CHEMISTRY

BOOKS - S DINESH & CO CHEMISTRY (HINGLISH)

CARBOXYLIC ACIDS

Example

1. Write the structures and the IUPAC names of the following carboxylic acids.

(i) Caporic acid , (ii) Pivalic acid (iii) γ-Methylvaleric acid

(iv) Sorbic acid , (v) Tartaric acid , (vi) Succinic acid

2. How will you prepare each of the following carboxylic acids by using a Grignard reagent?

(i) Phenylacetic acid , (ii) But-3-enoic acid , (iii) Hexanoic acid

(iv) 2, 2-Dimethylpentanoic acid.

Watch Video Solution

3. Write chemical reactions to affect the following transformations:

(i) Butan-1-ol to butanoic acid

(ii) Benzyl alcohol to phenylethanoic acid

(iii) 3 Nitrobromobenzene to 3-nitrobenzoic acid

(iv) 4-Methylacetophenone to benzene-1,4-dicarboxylic acid

(v) Cyclohexene to hexane-1,6-dioic acid

(vi) Butanal to butanoic acid.

Watch Video Solution

4. Arrange the following in order of increasing acidic strength

(i) $HCOOH, ClCH_2COOH, CH_3COOH$

(ii) $CH_3COOH, (CH_3)_2CHCOOH, (CH_3)_3\mathbb{C}OOH$

(iii) $ClCH_2COOH, Cl_2CHCOOH, ClCl_3C.COOH$

(iv)

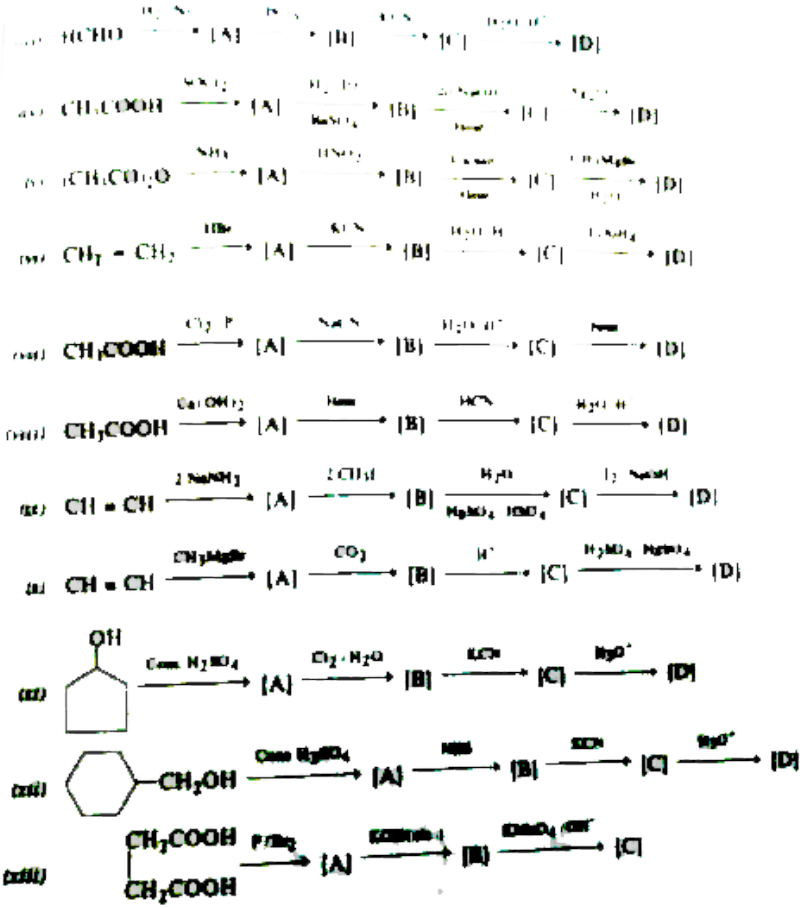
$ClCH_2COOH, CH_3CH_2COOH, ClCH_2CH_2COOH, (CH_3)_2CH.COOH$

Watch Video Solution

Completion Of The Missing Links

1. (i) $CH \equiv CH \xrightarrow[H_2SO_4/HgSO_4]{H_2O} [A] \xrightarrow{o} [B] \xrightarrow{SOCl_2} [C] \xrightarrow[AlCl_3]{\text{Benzene}} [D]$

(ii) $C_2H_5Cl \xrightarrow{KCN} [A] \xrightarrow{H_2O/H^+} [B] \xrightarrow{NH_3} [C] \xrightarrow{Heat} [D]$



View Text Solution

N C E R T In Text Questions

1. Write the structures of the following compounds:

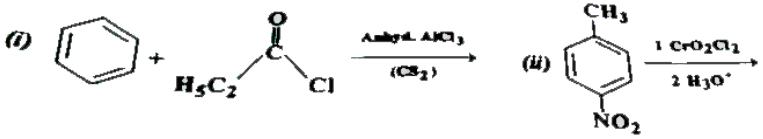
(i) $\propto$ -Methoxypropionaldehyde , (ii) 3-Hydorxybutanal

(iii) 2-Hydroxycyclopentanecarbaldehyde , (iv) 4-Oxopentanal

Di-sec butlketone , (vi) 4-Fluoroacetophenone

Watch Video Solution

2. Write the structures of the products of the following reactions:



(iii) $(C_6H_5CH_2)_2Cd + 2CH_3COCl \rightarrow$, (iv) $H_3CC \equiv CH \xrightarrow{Hg^{2+}, H_2SO_4}$

Watch Video Solution

3. Arrange the following compounds in increasing order of their boiling points.

$CH_3CHO, CH_3CH_2OH, CH_3OCH_3, CH_3CH_2CH_3$

Watch Video Solution

4. Arrange the following compounds in increasing order of their reactivity in nucleophilic addition reactions.

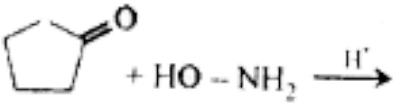
(i) Ethanal, Propanal, Propanone, Butanone.

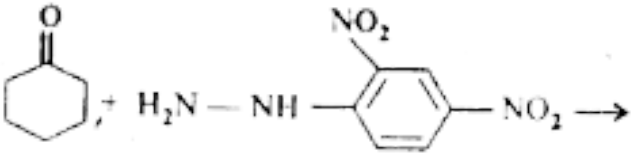
(ii) Benzaldehyde, p-Tolualdehyde, p-Nitrobenzaldehyde, Acetophenone.

Hint: Consider steric effect and electronic effect.

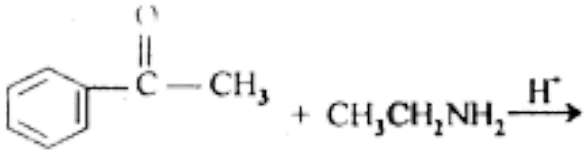
Watch Video Solution

5. Predict the products of the following reactions:

(i) 

(ii) 

(iii) $R-CH=CH-CHO + NH_2-\overset{O}{\overset{\|}{C}}-NH-NH_2 \xrightarrow{H^+}$

(iv) 

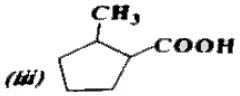
Watch Video Solution

6. Give the IUPAC names of the following compounds :

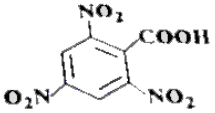
(i) $C_6H_5CH_2CH_2COOH$

(ii) $(CH_3)_2C = CHCOOH$

(iii)



(iv)



Watch Video Solution

7. Show how each of the following compounds can be converted to benzoic acid.

(i) Ethylbenzene

(ii) Acetophenone

(iii) Bromobenzene

(iv) Phenylethene (Styrene)

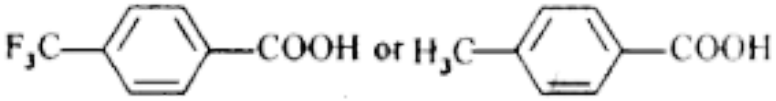
Watch Video Solution

8. Which acid of each pair shown here would you expect to be stronger?

(i) CH_3CO_2H or CH_2FCO_2H

(ii) CH_2FCO_2 or CH_2ClCO_2H

(iii) $CH_2FCH_2CH_2CO_2H$ or $CH_3CHFCH_2CO_2H$



Watch Video Solution

N C E R T Exercise

1. What is meant by the following terms ? Give an example of the reaction in each case.

(i) Cyanohydrin

(ii) Acetal

(iii) Semicarbazone

(iv) Aldol

(v) Hemiacetal

(vi) Oxime

(vii) Ketal

(vii) Imine

(ix) 2,4-DNP-derivative

(x) Schiff's base

Watch Video Solution

2. Name the following compounds according to the IUPAC system of nomenclature:

i. $CH_3CH(CH_3)CH_2CH_2CHO$

ii. $CH_3CH_2COCH(C_2H_5)CH_2CH_2Cl$

iii. $CH_3CH=CHCHO$

iv. $CH_3COCH_2COCH_3$

v. $CH_3CH(CH_3)CH_2C(CH_3)_2COCH_3$

vi. $(CH_3)_3CCH_2COOH$

vii. $OHCC_6H_4CHO-p$

Watch Video Solution

3. Draw the structures of following compound:

i. 3-Methylbutanal

ii. p-Nitropropiopehnone

iii. P-Methylbenzaldehyde

iv. 4-Methylpent-3-en-2-one

v. 4-Chloropentan-2-one

vi. 3-Bromo-4-phenylpentanoic acid

vii. p-p'-Dihydroxybenzophenone

viii. Hex-2-en-4-ynoic acid

Watch Video Solution

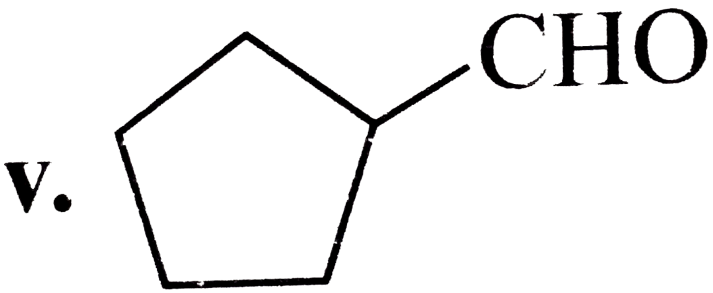
4. Write the IUPAC names of following ketones and aldehydes. Wherever possible, give common nemes also.

i. $CH_3CO(CH_2)_4CH_3$

ii. $CH_3CH_2CHBrCH_2CH(CH_3)CHO$

iii. $CH_3(CH_2)_5CHO$

iv. $Ph - CH = CH - CHO$

v. 

v.

vi. $PhCOPh$

Watch Video Solution

5. Draw the structure of following derivatives:

i. 2,4-Dinitrophylhydrazone of benzaldehyde.

ii. Cyclopropanone oxime

iii. Actaldehyde dimethyl acetal

iv. Semicarbazone of cyclobutanone

v. Ethylene ketal of hexan-3-one

vi. Methyl hemiacetal of formaldehyde

Watch Video Solution

6. Predict the products formed when cyclohexane carbaldehyde reacts with the following reagents:

i. PhMgBr and then H_3O^+

ii. Tollens reagent

iii. Semicarbazine and weak acid

iv. Excess ethanol and acid

v. Zinc amalgam and dilute hydrochloric acid

Watch Video Solution

7. Which of the following compounds would undergo aldol condensation or the Cannizzaro reaction, or neither? Writer the structures of expected products of aldol condensation and Cannizzaro reaction.

i. Methanal ii. 2-Methylpentanal

iii. Benzaldehyde iv. Benzophenone

v. Cyclohexanone vi. 1-Phenylpropanone

vii. Phenylacetaldehye viii. Butan-1-ol

ix. 2,2-Dimethylbutanal

Watch Video Solution

8. How will you convert ethnal into the following compounds ?

i. Butane-1,3-idol , ii. But-2-enal

iii. But-2-enoic acid

Watch Video Solution

9. Write structure formulae and names of four possible aldol condensation products form propanal and butanal. In each case. Indicate which aldehyde acts as nucleophile and which as electrophile.

Watch Video Solution

10. An organic compound with the molecular folmula $C_9H_{10}O$ form 2,4-DNP derivative, reduces Tollens reagent, and undergoes Cannizaro reaction. On vigorous oxidation, it gives 1,2-benzenedicarboxylic acid. Identify the compound.

Watch Video Solution

11. 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 produced (B). (C) on dehydration gives but-1-ene. Write equations for the reactions involved.

Watch Video Solution

12. Arrange the following compounds in the increasing order of their property as indicated:

i. Acetaldehyde, acetone, di-tert-butyl ketone, methyl tert-butyl ketone (reactivity towards HCN).

ii.

$CH_3CH_2CH(Br)COOH, CH_3CH(Br)CH_2COOH, (CH_3)_2CHCOOH,$

(acidic strength).

iii. Benzoic acid, 4-nitrobenzoic acid, 3,4-dinitro-benzoic acid, 4-methoxybenzoic acid (acidic strength).

Watch Video Solution

13. Give simple chemical test to distinguish between the following pairs of compounds.

i. Propanal and Propanone

ii. Acetophenone and Benzophenone

iii. Phenol and Benzioc acid

iv. Benzoic acid and Ethyl benzoate

v. Pentan-2-one and Pentan-3-one

vi. Benzaldehyde and Acetophenone

vii. Ethanal and Propanal

Watch Video Solution

14. How will you prapare the following compounds from benzene ? You may use any inorganic reagent and any organic one having not more than one carbon atom.

i. Methyl benzonate ii. m-Nitrobenzonic acid

iii. p-Nitrobenzoic acid iv. Phenylacetic acid

v. p-Nitrobenzaldehyde

Watch Video Solution

15. How will you bring about the following conversions in not more than two steps ?

i. Propanone to propene

ii. Benzoic acid to Benzaldehyde

iii. Ethanol to 3-Hydroxybutanal

iv. Benzene to m-Nitroacetopenone

v. Benzaldehyde to Benzophenone

vi. Bromobenzene to 1-Phenylethonal

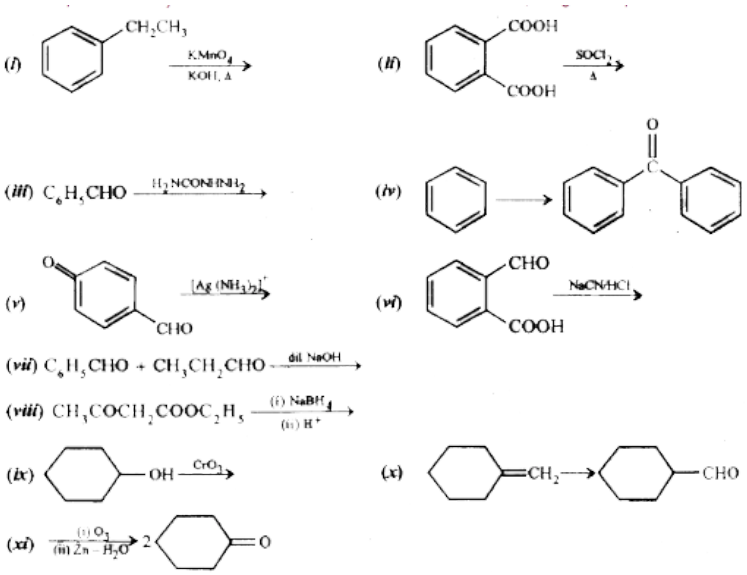
vii. benzaldehyde to 3-Phenylpropan-1-ol

viii. Benzaldehyde to α-Hydrophylacetic acid

ix. Benzoic acid to m-Nitrobenzyl alcohol

Watch Video Solution

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



Watch Video Solution

17. Giving plausible explanation for each of the following:

i. Cyclohexanone forms cyanohydrin good yield but 2,2,6-trimethylcyclohexanone does not.

ii. There are two $(-NH_2)$ groups in semicarbazide. However, only one is involved in the formation of semicarbazones.

iii. During the preparation of esters from a carboxylic acid and an alcohol in the easter should be removed as soon as it is formed.

Watch Video Solution

18. An organic compound contains 69.77% carbon, 11.63% hydrogen, and rest oxygen. The molecular mass of the compound is 86. It does not reduce Tollens reagent but forms an aditional compound with sodium hydrogensulphite and gives positive iodoform test. On vigorous oxidation, it gives ethanoic and propanoic acid. Write the possible structure of the compound.

Watch Video Solution

19. Although phenoxide ion has more number of resonating structures than carboxylate ion, carboxylic acid is a stronger than phenol. Why ?

Watch Video Solution

Short Answer Type Questions

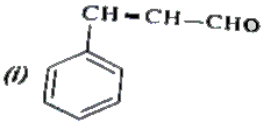
1. Suggest a reason for the larger differenece between boiling points of butanol and butanal, although they have almost the same solubility in water.

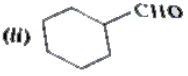
Watch Video Solution

2. Write a test to differentiate between pentan-2-one and pentan-3-one.

Watch Video Solution

3. Give the IUPAC names of the following compounds.

(i) 

(ii) 

(iii) $CH_3-CH_2-\underset{\underset{O}{\|}}{C}-CH_2-CHO$

(iv) $CH_3-CH=CH-CHO$.

