

QB365

Important Questions - Aldehydes , Ketones and Carboxylic acids

12th Standard CBSE

Chemistry

Reg.No. :

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Time : 01:00:00 Hrs

Total Marks : 50

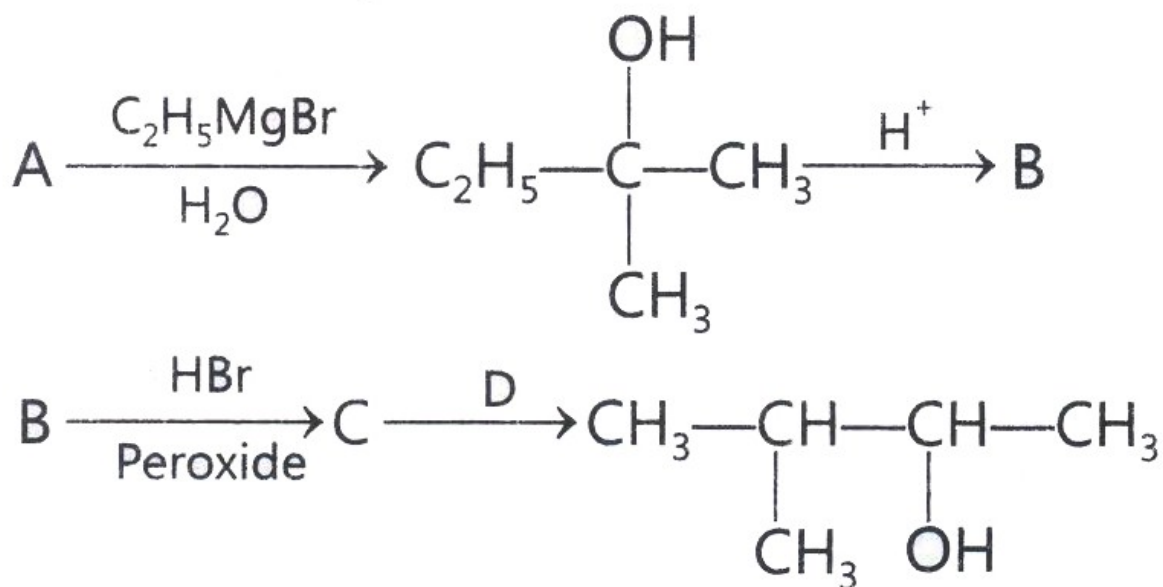
Section - A

- 1) Chlorination of toluene in presence of light and heat followed by treatment with aqueous NaOH gives : **1**
(a) o-Cresol (b) p-Cresol (c) 2, 4 - Dihydroxytoluene (d) Benzoic acid
- 2) In the following sequence of reactions : Toluene $\xrightarrow{KMnO_4}$ A $\xrightarrow{SOCl_2}$ B $\xrightarrow[\text{BaSO}_4]{H_2/Pd}$ C The product A is **1**
(a) C₆H₅CH₂OH (b) C₆H₅CHO (c) C₆H₅COCH₃ (d) C₆H₅Cl
- 3) Consider the reaction : RCHO + NH₂NH₂ → RCH=N-NH₂ What short of reaction is it ? **1**
(a) Electrophilic addition - elimination reaction (b) Free radical addition - elimination reaction
(c) Free radical addition - elimination reaction (d) Nucleophilic addition - elimination reaction
- 4) (CH₃)₂C = CHCOCH₃ can be oxidised to (CH₃)₂C = CHCOOH by : **1**
(a) Chromic acid (b) NaOI (c) Cu at 300°C (d) KMnO₄
- 5) Which of the following reagents converts C₆H₅COCHO to C₆H₅CHOHCOOH ? **1**
(a) Aq. NaOH (b) Acidic Na₂SO₃ (c) Na₂CrO₄/H₂SO₄ (d) NaNO₂/HCl
- 6) The decrease in order of acidity among the following compounds, ethanol (I), 2, 2, 2-trifluoroethanol (II), trifluoroacetic acid (III) and acetic acid (IV) is **1**
(a) III > II > IV > I (b) IV > III > II > I (c) I > II > III > IV (d) III > IV > II > I
- 7) Which of the following on oxidation with alkaline KMnO₄ followed by acidification with dil. HCl gives benzoic acid **1**
(a) toluene (b) ethylbenzene (c) isopropylbenzene (d) tert-butylbenzene
- 8) When calcium acetate is distilled alone, ----- is formed **1**
- 9) Esters on treatment with excess of Grignard reagents followed by acid hydrolysis gives ----- **1**
- 10) Vinegar is a dilute solution of ----- **1**

Section - B

11) Write the structural formulae of compounds A, B and C and name the reagent D in the following reaction:

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12) Benzaldehyde reduces Tollens' reagent but not the Fehling's or the Benedict's solution. Explain.

