CHEMISTRY

BOOKS - S DINESH & CO CHEMISTRY (HINGLISH)

ALDEHYDES AND KETONES

Example

1. Write the structure of an isomeric aldehydes and ketones with the molecular formula $C_5H_{10}O$. Give their $IUPAC$ names.

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2. Draw the structure of the following :

(i) 3-Methylbutanal , (ii) p-Methoxybenzaldehyde , (iii) 4-Chloropentan-2-one

(iv) p,p-Dihydroxybenzophenone, (v) p-Nitropropiophenone , (vi) 4-Methylpent-3-en-2-one,

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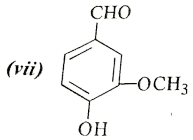
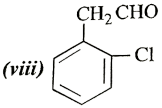
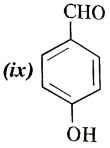
3. Give the IUPAC name of the following compounds:

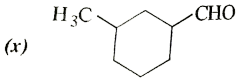
(i) $(CH_3)_2$, (ii) $CH_3COCH(CH_3)_2$, (iii) $Cl_2CHCOCH_3$

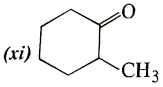
(iv) $CH_3CH(OH)CH_2CHO$, (v) $C_6H_5CH_2CHO$, (vi) $CH_2 = CHCOCH = CH_2$

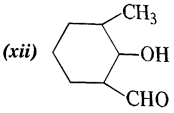


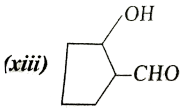


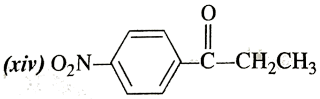












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4. Give names of the reagents to bring about the following transformations:

(i) Hexan-1-ol to hexanal

(ii) Cyclohexanol to cyclohexanone

(iii) p-Fluorotoluene to

(iv) Ethanenitrile to ethanal p-fluorobenzaldehyde

(v) Allyl alcohol to propenal

(vi) But-2-ene to ethanal

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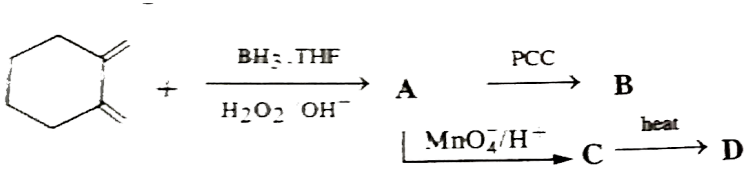
5. Complete the following



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6. How will you convert $Ph - C \equiv Ch \rightarrow Ph - \overset{\overset{O}{||}}{C} - CH_3$?

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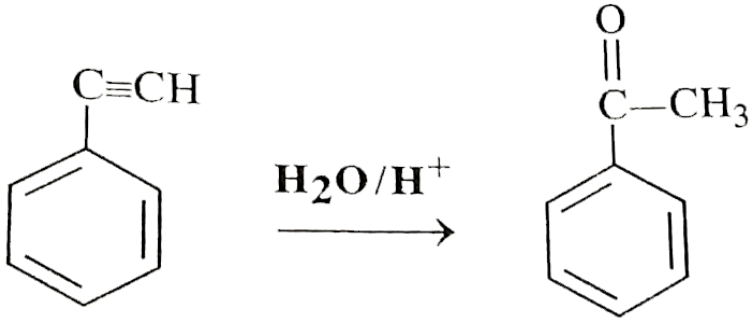
7. Complete the following conversion.



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8. You are provided with following four reagents: $I_2 / NaOH$, $NaHSO_3$, $LiAH_4$ Schiff's reagent. Write which two reagent. Write which two reagents can be used to distinguish between the compounds in each of the following pairs :

(i) CH_3CHO and CH_3COCH_3 , (ii) CH_3CHO and C_6H_5CHO

(iii) $C_6H_5COCH_3$ and $C_6H_5COC_6H_5$

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9. Write the various steps involved in the following conversion :

$$CH_3 - \underset{\underset{CH_3}{|}}{C}H - CH_2 - CH_2 - OH \rightarrow CH_3 - \underset{\underset{CH_3}{|}}{C}H - CHO$$

