Bachelor of Science (B.Sc.)-II Fourth Semester

B.Sc. 2452 - Chemistry Paper-II (Organic Chemistry)

P. Pages : 2 **GUG/W/18/1285**

Time : Three Hours * 0 9 9 8 * Max. Marks : 50

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1. a) What are chromophores and auxochromes? Explain the following terms with suitable examples. **5**

1) Red-Shift 2) Blue Shift.

b) Discuss different types of stretching and bending vibration in I.R. spectroscopy? **5**

OR

c) Discuss Lamberts - Beer's Law. **2½**

d) Discuss following transitions in ultra-violet and visible spectroscopy. **2½**

1) $\sigma \rightarrow \sigma^*$ Transition

2) $\pi \rightarrow \pi^*$ Transition

e) What happens when a molecule absorbs infrared radiations? **2½**

f) Write note on Finger print region in I.R spectroscopy. **2½**

2. a) What is acidity of carboxylic acid. Explain the effect of electron donating groups and electron withdrawing groups on the acidity of carboxylic acid? **5**

b) What are acyl derivatives. Discuss relative reactivities of different acyl derivatives. How will you prepare acetyl chloride from acetic acid? **5**

OR

c) Discuss the mechanism of decarboxylation of carboxylic acids? **2½**

d) How phthalic acid is obtained from ortho-xylene? and what is the action of heat on phthalic acid? **2½**

e) Discuss the mechanism of alkaline hydrolysis of ester? **2½**

f) How will you convert acetic anhydride into acetamide and acetyl chloride? **2½**

3. a) What are nitroalkanes? Discuss the reduction of nitrobenzene in different medium. **5**

b) What are amines? How will you separate primary secondary and tertiary amines from their mixture by Hoffman's method? **5**

OR

c) Explain why halonitroarenes are more reactive than aryl halides? **2½**

d) What is benzene diazonium salt? What happens when benzene diazonium chloride is heated with KCN? **2½**

e) What is basicity of amines? Explain why trimethyl amine is less basic than dimethyl amine? **2½**

f) Give preparation and uses of picric acid. **2½**

4. a) Give the principle and calculations involved in the estimation of nitrogen by Duma's method. **5**

5.85 mg of organic substance containing nitrogen was Kjeldahl Zed and ammonia evolved was absorbed in 2.26 ml of 0.1 N HCI. The excess of acid required 0.5 ml N/S NaOH for its neutralization. Calculate the percentage of nitrogen.

b) How will you prepare acetoacetic ester by Claisen condensation reaction? Discuss the keto-enol tautomerism in acetoacetic ester? **5**

OR

c) 0.3 gms of an organic substance gives 0.54 gms of water and 0.88 gms of carbon dioxide on complete combustion. Calculate the percentage of carbon and hydrogen in the compound. **2½**

d) What are organometallic compounds? How will you prepare tertiary alcohol from Grignard reagent? **2½**

e) How will you obtain Crotonic acid from malonic ester? **2½**

f) Give principle and calculations involved in the estimation of halogen in an organic compound by Carius method. **2½**

5. Attempt **any ten.**

1) What is molar absorptivity? **1**

2) Define the term hyperchromic shift. **1**

3) What is infrared spectrum? **1**

4) Write HVZ reaction **1**

5) What is the action of ammonia on succinic acid (Reaction only)? **1**

6) What is IUPAC name of $CH_3CONHCH_3$? **1**

7) Give any one method for preparation of nitroethane. **1**

8) What is the action of bromine on aniline? (reaction only) **1**

9) Give one example of coupling reaction (reaction only) **1**

10) Define empirical formula. **1**

11) What are alpha hydrogens. **1**

12) Arrange the following compounds in decreasing order of their reactivity. **1**

1) CH_3MgBr 2) CH_3Li 3) CH_3ZnCH_3

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