

[This question paper contains 4 printed pages.]

Sr. No. of Question Paper : 6011

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Your Roll No.....

Unique Paper Code : 217303

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

Name of the Paper : CHHT-306 : Organic Chemistry – II

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 **five** questions.
3. **All** questions carry equal marks.

1. (a) An organic compound **A**, (C_4H_8O) gives positive iodoform test but does not respond to Tollen's test. **A** on reaction with hydroxylamine forms two geometrical isomers **B** and **C**. Compounds **B** and **C** on heating separately with H_2SO_4 give compounds **D** and **E** respectively. Identify **A**, **B**, **C**, **D** and **E** explaining the reactions involved. Write the mechanism of the reaction by which **B** is converted into **D**. (10)

(b) How will you distinguish between the following pairs of compounds ? Write any one method with the reaction(s) involved.

(i) Acetaldehyde and benzaldehyde

(ii) Acetic acid and phenol (2×2½)

2. How will you synthesise the compounds **a**, **b**, & **c** from ethyl acetoacetate and **d** & **e** from diethyl malonate ?

(a) Crotonic acid

P.T.O.

- (b) Acetyl acetone
- (c) Succinic acid
- (d) Adipic acid
- (e) Barbitone (Veronal) (5×3)

3. Explain the following :

- (a) *o*-Bromoanisole and *m*-bromoanisole on treatment with NaNH_2 in liq. NH_3 give the same product.
- (b) *o*-Nitrophenol has lower solubility and higher volatility than *p*-nitrophenol.
- (c) Ethoxybenzene on cleavage with HI gives ethyl iodide and phenol rather than iodobenzene and ethyl alcohol.
- (d) $\text{S}_{\text{N}}2$ reaction of alkyl halides are accompanied by inversion of configuration.
- (e) The $\text{pK}_{\text{a}1}$ value of maleic acid is lower than that of fumaric acid whereas $\text{pK}_{\text{a}2}$ of fumaric acid is lower than that of maleic acid. (5×3)

4. Write the products for the following with equation :

- (a) When α -, β -, & γ -Hydroxyacids are heated.
- (b) Aerial oxidation of cumene followed by treatment with dil. H_2SO_4 .
- (c) Benzaldehyde when heated with acetic anhydride and sodium acetate followed by reaction with ethyl alcohol in the presence of acid catalyst.
- (d) 2,2-Dimethyl-1-propanol is heated with Conc. H_2SO_4 .

(e) Ethylene glycol is treated with HIO_4 followed by reaction with Zn-Hg and HCl. (5×3)

5. How will you carry out the following conversions ?

(a) Ethanoic acid to malonic acid

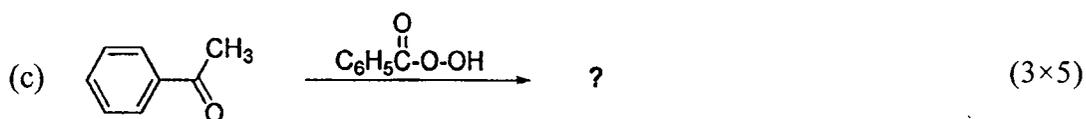
(b) Acetone to 4-methyl-3-penten-2-one

(c) Benzenesulphonic acid to aniline

(d) Benzoic acid to benzaldehyde

(e) Acetaldehyde to lactic acid. (5×3)

6. Complete the following reactions. Write the name of the reaction with mechanism.



7. Write short notes on any **three** of the following with emphasis to (i) the functional group that undergoes these reactions, (ii) products formed, (iii) reaction conditions and (iv) mechanism.

(a) Perkin reaction

(b) Reimer – Tiemann reaction

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(c) Hofmann – bromamide degradation

(d) Benzoin condensation

(e) Pinacol – Pinacolone rearrangement

(3×5)

(2200)