

NKT/KS/17/5172

Bachelor of Science (B.Sc.) Semester-V (CBS) Examination

CH-501 : ORGANIC CHEMISTRY

Paper—1(Chemistry)

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) Give the laboratory preparation of Nitrobenzene. What happens when Nitrobenzene undergoes :
- (i) Reduction in alkaline medium
- (ii) Friedal-Craft reaction ? 5
- (B) Explain basic nature of amines. How will you distinguish between primary, secondary and tertiary amines by Hinsberg test ? 5

OR

- (C) What are nitroalkanes ? What is action of nitrous acid on :
- (i) Ethylamine
- (ii) Diethylamine ? 2½
- (D) Give the preparation and uses of Picric acid. 2½
- (E) Write a note on Gabriel-Phthalimide reaction used in preparation of ethylamine. 2½
- (F) What is coupling reaction ? How benzene diazonium chloride is converted into :
- (i) Phenyl hydrazine and
- (ii) Biphenyl ? 2½
2. (A) How is pyridine obtained from :
- (i) Pyrrole and
- (ii) β -picoline
- Discuss the MO structure and aromaticity of pyridine. 5
- (B) Explain the molecular orbital structure of pyrrole. Write a note on Fischer-Indole synthesis of Indole. 5

OR

- (C) Explain why pyridine undergoes electrophilic substitution at 3-position. 2½
- (D) Explain why pyridine is more basic than pyrrole. 2½
- (E) What happens when quinoline is treated with :
- (i) alk. KMnO_4 and
- (ii) conc. HNO_3 + conc. H_2SO_4 ? 2½
- (F) Give the Bischler-Napieralski synthesis of Isoquinoline. 2½
3. (A) Give the principle and calculations involved in the estimation of carbon and hydrogen in an organic compound by Liebig's method. 0.20g of an organic dibasic acid gave on combustion 0.04 g water and 0.195 g carbon dioxide. Calculate the percentage of carbon and hydrogen in the given organic compound. 5
- (B) What are Grignard's Reagent ? Give one example. What is the action of methyl magnesium bromide on :
- (i) Acetone
- (ii) Dry ice
- (iii) Acetyl acetone and
- (iv) Methyl cyanide. 5

OR

- (C) Give the principle and calculations involved in the estimation of sulphur by Carius method. 2½
- (D) What are organometallic compounds ? Give one method of preparation of diethylzinc. 2½
- (E) An organic compound on analysis was found to contain C = 22.01%, H = 4.60% and Br = 73.99%. Find the empirical formula of the compound.
- (At wt. of H = 1, C = 12, Br = 80) 2½
- (F) Starting from Methyl lithium how will you obtain the following :
- (i) Ethanol and
- (ii) Acetone ? 2½

4. (A) Discuss briefly the various types of electronic transitions which occur in the UV-Visible region. 5
- (B) Discuss the different types of stretching and bending vibrations with reference to IR spectroscopy. 5

OR

- (C) Give the characteristics absorption peak in IR spectrum of CH_3COOH 2½
- (D) Define the terms : 2½
- (i) Hyperchromic effect
- (ii) Hypochromic effect.
- (E) How can UV spectroscopy be used to distinguish between cis and trans isomers. 2½
- (F) Give the applications of IR spectroscopy. 2½
5. Solve any **TEN** of the following :

- (i) Identify the unknown compound "A"



- (ii) Arrange the following in the decreasing order of basicity : 1
- (i) NH_3 (ii) CH_3NH_2 (iii) $(\text{CH}_3)_2\text{NH}$ and (iv) $(\text{CH}_3)_3\text{N}$
- (iii) Give the significance of freezing reaction condition in diazotization reaction. 1
- (iv) Draw the molecular orbital diagram of Furan 1
- (v) How is pyridine converted to 2-phenyl-pyridine ? 1
- (vi) Give Chichibabin reaction. 1
- (vii) What is the use of Kjeldahl's method ? 1
- (viii) What is the action of ammonia on methyl magnesium iodide ? 1
- (ix) Write the principle involved in the estimation of halides in the Carius method. 1
- (x) Give the range of IR region. 1
- (xi) Define Bathochromic effect. 1
- (xii) Give the statement of Beer-Lambert's law. 1