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Unique Paper Code : 32171302_OC

Name of the Course : B.Sc. (H) Chemistry

Name of the Paper : Chemistry C-VI Organic Chemistry II:

Oxygen Containing Functional Groups

Semester : III

Duration : 3 hours

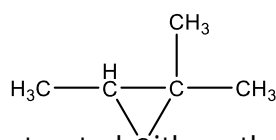
Maximum Marks: : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any four questions in all.
3. All questions carry equal marks.
4. This question paper contains three pages.

Q1 a) An organic compound A ($C_5H_{10}O$) on treatment with hydroxylamine gives two isomeric compounds B and C. B and C on reaction with acid separately gives D and E, respectively. Compound A does not give tollen's test. Compound A on reduction with $NaBH_4$ followed by dehydration with conc. H_2SO_4 gives compound F. Compound F on oxidative ozonolysis forms CH_3COOH and CH_3CH_2COOH . Identify A, B, C, D, E and F. Write all the reactions and mechanisms involved.

15



b) Explain the reaction when is treated with methanol in acidic medium. 3.75

Q2 a) How will you prepare a & b from ethyl acetoacetate and c, d & e from diethyl malonate? 15

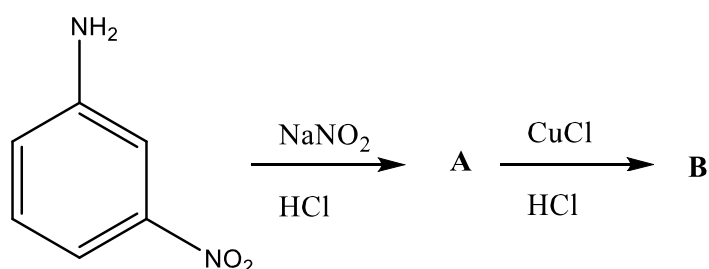
- i) Pentane-1,5-dioic acid
- ii) 2-Methylhexanoic acid
- iii) Succinic acid
- iv) Cinnamic acid
- v) 5,5-Dimethyl barbituric acid

b) SN_1 reactions show racemization as well as inversion of configuration. Explain 3.75

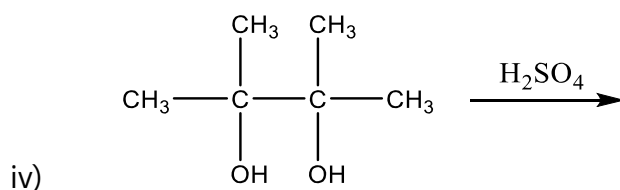
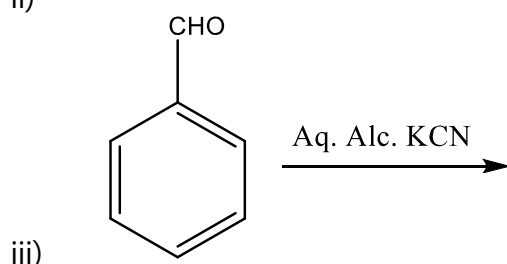
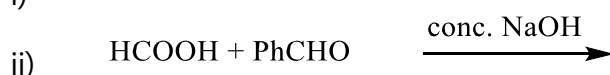
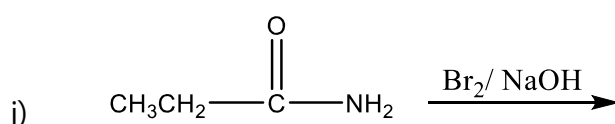
Q3 a) Explain why 15

- i) Enol form of ethylacetoacetate is more stable than that of ethylacetate?
- ii) Benzoic acid is stronger acid than acetic acid?
- iii) Maleic acid is stronger acid than fumaric acid for first dissociation but for second dissociation it is weaker than fumaric acid?
- iv) Aryl halides are weaker than alkyl halides towards nucleophilic substitution reactions?
- v) Acetone can be prepared from CH_3COCl and $(\text{CH}_3)_2\text{Cd}$ and not from CH_3COCl and CH_3MgCl ?

b) Identify A and B 3.75



Q4 a) Complete the following, giving name of the reaction and mechanism involved (three) 15 Any

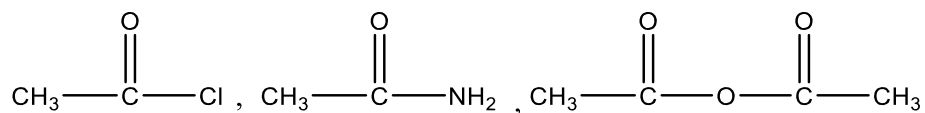


b) *p*-Chlorotoluene on treatment with NaNH_2 and liq. NH_3 gives *m*-toluidine. Explain 3.75

Q5 a) How will you carry out the following conversions (*Any three*) 15

- i) Phenol to Aspirin
- ii) Benzene to Fluorobenzene
- iii) Aniline to iodobenzene
- iv) Benzaldehyde to benzamide

b) Arrange the following compounds in order of increasing reactivity towards hydrolysis and give reason 3.75



Q6 a) What happens when 12.75

i) Dicarboxylic acids succinic acid, glutaric acid and adipic acid are heated with acetic anhydride and the product is distilled at 300 °C.

ii) Phenol is treated with CHCl_3 and NaOH and the product is treated with alkaline KMnO_4 .

iii) Benzaldehyde is treated with acetic anhydride in presence of sodium acetate.

b) Write a short note on of the following (*Any two*) 6

- i) Claisen rearrangement
- ii) Knoevenagel reaction
- iii) Aldol condensation

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