

Register Number :

Name of the Candidate :

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B.Sc. DEGREE EXAMINATION, 2008

(APPLIED CHEMISTRY)

(SECOND YEAR)

(PAPER - III - A - MAIN)

640. ORGANIC CHEMISTRY

(Including Lateral Entry)

December]

[Time : 3 Hours

Maximum : 100 Marks

Answer ONE question from each Unit.

All questions carry equal marks.

(5 × 20 = 100)

UNIT - I

1. (A) (a) What are the products when H - Br and Br - Br are cleaved homolytically and heterolytically ?

Turn over

(b) What are substitution reactions? Explain the substitution reaction between

- (i) Ethyl chloride and sodium hydroxide.
- (ii) Ethane with bromine.
- (iii) Benzene with $\text{H}_2\text{SO}_4 / \text{HNO}_3$.

(c) What are the products of the following reactions? Identify the type to which each one of these reactions belongs:

- (i) $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH} \xrightarrow{\text{H}^+}$
- (ii) $\text{CH}_3\text{CH}=\text{CH}_2 + \text{Br}_2 \rightarrow$
- (iii) $\text{CH}_3 - \underset{\text{Cl}}{\text{CH}} - \text{CH}_2 - \text{CH}_3 + \text{alc} \cdot \text{KOH} \rightarrow$
- (iv) $\text{CH}_2=\text{CHCl} \xrightarrow{\Delta}$
(4 + 6 + 10)

(OR)

(B) (a) What is the reagent involved in sulphonation of benzene? Is this electrophilic or nucleophilic? - Justify.

(c) Explain the preparation and properties of

- (i) Indole.
- (ii) Thiazole. (3 + 7 + 10)

(OR)

(B) (a) How is indole prepared?

(b) Complete the following reactions:

- (i) $\text{Furan} + \text{H}_2 \xrightarrow{\text{Ni}}$
- (ii) $\text{Thiophene} + \text{HNO}_3 \xrightarrow{\text{acetic anhydride}}$
- (iii) $\text{Pyridine} + \text{NaNH}_2 \xrightarrow{\text{toluene} / \Delta}$
- (iv) $4\text{-Chloro-1-butanol} \xrightarrow[\text{H}_2\text{O}]{\text{NaOH}}$

(c) Give the preparation and any two reactions of imidazole. (3 + 10 + 7)

(c) Write short notes on :

- (i) Classification of proteins.
- (ii) Methods of isolation of terpenes.
(3 + 9 + 8)

(OR)

(B) (a) What are alkaloids ? Give the name and structure of the alkaloid isolated from tobacco.

- (b) Write a note on enzymes.
- (c) Discuss the following :
 - (i) General methods of structure elucidation of alkaloids.
 - (ii) Colour reactions of protein.
(3 + 7 + 10)

UNIT - V

5. (A) (a) How is pyrrole prepared ?
- (b) Compare the properties of pyrrole, furan and thiophene.

(b) What happens when

- (i) CH_3Cl undergoes homolytic cleavage ?
- (ii) $\text{CH}_3\text{CH}_2\text{Cl}$ undergoes heterolytic cleavage ?
- (ii) Br_2 undergoes addition reaction with 2 - butene ?

(c) Complete the reactions. Identify the products and name them.

- (i) 1 - Chloropropane + aqueous KOH.
- (ii) 2 - Chloropropane + alc·KOH.
- (iii) Chlorobenzene + CN^- .
- (iv) Methane + Cl_2 (2 molecules)

$\xrightarrow{\text{Sunlight}}$

(4 + 6 + 10)

UNIT - II

2. (A) (a) Explain how phthalic anhydride is manufactured commercially ?
- (b) Discuss any three reactions of acetophenone.

Turn over

- (c) (i) Explain how hydrogenation of vegetable oils is done ?
- (ii) Give the preparation and properties of aniline. (4 + 6 + 10)

(OR)

- B. (a) How are alkyl benzenes manufactured ?
- (b) Explain any two methods of esterifications of organic acids with examples.
- (c) Write a note on preparation of carbonyl compounds. Give any four nucleophilic addition reactions of carbonyl compounds with examples. (4 + 6 + 10)

UNIT - III

3. (A) Discuss the following reactions with examples :
- (a) Favorskii rearrangement.
- (b) Aldol condensation.
- (c) Beckmann rearrangement. (7 + 6 + 7)

(OR)

- (B) (a) What is benzoin condensation ? Give an example.
- (b) Name the reaction / rearrangement involved in each one of the following. Identify the products formed :
- (i) $C_6H_5CO NH_2 + Br_2 / KOH \rightarrow$
- (ii) Benzil + $OH^- \rightarrow$
- (iii) Acetone oxime + $H^+ \rightarrow$
- (c) What is benzilic acid rearrangement ? How is it carried out ? Give two examples for it. (5 + 9 + 6)

UNIT - IV

4. (A) (a) Give the structure of
- (i) Nicotine.
- (ii) Piperine.
- (b) How is the structure of α - pinene established ?

Turn over