Watch Video Solution

4. Give the structure of the following compounds :

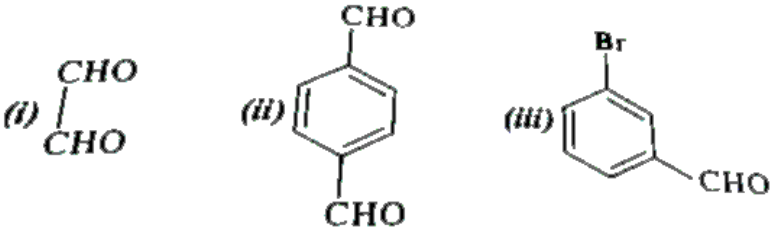
(i) 4-Nitropropiophenone

(ii) 2-Hydroxycyclopentanecarbaldehyde

(iii) Phenyl acetaldehyde.

Watch Video Solution

5. Write IUPAC names of the following :



Watch Video Solution

6. Benzaldehyde can be obtained from benzalchloride. Write reactions for obtaining benzalchloride and then benzaldehyde from it.

Watch Video Solution

7. Name the electrophile produced in the reaction of benzene with benzoyl chloride in the presence of anhydrous $AlCl_3$. Name the reaction also.

Watch Video Solution

8. Oxidation of ketones involves carbon-carbon bond cleavage. Name the products formed on oxidation of 2, 5-dimethylhexan-3-one.

Watch Video Solution

9. Arrange the following in decreasing order of their acidic strength and give reason for your answer.

$CH_3CH_2OH, CH_3COOH, ClCH_2COOH, FCH_2COOH, C_6H_5CH_2COO$

Watch Video Solution

10. What product will be formed on reaction of propanal with 2-methylpropanal in the presence of NaOH? Write the name of the reaction also.

Watch Video Solution

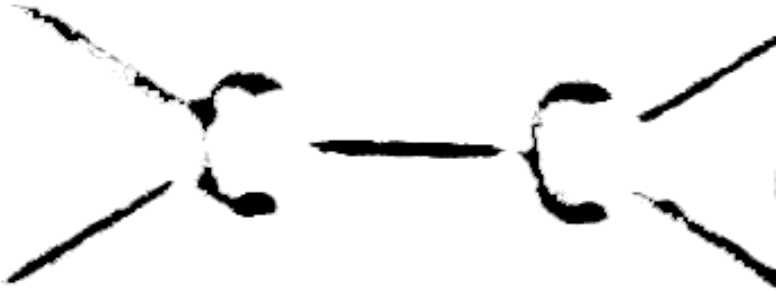
11. Compound 'A' is prepared by oxidation of compound 'B' with alkaline $KMnO_4$. Compound 'A' on reduction with lithium aluminium hydride gets converted back to compound 'B'. When compound 'A' is heated with compound 'B' in the presence of H_2SO_4, it produces fruity smell of compound 'C'. To which family, the compounds 'A', 'B' and 'C' belong to ?

Watch Video Solution

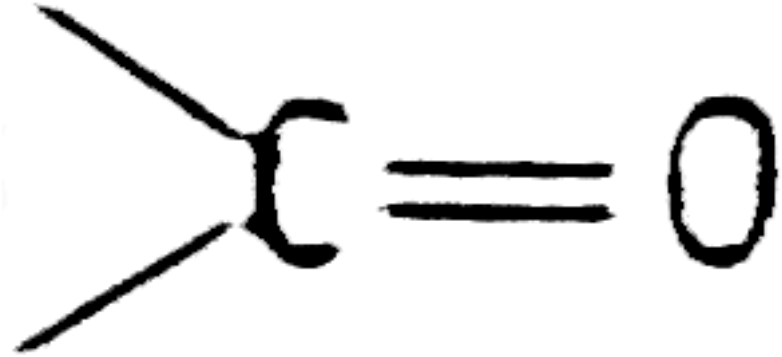
12. Arrange the following in decreasing order of their acidic strength. Give explanation for the arrangement.

$C_6H_5COOH, FCH_2COOH, NO_2CH_2COOH$

Watch Video Solution



13. Alkenes and carbonyl compounds



both contain a π bond but alkenes show electrophilic addition reactions whereas carbonyl compounds show nucleophilic addition reactions. Explain.

Watch Video Solution

14. Carboxylic acids contain carbonyl group but do not show the nucleophilic addition reactions like aldehydes or ketones. Why?

Watch Video Solution

15. Identify the compounds A, B and C in the following reaction :

$$CH_3 - Br \xrightarrow{Mg\,/\,ether} (A) \xrightarrow[(i)\,\text{Water}]{(i)\,CO_2} (B) \xrightarrow[\Delta]{CH_3OH\,/\,H} (C)$$

Watch Video Solution

16. Why are carboxylic acids more acidic than alcohols or phenols although all of them have hydrogen atom attached to a oxygen atom (-O-H)?

Watch Video Solution

17. Complete the following reaction sequence :

$$CH_3 - \overset{\overset{O}{||}}{C} - CH_3 \xrightarrow[(ii)\, H_2O]{(i)\, CH_3MgBr} (A) \xrightarrow[\text{ether}]{\text{Na metal}} (B) \xrightarrow{CH_3 - Br} (C)$$

Watch Video Solution

18. Ethylbenzene is generally prepared by acetylation of benzene followed by reduction and not by the direct alkylation of benzene. Think of a possible reason.

Watch Video Solution

19. Can Gattermann-Koch reaction be considered similar to Friedel Craft's acylation ? Discuss.

Watch Video Solution

Long Answer Type Questions

1. An alkene 'A' (molecular formula C_5H_{10}) on ozonolysis gives a mixture of two compounds 'B' and 'C'. Compound 'B' gives positive Fehling's test and also forms iodoform on treatement with I_2 and $NaOH$. Compound 'C' does not give Fehling's test but forms iodoform. Identify the compounds A, B and C. Write the reaction for ozonolysis and formation of iodoform from B and C.

Watch Video Solution

2. An aromatic compound 'A' (Molecular formula C_8H_8O)) gives positive 2, 4-DNP test. It gives a yellow precipitate of compound 'B' on treatment 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 and write all the reactions involved.

Watch Video Solution

3. Write down functional isomers of a carbonlyl compound with molecular formula C_3H_6O. Which isomer will react faster with HCN and why ? Explain the mechanism of the reaction also. Will the reaction lead to the completion with the conversion of whole reactant into product under reaction conditions ? If a strong acid is added to the reaction mixture, what will be the effect on concentration of the product and why?

Watch Video Solution

4. 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 hydrogen sulphate. Liquid 'B' also forms a white crystalline solid with sodium hydrogen sulphate. 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.

Watch Video Solution

Additional Important Questions

1. Carboxylic acids donot give the characteristic reactions of carbonyl group. Explain.

Watch Video Solution

2. Fromic acid reduces Tollen's reagent while other carboxylic acids donot. Justify.

Watch Video Solution

3. 2, 4, 6-trimethylbenzoic acid is quite difficult to esterify. Assign reason.

Watch Video Solution

4. m-Hydroxybenzoic acid is a stronger acid than benzoic acid while p-hydroxybenzoic acid is weaker. Explain.

Watch Video Solution

5. Why does not formic acid form an anhydride upon heating?

Watch Video Solution

6. Completely anhydrous acetic has molecular mass of 120. Explain.

Watch Video Solution

7. Why is peroxy acid weaker than carboxylic acid ?

Watch Video Solution

8. Why is acetyl chloride a better acetylating agent than acetic acid ?

Watch Video Solution

9. Chloroformic acid does not exist while chloroethylformate exists. Explain.

Watch Video Solution

10. Carbon-oxygen bond lengths in formic acid are different but are the same in sodium formate. Justify.

Watch Video Solution

11. Phenate ion has more number of contributing structures than benzoate ion, but still benzoic acid is a stronger acid. Explain.

Watch Video Solution

12. Tertiary butyl benzene does not give benzoic acid when oxidised with $KMnO_4$. Why?

Watch Video Solution

13. Fluorine is more electronegative than chlorine but p-fluorobenzoic acid is a weaker acid than p-chlorobenzoic acid. Explain.

Watch Video Solution

14. CH_3COO^- ion is more stable than $C_2H_5O^-$ ion. Assign reason.

Watch Video Solution

15. Peroxyacetic acid is a weaker acid than acetic acid. Explain.

Watch Video Solution

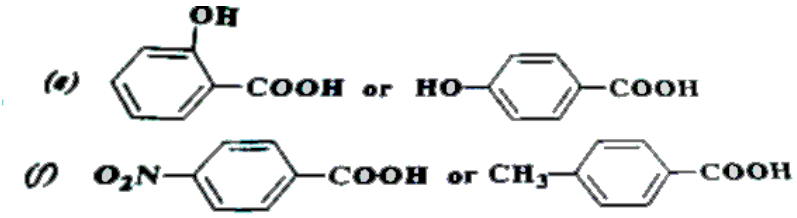
16. Why are boiling of aldehydes and ketones lower than those of the corresponding acids ?

Watch Video Solution

17. Which out of each pair is expected to be a stornger acid ?

(a) CH_3COOH or $HCOOH$, (b) CH_3COOH or C_6H_5OH

(c) C_6H_5COOH or $HCOOH$, (d) $CH_2(Cl)COOH$ or $CH_2(Br)COOH$



Watch Video Solution

18. What is glacial acetic acid ? Why is it so named ?

Watch Video Solution

19. How will you prepare 2-methylbutanoic acid from butan-2-01 ?

Watch Video Solution

20. How will you convert propionic acid to acetic acid ?

Watch Video Solution

21. How will you prepare butanoic acid from 1-bromopropane?

Watch Video Solution

22. Suggest an oxidising agent to convert $(CH_3)_2C = CHCOCH_3$ to $(CH_3)_2C = CHCOOH.$

Watch Video Solution

23. Explain Why :

(i) Carboxylic acids are stronger acids than alcohols.

(ii) Carboxylic acids are stronger acids than phenols

(iii) $\propto$ -chloropropionic acid is a stronger acid than β-chloropropionic acid.

Watch Video Solution

24. How will you detect the presence of carboxyl group in a compound ?

Watch Video Solution

25. Why is $CH_2 = CH - COOH$ a stronger acid than CH_3CH_2COOH ?

Watch Video Solution

26. Out of but-3-enoic acid and but-3-yonic acid, which is a stronger acid ?

Watch Video Solution

27. Carboxylic acids with five or less carbon atoms are water soluble while the higher acids are insoluble in water. Explain.

Watch Video Solution

28. Assign a suitable structure to $C_6H_8O_2$ that can give iodoform test and white trubidity with Lucas reagent on heating.

Watch Video Solution

29. Arrange the following compounds in the increasing order of their property as indicated:

i. Acetaldehyde, acetone, di-tert-butyl ketone, methyl tert-butyl ketone (reactivity towards HCN).

ii.

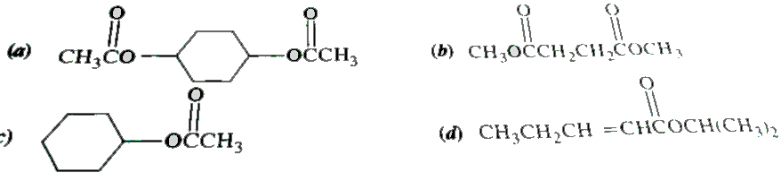
$CH_3CH_2CH(Br)COOH, CH_3CH(Br)CH_2COOH, (CH_3)_2CHCOOH,$

(acidic strength).

iii. Benzoic acid, 4-nitrobenzoic acid, 3,4-dinitro-benzoic acid, 4-methoxybenzoic acid (acidic strength).

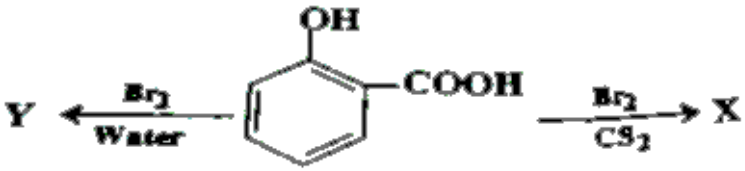
Watch Video Solution

30. From which carboxylic acid and alcohol are the following esters derived ?



Watch Video Solution

31. Salicylic acid is treated with bromine under two different conditions as shown :



Watch Video Solution

Questions From Board Examinations

1. Completely anhydrous acetic acid has molecular mass of 120. Explain.

Watch Video Solution

2. How will you convert benzene to benzoic acid ?

Watch Video Solution

3. Why is benzoic acid a stronger acid than acetic acid ?

Watch Video Solution

4. Give a chemical test to distinguish between propanal and propanoic acid.

Watch Video Solution

5. Give two chemical tests to distinguish between benzaldehyde and benzoic acid.

Watch Video Solution

6. How will you convert acetic acid to methylamine ?

Watch Video Solution

7. Complete the reaction : $CH_3COOH + PCl_5 \rightarrow$

Watch Video Solution

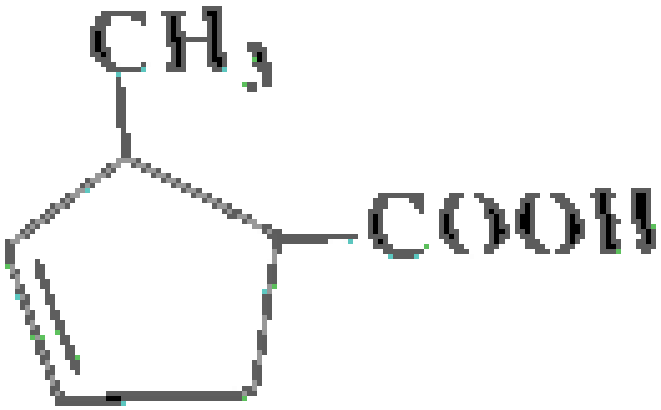
8. Give chemical equation for Fischer esterification reaction.

Watch Video Solution

9. How will you convert benzoic acid to benzamide ?

Watch Video Solution

10. Write IUPAC name of the compound



Watch Video Solution

11. Why has monochloroethanoic acid higher pK_a value than dichloroethanoic acid ?

Watch Video Solution

12. Why is ethanoic acid weaker acid than benzoic acid ?

Watch Video Solution

13. Write IUPAC name of $CH_3 - \underset{Cl}{\underset{|}{CH}} - \underset{COOH}{\underset{|}{CH}} - CH_3$

Watch Video Solution

14. Give the formulae of [A] and [B]

$$CH_3MgBr + CO_2 \xrightarrow[(ii)\, H^+ / H_2O]{(i)\, \text{Dry ether}} [A] \xrightarrow{PCl_5} [B]$$

Watch Video Solution

15. Give the formula of [A] and [B]

$$CH_3 - \overset{O}{\overset{||}{C}} - OH \xrightarrow{SOCl_2} [A] \xrightarrow{LiAlH_4} [B]$$

Watch Video Solution

16. How will you convert acetic acid into acetaldehyde ?

Watch Video Solution

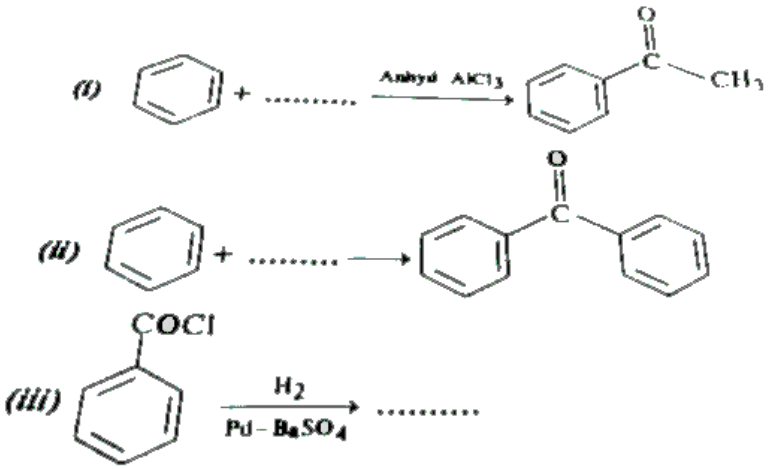
17. Write the IUPAC name of $CH_3 - C \equiv C - CH = CH - \overset{\overset{O}{||}}{C} - OH$

Watch Video Solution

18. How will you prepare benzoic acid from ethyl benzene ?

Watch Video Solution

19. Complete the following :



Watch Video Solution

20. Write chemical equation to illustrate Hell-Volhard-Zelinsky reaction.

Watch Video Solution

21. How will you convert bromobenzene to benzoic acid ?

Watch Video Solution

22. How will you convert ethyl cyanide to ethanoic acid ?

Watch Video Solution

23. How will you convert benzoic acid into benzaldehyde ?

Watch Video Solution

24. How will you distinguish between phenol and benozic acid ?

Watch Video Solution

25. Arrange the following compounds in the increasing order of their property as indicated:

i. Acetaldehyde, acetone, di-tert-butyl ketone, methyl tert-butyl ketone (reactivity towards HCN).

ii.

$CH_3CH_2CH(Br)COOH, CH_3CH(Br)CH_2COOH, (CH_3)_2CHCOOH,$

(acidic strength).

iii. Benzoic acid, 4-nitrobenzoic acid, 3,4-dinitro-benzoic acid, 4-methoxybenzoic acid (acidic strength).

Watch Video Solution

26. Complete each synthesis by filling the missing starting materials, reagents or products (X,Y)

(i) $C_6H_5CHO + CH_3CH_2CHO \xrightarrow{NaOH} X$

(ii) $CH_3CH_2CH_2CH_2OH \xrightarrow{Y} CH_2CH_2CH_2COOH$

Watch Video Solution

27. How will you bring about the following conversions in not more than two steps ?

(i) Toluene to Benzaldehyde

(ii) Ethylcyanide to 1-Phenylpropanone.

