

Bachelor of Science (B.Sc.) Semester—V Examination

CH-501 : ORGANIC CHEMISTRY (Old and New)

Compulsory Paper—1

(Chemistry)

Time : Three Hours]

[Maximum Marks 50

- N.B. :— (1) All FIVE questions are compulsory and carry equal marks.
 (2) Write chemical equations and draw diagrams wherever necessary.

1. (A) How is nitrobenzene prepared from benzene ? Discuss reduction of nitrobenzene under
 (i) Acidic
 (ii) Alkaline and
 (iii) Neutral conditions. 5
- (B) Why amines are basic in nature ? Explain separation of aliphatic primary, secondary and tertiary amines by Hoffmann's method. 5
- OR
- (C) Give preparation and uses of Picric acid. 2½
- (D) Starting from benzene diazonium chloride, how will you prepare :
 (i) P-Aminoazobenzene
 (ii) Phenol ? 2½
- (E) Give the preparation of nitroethane from ethane. What is the action of nitrous acid on nitroethane ? 2½
- (F) Discuss Gabriel Phthalimide reaction for the synthesis of primary amines. 2½
2. (A) Explain the structure of pyridine on the basis of M.O. theory. Explain basicity of pyrrole and pyridine. 5
- (B) Discuss molecular orbital picture of the following :
 (i) Thiophene and
 (ii) Furan. 5
- OR
- (C) How pyridine obtained from :
 (i) β -picoline and
 (ii) Pentamethylene diamine hydrochloride ? 2½
- (D) Explain Skraups Synthesis of Quinoline. 2½
- (E) Discuss Bischler Napieralski synthesis of Isoquinoline. 2½
- (F) Write note on Fischer-Indole Synthesis. 2½
3. (A) Give the principle and calculations involved in the estimation of nitrogen by Kjeldahl's method. An organic compound contain 12.76% C, 2.13% H and 85.11% Br. Its vapour density is 94. Determine the empirical formula of organic compound. (At Wt, C = 12, H = 1 and Br = 80). 5
- (B) What are Organometallic Compounds ? Give laboratory preparation of methyl magnesium bromide. What happens when methyl magnesium bromide reacted with :
 (i) Dry ice
 (ii) Acetonitrile
 (iii) Carbon disulphide followed by hydrolysis ? 5

OR

(Contd.)

(C) An organic compound contains C, H and O gave following results on analysis :

C = 40%, H = 6.66%

Determine the empirical formula of the compound.

2½

(D) Give the principle and calculations of estimation of halogens by Carius method.

2½

(E) Write a note on Reformatsky reaction.

2½

(F) How will you prepare following :

(i) Isopropyl alcohol

(ii) Methyl amine from methyl lithium ?

2½

4. (A) Discuss terms with example :

(i) Hypochromic shift

(ii) Hyperchromic shift.

5

(B) Explain the types of molecular vibrations in polyatomic molecules with reference to IR Spectroscopy.

5

OR

(C) Discuss Fingerprint region in IR Spectroscopy.

2½

(D) Define the following with example :

(i) Auxochromes

(ii) Chromophores.

2½

(E) State and explain Beer-Lambert's Law.

2½

(F) How is IR Spectroscopy useful to distinguish cis and trans isomers ?

2½

5. Attempt any TEN of the following :

(i) What is the action of heat on 1-Nitropropane ?

(ii) Give carbylamine reaction of ethyl amine.

(iii) What is the action of NaNO_2 and HCl on aniline ?

~~(iv)~~ Give aromaticity of pyrrole on the basis of Huckel's rule.

~~(v)~~ Define Heterocyclic compounds.

~~(vi)~~ Write structural formulae of two condensed heterocyclic compounds containing nitrogen in the ring.

(vii) What is purpose of Liebig's method ?

(viii) What is the action of acetyl chloride on diethyl zinc ?

(ix) Starting from Phenyl lithium, how will you prepare 2-Phenyl Pyridine ?

~~(x)~~ What is Hook's law ?

(xi) What is the unit of scale used in electronic spectroscopy ?

(xii) What is molar absorptivity ?

1×10=10