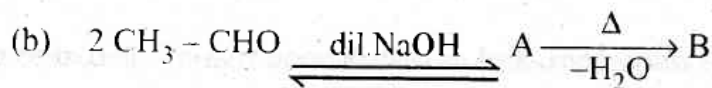
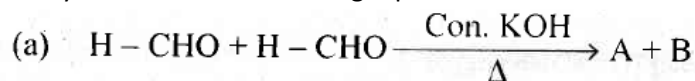


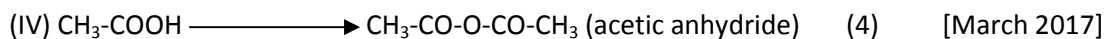
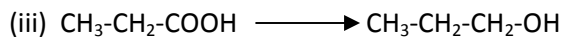
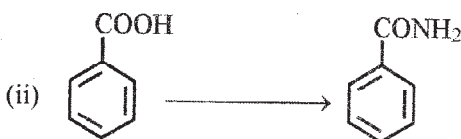
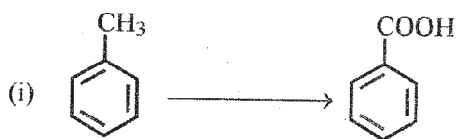
Previous HSE questions from the chapter “Aldehydes, Ketones and Carboxylic Acids”

1. Identify A and B in the following equations :



(2)

2. How the conversion of carbon dioxide to carboxylic acid can be effected using Grignard reagent? (2)
3. How the conversion of an aldehyde to acetal can carry out? (Write chemical equations) (3) [SAY 2018]
4. Aromatic aldehydes undergo electrophilic substitution reactions. Write the nitration reaction of benzaldehyde with chemical equation. (2)
5. Briefly describe Gattermann Koch reaction. (2)
6. How would you account for the followings :
- Aldehydes are more reactive than ketones towards nucleophilic addition reaction.
 - Boiling point of aldehydes are lower than alcohols.
 - Addition reaction of sodium hydrogen sulphite is useful for the separation and purification of aldehydes. (3x1 =3) [March 2018]
7. a) Which among the following reduces Tollen's reagent?
- i) Methanal ii) Propanone iii) Benzophenone iv) Acetophenone (1)
- b) Since both aldehydes and ketones possess carbonyl functional group, they undergo similar chemical reactions.
- Explain the structure of carbonyl group. (2)
 - Explain aldol condensation with an example. (2) [SAY 2017]
8. a) Which among the following does not give red precipitate with Fehling's solution?
- i) Ethanal ii) Propanal iii) Butanal iv) Benzaldehyde (1)
- b) How will you bring about the following conversions?
- Toluene to Benzaldehyde
 - Benzoic acid to Benzamide (2)
- c) Explain Cannizzaro reaction with an example. (2) [SAY 2017]
9. a) The product obtained when benzene is treated with carbon monoxide and hydrogen chloride in presence of anhydrous AlCl_3 is:
- i) Chlorobenzene ii) Phenol iii) Benzaldehyde iv) Benzoic acid (1)
- b) How will you carry out the following conversions?



10. Explain the following:

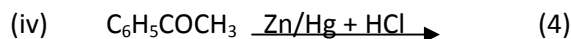
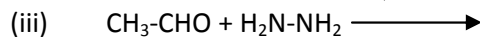
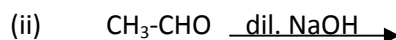
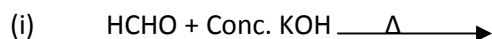
i) Esterification ii) Tollen's test iii) HVZ reaction iv) Decarboxylation of carboxylic acid (4) [March 2017]

11. Aldehydes and ketones are the compounds having $>C=O$ group.

a) Choose the IUPAC name of the compound $CH_3-CH=CH-CHO$

- (i) Propen-1-al (ii) But-2-en-1-al (iii) Butanal (iv) But-2-en-2-al (1)

b) Complete the following reactions:

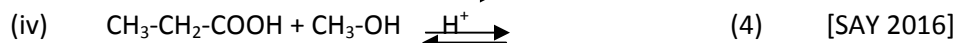
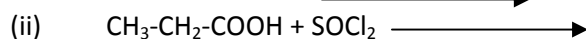
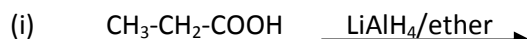


12. Aldehydes, ketones and acids contain $>C=O$ group.

a) Choose the IUPAC name of the compound $(CH_3)_2CH-COOH$.

