2024
B.A./B.Sc.
Fourth Semester
CORE – 9
CHEMISTRY
Course Code: CHC 4.21
(Organic Chemistry - III)

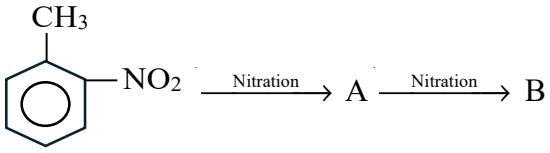
Total Mark: 70 *Pass Mark: 28*
Time: 3 hours

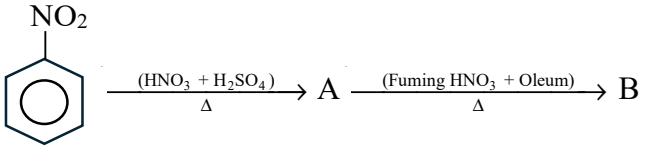
Answer five questions, taking one from each unit.

UNIT–I

1. (a) With suitable chemical reaction, explain Gabriel's phthalimide synthesis. 3
   (b) How will you distinguish between 1°, 2° and 3° amines by nitrous acid test? Explain with chemical reaction. 4
   (c) Explain Mannich reaction with mechanism. 4
   (d) Para-nitroanniline is less basic than aniline. Give reason. 3

2. (a) Give reason why: 2×3=6
      (i) Aryldiazonium salts are more stable than alkyldiazonium salts.
      (ii) Methylamine is a stronger base than methanol.
      (iii) Aniline is a weaker base than methylamine.
   (b) Complete the following reactions: 2×2=4

(i) 

(ii) 

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

(i) $CH_3 - Cl + AgNO_2 + C_2H_5OH + H_2O \longrightarrow$

(ii) $CH_3CH_2NO_2 + 3H_2 \xrightarrow{Ni}$

(iii) $CH_3CH_2CH_2NH_2 + CH_3Br \longrightarrow$

(iv) $C_6H_5OH + NH_3 + ZnCl_2 \xrightarrow{300°C}$

UNIT–II

3. (a) Giving chemical reaction mechanism show what happens when: 3×2=6

(i) Naphthalene is treated with concentrated sulfuric acid at 165°C.

(ii) Naphthalene is warmed with concentrated nitric acid in presence of sulfuric acid.

(b) Give one method of preparation of anthracene with chemical reaction. 3

(c) How will you prepare naphthol from naphthalene? Give the chemical reaction and also mention the uses of naphthol. 4+1=5

4. (a) Describe the structure elucidation of anthracene. 5

(b) Give chemical reaction what happen when anthracene is treated with: 2×3=6

(i) Chlorine in presence of carbon tetrachloride.

(ii) Oxygen in presence of V_2O_5 at 500°C.

(iii) Acetyl chloride in presence of aluminium chloride.

(c) Write the synthesis of phenanthrene by Haworth synthesis. 3

UNIT–III

5. (a) Explain *any four* of the following name reactions with their mechanisms: 3½×4=14

(i) Paal-Knorr synthesis of pyrrole

(ii) Gabriel synthesis of pyrimidine

(iii) Fischer-Indole synthesis

(iv) Skraup synthesis of quinoline

(v) Bischler-Napieralski synthesis of isoquinoline

6. (a) Give reason why: $3\frac{1}{2}\times4=14$
   (i) Nucleophilic substitution in pyridine occurs at 2- or α-position whereas electrophilic substitution occurs at 3- or β-position.
   (ii) Pyrimidine gives electrophilic substitution at position -5 whereas nucleophilic substitution at position-4.
   (iii) Furan is not stable to acids although it has aromatic character.
   (iv) Pyrrole resembles phenol in its chemical properties. Justify.

UNIT–IV

7. (a) Write the structure of quinine and morphine. Mention the medical uses of quinine and morphine. 2+3=5
   (b) Discuss the structure elucidation of nicotine. 5
   (c) Explain the Emde degradation/ modification with chemical reaction. 4

8. (a) How will you isolate nicotine from tobacco leaves? 2
   (b) Write the medicinal importance of cocaine and reserpine. 2+2=4
   (c) Give any one method of synthesis of nicotine. 3
   (d) Discuss the general structural elucidation of alkaloids. 5

UNIT–V

9. (a) What are terpenoids? Give its classification. 1+3=4
   (b) Discuss the structure elucidation of citral. 5
   (c) What is isoprene rule? Give example. 2
   (d) Give any one method of synthesis of α-terpineol. 3

10. (a) How will you convert neral into p-cymene? Give chemical reaction. 2
   (b) Explain the following name reactions: 3×3=9
      (i) Perkin Junior synthesis of α-terpineol.
      (ii) Barbier, Bouveault and Tiemann synthesis of citral.
      (iii) Arens and Van Drop synthesis of citral.
   (c) Give one method of isolation of terpenoids from plants. 3