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13) There are two $-\text{NH}_2$ groups in semicarboxide. However, only one is involved in the formation of semicarbazone. Give plausible explanation.

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14) Alkenes $\begin{array}{c} \diagdown \quad \diagup \\ \text{C} = \text{C} \\ \diagup \quad \diagdown \end{array}$ and carbonyl compounds $\begin{array}{c} \diagdown \quad \diagup \\ \text{C} = \text{O} \\ \diagup \quad \diagdown \end{array}$, both contain a π -bond but alkenes show

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electrophilic addition reactions whereas carbonyl compounds show nucleophilic addition reactions. Explain.

15) When liquid 'A' is treated with a freshly prepared ammoniacal silver nitrate solution, it gives bright silver mirror. The liquid forms a white crystalline solid on treatment with sodium hydrogensulphite. Liquid 'B' also forms a white crystalline solid with sodium hydrogensulphite but it does not give test with ammoniacal silver nitrate. Which of the two liquids is aldehyde? Write the chemical equations of these reactions also.

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Section - C

16) What happens when:

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(i) An aqueous solution of sodium acetate is electrolysed?

(ii) Calcium acetate is dry distilled?

(iii) Sodium benzoate is heated with soda lime?

17) How will you bring about the following conversions in not more than two steps? (i) Benzoic acid to Benzaldehyde (ii) Benzene to m-Nitroacetophenone (iii) Bromobenzene to 1-Phenylethanol

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18) How will you convert the following? Give chemical example:

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(i) Butan-1-ol to butanoic acid

(ii) Cyclohexane to Hexane-1, 6-dioic acid

(iii) Benzyl alcohol to phenyl ethanoic acid

(iv) 4-Methyl acetophenone to benzene-1, 4-dicarboxylic acid

(v) 3-Nitrobromobenzene to 3-nitrobenzoic acid

(vi) Butanal to butanoic acid

- 19) Convert the following: 3
- (a) Bromobenzene to 1-phenylethanol
- (b) Benzaldehyde to 3-phenylpropan-1-ol
- (c) Benzoic acid to m-Nitrobenzyl alcohol
- 20) An aromatic compound 'A' (Molecular formula C_8H_8O) gives positive 2, 4-DNP test. It gives a yellow precipitates of compound 'B' on treatments with iodine and sodium hydroxide solution. Compound 'A' does not give Tollen's or Fehling's test. On drastic oxidation with potassium permanganate it forms a carboxylic acid 'C' (Molecular formula $C_7H_6O_2$), which is also formed along with the yellow compound in the above reaction. Identify A, B and C write all the reactions involved. 3

Section - D

- 21) (a) Explain the mechanism of nucleophilic attack on the carbonyl group of an aldehyde or a ketone. (b) An organic compound (A) (molecular formula $C_8H_{16}O_2$) was hydrolysed with dilute sulphuric acid to give a carboxylic acid (B) and an alcohol (C). Oxidation of (C) with chromic acid also produced (B). On dehydration (C) gives but-1-ene. Write the equations for the reactions involved. 5
- 22) Draw the structures of the following derivatives: 5
- (i) Propanone oxime,
- (ii) Semicarbazone of CH_3CHO .
- (b) How will you convert ethanal into the following compounds? Give the chemical equations involved.
- (i) $CH_3 - CH_2$
- (ii) $CH_3 - \underset{\substack{| \\ OH}}{CH} - CH_2 - CHO$
- (iii) CH_3CH_2OH
- 23) A ketone A (C_4H_8O), which undergoes haloform reactions gives compound B on reduction. B on heating with sulphuric acid gives a compound C which forms mono-ozonide D. D on hydrolysis in presence of zinc dust gives only scetaldehyde E. Identify A, B, C, D and E. Write the reactions involved. 5