- (i) Butanoic acid (ii) Ethanoic acid (iii) 2-Methylpropanoic acid (iv) Propanoic acid (1)

b) Complete the following reactions:



13. Aldehydes, Ketones and Carboxylic acids are Carbonyl compounds.

a) Aldehydes differ from Ketones in their oxidation reactions. Illustrate with one example. (1)

b) How will you prepare benzaldehyde by Gatterman-Koch reaction? (1)

c) Write the reactions of carboxylic acid with the following reagents. (Write the chemical equations)

(i) Thionyl chloride ($SOCl_2$)

(ii) Chlorine in presence of small amount of red phosphorous.

(iii) Lithium Aluminium hydride ($LiAlH_4$)/ether. (3)

14. a) Write a test to distinguish between aldehydes and ketones. (1)

b) How will you prepare benzaldehyde by Etard's reaction? (1)

c) How will you bring about the following conversions? (Write the chemical equations)

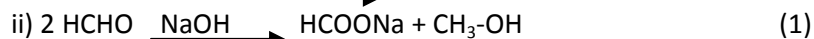
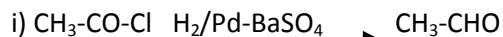
(i) Ethanol \rightarrow Ethanoic acid

(ii) Benzamide \rightarrow benzoic acid

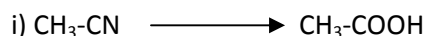
(iii) Benzaldehyde \rightarrow meta nitrobenzaldehyde (3) [March 2016]

15. a) Explain aldol condensation taking CH_3-CHO as example. (2)

b) Write the named reactions involved in the following conversions:



c) How are the following conversions achieved?



16. Aldehydes, Ketones and Acids contain $>C=O$ group.

a) Name the product obtained by the reaction between acetic acid and ethanol. (1)

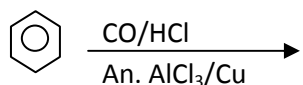
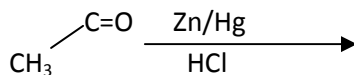
b) (i) Give any two tests to distinguish between aldehydes and ketones. (2)

(ii) Two chemical reactions are given below:

(1) Identify the products of each reaction.

(2) Give the name of each reaction.





(2) [March 2015]

17. a) Aldol condensation reaction is a special reaction of aldehydes.

i) What is aldol condensation reaction? (1)

ii) Write the structural formula of aldol formed from ethanal (1)

b) Write simple chemical tests and observations used to distinguish between the following compounds:

i) Propanal and propanone (1)

ii) Phenol and benzoic acid (1)

c) Write the names of the reagents used to bring about the following transformations

i) $\text{C}_6\text{H}_5\text{COCl} \rightarrow \text{C}_6\text{H}_5\text{CHO}$

ii) $\text{CH}_3\text{COOH} \rightarrow \text{CH}_2\text{Cl-COOH}$ (1) [March 2014]

18. a) Methanal (HCHO) is an aldehyde having no α -hydrogen atom. What are the products formed when methanal is treated with strong KOH solution? (1)

b) How are the following conversions achieved?

i) Benzoyl chloride ($\text{C}_6\text{H}_5\text{COCl}$) to benzaldehyde ($\text{C}_6\text{H}_5\text{-CHO}$)

ii) Acetic acid (CH_3COOH) to chloroacetic acid ($\text{CH}_2\text{Cl-COOH}$)

iii) Benzene to Benzaldehyde

iv) Ethanal ($\text{CH}_3\text{-CHO}$) to Ethane ($\text{CH}_3\text{-CH}_3$)

(1 X 4 = 4) [SAY 2014]



19. a) Among formaldehyde, acetaldehyde and formic acid, which compounds undergo Cannizzaro reaction? Give reason. (1½)

b) What is esterification? (1)

c) Thionyl chloride is preferred to as the reagent to prepare acid chlorides. Why? (½)

d) Write the chemical reaction to effect the transformation of sodium acetate to ethane. (1)

e) Write the IUPAC names of the compounds given below.

i) $\text{CH}_3\text{-CH}_2\text{-CO-CH}_3$ ii) $\text{HOOC-CH}_2\text{-COOH}$. (1) [SAY 2013]