Watch Video Solution

Watch Video Solution

28. A compound (A) on oxidation gives B $(C_2H_4O_2)$. (A) also reacts with dil. NaOH and on subsequent heating forms (C). The compound (C) on catalytic hydrogenation gives (D). Identify A, B, C, D and write down the reactions involved.

Watch Video Solution

29. Write chemical equation for the following conversions :

(a) Benzene to benzyl alcohol

(b) Propane nitrile to -1 phenylpropanone.

Watch Video Solution

30. An organic compound (X) undergoes acid hydrolysis to form two compound (Y) and (Z). The compound (Y) reacts with sodium carbonate to form (A) which when heated with soda lime forms (B) which is CH_4. The

compounds (Y) on reduction with $LiAlH_4$ forms (Z.) Identify X,Y,Z,A,B and write the reactions involved.

Watch Video Solution

31. Account for the following :

(i) Benzoic acid does not undergo Friedel crafts reaction

(ii) Pk_a value of chloroacetic acid is lower than Pk_a of acetic acid.

Watch Video Solution

32. Identify A, B and C in the following reaction

$$CH \equiv CH \xrightarrow[HgSO_4]{\text{dil. } H_2SO_4} A \xrightarrow{\text{dil.NaOH}} B \xrightarrow{\text{heat}} C \rightarrow$$

Watch Video Solution

33. (b) Give reasons :

(i) p-Nitrobenzoic acid has higher K_a value than benozic acid

(ii) Acetone is soluble in water but benzophenone is not.

Watch Video Solution

34. Give the IUPAC name of the compound

$$(CH_3)_3C - \underset{\underset{O}{||}}{C} - COOH$$

Watch Video Solution

35. Give the names of the reagents which bring about the following conversions :

(i) Ethanoic acid to ethanol

(ii) Sodium benzoate to benzene.

Watch Video Solution

36. Give a reason for the following :

(i) Chloroacetic acid is more acidic than acetic acid.

(ii) Cacboxylic acids have higher boiling points than alcohols.

4-nitrobenzoic acid is more acidic than 4- methoxybenzoic acid.

View Text Solution

37. Arrange the following in increasing order of acid strength :

(i) $CH_3CH_2CH(Br)COOH$, (ii) $CH_3CH(Br)CH_2COOH$, (iii) CH_3COOH

Watch Video Solution

38. How are following conversions carried out ?

Ethyl cyanide to ethanoic acid

(ii) Butan-1-01 to butanoic acid

(iii) Benzoic acid to m-bromobenzoic acid.

Watch Video Solution

39. Formic acid is stronger acid than acetic acid. Explain.

Watch Video Solution

40. How will you convert acetic acid into ethylamine ?

Watch Video Solution

41. What happens when :

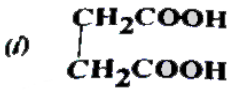
(i) Formic acid reacts with conc H_2SO_4.

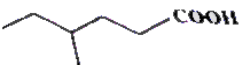
(ii) Acetic acid reacts with Cl_2 in the presence of red P.

Calcium acetate is heated.

Watch Video Solution

42. Write IUPAC names of :

(i) 

(ii) 

Watch Video Solution

43. How will you convert

(i) Ethanal to 2-hydroxypropanoic acid.

(ii) Toluene to benzoic acid.

Watch Video Solution

44. Why is ethanal soluble in water ?

Watch Video Solution

45. Give two chemical tests to distinguish between benzaldehyde and benzoic acid.

Watch Video Solution

46. Why is carboxylic acid a stronger acid than phenol ?

Watch Video Solution

47. Write chemical equation to illustrate Hell-Volhard-Zelinsky reaction.

Watch Video Solution

48. The IUPAC name of $(CH_3)_2CHCOOH$ is:

Watch Video Solution

49. How will you convert benzoic acid into benzene ?

Watch Video Solution

50. Complete the following reactions :

(i) $R - CH_2COOH \xrightarrow{X_2 / \text{Red } P} ?$

(ii) $2CH_3COOH \xrightarrow{P_2O_5 / \text{heat}} ?$

Watch Video Solution

51. How will you convert benzoic acid into benzaldehyde ?

Watch Video Solution

52. Name the reagents used in the following reactions ?

View Text Solution

53. How will your convert:

(i) Acetic acid to methane

(ii) Benzoic acid to benzaldehyde.

Watch Video Solution

54. Arrange the following compounds in increasing order of acidic strength 2, 4-dinitrobenzoic acid, 4-methoxybenzoic acid, 4-nitrobenzoic acid.

Watch Video Solution

55. Give a suitable example of H.V.Z. reaction.

Watch Video Solution

56. Arrange the following in increasing order of acidic strength :

$(CH_3)_2CHCOOH(I), CH_3CH_2CH(Br)COOH(II), CH_3CH(Br)CH_2C$

Watch Video Solution

57. Distinguish between CH_3CH_2COOH and $HCOOH$.

Watch Video Solution

58. Why is pKa of $F - CH_2COOH$ lower than that of $Cl - CH_2COOH$?

Watch Video Solution

59. Account for the following :

(i) Benzoic acid does not undergo Friedel crafts reaction

(ii) Pk_a value of chloroacetic is lower than Pk_a of acetic acid.

Watch Video Solution

60. Write the reaction involved in the following :

(i) Hell-Volhard zelinsky.

(ii) Decarboxylation reaction.

Watch Video Solution

61. Write structures of compound A, B and C in each of the following reactionS:

$$C_6H_5Br \xrightarrow{mg/\text{dry ether}} [A] \xrightarrow[(b)\,H_3O^+]{(a)\,CO_2\,(g)} [B] \xrightarrow{PCl_5} (C)$$

Watch Video Solution

62. How will you convert :

(i) Benzoic acid to benzaldehyde (ii) Acetophenone to benzoic acid (iii) Ethanoic acid to 2-hydroxyethanoic acid ?

Watch Video Solution

63. Write chemical equation to illustrate Hell-Volhard-Zelinsky reaction.

Watch Video Solution

64. Write test to distinguish between

(i) Phenol and carboxylic acid

(ii) Formic acid and acetic test.

View Text Solution

65. How will you prepare carboxylic acid from Grignard's reagent ? Give equation.

Watch Video Solution

66. Write two uses of acetic acid.

Watch Video Solution

67. (i) Convert acetic acid to formic acid

(ii) Discuss esterification reaction.

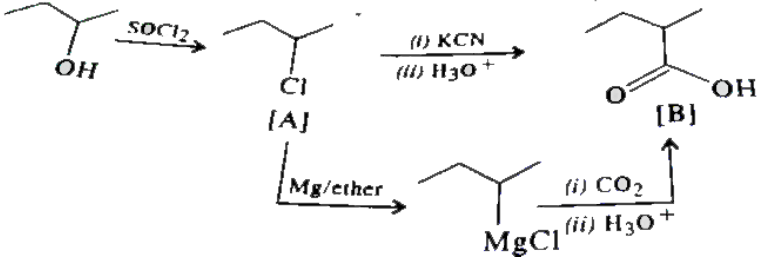
Watch Video Solution

Higher Order Thinking Skills Hots Questions

1. Dissociation constants of benzoic acid, p-nitrobenzoic acid and p-hydroxybenzoic acid are 6.3×10^{-5}, 36×10^{-5} and 2.5×10^{-5} respectively. Explain.

Watch Video Solution

2. Two methods have been adopted to prepare 2-methylbutanoic acid from butan-2-01. Which path is better ?



Watch Video Solution

3. How will you prepare each of the following carboxylic acids by using a Grignard reagent?

(i) Phenylacetic acid , (ii) But-3-enoic acid , (iii) Hexanoic acid

(iv) 2, 2-Dimethylpentanoic acid.

Watch Video Solution

4. Give steps involved in the conversion of :

(a) Toluene to $\propto$ -bromophenyl acetic acid , (b) Butan-1-0I to pent-2-enoic acid

Watch Video Solution

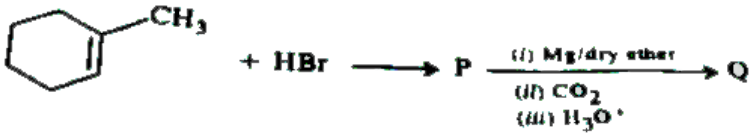
5. An ester has a molecular mass of 102. On aqueous hydrolysis, it produces a monobasic acid and alcohol. If 0.185 g of the acid produced completely neutralises 25 mL of 0.1 N NaOH, find out the structural forulae of the alcohol produced and the ester with proper reasoning.

View Text Solution

6. HCOOH is dehydrated when warmed with conc. H_2SO_4 but CH_3COOH is not. Explain.

Watch Video Solution

7. Predict the product Q of the following reaction :



Watch Video Solution

Some Typical Word Problems Based On Conversion

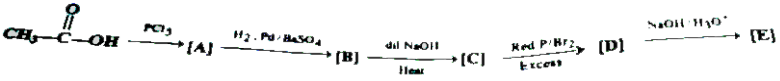
1. Compound (A) $(C_6H_{12}O_2)$ on reduction with $LiAlH_4$ yielded two compounds (B) and (C). The compound (B) on oxidation gave (D), which on treatment with aqueous alkail and subsequent heating furnished (E). The latter on catalytic hydrogenation gave (C). The compound (D) was oxidised further to give (F) which was found to be a monobasic acid (molecular formula weight $= 60.0$). Deduce the structures of (A), (B), (C), (D), and (E).

Watch Video Solution

2. An organic compound A $(C_7H_6Cl_2)$ on treatment with NaOH solution gives another compound B (C_7H_6O). B on oxidation gives and acid C $(C_7H_6O_2)$ which on treatment with a mixture of conc. HNO_3 and H_2SO_4 gives a compound D $(C_7H_5NO_4)$. B on treatment with conc. NaOH gives a compound E (C_7H_8O) and C_6H_5COONa. Deduce the structures of [A], [B], [C], [D] and [E].

Watch Video Solution

3. Identify A, B, C, D and E in the following sequence of reactions.



Watch Video Solution

4. An acid [A] $C_8H_7O_2Br$ on bromination in the presence of $FeBr_3$ gives two isomers [B] and [C] of the formula $C_8H_6O_2Br_2$. Vigorous oxidation of [A], [B] and [C] gives acids [D], [E] and [F] respectively. The acid [D], $C_7H_5O_2Br$ is the strongest acid among all the isomers whereas [E] and [F] each as molecular formula of $C_7H_4O_2Br_2$. Give structures of [A] to [F] with justification.

Watch Video Solution

5. The hydrocarbon [A] adds one mole of hydrogen in the presence of a platinum catalyst to form n-hexane. When [A] is oxidised vigorously with $KMnO_4$, a single carboxylic acid containing three carbon atoms is isolated. Give the strucure of [A] and explain the reactions.

Watch Video Solution

6. 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 produced (B). (C) on dehydration gives but-1-ene. Write equations for the reactions involved.

Watch Video Solution

7. Write the structures of A, B, C and D in the following reactions :

View Text Solution

N C E R T Exmplar Problems

1. Addition of water to alkyness occurs in acidic medium and in the presence of Hg^{2+} ions as a catalyst. Which of the following products will be formed on additon of water to but-1-yne under these conditions?

A. $CH_3 - CH_2 - CH_2 - \overset{\overset{O}{||}}{C} - H$

B. $CH_3 - CH_2 - \overset{\overset{O}{||}}{C} - CH_3$

C. $CH_3 - CH_2 - \overset{\overset{O}{||}}{C} - OH + CO_2$

D. $CH_3 - \overset{\overset{O}{||}}{C} - OH + H - \overset{\overset{O}{||}}{C} - H$

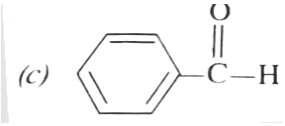
Answer: B

Watch Video Solution

2. Which of the following compounds is most reactive towards nucleophilic addition reactions ?

A. $CH_3 - \overset{\overset{O}{||}}{C} - H$

B. $CH_3 - \overset{\overset{O}{||}}{C} - CH_3$

C. 

D. 

Answer: A

Watch Video Solution

3. The correct order of increasing acidic strength is

A. Phenol $<$ Ethanol $<$ Chloroacetic acid $<$ Acetic acid

B. Ethanol $<$ Phenol $<$ Chloroacetic acid $<$ Acetic acid

C. Ethanol $<$ Phenol $<$ Acetic acid $<$ Chloroacetic acid

D. Chloroacetic acid $<$ Acetic acid $<$ Phenol $<$ *Ethanol.*

Answer: C

Watch Video Solution

4. Compound $Ph-O-\overset{O}{\overset{||}{C}}-Ph$ can be prepared by the reaction of _____.

A. Phenol and benzoic acid in the presence of $NaOH$

B. Phenol and benzoyl chloride in the presence of pyridine

C. Phenol and benzoyl chloride in the presence of $ZnCl_2$

D. Phenol and benzaldehyde in the presence of palladium.

Answer: B

Watch Video Solution

5. The reagent which does not react with both acetone and benzaldehyde is

A. Sodium hydrogen sulphite

B. Phenyl hydrazine

C. Fehling's solution

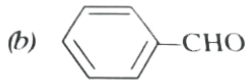
D. Grignard reagent

Answer: C

Watch Video Solution

6. Cannizzaro's reaction is not given by

A. 

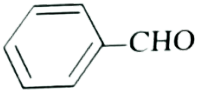
B. 

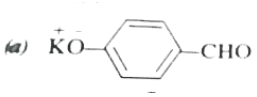
C. $HCHO$

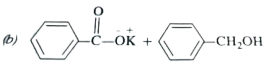
D. CH_3CHO

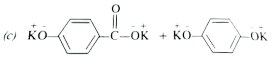
Answer: D

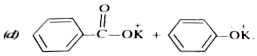
Watch Video Solution

7. Which product is formed when the compound  is treated with concentrated aqueous KOH solution?

A. 

B. 

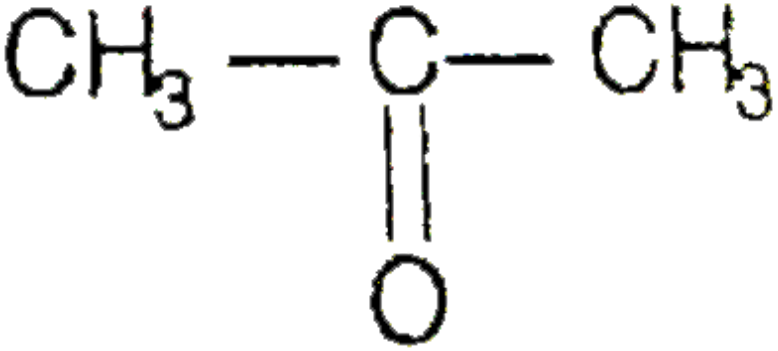
C. 

D. 

Answer: B

Watch Video Solution

8. $CH_3 - C \equiv CH \xrightarrow[1\% HgSO_4]{40\% H_2SO_4} A \xrightarrow{\text{isomerisation}}$



Structure of A and type of isomerism in the above reaction respectively are

A. Prop-1-en-2-01,metamerism

B. Prop-1-en-1-01, tautomersim

C. Prop-2-en-2-01, geometrical isomerism

D. Prop-1-en-2-01, tautomerism

Answer: D

Watch Video Solution

9. Compound A and C in the following reaction are

$$CH_3CHO \xrightarrow[(ii)\,H_2O]{(i)\,CH_3MgBr} (A) \xrightarrow{H_2SO_4,\,\Delta} (B) \xrightarrow{\text{Hydroboration oxidation}} (C)$$

A. identical

B. positional isomers

C. functional ismoers

D. optical isomers.

Answer: B

Watch Video Solution

10. Which is the most suitable reagent for the following conversion ?

$$CH_3 - CH = CH - CH_2 - \overset{\overset{O}{||}}{C} - CH_3 \rightarrow$$

$$CH_3 - CH = CH - CH_2 - \overset{\overset{O}{||}}{C} - OH$$

A. Tollen's reagent

B. Benzoyl peroxide

C. I_2 and $NaOH$ solution

D. Sn and NaOH solution.

Answer: C

Watch Video Solution

11. Which of the following compound will give butanone on oxidation with alkaline $KMnO_4$ solution ?

A. Butan-1-01

B. Butan-2-01

C. Both of these

D. None of these.

Answer: B

Watch Video Solution

12. In Clemmensen reduction, carbonyl compound is treated with .....

A. Zinc amalgam + HCl

B. Sodium amalgam + HCl

C. Zinc amalgam + nitric acid

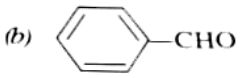
D. Sodium amalgam $+ HNO_3$

Answer: A

Watch Video Solution

13. Which of the following compounds do not undergo aldol condensation?

A. $CH_3 - CHO$

B. 

