## **CONVERSION QUESTIONS FOR FUNCTIONAL GROUP III-**

## **ALDEHYDE, KETONES, ACIDS & THEIR DERIVATIVES**

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Q.1 In the following reactions, identify the compounds A and B

$$(i)R - CN \xrightarrow{Hydrolysis} A + NH_3$$

$$(ii)A + SOCl_2 \rightarrow B + SO_2 \uparrow + HCl \uparrow$$

- Q.2 How will you convert the following?
  - (i) Ethanal to 2-hydroxy propanoic acid (ii) Toluene to benzoic acid
- Q.3 Predict the products of the following reactions:

$$(i) C_6 H_5 - CH_3 \xrightarrow{(a) \text{ KMnO}_4} ? \qquad (ii) \qquad \xrightarrow{Br_2/FeBr_3} ?$$

Q.4 Write the reagents required in the following reaction:

$$CH_3 - COOH \xrightarrow{?} CH_3 - CONH_2$$

Q.5 Predict the product of the following reaction:

$$CH_3COONa \xrightarrow{NaOH/CaO} ?$$

Illustrate the decarboxylation reaction giving a suitable example.

Q.6 Complete the following reaction:

$$CH_3COOH \xrightarrow{Br_2/P}$$

- Q.7 Convert
  - (i) Benzonitrile to acetophenone
- (ii) 1,2- dicyclohexylethene to cyclohexanone
- Q.8 Give names of the reagents to bring about the following transformations.
  - (a) Benzoyl chloride to benzaldehyde
- (b) Benzene to benzaldehyde
- (c) Benzene to acetophenone
- Q.9 Complete the following equations, giving the names of the reactants and products.

$$(i) \ \mathrm{C_6H_6} + \dots \underbrace{\qquad \qquad \qquad }_{Anhy.AlCl_3} \rightarrow C_6H_5COCH_3$$

$$(ii) (CH_3)_2 CO \xrightarrow{LiAlH_4} \rightarrow$$

Q.10 Complete the following reaction sequence.

$$CH_{3} - \overset{o}{C} - CH_{3} \xrightarrow{(i) \ CH_{3}MgBr} A \xrightarrow{Na\text{metal}} B \xrightarrow{CH3 - Br} C$$

## Q,11 Write the products of the following reactions

(i) CHO 
$$CONC.NaOH$$
 (ii)  $\longrightarrow +H_2NNH-CO-NH_2 \xrightarrow{H^+}$ 

Q.12 How will you bring about the following conversions?

$$(i) \ CH_2 = CH_2 \rightarrow COOH - CH_2 - CH_2 - COOH$$

Q.13 Complete the following reaction and explain the formation of products.

$$(i) \ HCOOH \xrightarrow{Conc.H_2SO_4} \\ (ii) \ CH_3COOH + CH_3OH \xrightarrow{Conc.H_2SO_4}$$

Q.14 Identify the products A and B in the following reactions

$$(i) CH_{3}COOH \xrightarrow{Cl_{2}/P} (A) \xrightarrow{Aq.NaOH} (B)$$

$$(ii) CH_{3}COOH \xrightarrow{NH_{4}OH} (A) \xrightarrow{HEAT} (B)$$

Q.15 (i) Write the products formed when CH3CHO reacts with the following reagents:

- (a) HCN
- (b) H<sub>2</sub>N-OH
- (c) CH<sub>3</sub>CHO in the presence of dilute NaOH.
- (ii) Write the chemical equations to illustrate the following name reactions.
  - (a) Rosenmund's reduction
- (b) Cannizaro reaction
- (iii) Out of CH<sub>3</sub>CH<sub>2</sub> CO CH<sub>2</sub> CH<sub>3</sub> and CH<sub>3</sub>CH<sub>2</sub> CO CH<sub>3</sub> which gives iodoform test?
- Q.16 Predict the products formed when cyclohexane carbaldehyde reacts with following reagents.
  - (i)PhMgBr and then H<sub>3</sub>O<sup>+</sup>.
- (ii) Tollen's reagent
- (iii) Semicarbazide and weak acid

- (iv) Excess ethanol and acid
- (v) Zinc amalgam and dilute hydrochloric
- Q.17 What is meant by the following terms? Give an example of the reaction in each case.
  - (i) Hemiacetal
- (ii) Oxime
- (iii) Ketal

- (iv) Imine
- (v) Schiff's base

Q.18 Complete each synthesis by giving missing starting material, reagent or products.

(i) 
$$C_6H_5CHO$$

Benzaldehyde

O

(iii)

 $Ag(NH_3)_2$ 

CHO

(iv)

 $CHO$ 
 $Ag(NH_3)_2$ 

CHO

(v)  $C_6H_5CHO + CH_3CH_2CHO$ 

Dil. NaOH

## Q.19 How will you convert

- (a) benzene to acetophenone?
- (b) Propanone to 2 methylpropan -2-ol?

Q.20 Write structures of compounds A,B and C in each of the following reactions.

$$(i) \ C_{6}H_{5}Br \xrightarrow{Mg/dry\ ether} A \xrightarrow{(a)\ CO_{2}(g)} B \xrightarrow{PCl_{5}} C$$

$$(ii) CH_3CN \xrightarrow{(a) CuCl_2/HCl} A \xrightarrow{Dil.NaOH} B \xrightarrow{\Delta} C$$