20. a) Suggest a method of preparation of benzaldehyde from toluene.(1)

b) Aldehydes and ketones differ in their chemical reactions. How do they react with the following?

i) Tollens' reagent ii) Alcohol. (2)

c) How will you convert propanoic acid into the following compounds?

i) Ethane ii) Butane. (2) [March 2013]

21. a) Complete the following: Write down the structures of A, B and C.

i) $\text{CH}_3\text{-CH}_2\text{-CHO} \xrightarrow{\text{KMnO}_4}$ A

ii) $\text{CH}_3\text{-CH}_2\text{-CO-CH}_3 \xrightarrow{\text{Zn amalgam/HCl}}$ B

iii) $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-COOH} \xrightarrow[\text{H}_2\text{O}]{\text{Bromine/Red P}}$ C

b) Write down the IUPAC names of A, B and C. (1½)

c) Explain the following reactions. i) Cannizzaro reaction. ii) Esterification. (1) [SAY 2012]

22. a) Which named reaction is used to reduce $\text{CH}_3\text{-CO-Cl}$ to $\text{CH}_3\text{-CHO}$? (1)

b) Aldehydes and ketones undergo reactions due to the presence of α -hydrogen atom.

i) Write the name reaction of aldehyde which takes place only because of the presence of α -hydrogen atom. (1)

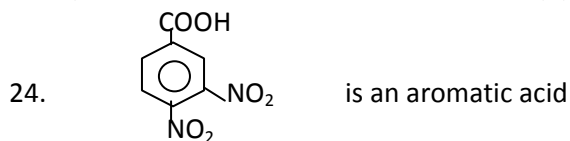
ii) How will you bring about the above reaction? (1)

c) i) $\text{CH}_2\text{Cl-COOH}$ is a strong acid than CH_3COOH . Why?

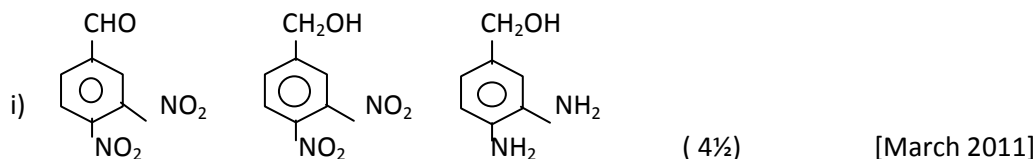
ii) How will you convert $\text{CH}_3\text{-COOH}$ to $\text{CH}_2\text{Cl-COOH}$? (2) [March 2012]

23. Aldehydes resemble ketones in many respects.

- Give the reason for their resemblance. (1)
- Give a reaction in which aldehydes resemble ketones. (1)
- Write two tests to distinguish between aldehydes and ketones. (2)
- What is Cannizzaro reaction? (1) [SAY 2011]



- What is its IUPAC name? (½)
- Explain the conversion of the above acid to the following:



25. a) Aldehydes and ketones are organic compounds containing carbonyl group.

- Write a chemical reaction used to distinguish between aldehydes and ketones. (1)
 - Aldehydes and ketones can be subjected to Clemmensen reduction and Wolff-Kishner reduction. Name the reagents in both cases. (1)
- b) How will you make the following conversions:
- Ethanoic acid to ethanol.
 - Propanoic acid to 2-chloropropanoic acid
 - Toluene to benzoic acid. (3) [March 2010]

26. Nucleophilic addition reaction is a characteristic of carbonyl group.

- Explain this with specific examples, how the reaction takes place, (2)
- i) Show the order of reactivity of following compounds in nucleophilic addition;
 $\text{CH}_3\text{-CHO}$, $\text{CH}_3\text{-CO-CH}_3$, H-CHO (1)
- ii) Justify your answer. (2) [March 2009]

27. a) Show how aldehyde reacts with the following reagents.

- $\text{NH}_2\text{CONHNH}_2$ (Semi carbazide)
 - Zinc amalgam and conc. HCl (2)
- b) i) How can you manufacture formic acid from CO? (1)
- Suggest a chemical test to distinguish this acid from acetic acid. Account for the observation. (2)
- [March 2009]

28. Aliphatic aldehydes differ from aromatic aldehydes.

- Give one example each for an aliphatic aldehyde and an aromatic aldehyde containing seven carbon atoms.
- Give one reaction in which the above aldehydes differ. (3) [March 2008]

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