C. $CH_3 - \overset{O}{\overset{||}{C}} - CH_3$

D. $CH_3 - \underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}} - CHO.$

Answer: B::D

Watch Video Solution

14. Treatement of compound $Ph - O - \overset{\overset{O}{||}}{C} - Ph$

with NaOH solution yields

A. Phenol

B. Sodium phenoxide

C. Benzoic acid

D. Benzophenone.

Answer: B::C

Watch Video Solution

15. Which of the following conversion can be carried out by Clemmensen reduction ?

A. Benzaldehyde into benzyl alcohol

B. Cyclohexanone into cyclohexane

C. Benzoyl chloride into benzaldehyde

D. Benzophenone into diphenyl methane.

Answer: B::D

Watch Video Solution

16. Through which of the following reactions number of carbon atoms can be increased in the chain ?

A. Grignard reaction

B. Cannizzaro's reaction

C. Aldol condensation

D. HVZ reaction.

Answer: A::C

Watch Video Solution

17. Benzophenone can be obtained by .....

A. Benzoyl chloride + Benzene + $AlCl_3$

B. Benzoyl chloride + Diphenyl cadmium

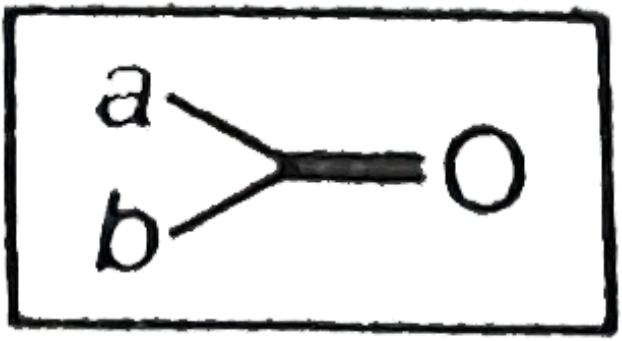
C. Benzoyl chloride + Phenyl magnesium chloride

D. Benzne + Carbon monoxide + $Zncl_2$

Answer: A::B

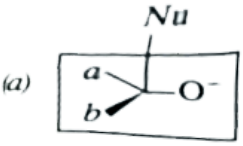
Watch Video Solution

18. Which of the following is the correct represetation for intermediate of nucleophilic addition reaction to the given carbonyl compound (A) ?

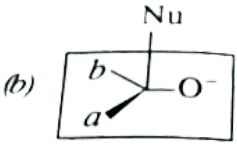


(A)

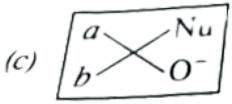
A.

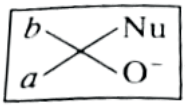


B.



C.



(d) 

D.

Answer: A::B

Watch Video Solution

19. Match the common names given in Column I with the IUPAC names given in Column II.

	Column I (Common names)		Column II (IUPAC names)
A.	Cinnamaldehyde	1.	Pentanal
B.	Acetophenone	2.	Prop-2-en-al
C.	Valeraldehyde	3.	4-methylpent-3-en-2-one
D.	Acrolein	4.	3-phenylprop-2- en-al
E.	Mesityl oxide	5.	1-phenylethanone

Watch Video Solution

20. Match the acids given in Column I with their correct IUPAC names given in Column II.

	Column I (Acids)	Column II (IUPAC names)
A.	Phthalic acid	1. Hexane- 1, 6-dioic acid
B.	Oxalic acid	2. Benzene-1, 2-dicarboxylic acid
C.	Succinic acid	3. Pentane-1, 5-dioic acid
D.	Adipic acid	4. Butane-1, 4-dioic acid
E.	Glutaric acid	5. Ethane-1, 2-dioic acid

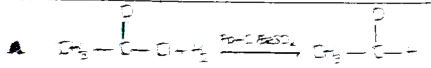
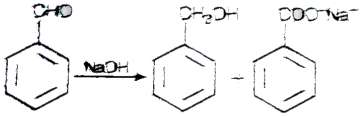
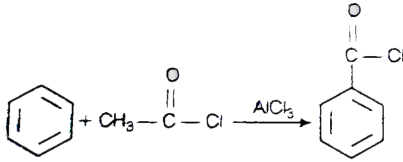
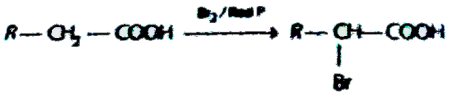
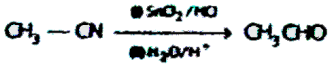
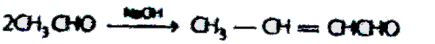
Watch Video Solution

21. Match the reactions given in Column I with the suitable reagents given in Column II.

	Column I (Reactions)		Column II (Reagents)
A.	Benzophenone → Diphenylmethane	1.	$LiAlH_4$
B.	Benzaldehyde → 1-phenylethanol	2.	DIBAL-H
C.	Cyclohexanone → Cyclohexanol	3.	Zn(Hg)/Conc. HCl
D.	Phenyl benzoate → Benzaldehyde	4.	CH_3MgBr

Watch Video Solution

22. Match the example given in Column I with the name of the reaction in Column II.

Column I (Example)		Column II (Reaction)
A.		1. Friedel–Crafts acylation
B.		2. H.V.Z reaction
C.		3. Aldol condensation
D.		4. Cannizzaro's reaction
E.		5. Rosenmund's reduction
F.		6. Stephen's reaction

Watch Video Solution

Assertion Reason Type Questions

1. Assertion (A) Formaldehyde is a planar molecule.

Reason (R) It contains sp^2 hybridised carbon atom.

A. Assertion and reason both are correct and reason is correct explanation of assertion.

B. Assertion and reason both are wrong statements.

C. Assertion is correct statement but reason is wrong statement.

D. Assertion is wrong statement but reason is correct statement.

Answer: A

Watch Video Solution

2. Assertion (A) compound containing -CHO group are easily oxidised to corresponsing carboxylic acids

Reason (R) : Carboxylic acids can be reduced to alcohols by treatement with $LiAlH_4$

A. Assertion and reason both are correct and reason is correct explanation of assertion.

B. Assertion and reason both are wrong statements.

C. Assertion is correct statement but reason is wrong statement.

D. Assertion and reason both are correct statements but reason is not correct explanation of assertion.

Answer: D

Watch Video Solution

3. Assertion (A) The α-hydrogen atom in carbonyl compounds is less acidic.

Reason (R) The anion formed after the loss of α-hydrogen atom is resonance stabilised.

A. Assertion and reason both are correct and reason is correct explanation of assertion.

B. Assertion and reason both are wrong statements.

C. Assertion is correct statement but reason is wrong statement.

D. Assertion is wrong statement but reason is correct statement.

Answer: D

Watch Video Solution

4. Assertion : Aromatic aldehydes and formaldehyde undergo Cannizzaro reaction

Reason : Aromatic aldehydes are almost as reactive as formaldehyde.

A. Assertion and reason both are correct and reason is correct explanation of assertion.

B. Assertion and reason both are wrong statements.

C. Assertion is correct statement but reason is wrong statement.

D. Assertion is wrong statement but reason is correct statement.

Answer: C

Watch Video Solution

5. Assertion (A) Aldehydes and ketones, both react with Tollen's reagent to form silver mirror.

Reason (R) Both, aldehydes and ketones contain a carbonyl group.

A. Assertion and reason both are correct and reason is correct explanation of assertion.

B. Assertion and reason both are wrong statements.

C. Assertion is correct statement but reason is wrong statement.

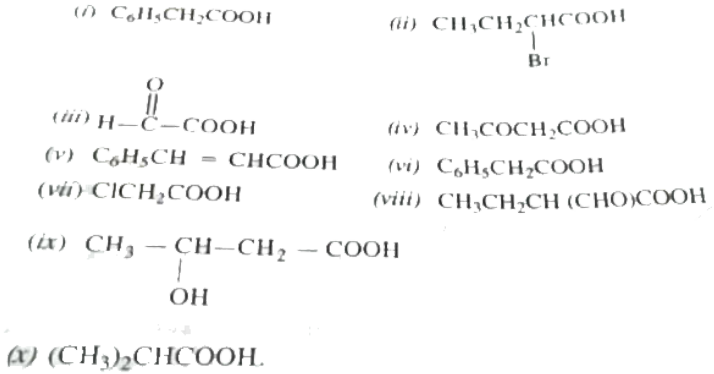
D. Assertion is wrong statement but reason is correct statement.

Answer: D

Watch Video Solution

Assignment

1. Write the IUPAC name of



Watch Video Solution

2. Write the structural formulae and give IUPAC names of the following :

(i) Lactic acid , (ii) Tartaric acid

(iii) Isobutyric acid , (iv) Crotonic acid

(v) Salicylic acid , (vi) Terephthalic acid.

Watch Video Solution

3. What is the relation between K_a and pK_a value of carboxylic acid ?

Watch Video Solution

4. Acetic acids exists in dimer state in benzene due to

Watch Video Solution

5. Why is benzoic acid a stronger acid than acetic acid ?

Watch Video Solution

6. The product formed during Hell-Volhard-Zelinsky reaction is

Watch Video Solution

7. Arrange the following in decreasing order of boiling point.

(i) $CH_3CH_2CH_2CH_2OH$ (ii) $CH_3CH_2OCH_2CH_3$

(iii) $CH_3CH_2CH_2COOH$

Watch Video Solution

8. Explain the following about acetic acid

(i) Its boiling point is higher than that of n-propyl alcohol

(ii) It is weaker acid than formic acid and α-chloroacetic acid

Watch Video Solution

9. What happens when :

(i) Sodium acetate is heated with soda lime

(ii) Malonic acid is heated

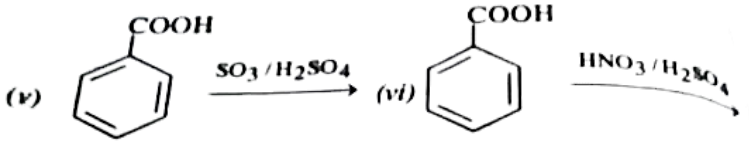
(iii) Calcium acetate is dry distilled

Watch Video Solution

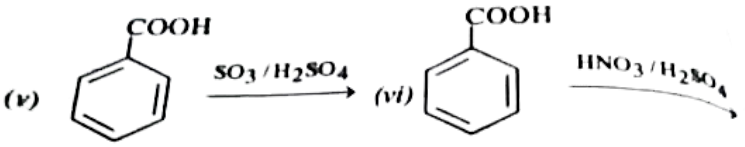
10. Complete the following :

(i) $CH_3COOH \xrightarrow{P/B_2}$, (ii) $CH_3COOH \xrightarrow[H_2SO_4]{CH_3OH}$

(iii) $CH_3COOH \xrightarrow{LiAlH_4}$, (iv) $CH_3COOK \xrightarrow[\text{Electrolysis}]{H_2O}$

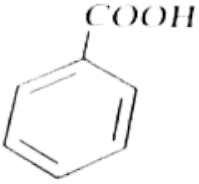
(v) 

,

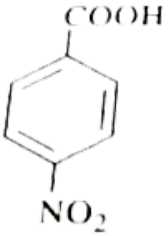


Watch Video Solution

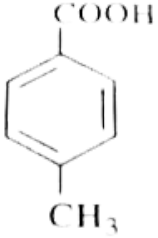
11. Arrange the following in decreasing order of acidic strength



(I)



(II)



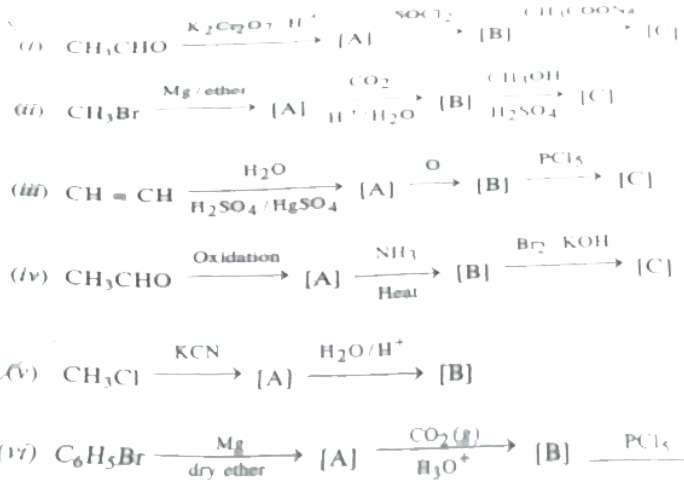
(III)

Watch Video Solution

12. How will your prepare teriary butyl alcohol from acetic acid ?

Watch Video Solution

13. Complete the missing links in the following :



View Text Solution

14. (a) How will you prepare benzoic acid

(i) from ethyl benzene

(ii) by using Grignard reagent?

(b) How is benzoic acid converted to

(i) Benzyl alcohol

(ii) Benzyl ethanoate ?

View Text Solution

15. Explain giving reasons each of the following :

(i) Chloroacetic acid has lower pK_a value than acetic acid

(ii) Carboxylic acids have higher boiling points than alcohols of comparable molecular masses

(iii) Electrophilic substiution in benzoic acid takes place at the meta position.

View Text Solution

16. Write short notes on : (i) Kolbe's electrolysis

(ii) H.V.Z. reaction

(iii) Esterification reaction

View Text Solution

17. How will your convert : (i) Propionic acid to acetic acid

(ii) Acetylene to acetic acid

(iii) Formic acid to oxalic acid

(iv) Malonic acid to acetic acid ?

(v) Benzoic acid to benzophenone.

(vi) Acetic acid to acetonitrile.

(vii) Methyl bromide to acetic acid

(viii) Methyl bromide to acetic acid

(ix) Acetophenone to benzoic acid

(x) Acetic acid to ethane.

View Text Solution

18. Give chemical tests to distinguish between :

(i) Benzoic acid and phenol

(ii) Ethanamide and ethanoic acid.

View Text Solution

19. Justify :

Trichloroacetic acid is a stronger acid than dichloroacetic acid

(ii) Formic acid is a stronger acid than acetic acid.

Watch Video Solution

20. (a) Describe the preparation of acetic acid from acetylene. How can the following be obtained from acetic acd ?

(i) Acetone (ii) Acetaldehyde

(b) In what way can acetic acid be distinguished from acetone ?

(c) Why does carboxylic acid not give the characteristic reactions of a carbonyl group ?

View Text Solution

21. Give a suitable example of H.V.Z. reaction.

Watch Video Solution

22. Describe a test to distinguish between phenol and benzoic acid.

Watch Video Solution

23. How will you convert benzene to benzoic acid ?

Watch Video Solution

24. Why is benzoic acid a stronger acid than acetic acid ?

Watch Video Solution

25. How will you convert propionic acid to ethyl amine ?

Watch Video Solution

26. Give two chemical tests to distinguish between benzaldehyde and benzoic acid.

Watch Video Solution

27. Describe the following

i. Acetylation

ii. Cannizzaro reaction

iii. Cross aldol condensation

iv. Decarboxylation

Watch Video Solution

28. Why has monochloroethanoic acid higher pK_a value than dichloroethanoic acid ?

Watch Video Solution

29. Write IUPAC name of $CH_3 - \underset{Cl}{\underset{|}{CH}} - \underset{COOH}{\underset{|}{CH}} - CH_3$

Watch Video Solution

30. Give the formula of [A] and [B]

$$CH_3 - \overset{O}{\overset{||}{C}} - OH \xrightarrow{SOCl_2} [A] \xrightarrow{LiAlH_4} [B]$$

Watch Video Solution

31. How will you convert acetic acid into acetaldehyde ?

Watch Video Solution

32. Write the reaction involved in the following :

(i) Hell-Volhard zelinsky.

(ii) Decarboxylation reaction.

Watch Video Solution

33. describe the following conversions :

(i) Ethyl benzene to benzoic acid

(ii) Bromobenzene to benzoic acid

(iii) Butan-1-01 to butanoic acid.

(iv) Ethyl cyanide to ethanoic acid.

View Text Solution

34. How will you convert benzoic acid into benzaldehyde ?

Watch Video Solution

35. Write the reaction involved in the following :

(i) Hell-Volhard zelinsky.

(ii) Decarboxylation reaction.

Watch Video Solution

36. Arrange the following in order of decreasing of acid strenth indicated ?

(i) Benzoic acid, 3, 4-Dinitrobenzoic acid, 4-Methylbenzoic acid ltbgt (ii) $CH_3CH_2CH(Br)COOH, CH_3CH(Br)CH_2COOH, (CH_3)_2CHCOOH$

Watch Video Solution

37. Draw the structure of hexane-1, 6-dioic acid.

Watch Video Solution

38. Why is carboxylic acid a stronger acid than phenol ?

Watch Video Solution

39. Complete the reaction : $CH_3COOH \xrightarrow{Cl_2 / P} ?$

Watch Video Solution

40. How will you convert benzoic acid into benzene ?

Watch Video Solution

41. Complete the following reactions :

(i) $R - CH_2COOH \xrightarrow{X_2 / \text{Red } P} ?$

(ii) $2CH_3COOH \xrightarrow{P_2O_5 / \text{heat}} ?$

Watch Video Solution

42. Predict the products of the following reactions :

(i) $C_6H_5CH_2CH_3 \xrightarrow[H^+]{KMnO_4 / KOH}$

(ii) $CH_3COOH \xrightarrow{NH_3 / \text{heat}}$

Watch Video Solution

43. Which reagent is used in the following conversion :

$CH_3COOH \xrightarrow{?} CH_3COCl$

Watch Video Solution

44. Account for the following :

(i) Benzoic acid does not undergo Friedel crafts reaction

(ii) Pk_a value of chloroacetic is lower than Pk_a of acetic acid.