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10. 0.44g of a monohydric alcohol when added to CH_3MgI in ether librates at STP, 112cm^3 of methane. With PCC the same alcohol forms a carbonyl compound that answer silver mirror test. The monohydric alcohol is :

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11. Suggest a suitable way to synthesise the following with the help of aldol condensation

(i) 4-Phenylbutan-2-ol , (ii) 3-Phenylpropan-1-ol

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12. An organic compound [A] with molecular formula $C_9H_{10}O$ forms an arage-red precipitate [B] with $2, 4$ DNP reagent. Compound [A] gives yellow precipiatate [C] on heating wihth iodine in the presence of soedium hydroxide along with a colourless compound [D]. The compound [A] does not reduce Tollen's reagent or Fehling's solution nor does it decolourise bromine water or Baeyer's reagent. On drastic oxidation with chromic acid, compound [A] gives a crboxylic acid [E] having molecular formula $C_7H_6O_2$. Deduce the strcutres of the organic compounds [A] to [E].

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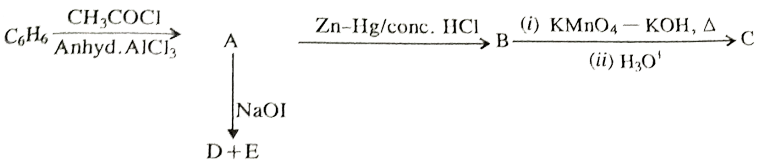
13. Write the structure of A, B, C, D and E in the following reactions :



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14. An organic compound (A) with molecular formula C_8H_8O forms an orange-red precipitate with 2,4-DNP reagent and gives yellow precipitate on heating with iodine in the presence of sodium hydroxide. It neither reduces Tollensâ€™ or Fehlingsâ€™ reagent, nor does it decolourise bromine water or Baeyerâ€™s reagent. On drastic oxidation with chromic acid, it gives a carboxylic acid (B) having molecular formula $C_7H_6O_2$. Identify the compounds (A) and (B) and explain the reactions involved.

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Problem

1. An alkane A on ozobolysis yields acetone and an aldeyde. The aldehyde is easily oxidised to an acid B. When B is treated with bromine in presence of yields a compound C which on hydrolysis gives a hydroxyle acid D. This acid can also be obatined from acetone by the reaction with hydrogen cyanide followed by hydrolysis. Identify the compounds A, B C and D.

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2. An organic compound $'A'(C_4H_{10}O)$ is optically active. On mild oxidation, it gives a compound $'B'(C_4H_8O)$ but upon vigorous oxidation, it gives another compound $'C'(C_3H_6O_2)$. The compound $'C'$ along with $'D'$ are also formed from $'B'$ by reacting with iodine in the presence of alkali. Deduce the structures of $'A'$, $'B'$, $'C'$ and $'D'$.

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3. A compound [A] with molecular formula $C_5H_{10}O$ gave a positive $2,4$-D.N.P. Test but a negtive Tollen's test. It was oxidised to carboxylic acid [B]

with molecular formula $C_3H_6O_2$ when treated with alkaline $KMnO_4$ under vigorous conditions. Sodium salt of [B] gave a hydrocarbon [C] on Kolbe's electrolyte reaction. Identify [A],[B] and [C] and write the chemical equations for the reactions.

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4. A compound [A] of molecular formula C_4H_9Br yields a compound [B] of molecular formula $C_4H_{10}O$ when reated with aqueous $NaOH$. On oxidation [B] gives a ketone [C]. The vigorous oxidation of ketone gives ethanoic acid. Dutuce the structure of A, B and C.

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5. A ketone A, which undergoes halform reaction, gives compound B on reduction B on heating with sulphuric acid gives compounds C, which forms mono-ozonide D.D on hydrolysis in the presence of zinc dust gives only acetaldehyde. Identify A, B and C. Write down the reaction involved.

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6. An organic compound [A] with molecular formula C_4H_8O when reduced with $NaBH_4$ gives compound [B] which reacts with HBr to form compound [C] (optically active) Identify A,B , C and wirte the two enantimoers of compound [C].

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7. Hydrocarbon (X), C_7H_{12}, on reaction with boron hydride followed by treatment with CH_3COOH yields (A). On reductive ozonolysis (A) yields a mixture of two aldehydes, (B) and (C). Of these, only (B) can undergo Cannizzaro reaction. (A) exists in two geometrical isomer, $(A-1)$ and $(A-2)$, of which $(A-2)$ is more stable. Gives structures of (X), (A), (B), (C), $(A-1)$, and $(A-2)$ with proper reasoning.

