

Bachelor of Science (B.Sc.) Semester—III (C.B.S.) Examination

CHEMISTRY (CH-302)

(Organic Chemistry)

Paper—II

Time : Three Hours]

[Maximum Marks : 50

N.B. :— (1) All **FIVE** questions are compulsory and carry equal marks.
(2) Give diagrams and chemical reactions wherever necessary.

1. (A) What are activating and deactivating groups ? Explain o, p-directive influence of —OH group in benzene for further electrophilic substitution reaction. 5
(B) Discuss mechanism of SN^1 reaction with its energy profile diagram. 5

OR

(C) Write Ullmann synthesis of biphenyl. How it reacts with conc. HNO_3 in presence of conc. H_2SO_4 ? 2½
(D) How is ethane obtained by :
(i) Wurtz reaction, and
(ii) Kolbe's reaction ? 2½
(E) What happens when Toluene is reacted with :
(i) Fuming HNO_3 , and
(ii) Chlorine in diffused sunlight ? 2½
(F) Give synthesis and uses of B.H.C. 2½
2. (A) How will you prepare ethylene glycol from :
(i) Ethylene bromide, and
(ii) Ethylene oxide ?
Write note on Pinacol-Pinacolone rearrangement. 5
(B) Discuss mechanism of Reimer-Tiemann reaction. 5

OR

(C) Write note on Hydrogen Bonding with suitable example. 2½

(D) Explain acidic nature of Phenol. 2½

(E) What is the action of excess of HI on glucerol ? 2½

(F) Write a note on structure and bonding in Phenol. 2½

3. (A) Discuss the mechanism of Perkin reaction. 5

(B) Explain the structure of carbonyl group. How will you prepare following :
(i) Acetaldehyde from acetyl chloride, and
(ii) Acetophenone from benzonitrile ? 5

OR

(C) Write a note on Cannizzaro's reaction. 2½

(D) Give the reaction of acetaldehyde with :
(i) Tollens Reagent and
(ii) Fehling solution. 2½

(E) Write a note on Wittig reaction. 2½

(F) Give the general mechanism of nucleophilic addition to carbonyl group. 2½

4. (A) What is the effect of following on carboxylic acid :
(i) Electron donating group and
(ii) Electron withdrawing group ? 5

(B) What is the action of following on acetic acid ?
(i) PCl_3 and
(ii) SOCl_2 ?

What happens when :
(i) Acetyl chloride reacts with ethyl amine,
(ii) Acetyl chloride reacts with acetic acid ? 5

OR

(C) Write short accounts on Hell-Volhard-Zelinsky reaction. 2½

(D) Write names and give examples of any four derivatives of carboxylic acids. 2½

(E) What is the action of heat on :
 (i) Succinic acid, and
 (ii) Phthalic acid ? 2½

(F) Give Claisen-condensation reaction of ethyl acetate. 2½

5. Attempt any **TEN** of the following questions :—

(i) Classify the following as activating and deactivating groups :
 (a) $-\text{NH}_2$ and (b) $-\text{NO}_2$ 1

(ii) Give the uses of DDT. 1

(iii) How will you prepare Carbon tetrachloride from methane ? 1

(iv) Name and draw the structure of Polyhydric alcohol. 1

(v) Draw resonance structure of Phenoxide ion. 1

(vi) Give chemical reaction of Phenol with bromine water. 1

(vii) Give the structural formula of 2-methyl propanal. 1

(viii) Complete the following reaction :

$$\begin{array}{c} \text{H} \\ | \\ \text{H}-\text{C}=\text{O} + [\text{O}] \xrightarrow[\text{H}_2\text{SO}_4]{\text{K}_2\text{Cr}_2\text{O}_7} ? \end{array}$$
 1

(ix) Draw orbital structure of carbonyl group. 1

(x) Give the IUPAC name of $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$. 1

(xi) Give the products of hydrolysis ethyl acetate. 1

(xii) How crotonic acid is obtained from crotonaldehyde ? 1