Watch Video Solution

45. What are carboxylic acid ? Discuss general methods of prepara-tion of carboxylic acids.

View Text Solution

46. Distinguish between CH_3CH_2COOH and $HCOOH$.

Watch Video Solution

47. Why is pKa of $F-CH_2COOH$ lower than that of $Cl-CH_2COOH$?

Watch Video Solution

48. Why is $CH_2=CH-COOH$ a stronger acid than CH_3CH_2COOH ?

Watch Video Solution

49. Account for the following :

(i) Benzoic acid does not undergo Friedel crafts reaction

(ii) Pk_a value of chloroacetic is lower than Pk_a of acetic acid.

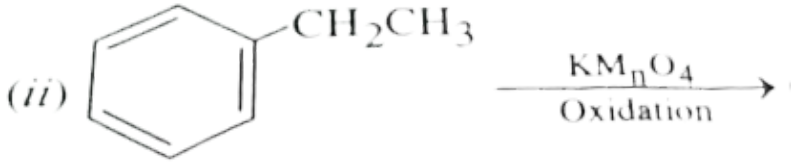
Watch Video Solution

50. Do the following conversion is not more than two steps (i) Benzoic acid to benzaldehyde (ii) Ethylbenzene to benzoic acid.

View Text Solution

51. Complete the following :

(i) $CH_3COONa \xrightarrow[CaO/Heat]{NaOH}$

(ii) 

Watch Video Solution

52. Chloroacetic acid is a stronger acid than acetic acid this can be explained using

Watch Video Solution

53. What happens when acetic acid reacts with (i) Ammonia (ii) $SOCl_2$?

Watch Video Solution

54. Identify the reaction and write IUPAC name of the product.

$CH_3CH_2COOH \xrightarrow{Br_2 / \text{Red P}}$

Watch Video Solution

55. Write tests to distinguish between

(i) Phenol and carboxylic acid

(ii) Formic acid and acetic acid

View Text Solution

56. How will you prepare carboxylic acid from Grignard's reagent ? Give equation.

Watch Video Solution

Multiple Choice Question Bank Mcqb

1. In which of the following the number of carbon atoms are not the same when carboxylic acid is obtained by oxiadation ?

A. CH_3COCH_3

B. CCl_3CH_2CHO

C. $CH_3CH_2CH_2OH$

D. CH_3CH_2CHO

Answer: A

Watch Video Solution

2. On bromination, propionic acid gives two isomeric 2-bromopropionic acids. This pair is an example of

A. Optical isomers

B. Cis-trans isomers

C. Chain isomers

D. Position isomers.

Answer: A

Watch Video Solution

3. Sodium formate on heating yields

A. Oxalic acid and H_2

B. Sodium oxalate and H_2

C. CO_2 and $NaOH$

D. Sodium oxalate

Answer: B

Watch Video Solution

4. An ester is boiled with KOH and the product is cooled and acidified with concentrated HCl. A white crystalline precipitate separates out. The ester is :

A. Methyl acetate

B. Ehtyl acetate

C. Ethyl formate

D. Ethyl benzoate

Answer: D

Watch Video Solution

5. Carbonation of methyl magnesium bromide gives an organic compound which can also be obtained by :

A. Hydrolysis of acetonitrile with mineral acid

B. Oxidation of methyl alcohol

C. Hydrolysis of methyl isocyanide with mineral acid

D. Hydrolysis of methyl formate with mineral acid.

Answer: A

Watch Video Solution

6. Which of the following on oxidation followed by hydrolysis gives acetic acid ?

A. Acetaldehyde cyanolydrin

B. Acetone cyanohydrin

C. Formaldehyde cyanohydrin

D. None of these.

Answer: A

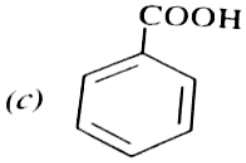
Watch Video Solution

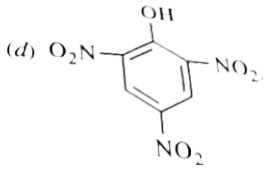
7. The storngest acid among the following is :

A. CCl_3COOH

B. FCH_2COOH

C.



D. 

Answer: D

Watch Video Solution

8. When 2-hydroxybenzoic acid is distilled with zinc dust, it gives :

A. Phenol

B. Benzoic acid

C. Benzaldehyde

D. A polymeric product.

Answer: B

Watch Video Solution

9. Which represents the correct order of relative acidic strengths ?

A. $HCOOH > CH_3COOH > ClCH_2COOH > C_2H_5COOH$

B. $ClCH_2COOH > HCOOH > CH_3COOH > C_2H_5COOH$

C. $CH_3COOH > HCOOH > ClCH_2COOH > C_2H_5COOH$

D. $C_2H_5COOH > CH_3COOH > HCOOH > ClCH_2COOH.$

Answer: B

Watch Video Solution

10. $\left[Ag(NH_3)_2\right]OH$ forms metallic silver when it reacts with :

A. $HCOOH$

B. CH_3COOH

C. CH_3COCH_3

D. CH_3OH

Answer: A

Watch Video Solution

11. The intermediates formed during the reaction of $R-\overset{\overset{O}{||}}{C}-NH_2$ with Br_2 and KOH are :

A. $RCONHBr$ and $RNCO$

B. $RNHCOBr$ and $RNCO$

C. $RNHBR$ and $RCONHBr$

D. $RCONH_2$

Answer: A

Watch Video Solution

12. In a set of the given reactions, acetic acid yields a product C.

$CH_3COOH + PCl_5 \rightarrow A$

$$A \xrightarrow[\text{Anhy}AlCl_3]{C_6H_6} B \xrightarrow[\text{Ether}]{C_2H_5MgBr} C$$

Product C would be

A. $CH_3CH(OH)C_2H_5$

B. $CH_3COC_6H_5$

C. $CH_3CH(OH)C_6H_5$

D. $CH_3 - \overset{C_2H_5}{\underset{|}{C}} - (OH)C_6H_5.$

Answer: D

Watch Video Solution

13. In the reaction

$$CH_3CHO + HCN \rightarrow CH_3CH(OH)CN \xrightarrow{H_2O} CH_3CH(OH)COOH$$

an asymmertic cabron is generated. The acid obtained would be

A. d-isomer

B. l-isomer

C. 50% d and 50% l-isomer

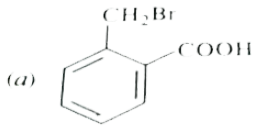
D. 20% d and 80% l-isomer

Answer: C

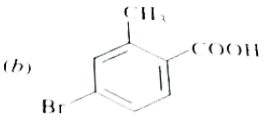
Watch Video Solution

14. $o-Toluic$ acid on reaction with Br_2+Fe gives

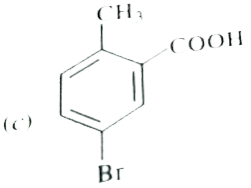
A.



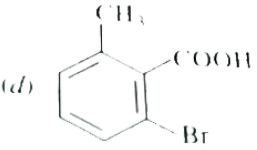
B.



C.



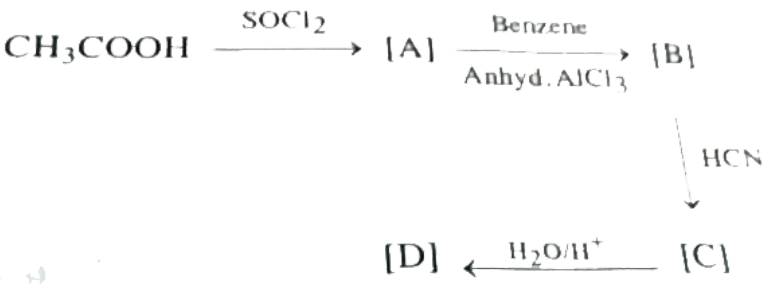
D.



Answer: C

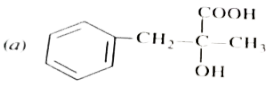
Watch Video Solution

15. In a set of reactions, acetic acid yielded a product D.

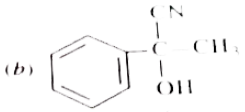


The structure of D would be :

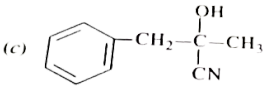
A.



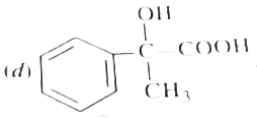
B.



C.



D.



Answer: D

Watch Video Solution

16. In a set of reactions propionic acid yielded a compound D

$CH_3CH_2COOH \xrightarrow{SOCl_2} B \xrightarrow{NH_3} C \xrightarrow[Br_2]{KOH} D$ The structure of D would be .

A. $CH_3CH_2NH_2$

B. $CH_3CH_2CH_2NH_2$

C. $CH_3CH_2CONH_2$

D. $CH_3CH_2NHCH_3$.

Answer: A

Watch Video Solution

17. Which of the following represents the correct order of the acidic strength in the given compounds ?

A.

$$FCH_2COOH > CH_3COOH > BrCH_2COOH > ClCH_2COOH$$

B.

$$BrCH_2COOH > ClCH_2COOH > FCH_2COOH > CH_3COOH$$

C.

$$FCH_2COOH > ClCH_2COOH > BrCH_2COOH > CH_3COOH$$

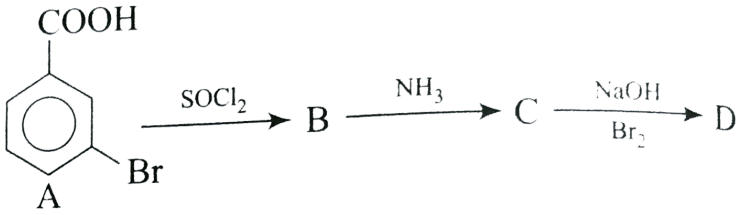
D.

$$CH_3COOH > BrCH_2COOH > ClCH_2COOH > FCH_2COOH$$

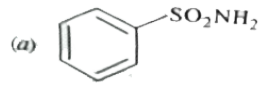
Answer: C

Watch Video Solution

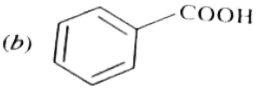
18. In a set of reaction m-bromobenzoic acid gives a product D. Identify the product D



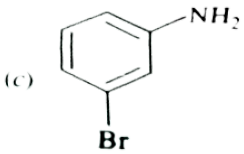
A.



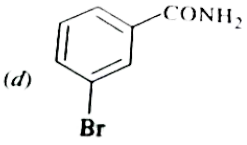
B.



C.



D.



Answer: C

Watch Video Solution

19. An orgainc compound A upon reacting with NH_3 gives B On heating B give C. C in presence KOH reacts with Br_2 to yield $CH_3CH_2NH_2A$

is .

A. CH_3COOH

B. $CH_3CH_2CH_2COOH$

C. $CH_3\underset{\underset{CH_3}{|}}{C}HCOOH$

D. CH_3CH_2COOH

Answer: D

Watch Video Solution

20. Which of the following acids does not exhibit optical isomerism?

A. Maleic acid

B. α-aminopropionic acid

C. Lactic acid

D. Tartaric acid.

Answer: A

Watch Video Solution

21. Methylbenzoate can he prepared by :

A. $C_6H_5COOH + CH_3OH \xrightarrow{H^+}$

B. $C_6H_5COCl + CH_3OH \xrightarrow{\text{Pyridine}}$

C. $C_6H_5COOH + CH_2N_2 \rightarrow$

D. All the above methods.

Answer: D

Watch Video Solution

22. Which of the following reactions involves the formation of a methyl ester from a carboxylic acid ?

A. Hell-Volhard-Zelinsky reaction

B. Hundiecker reaction

C. Reaction with ammonia

D. Reaction with diazomethane.

Answer: D

Watch Video Solution

23. The enolic form of ethyl acetoacetate as shown below has

A. 9 sigma bonds and 2 pi-bonds

B. 9 sigma bonds and 1 pi-bonds

C. 18 sigma bonds and 2 pi-bonds

D. 18 sigma bonds and 1 pi-bond.

Answer: C

Watch Video Solution

24. Glutaric acid is :

A. butane-1, 4-dioic acid

B. propane-1, 3-dioic acid

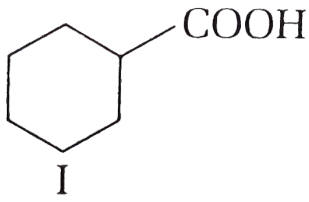
C. pentane-1, 5-dioic acid

D. hexane-1, 4-dioic acid

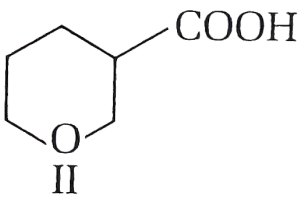
Answer: C

Watch Video Solution

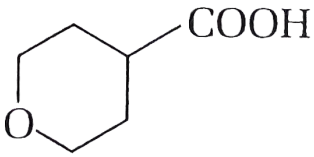
25. The correct order of strengths of the carboxylic acids



I



II



III

is

A. $I > II > III$

B. $II > III > I$

C. $III > II > I$

D. $II > I > III$

Answer: B

Watch Video Solution

26. Carboxylic acid have higher boiling points than aldehydes, ketones and even alcohol of comparable molecular mass. It is due to their

A. formation of intramolecular-H-bonding

B. formation of carboxylate ion

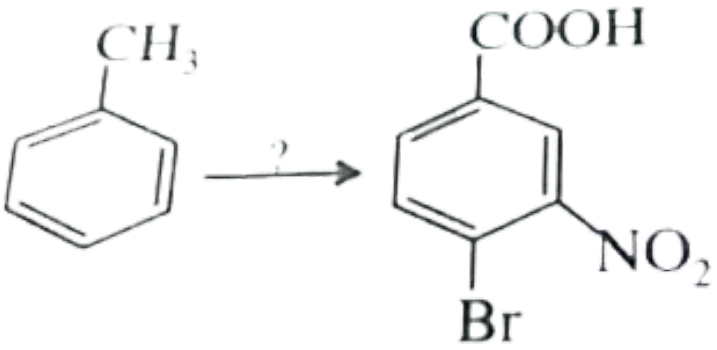
C. more extensive association of carboxylic acid via van der waals forces of attraction

D. formation of intermolecular H-bonding

Answer: D

Watch Video Solution

27. What are the suitable reagents for the following conversion ?



A. $Br_2 / FeBr_3, KMnO_4, HNO_3 / H_2SO_4$

B. $KMnO_4, Br_2 / FeBr_3, HNO_3$

C. $HNO_3, Br_2 / FeBr_3, KMnO_4$

D. $HNO_3, KMnO_4, Br_2 / FeBr_3$

Answer: A

Watch Video Solution

28. Which is the strongest acid ?

A. $HCOOH$

B. CH_3COOH

C. $(CH_3)_2CHCOOH$

D. $(CH_3)_3CCOOH$

Answer: A

Watch Video Solution

29. Acrylic acid reacts with HBr to give :

A. $Br - CH_2 - \underset{\underset{Br}{|}}{CH} - COOH$

B. $Br - CH_2CH_2 - COOH$

C. $CH_2 = CHCOBr$

D. $CH_3 - \underset{\underset{Br}{|}}{CH} - COOH$

Answer: B

Watch Video Solution

Watch Video Solution

30. Which of the following cannot reduce fehling's solution and tollen's reagent?

A. Formic acid

B. Acetic acid

C. Formaldehyde

D. Acetaldehyde

Answer: B

Watch Video Solution

31. What is the main fact which supports that carboxylic acids can undergo ionization?

A. Absence of α-hydrogen

B. Higher reactivity of α-hydrogen

C. Resonance stabilisation of carboxylate ion

D. Hydrogen bonding.

Answer: C

Watch Video Solution

32. Which is the strongest acid ?

A. CH_3OH

B. CH_3CH_2OH

C. C_6H_5COOH

D. $C_6H_5SO_3H$.

Answer: C

Watch Video Solution

33. 59 gram of an amide obtained from a carboxylic acid (RCOOH) upon heating with alkali liberated 17g of NH_3 The acid is :

A. Formic acid

B. Acetic acid

C. Propionic acid

D. Benzoic acid

Answer: B

Watch Video Solution

34. The correct order of acid strengths of benzoic acid (X) peroxybenzoic acid (Y) and p-nitrobenzoic acid (Z) is

A. $Y > Z > X$

B. $Z > Y > X$

C. $Z > X > Y$

D. $Y > X > Z$

Answer: C

Watch Video Solution

35. Which of the following esters is formed by reacting propan-2-01 with ethanoic acid ?

A. $(CH_3)_2CHCOOCH_3$

B. $CH_3COOCH_2CH_3$

C. $CH_3COOCH(CH_3)_2$

D. $(CH_3)_2CHCOOCH_2CH_3$

Answer: A

Watch Video Solution

36. Consider the following reaction

Phenol $\xrightarrow[\text{dust}]{Zn} X \xrightarrow[\substack{\text{Anhydrous} \\ AlCl_3}]{CH_3Cl} Y \xrightarrow[KMnO_4]{\text{Alkaline}} Z$