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8. An alkane (A) $C_{16}H_{16}$ on ozonolysisi gives only one products (B) C_8H_8O. Compound (B) or reaction with $NaOH/I_2$ yields sodium benzoate. Comopund (B) reacts with KOH/NH_2NH_2 yielding a hydrogen (C) $C_8H(10)$. Write the structures of compounds (B) and (C). Based on this infromation two their structures and identify the isomer which on catalytic hydrpgenation $(H_2/Pd-C)$ gives a racemic mixture.

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9. An organic compound $[A]$ C_8H_6 on reacting with dilute sulphuric acid containing mercuric sulphate gives a compound $[B]$ which can also be obtained from a reaction of benzene with acid chloride in the presence of anhydrous $AlCl_3$. The compound $[B]$ when treated with iodine and aqueous $NaOH$ yields $[C]$ and a yellow compound $[D]$. Identify $[A]$, $[B]$, $[C]$ and $[D]$ with justification. Show how $[B]$ is formed from $[A]$.

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10. An unknown aldehyde [A] on reacting with alkali gives β-hydroxyaldehyde which loses water to form an unsaturated but-2-enal. Another aldehyde [B] undergoes disproportionation reaction in the presence of conc. Alkali to form products [C] and [D]. The compound [C] is an aryl alcohol with formula C_7H_8O.

(i) Identify [A] to [B]. , (ii) Write the sequence of reactions involved.

(iii) Name the proucts when , [B] reacts with zinc amalgam and hydrochloric acid.

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11. An organic compound [A] with molecular formula $C_5H_8O_2$ is reduced to n-pentane on treatment with $Zn - Hg/HCl$. The compound [A] forms a dioxine with hydroxyl amine and give a positive iodoform test and Tollen's test. Identify the compound [A] and deduce its structure?

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12. An organic compoud [A] which has characteristic odour on treatment with $NaOH$ forms two compounds [B] and [C]. Compounds [B] has the molecule formula C_7H_8O. Which on oxidation gives back compound [A]- The compound [C] is the sodium salt of an acid [C]. When [C] is heated with sodalime, it yield an aromatic hydrocarbon [D]. Deduce the structures of [A], [B], [C] and [D].

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13. An organic compound 'A' (molecular formula $C_4H_{10}O$) reacts vigorusly with acetyl chloride wand responds to iodoform test. When passed over heated alumina, 'A' is converted into another compound 'B' (C_4H_8) which upon ozonolysis gives only an aldehyde. Identify 'A' and 'B' with reactions.

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14. An aldehyde (A) $(C_{11}H_8O)$, which does not undergo self aldol condensation, gives benzaldehyde and 2 mol of (B) on ozonolysis.

Compound (B) on oxidation with silver ion gives oxalic acid. Identify the compounds (A) and (B).

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15. (A), (B) and (C) are three non-cylic funtional isomers of a carbonyl compound with molecular formula C_4H_8O. Isomers (A) and (C) give positive Tollen's test whereas isomer (B) does not give Tollens' test but gives positive iodoform test. Isomers (A) and (B) on reduction with $Zn(Mg)$ | conc. HCl give the same product (D).

(a) Write the structures of (A), (B) ,(C) and (D).

(b) Out of (A), (B) and (C) isomers, which one is least reactive towards addition of HCN ?

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Additional Important Question

1. Carbonyl compounds are more polar than alcohols although electronegative difference between C and O atoms is less than O and H atoms. Explain.

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2. Dialkyl cadmium is used to prepare ketones from acid chlorides and not from Grignard reagents. Assign reason.

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3. In the preparation of aldehydes from primary alcohols, aldehydes formed must be distilled as soon as they are formed. Why ?

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4. Boiling points of carbonyl compounds lie between the parent alkanes and correponding alcohols. Justify.

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5. Give reasons in one or two sentances for the following: 'Hydrazones of aldehydes and ketones are not prepared in highly acidic medium'.

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6. Iodoform is prepared by reacting acetone with hypoiodite and not with iodine. How will you account for it ?

