further electrophilic substitution. 5
- (b) What are aryl halides ? How is chlorobenzene obtained by Sandmeyer's Reaction and Rasching Process ? Compare the reactivity of ethyl chloride with chlorobenzene. 5

OR

- (c) Starting from chlorobenzene how will you prepare :
 - (i) Benzene and
 - (ii) Benzoic acid ? 2½
- (d) Give synthesis and uses of DDT. 2½
- (e) How will you prepare Biphenyl from Iodobenzene ?
Name the reaction. 2½

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(f) Explain mechanism of first order nucleophilic substitution reaction of alkyl halides. $2\frac{1}{2}$

2. (a) How will you prepare ethylene glycol from :

(i) Ethylene bromide and

(ii) Epoxy ethane ?

Write note on Pinacol-Pinacolone rearrangement. 5

(b) Discuss structure and bonding in Phenol. How will you prepare phenol from cumene ? What happens when phenol reacts with conc. H_2SO_4 at room temp. and at $100^\circ C$? 5

OR

(c) What is the action of excess of HI on glycerol ? $2\frac{1}{2}$

(d) How is ethylene glycol prepared from ethylene bromide ? What is action of periodic acid on it ? $2\frac{1}{2}$

(e) Write note on Fries rearrangement. $2\frac{1}{2}$

(f) How will you convert glycerol to :

(i) Acrolein and

(ii) Trinitroglycerin ? $2\frac{1}{2}$

3. (a) Discuss the structure of carbonyl group. How will you synthesize :

(i) Acetaldehyde from acetyl chloride

(ii) Acetophenone from benzonitrile ? 5

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(b) Give reaction of Benzoin Condensation and explain in detail its mechanism. 5

OR

(c) Write a note on Wittig reaction. $2\frac{1}{2}$

(d) Write note on Aldol condensation. $2\frac{1}{2}$

(e) What is the action of :

(i) Zn amalgam and conc. HCl on ethyl-methyl ketone and

(ii) Lithium aluminium hydride on acetophenone ? $2\frac{1}{2}$

(f) Give the mechanism of Knoevenagel condensation. $2\frac{1}{2}$

4. (a) Explain the acidity of carboxylic acids. What is the effect of substituents on it ? 5

(b) Give the following conversions :

(i) Benzaldehyde to Benzoic acid,

(ii) Ammonium acetate to acetamide,

(iii) Succinic acid to Succinic anhydride,

(iv) Acetyl chloride to acetaldehyde, and

(v) Crotonaldehyde to crotonic acid. 5

OR

(c) Explain esterification reaction with suitable example. $2\frac{1}{2}$

- (d) Write note on Helt-Volhard-Zelinsky reaction. 2½
- (e) How will you prepare cinnamic acid by Perkin reaction ? What is action of hydrogen bromide on cinnamic acid ? 2½
- (f) Give mechanism of acid catalyzed hydrolysis ester. 2½

5. Attempt any **TEN** of the following : 10×1=10

- (i) Give order of reactivity of alkyl halide and aryl halide.
- (ii) Draw energy profile diagram of S_N^2 reaction.
- (iii) Write molecular formula and draw structure for BHC.
- (iv) What happens when ethylene glycol heated with conc. H_2SO_4 ?
- (v) How is allyl alcohol obtained from glycerol ?
- (vi) How is phenol obtained from chlorobenzene ?
- (vii) Give common and IUPAC names for $H_3C-CH_2-CH_2-\overset{\overset{O}{||}}{C}-H$.
- (viii) How will you convert acetone into propane ?
- (ix) How is phthalic acid obtained from o-xylene ?
- (x) Give the preparation of succinic acid from malic acid.
- (xi) How cinnamic acid reacts with Soda lime ?
- (xii) How will you obtain acetic acid from acetonitrile ?