The product Z is

A. Benzene

B. Toluene

C. Benzaldehyde

D. Benzoic acid

Answer: D

Watch Video Solution

37. The ease of esterification of the acids $HCOOH(I), CH_3COOH(II),$ and $CH_3CH_2COOH(III)$ with CH_3OH is

A. $(III) < (II) < (I)$

B. $(I) < (II) < (III)$

C. $(II) < (I) < (III)$

D. $(I) = (II) = (III)$

Answer: A

Watch Video Solution

38. Which of the following will evolve N_2 gas with Br_2 / KOH ?

A. NH_2CONH_2

B. CH_3CONH_2

C. $HCONH_2$

D. $C_6H_5CONHCH_3$

Answer: A

Watch Video Solution

39. Which of the following has the maximum acidic strength?

A. o-Nitrobenzoic acid

B. m-Nitrobenzoic acid

C. p-Nitrobenzoic acid

D. p-Nitrophenol.

Answer: A

Watch Video Solution

40. The compound B is :

$$CH_3CH_2COOH \xrightarrow[redP]{Cl_2} A \xrightarrow{Alc.KOH} B$$

A. CH_3CH_2COCl

B. CH_3CH_2CHO

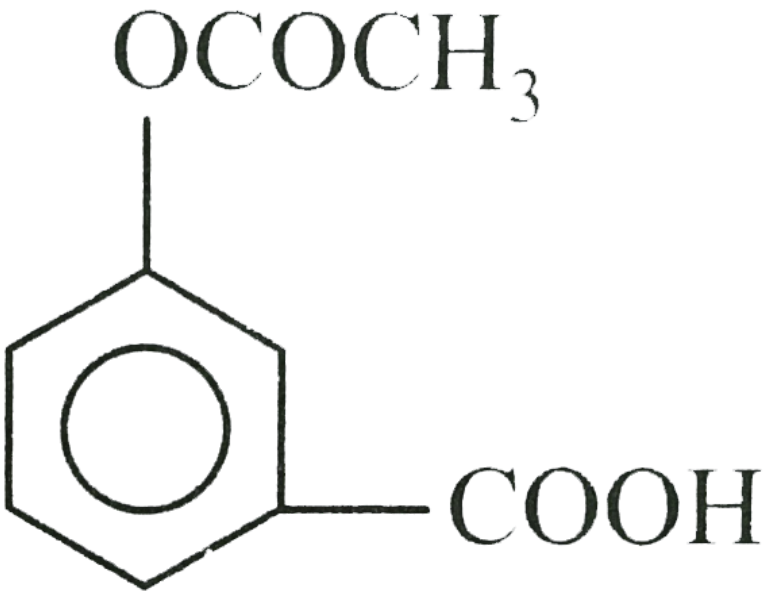
C. $CH_2 = CHCOOH$

D. $ClCH_2CH_2COOH$

Answer: C

Watch Video Solution

41. The compound is used as



A. antiseptic

B. antibiotic

C. analgesic

D. pesticide

Answer: C

Watch Video Solution

42. The compound formed as a result of oxidation of ethyl benzene by $KMnO_4$ is

A. benzyl alcohol

B. benzophenone

C. acetophenone

D. Benzoic acid

Answer: D

Watch Video Solution

43. When $CH_2 = CHCOOH$ is reduced with $LiAlH_4$., the compound obtained is

A. CH_3CH_2COOH

B. $CH_2 = CHCH_2OH$

C. $CH_3CH_2CH_2OH$

D. CH_3CH_2CHO

Answer: A

Watch Video Solution

44. Among the following the lowest pK_a value is of :

A. CH_3COOH

B. $HCOOH$

C. $(CH_3)_2CHCOOH$

D. CH_3CH_2COOH

Answer: B

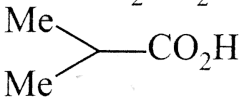
Watch Video Solution

45. The correct order of increasing acidic strength of the compounds:

(1) CH_3CO_2H

(2) $MeOCH_2CO_2H$

(3) CF_3CO_2H

(4) 

A. $B < D < A < C$

B. $D < A < C < B$

C. $D < B < A < C$

D. $A < D < C < B$

Answer: C

Watch Video Solution

46. The correct order of increasing acidity of the followins is :

A. $HCN > ClCH_2COOH > HCOOH > CH_3COOH$

B. $HCN > HCOOH > ClCH_2COOH > CH_3COOH$

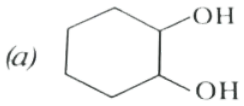
C. $ClCH_2COOH > HCOOH > CH_3COOH > HCN$

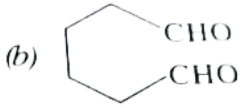
D. $ClCH_2COOH > HCN > HCOOH > CH_3COOH$

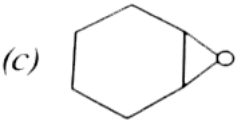
Answer: C

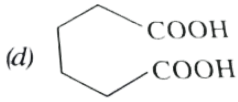
Watch Video Solution

47. The final product in the given reaction is

A. 

B. 

C. 

D. 

Answer: D

Watch Video Solution

48. Which of the following compound will have the smallest pK_a value ?

A. Benzoic acid

B. Formic acid

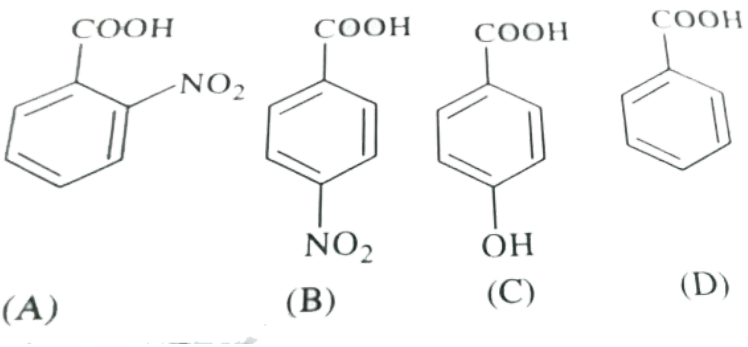
C. Acetic acid

D. Phenyl acetic acid

Answer: B

Watch Video Solution

49. Arrange the following acids in order of their increasing acidity



A. $A < B < C < D$

B. $B < C < A < D$

C. $C < B < D < A$

D. $C < D < B < A$

Answer: D

Watch Video Solution

50. When propionic acid is treated with aqueous sodium bicarbonate, CO_2 is liberated. The carbon of CO_2 comes from

A. methyl group

B. carboxylic acid group

C. methylene group

D. bicarbonate ion.

Answer: D

Watch Video Solution

51. The strongest acid among the following compounds is :

A. $HCOOH$

B. $CH_3CH_2(cl)COOH$

C. $ClCH_2CH_2CH_2COOH$

D. CH_3COOH

Answer: B

Watch Video Solution

52. Which of the following can distringuish phenol and benzoic acid ?

A. Tollen's reagent

B. Molisch reagent

C. Neutral $FeCl_3$

D. Aqueous $NaOH$

Answer: C

Watch Video Solution

53. An orgainc compound A upon reacting with NH_3 gives B On heating B give C. C in presence KOH reacts with Br_2 to yield $CH_3CH_2NH_2A$ is .

A. CH_3CH_2COOH

B. CH_3COOH

C. $CH_3CH_2CH_2COOH$

D. $Ch\underset{CH_3}{\underset{|}{C}}HCOOH$

Answer: A

Watch Video Solution

54. In the reaction

$$CH_3COOH \xrightarrow{LiAlH_4} A \xrightarrow{PCl_4} B \xrightarrow{Alc.KCN} C$$

The product C is

A. acetaldehyde

B. acetylene

C. ethylene

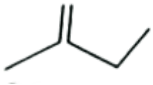
D. acetyl chloride.

Answer: C

Watch Video Solution

55. Perdict the product (C) of the following sequence of reactions :

$$CH_3COOH \xrightarrow{PCl_5} [A] \xrightarrow[\text{Anhyd.}AlCl_3]{C_6H_6} [B] \xrightarrow[H_2O^+]{CH_3MgBr} [C]$$

A. (a) 

B. $CH_3CH(OH)C_6H_5$

C. $CH_3CH(OH)C_2H_5$

D. $(CH_3)_2C(OH)C_6H_5$

Answer: D

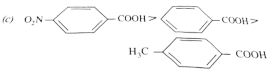
Watch Video Solution

Watch Video Solution

56. Which order is improper for acidic strength ?

A. $Cl_3CCOOH > Cl_2CHCOOH > ClCH_2COOH$

B. $CH_3 - \underset{Cl}{CH} - \underset{Cl}{CH} - COOH > CH_3 - \underset{Cl}{CH} - CH_2 - COOH > CH$

C. 

D. $HCOOH > CH_3COOH > C_6H_5COOH$

Answer: D

View Text Solution

57. The correct increasing order of the acid strength fo acids, butyric acid (I), 2-chlorobutyric acid (II), 3-chlorobutyaric acid (III), 2,2-dichlorobutyric acid (IV) is :

A. $I < II < III < IV$

B. $III < II < IV < I$

C. $III < I < II < IV$

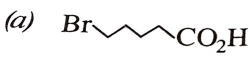
D. $IV < III < II < I$

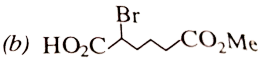
Answer: C

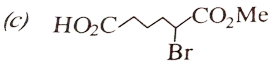
Watch Video Solution

58. The reaction sequence given below gives products R.

The structure of the product R is

A. 

B. 

C. 

D. (d) 

Answer: D

Watch Video Solution

59. An organic compound [A] is $C_5H_8O_3$. On heating with soda lime, it gives [B]. The compound [B] reacts with HCN to give another compound [C] which reacts with thionyl chloride to produce [D]. When the compound [A] is heated with potassium dichromate the product is acetic acid and malonic acid.

The compound [A] is a

A. α-hydroxy acid

B. β-hydroxy ester

C. β-keto acid

D. β-keto ester.

Answer: A

Watch Video Solution

60. An organic compound [A] is $C_5H_8O_3$. On heating with soda lime, it gives [B]. The compound [B] reacts with HCN to give another compound [C] which reacts with thionyl chloride to produce [D]. When the compound [A] is heated with potassium dichromate the product is acetic acid and malonic acid.

The structure of compound [A] is :

A. $CH_3 - CH_2 - \overset{\overset{O}{||}}{C} - CH_2COOH$

B. $CH_3CH_2\underset{\underset{OH}{|}}{C}HCH_2COOH$

C. $CH_3\overset{\overset{O}{||}}{C}CH_2CH_2COOH$

D. $CH_3CH_2\underset{\underset{OH}{|}}{C}HCOOH$

Answer: A

Watch Video Solution

61. An organic compound [A] is $C_5H_8O_3$. On heating with soda lime, it gives [B]. The compound [B] reacts with HCN to give another compound [C] which reacts with thionyl chloride to produce [D]. When the compound [A] is heated with potassium dichromate the product is acetic acid and malonic acid.

The IUPAC name of compound [B] is :

A. Butan-2-ene

B. Pentan-3-ene

C. Pentanoic acid

D. Ethanoic acid.

Answer: A

Watch Video Solution

62. A compound [A] has the formula $C_4H_8O_2$. When reacted with a Grignard reagent, CH_3MgBr, it takes up two molecules of it and upon

acidification gives an alcohol [B]. The alcohol on reacting with Lucas reagent gives white coludiness on standing for sometime. When the alochol is oxidised, a compound [C] is produced with a pleasant smell. It neither reacts with Tollen's reagent, nor with Fehling's reagent.

The compound [A] is

A. an ester

B. a saturated carboxylic acid

C. an unsaturated carboxylic acid

D. an α-diketone.

Answer: A

Watch Video Solution

63. A compound [A] has the formula $C_4H_8O_2$. When reacted with a Grignard reagent, CH_3MgBr, it takes up two molecules of it and upon acidification gives an alcohol [B]. The alcohol on reacting with Lucas reagent gives white coludiness on standing for sometime. When the

alochol is oxidised, a compound [C] is produced with a pleasant smell. It neither reacts with Tollen's reagent, nor with Fehling's reagent.

The compound [A] is

A. n-propyl formate

B. ethylacetate

C. methylpropionate

D. None of these.

Answer: A

Watch Video Solution

64. A compound [A] has the formula $C_4H_8O_2$. When reacted with a Grignard reagent, CH_3MgBr, it takes up two molecules of it and upon acidification gives an alcohol [B]. The alcohol on reacting with Lucas reagent gives white coludiness on standing for sometime. When the alochol is oxidised, a compound [C] is produced with a pleasant smell. It

neither reacts with Tollen's reagent, nor with Fehling's reagent.

The alcohol [B] is

A. a primary alcohol

B. a secondary alcohol

C. a tertiary alcohol

D. cannot be predicted from availabe information.

Answer: B

Watch Video Solution

65. Carboxylic acids having at least one α-hydrogen react with Cl_2 or Br_2 in the presnence of red phosphorus to give α-halo acids. The reaction is known as H.V.Z. reaction. The HVZ reaction is limited to the formation of α-chloro acid and α-bromo acid and it is sometimes difficult to carry out the reaction. Answer the following questions :

Which of the following carboxylic acids will not give HVZ reaction ?

A. CH_3COOH

B. $CH_3 - \overset{CH_3}{\underset{|}{C}}H - COOH$

C. $CH_3 - CH_2 - COOH$

D. $CH_3 - \overset{CH_3}{\underset{CH_3}{\overset{|}{\underset{|}{C}}}} - COOH$

Answer: D

Watch Video Solution

66. Carboxylic acids having at least one α-hydrogen react with Cl_2 or Br_2 in the presence of phosphorous to give α-halo acids. The reaction is known as Hell -volhar-Zelinsky reaction (HVZ reaction).

$$R - CH_2 - COOH \xrightarrow[\Delta]{P/Br_2} R - CH(Br)COOH$$

The HVZ reaction is limited to the formation of α-chloro and α-bromo acids and it is sometimes backward to carry out. the reagents (X_2 and P) are noxious and the reaction time is often long and the conditions of reaction are harsh.

Which of the following will be obtained when acetic acid is subjected to HVZ reaction ?

A. $BrCH_2COOH$

B. $Br - \overset{Br}{\overset{|}{C}}H - COOH$

C. $Br - \underset{Br}{\overset{Br}{\overset{|}{\underset{|}{C}}}} - COOH$

D. All of these

Answer: D

Watch Video Solution

67. Carboxylic acids having at least one α-hydrogen react with Cl_2 or Br_2 in the presence of phosphorous to give α-halo acids. The reaction is known as Hell -volhar-Zelinsky reaction (HVZ reaction).

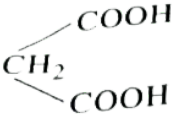
$$R - CH_2 - COOH \xrightarrow[\Delta]{P / Br_2} R - CH(Br)COOH$$

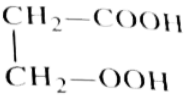
The HVZ reaction is limited to the formation of α-chloro and α-bromo acids and it is sometimes backward to carry out. the reagents (X_2 and P)

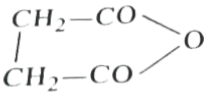
are noxious and the reaction time is often long and the conditions of reaction are harsh.

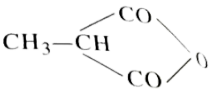
$$CH_3 - COOH \xrightarrow{Br_2/P} (A) \xrightarrow{NaCN} (B) \xrightarrow{HOH/H^+} (C)$$

The product (C) will be

A. (a) 

B. (b) 

C. (c) 

D. (d) 

Answer: A

Watch Video Solution

68. The acidity of carboxylic acid is determined by the nature of the alkyl group attached and the substiuent present on it. It is affected mainly by the inductive effect of the substituent and its position with respect to the -COOH group. Electron-donating substituent tends to decrease the acidic strength whereas electron-withdrawing substituent tends to increase acidic strength. The acidic strength of aromatic carboxylic acid on the other hand depends upon both the inductive and resonance effects of the substituents.

Which of the following would be expected to be most highly ionized in water ?

A. $ClCH_2CH_2CH_2COOH$

B. $CH_3CHClCH_2COOH$

C. $CH_3CH_2CCl_2COOH$

D. $CH_3CH_2CHClCOOH$

Answer: C

Watch Video Solution

69. The acidity of carboxylic acid is determined by the nature of the alkyl group attached and the substiuent present on it. It is affected mainly by the inductive effect of the substituent and its position with respect to the -COOH group. Electron-donating substituent tends to decrease the acidic strength whereas electron-withdrawing substituent tends to increase acidic strength. The acidic strength of aromatic carboxylic acid on the other hand depends upon both the inductive and resonance effects of the substituents.

Which of the following acids has the smallest dissocation constant ?

A. $CH_3CHFCOOH$

B. FCH_2CH_2COOH

C. $BrCH_2CH_2COOH$

D. $CH_3CHBCOOH.$

Answer: C

Watch Video Solution

70. The acidity of carboxylic acid is determined by the nature of the alkyl group attached and the substiuent present on it. It is affected mainly by the inductive effect of the substituent and its position with respect to the -COOH group. Electron-donating substituent tends to decrease the acidic strength whereas electron-withdrawing substituent tends to increase acidic strength. The acidic strength of aromatic carboxylic acid on the other hand depends upon both the inductive and resonance effects of the substituents.

Among the following, the strongest acid is :

A. CH_3COOH

B. C_6H_5COOH

C. $m - CH_3OC_6H_4COOH$

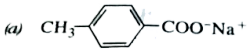
D. $p - CH_3OC_6H_4COOH.$

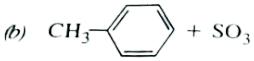
Answer: C

Watch Video Solution

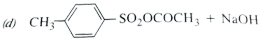
71. The acidity of carboxylic acid is determined by the nature of the alkyl group attached and the substiuent present on it. It is affected mainly by the inductive effect of the substituent and its position with respect to the -COOH group. Electron-donating substituent tends to decrease the acidic strength whereas electron-withdrawing substituent tends to increase acidic strength. The acidic strength of aromatic carboxylic acid on the other hand depends upon both the inductive and resonance effects of the substituents.

