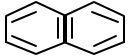


- (v) What is chlorination of alkane ? 1
- (vi) Complete the following reaction :
 $\text{CH}_3\text{COOH} \xrightarrow{?} \text{Cl-CH}_2\text{-COOH.}$ 1
- (vii) Which halogenation requires more energy ? 1
- (viii) Define oxidation reaction. 1
- (ix) Which electrophile is used for sulphonation of naphthalene ? 1
- (x) Complete the following reaction.
 $\xrightarrow[\text{H}_2\text{SO}_4]{160^\circ\text{C}} ?$ 1
- (xi) How many types of alkylation ? 1
- (xii) What is role of catalyst in hydrogenation reaction ? 1

NTK/KW/15/5848

Bachelor of Science (B.Sc.) Semester-III Examination
Paper-II : INDUSTRIAL CHEMISTRY (ICH-302)

Time—Three Hours]

[Maximum Marks—50

N.B. : (1) All **FIVE** questions are compulsory and carry equal marks.

(2) Draw diagrams and write equations wherever necessary.

1. (A) Explain the mechanism of nitration of Benzene. 5
- (B) How will you convert the following :
 - (i) Chlorobenzene to ortho and para nitrobenzene
 - (ii) Acetanilide to para nitro acetanilide. 5

OR

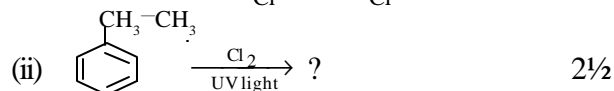
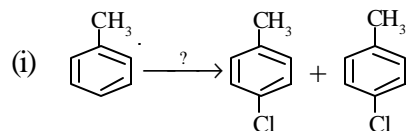
- (C) Explain the nitration of Toluene. 2½
- (D) Explain the kinetics of nitration with suitable example. 2½
- (E) Discuss the nitration of paraffinic hydrocarbon. 2½
- (F) Why nitration of chlorobenene is possible at ortho and para position ? 2½
2. (A) Explain the mechanism of chlorination with suitable example. 5

- (B) Explain with suitable reagents used for halogenation of aromatic side chain and nuclear halogenation. Give one example of each. 5

OR

- (C) How is chloral manufactured ? 2½
 (D) Which reagents are suitable for aromatic side chain and nuclear halogenation ? 2½
 (E) How will you prepare dichloromethane industrially ? 2½

- (F) Complete the following reactions :



3. (A) Explain the mechanism of sulphonation of Benzene. 5
 (B) How will you prepare following commercially :
 (i) Acetaldehyde
 (ii) Acetic acid ? 5

OR

- (C) Give the mechanism of alkyl benzene. 2½
 (D) What is meant by oxidising agent ? What is role of oxidising agent in chemical reaction ? 2½

- (E) Explain the kinetics of sulphonation. 2½
 (F) How will you prepare phthalic anhydride commercially ? 2½

4. (A) What is hydrogenation ? Give any two hydrogenating agents. Explain role of hydrogenating agent in hydrogenation reaction. 5
 (B) Explain the mechanism of alkylation reaction with suitable example. 5

OR

- (C) How will you manufacture methanol from carbon monoxide and hydrogen ? 2½
 (D) How is alkyl benzene manufactured industrially ? 2½
 (E) How will you convert ethyl acetate to ethyl alcohol ? 2½
 (F) Discuss the hydrogenation of vegetable oil. 2½

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

- (i) Write the chemical reaction of formation of nitronium ion. 1
 (ii) Define nitration. 1
 (iii) What is role of conc. H_2SO_4 during nitration ? 1
 (iv) What types of reagent are used in preparation of chlorobenzene ? 1