Which of the following is obtained when 4-methylbenzene sulphonic acid is hydrolyzed with excess of sodium acetate

A. 

B. 

C. 

D. 

Answer: C

Watch Video Solution

72. Chlorination of toluene in the presence of light and heat followed by treatment with aqueous NaOH gives

A. o-cresol

B. p-cresol

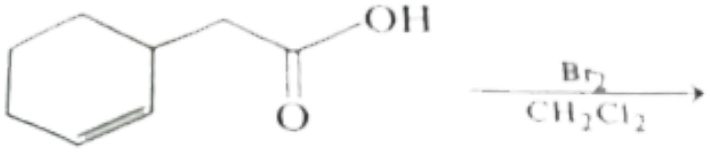
C. 2, 4-dihydroxytolune

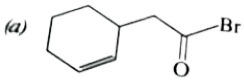
D. Benzoic acid

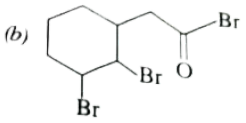
Answer: D

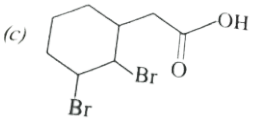
Watch Video Solution

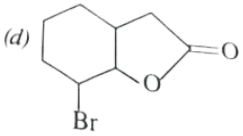
73. Identify the final product of the following reaction :



A. 

B. 

C. 

D. 

Answer: D

Watch Video Solution

74. Consider the following reaction

$$\underset{\text{Ester(x)}}{C_4H_8O_2} \xrightarrow[(\text{ii})H_3O^+]{(i)\,CH_3MgBr\,(\text{Excess})} \underset{\text{Alcohol(Y)}}{C_4H_{10}O}$$ Alcohol (Y) reacts fastest with Lucas reagent. Therefore (X) and (Y) are

A. $CH_3COOC_2H_5$ and $(CH_3)_3COH$

B. $HCOOC_3H_7$ and $(CH_3)_2CHOH$

C. $C_2H_5COOCH_3$ and $(C_2H_5)_3COH$

D. $HCOOC_3H_7$ and $(CH_3)_3COH$.

Answer: A

Watch Video Solution

75. Which of the following carboxylic acids undergoes decarboxylation easily ?

A. $C_6H_5COCOOH$

B. $C_6H_5COCH_2COOH$

C. $C_6H_5\underset{\underset{OH}{|}}{C}HCOOH$

D. $C_6H_5\underset{\underset{NH2}{|}}{C}HCOOH$

Answer: B

Watch Video Solution

76. In the reaction

$C_6H_5COOCH_3 \xrightarrow{LiAlH_4}$? the products formed are

A. C_6H_5COOH and CH_3OH

B. $C_6H_5CH_2OH$ and CH_3OH

C. C_6H_5CHO and CH_3COOH

D. All the above

Answer: B

Watch Video Solution

77. The molecular weight of benzoic acid in benzene as determined by depression in the freezing point method corresponds to

A. Ionization of benzoic acid

B. Dimerisation of benzoic acid

C. Trimerisation of benzoic acid

D. Solution of benzoic acid.

Answer: B

Watch Video Solution

78. Which of the following compounds is most susceptible to a nucleophilic attack at the carbonyl group?

A. CH_3COCl

B. CH_3CHO

C. CH_3COOCH_3

D. $CH_3COOCOCH_3$.

Answer: A

Watch Video Solution

79. When propionic acid is treated with aqueous sodium bicarbonate, CO_2 is liberated. The carbon of CO_2 comes from

A. methyl group

B. carboxylic acid group

C. methylene group

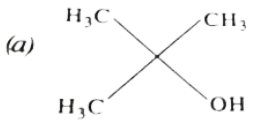
D. Bicarbonate

Answer: D

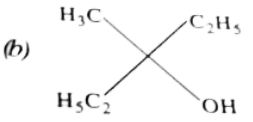
Watch Video Solution

80. Ethyl easter $\xrightarrow[\text{excess}]{CH_3MgBr} P$, the product P is

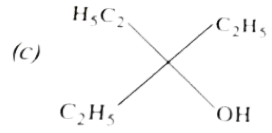
A.



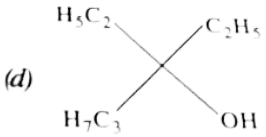
B.



C.



D.



Answer: A

Watch Video Solution

81. When benzamide is treated with $POCl_3$ the product is

A. Aniline

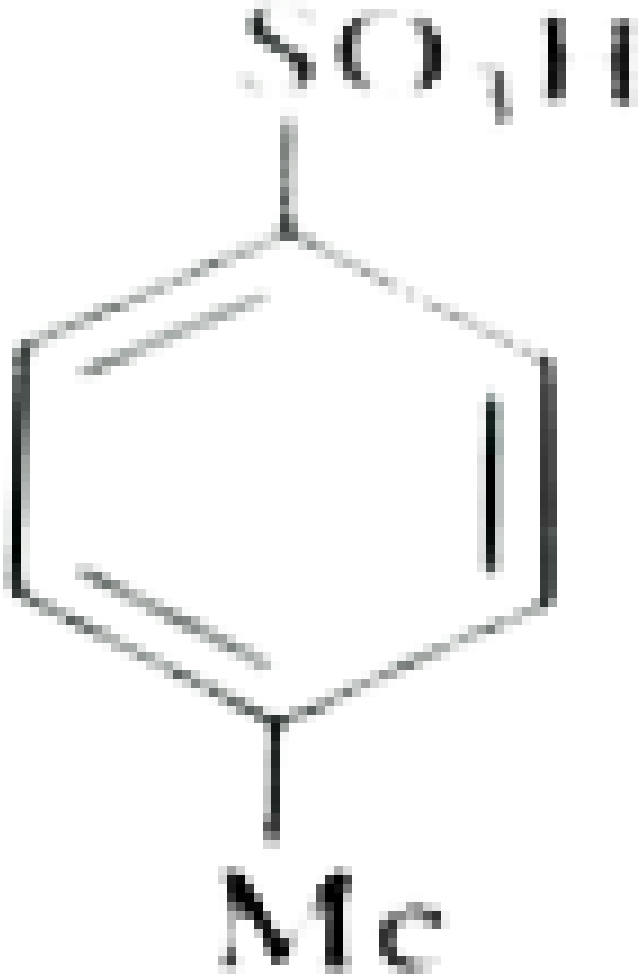
B. Chlorobenzene

C. Benzyl amine

D. Benzonitrile.

Answer: D

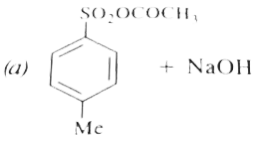
Watch Video Solution



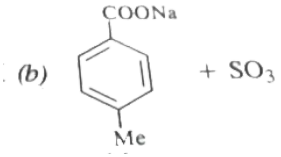
82. When

reacts with $CH_3COO^-Na^+$ (excess), the

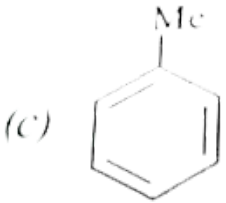
A.



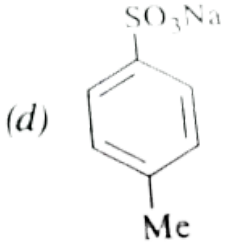
B.



C.



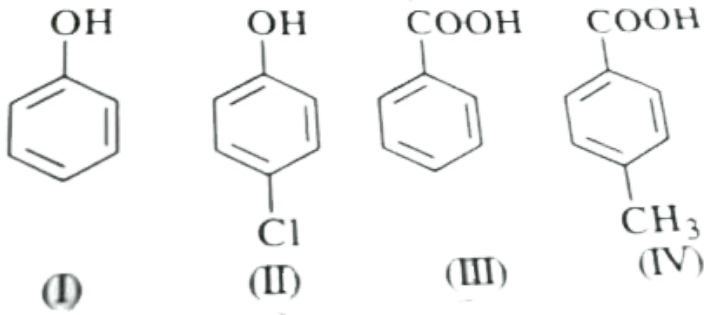
D.



Answer: D

Watch Video Solution

83. The correct order of acidity of the following is



A. $(III) > (IV) > (II) > (I)$

B. $(IV) > (III) > (I) > (II)$

C. $(III) > (II) > (I) > (IV)$

D. $(II) > (III) > (IV) > (I)$

Answer: A

Watch Video Solution

84. The carboxyl functional group $(-COOH)$ is present in :

A. Picric acid

B. Barbutric acid

C. Ascorbic acid

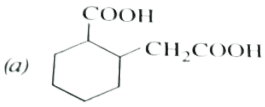
D. Aspirin.

Answer: B

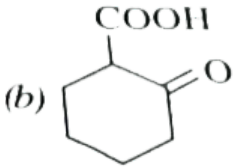
Watch Video Solution

85. The compound that undergoes decarboxylation most readily under mild condition is

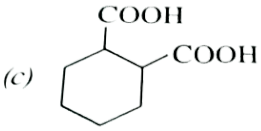
A.

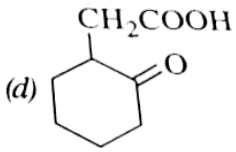


B.



C.

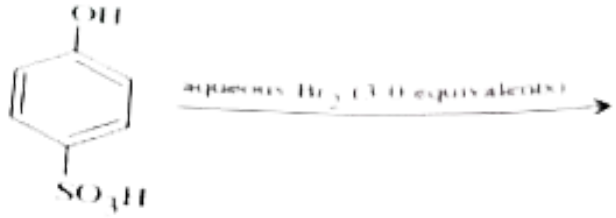


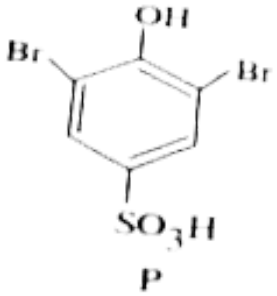
D. 

Answer: B

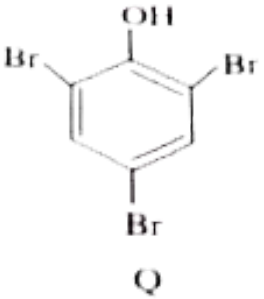
Watch Video Solution

86. The major product(s) of the following reaction is (are)

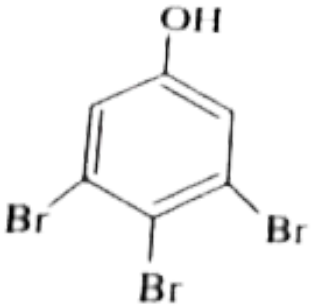




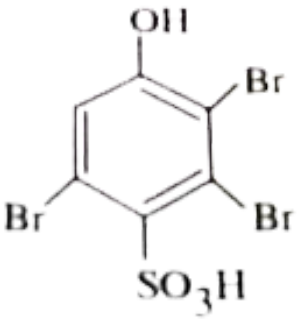
P



Q



R



S

A. P

B. Q

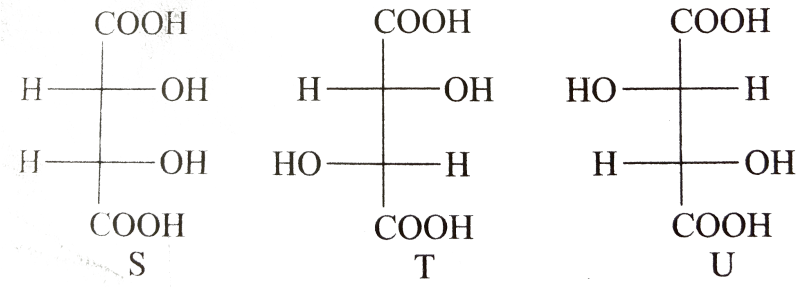
C. R

D. S

Answer: B

Watch Video Solution

87. P and Q are isomers of dicarboxylic acid $C_4H_4O_4$. Bothdecolorize Br_2/H_2O. On heating, P forms the cyclic anhydride. Upon treatment with dilute alkaline $KMnO_4$, P as well as Q could produce one or more than one forms S, T and U.



Compounds formed from P and Q are, respectively

A. Optically active S and optically active pair (T,U)

B. Optically inactive S and optically inactive pair (T,U)

C. Optically active pair (T,U) and optically active S

D. Optically inactive pair (T,U) and optically inactive S

Answer: A

Watch Video Solution

88. Among the following compounds, the one (s) that gives (gives) effervescence with aqueous $NaHCO_3$ solution is (are) :

(I) $(CH_3CO)_2O$, (II) CH_3COOH

(III) $PhOH$, (IV) CH_3COCHO

A. I and II

B. I and III

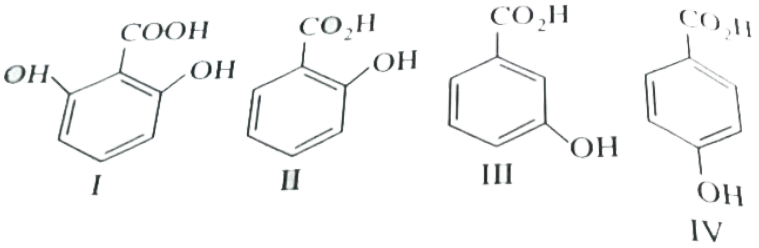
C. Only II

D. I and IV

Answer: A

Watch Video Solution

89. The correct order of acidity for the following compounds is



A. $I > II > III > IV$

B. $III > I > II > IV$

C. $III > IV > II > I$

D. $I > III > IV > II$

Answer: B::C

View Text Solution

90. The acids which do not contain a-COOH group are :

A. Propionic acid

B. Picric acid

C. Carbolic acid

D. Lactic acid.

Answer: B::C

Watch Video Solution

91. Phenol and benzoic acid may be distinguished by their reaction with :

A. Aqueous $NaOH$

B. Aqueous $NaHCO_3$

C. Neutral $FeCl_3$

D. Aqueous NH_3

Answer: B::C

Watch Video Solution

92. Which of the following on oxidation with alkaline $KMnO_4$ followed by acidification with HCl gives benzoic acid ?

A. Toluene

B. Ethyl benzene

C. o-oxylene

D. p-xylene

Answer: A::B

Watch Video Solution

93. Which of the following statements is/are correct about formic acid?

A. It is a stronger acid than acetic acid

B. It forms formyl chloride with PCl_5

C. It gives CO and H_2O on heating with conc. H_2SO_4

D. It reduces Tollen's reagent.

Answer: A::C::D

Watch Video Solution

94. Assertion : Benzoic acid is a weaker acid than formic acid.

Reason : Phenyl group destabilises the carboxylate anion due to conjugation.

A. If both assertion and reason are correct and reason is correct explanation for assertion.

B. If both assertion and reason are correct but reason is not correct explanation for assertion.

C. If assertion is correct but reason is incorrect.

D. If assertion and reason are both incorrect.

Answer: A

Watch Video Solution

95. Acetic acid does not undergo haloform reaction.

Acetic acid has no alpha-hydrogen.

A. If both assertion and reason are correct and reason is correct explanation for assertion.

B. If both assertion and reason are correct but reason is not correct explanation for assertion.

C. If assertion is correct but reason is incorrect.

D. If assertion and reason are both incorrect.

Answer: C

Watch Video Solution

96. Assertion: Formic acid reduces mercuric chloride to mercurous chloride on heating , while acetic acid does not.

Reason : Formic acid is stronger acid than acetic acid.

A. If both assertion and reason are correct and reason is correct explanation for assertion.

B. If both assertion and reason are correct but reason is not correct explanation for assertion.

C. If assertion is correct but reason is incorrect.

D. If assertion and reason are both incorrect.

Answer: B

Watch Video Solution

97. Assertion : Nitration of benzoic acid gives meta nitrobenzoic acid.

Reason : Carboxyl group deactivates the ortho and para positions in the ring.

A. If both assertion and reason are correct and reason is correct explanation for assertion.

B. If both assertion and reason are correct but reason is not correct explanation for assertion.

C. If assertion is correct but reason is incorrect.

D. If assertion and reason are both incorrect.

Answer: A

Watch Video Solution

98. Assertion : Carbxoylic acids donot give characteristic reactions of carbonyl group.

Reason : The carbonyl group is sterically hindered in carboxylic acid.

A. If both assertion and reason are correct and reason is correct explanation for assertion.

B. If both assertion and reason are correct but reason is not correct explanation for assertion.

C. If assertion is correct but reason is incorrect.

D. If assertion and reason are both incorrect.

Answer: C

Watch Video Solution

99. Assertion : Upon heating an amide with Br_2 and KOH, primary amine with one carbon atom less is formed.

Reason : The reaction occurs through occurs through carbene intermediate.

A. If both assertion and reason are correct and reason is correct explanation for assertion.

B. If both assertion and reason are correct but reason is not correct explanation for assertion.

C. If assertion is correct but reason is incorrect.

D. If assertion and reason are both incorrect.

Answer: C

Watch Video Solution

100. Assertion : Carboxylic acids are stronger acids than phenols.

Reason : There is a greater dispersal of negative charge on the carboxylate ion than on the phenate ion.

A. If both assertion and reason are correct and reason is correct explanation for assertion.

B. If both assertion and reason are correct but reason is not correct explanation for assertion.

C. If assertion is correct but reason is incorrect.

D. If assertion and reason are both incorrect.

Answer: A

Watch Video Solution

101. Assertion : Although fluorine is more electronegative than chlorine, p-chlorobenzoic acid is a stronger acid than p-fluorobenzoic acid.

Reason : Due to mathcing size of 2p-orbitals of F and C, F has stronger +R effect than Cl.

A. If both assertion and reason are correct and reason is correct explanation for assertion.

B. If both assertion and reason are correct but reason is not correct explanation for assertion.

C. If assertion is correct but reason is incorrect.

D. If assertion and reason are both incorrect.

Answer: A

Watch Video Solution

102. Assertion : Acid amides are weakly basic in nature.

Reason : Basic character of acid amides is due to lone electron pair on nitrogen atom.

A. If both assertion and reason are correct and reason is correct explanation for assertion.

B. If both assertion and reason are correct but reason is not correct explanation for assertion.

C. If assertion is correct but reason is incorrect.

D. If assertion and reason are both incorrect.

Answer: B

Watch Video Solution

103. Assertion: The pK_a of acetic acid is lower than that of phenol.

Reason : Phenoxide ion is more resonance sabilised.

A. If both assertion and reason are correct and reason is correct explanation for assertion.

B. If both assertion and reason are correct but reason is not correct explanation for assertion.

C. If assertion is correct but reason is incorrect.

D. If assertion and reason are both incorrect.

Answer: C

Watch Video Solution

104. Assertion: Formic acid reduces mercuric chloride to mercurous chloride on heating , while acetic acid does not.

Reason : Formic acid is stronger acid than acetic acid.

A. If both assertion and reason are correct and reason is correct explanation for assertion.

B. If both assertion and reason are correct but reason is not correct explanation for assertion.

C. If assertion is correct but reason is incorrect.

D. If assertion and reason are both incorrect.

Answer: B

Watch Video Solution

105. Assertion : Phenol and benzoic acid can be distinguished by $NaHCO_3$.

Reason : Benzoic acid is a stronger acid than phenol.

A. If both assertion and reason are correct and reason is correct explanation for assertion.

B. If both assertion and reason are correct but reason is not correct explanation for assertion.

C. If assertion is correct but reason is incorrect.

D. If assertion and reason are both incorrect.

Answer: B

Watch Video Solution

106. Assertion : Carboxylic acids of lower molecular mass are water soluble.

Reason : Carboxylic acids of lower molecular mass are hydrogen bonded with molecules of water.

A. If both assertion and reason are correct and reason is correct explanation for assertion.

B. If both assertion and reason are correct but reason is not correct explanation for assertion.

C. If assertion is correct but reason is incorrect.

D. If assertion and reason are both incorrect.

Answer: A

Watch Video Solution

107. Assertion: Formic acid reduces mercuric chloride to mercurous chloride on heating , while acetic acid does not.

Reason : Formic acid is stronger acid than acetic acid.

A. If both assertion and reason are correct and reason is correct explanation for assertion.

B. If both assertion and reason are correct but reason is not correct explanation for assertion.

C. If assertion is correct but reason is incorrect.

D. If assertion and reason are both incorrect.

Answer: B

Watch Video Solution

108. Assertion : Carboxylic acids contain a carbonyl group but donot give the characteristic reactions of the group.

Reason : The electrophilicity of the carbon atom is more in carboxylic acids than in aldehydes and ketones.

A. If both assertion and reason are correct and reason is correct explanation for assertion.

B. If both assertion and reason are correct but reason is not correct explanation for assertion.

C. If assertion is correct but reason is incorrect.

D. If assertion and reason are both incorrect.

Answer: C

Watch Video Solution

109. Assertion : Oxidation of toluene as well as ethyl benzene with $KMnO_4$ gives benzoic acid.

Reason : Both toluene and ethyl benzene are more reactive than benzene towards electrophilic substitution reactions.

A. If both assertion and reason are correct and reason is correct explanation for assertion.

B. If both assertion and reason are correct but reason is not correct explanation for assertion.

C. If assertion is correct but reason is incorrect.

D. If assertion and reason are both incorrect.

Answer: C

Watch Video Solution

110. Assertion : $(CH_3)_3CCOOH$ does not give HVZ reaction.

Reason : $(CH_3)_3CCOOH$ does not have any α-hydrogen atom.

A. If both assertion and reason are correct and reason is correct explanation for assertion.

B. If both assertion and reason are correct but reason is not correct explanation for assertion.

C. If assertion is correct but reason is incorrect.

D. If assertion and reason are both incorrect.

Answer: A

Watch Video Solution

111. Assertion: Formic acid reduces mercuric chloride to mercurous chloride on heating , while acetic acid does not.

Reason : Formic acid is stronger acid than acetic acid.

A. If both assertion and reason are correct and reason is correct explanation for assertion.

B. If both assertion and reason are correct but reason is not correct explanation for assertion.

C. If assertion is correct but reason is incorrect.

D. If assertion and reason are both incorrect.

Answer: B

Watch Video Solution

112. Assertion : C_6H_5MgBr reacts with CO_2 and forms benzoic acid.

Reason : CO_2 acts an electrophile in the reaction.

A. If both assertion and reason are correct and reason is correct explanation for assertion.

B. If both assertion and reason are correct but reason is not correct explanation for assertion.

C. If assertion is correct but reason is incorrect.

D. If assertion and reason are both incorrect.

Answer: A

Watch Video Solution

113. Assertion : $HCOOH$ formic acid add react with H_2SO_4 to form CO.

Reason : H_2SO_4 is mild (moderate) oxidizing agent.

A. If both assertion and reason are correct and reason is correct explanation for assertion.

B. If both assertion and reason are correct but reason is not correct explanation for assertion.

C. If assertion is correct but reason is incorrect.

D. If assertion and reason are both incorrect.

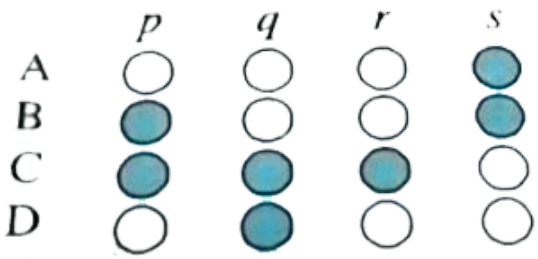
Answer: B

Watch Video Solution

Matrix Match Type Questions

1. Match the statements (A,B,C,D) in column I with the statements (p,q,r,s) is column II. The answers to the question have to be properly bubbled.

Column I (Starting reagent)	Column II (Compound formed)
(A) CH_3CN	(p) CH_3COOH
(B) CH_3MgBr	(q) $HCOOH$
(C) CH_3NC	(r) CH_3NH_2
(D) $CHCl_3$	(s) CH_3COCH_3

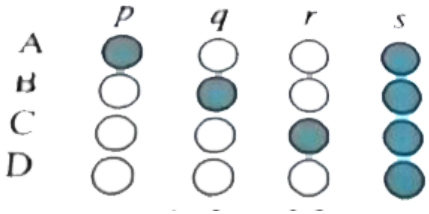


View Text Solution

View Text Solution

2.

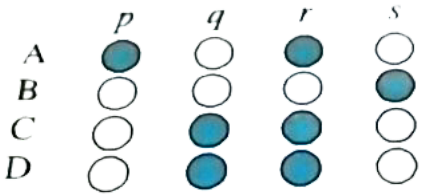
Column I	Column II
(A) $HCOOH$	(p) Silver mirror test
(B) C_6H_5COOH	(q) Sparingly water soluble
(C) CH_3COOH	(r) Vinegar
(D) C_2H_5COOH	(s) $NaHCO_3$



View Text Solution

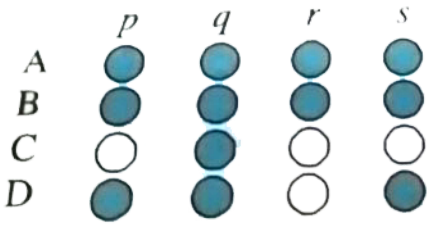
3.

Column I	Column II
(A) $HCOOH$	(p) Reducing agent
(B) C_6H_5OH	(q) HVZ reaction
(C) C_2H_5COOH	(r) $LiAlH_4$
(D) CH_3COOH	(s) Violet colour with $FeCl_3$



View Text Solution

Column I (Pairs can be distinguished by chemical tests)	Column II (Reagent used)
(A) $HCOOH + CH_3COOH$	(p) Tollen's reagent
(B) $HCOOH + C_6H_5COOH$	(q) Neutral $FeCl_3$
(C) $CH_3COOH + C_6H_5COOH$	(r) MnO_4/H^+
(D) $HCOOH + COOH.COOH$	(s) Fehling's Solution



4.

View Text Solution

Column 1	Column 2	Column 3
(I) Toluene	(i) $NaOH/Br_2$	(P) Condensation
(II) Acetophenone	(ii) $Br_2/h\nu$	(Q) Carboxylation
(III) Benzaldehyde	(iii) $(CH_3CO)_2O/CH_3COOK$	(R) Substitution
(IV) Phenol	(iv) $NaOH/CO_2$	(S) Haloform

5.

View Text Solution

Brain Storming Multiple Choice Questions Mcqs

1. Which of the following reaction will lead to enantiomeric molecules ?

A. $LiAIH_4$ reduction of acetone

B. $LiAIH_4$ reduction of benzophenone

C. $NaBH_4$ reducation of acetophenone

D. $NaBH_4$ reducation of acetone.

Answer: C

Watch Video Solution

2. The number of optical isomers of the compound $CH_3CHBrCHBrCOOH$ is

A. Zero

B. 1

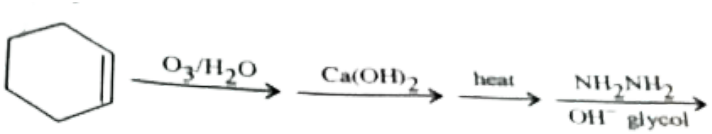
C. 3

D. 4

Answer: D

Watch Video Solution

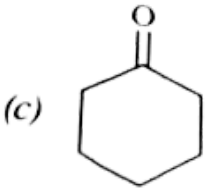
3. End product of following sequence of reaction is :



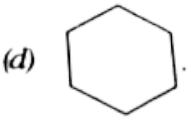
A.

B.

C.



D.



Answer: B

Watch Video Solution

4. The end product of the following reaction

$CH_3MgBr + CH_2 = CH - CHO \xrightarrow{H_3O^+}$ is :

A. $CH_2 = CH - \underset{CH_3}{\overset{OH}{\underset{|}{\overset{|}{C}}}} - H$

B. $\underset{OH}{\underset{|}{C}}\, H_2CH = CHCH_3$

C. $CH_3CH_2CH_2CHO$

D. None of these is correct.

Answer: C

Watch Video Solution

5. $CH_3CH_2CHO \xrightarrow[\text{Aldol}]{NaOH\,/\,heat} [A]$

The product [A] is :

A. $CH_3CH_2CH = CHCH_2CH_2CHO$

B. $CH_3CH_2CH = \underset{\displaystyle CH_3}{\overset{\displaystyle |}{C}}\,CHO$

C. $CH_3CH_2\underset{\displaystyle OH}{\overset{\displaystyle |}{C}}HCH_2CH_2CHO$

D. $CH_3CH_2\underset{\displaystyle OH}{\overset{\displaystyle |}{C}}H\,\underset{}{\overset{\displaystyle CH_3}{\overset{\displaystyle |}{C}}}\,HCHO$

Answer: B

Watch Video Solution

6. The end product of the following reaction

$CH \equiv CH \xrightarrow{CH_3MgBr} \xrightarrow{CO_2/H_3O^+} \xrightarrow[HgSO_4\,/\,H_2SO_4]{H_2O} \xrightarrow[\text{heat}]{Ag_2O} \xrightarrow{\text{heat}}$ is

A. $CH_3\overset{\displaystyle O}{\overset{\displaystyle ||}{C}}COOH$

B. CH_3COOH

C. $CH_3\overset{\overset{O}{||}}{C}CHO$

D. $(CH_3CO)_2O.$

Answer: B

Watch Video Solution

7. The Cannizzaro's of formaldehyde involves

A. intramolecular shift of proton

B. intramolecular shift of hydride ion

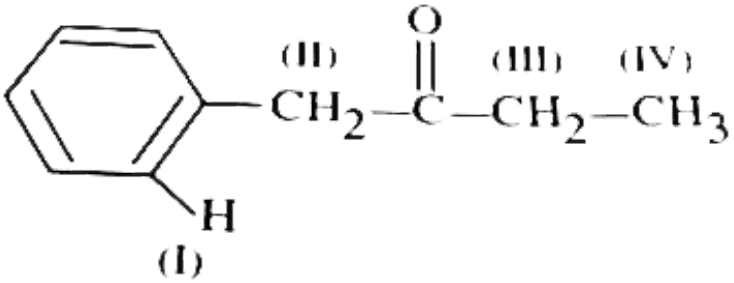
C. intermolecular shift of proton

D. intermolecular shift of hydride ion.

Answer: D

Watch Video Solution

8. Which of the following hydrogens is the most acidic ?



A. I

B. II

C. III

D. IV

Answer: B

Watch Video Solution

9. Acetone upon condensation can give :

A. mesityl oxide

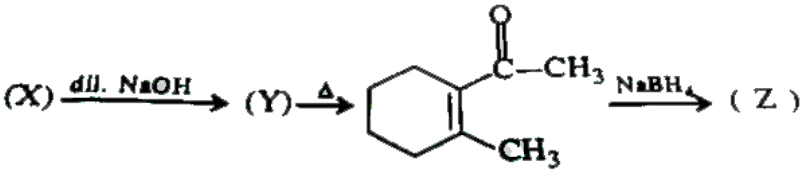
B. phorone

C. Crotonaldehyde

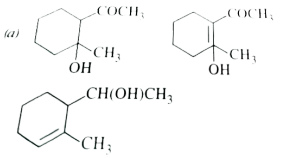
D. mesitylene

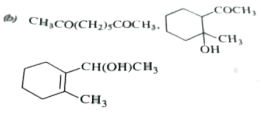
Answer: A::B::D

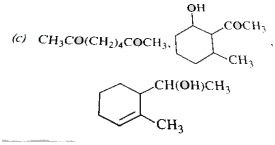
View Text Solution

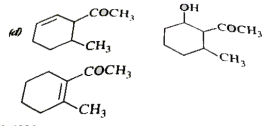
10. 

X, Y and Z in the above reaction are respectively.

A. 

B. 

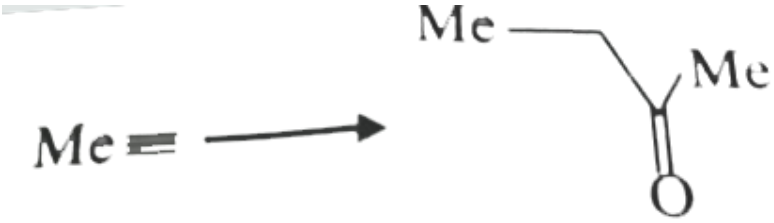
C. 

D. 

Answer: B

Watch Video Solution

11. The reagents to carry out of the following conversion are :



A. $HgSO_4$ / dil H_2SO_4

B. BH_3, H_2O_2 / $NaOH$

C. OSO_4, HIO_4

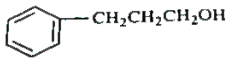
D. $NaNH_2$ / CH_3I, $HgSO_4$ / dil H_2SO_4

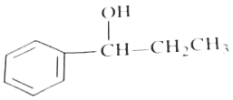
Answer: D

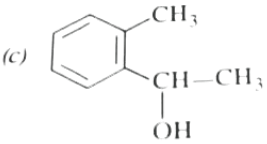
Watch Video Solution

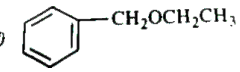
12. $PhCH_2MgBr + CH_3CH = O \rightarrow PhCH_2 - \overset{OH}{\overset{|}{C}}H - CH_3 + 'P'$

'P' is the isomer of other given product. The structure of 'P' is

A. 

B. 

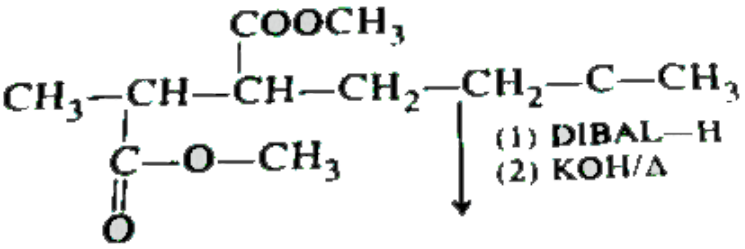
C. 

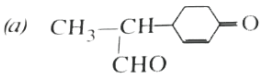
D. 

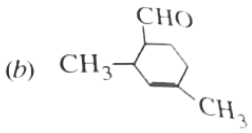
Answer: C

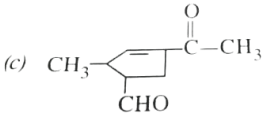
Watch Video Solution

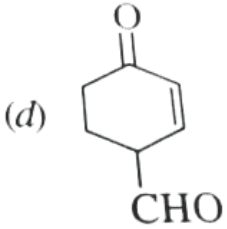
13. The final product of the given reaction is



A. 

B. 

C. 

D. 

Answer: A

Watch Video Solution