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7. Halogen acids readily combine with alkenes to form addition products but fail to react with carbonyl compounds. Discuss

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8. Why does pure HCN fail to react with aldehydes and ketones ?

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9. Sodium bisulphite is used to purify aldehydes and ketones. Explain.

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10. Out of benzaldehyde and propionaldehyde, which is mre reactive towards nucelophilic addition?

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11. Boiling points of ketones are higher than those of the isomeric aldehydes. Assign reason.

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12. Chloral hydrate is a gem-diol but still stable. How will you account for it ?

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13. Ketones are less reactive than aldehydes in the nucleophilic addition reactions. Justify .

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14. Why does not formaldehyde take part in aldol condensation?

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15. Why is it necessary to control the pH during the reaction of aldehydes and ketones with ammonia derivatives?

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16. Benzophenone does not react with $NaHSO_3$. Explain.

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17. Why does formaldehyde undergo Cannizzaro's reaction while acetaldehyde gives aldol condensation?

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18. How wil you convert an alkene into an aldehyde containing one carboon atom more?

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19. Outline the synthesis of $PhCH_2CH_2CHO$ from benzene, ethylene oxide and an inorganic salt.

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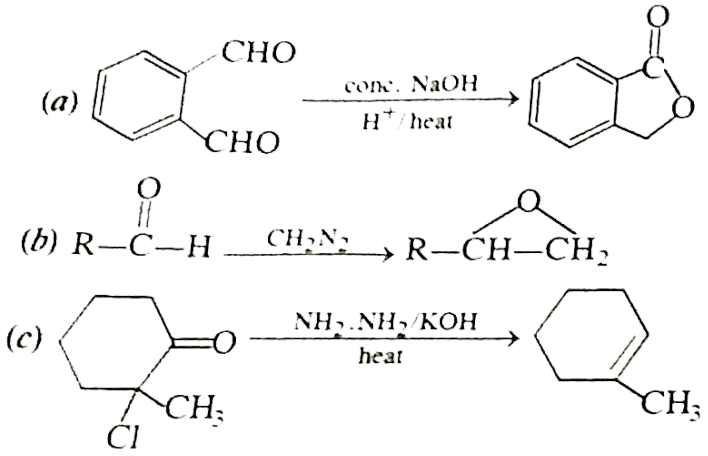
20. How will you bring about the following changes :



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21. Arrange the following in the order of their incresing reactivity towards HCN:

$CH_3CHO, CH_3COCH_3, HCHO, C_2H_5COCH_3$

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22. Arrange the following compounds in order of increasing reactivity towards HCN :

Acetaldehyde, Acetone, Di-tertiary butyl ketone, Methyl tertiary butyl ketone.

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23. Name two reagents which can be used to convert $> C = O$ to $> CH_2$ group.

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24. Which alkene upon reductive ozonolysis will give acetone as the product?

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25. Upon ozonolysis, molecule of a hydrcarbon produces of ethanal and one molecule of ethane dial. Identify the hydrocarbon.

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26. Why a benzaldehyde less reactive than acetaldehyde towards nucleophilic addition reactions?

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27. Formaldehyde gives Cannizzaro's reaction while acetaldehyde does not. Why ?

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28. What happens when ethanal is treated with methyl magnesium iodide followed by hydrolysis?

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29. Identify the compounds [E] to [J] in the following reactions.

$$[E] \xrightarrow{LiAH_4 / \text{ether}} [F] + [G]$$

$$[F] \xrightarrow{\text{PCC}} [H]$$

$$[H] \xrightarrow{NaOH\,(conc.)} [I] + [F]$$

$$[I] \xrightarrow{[J]} (C_6H_5CO_2)O$$

$$[G] \xrightarrow[NaOH]{[J]} C_6H_5COOC_6H_5$$

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30. Name the reagent by which most aldehydes can be made to undergo Cannizzaro's type reaction. Give the relevant equation also.

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31. Which of the following will not give the iodoform test?

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32. Acetone forms bisulphite compound when heated with sodium bisulphate whears di-tertiary butyl ketone fails to do so. Explain.

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33. The reactions of hydroxylamine with a symmetrical ketone $(R_2C = O)$ froms only one oxmie. However two isomeric oximes may be formed when an aldehyde or non-symmetical ketone takes part in the reaction. Explain.

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34. Compare th relative acidic strengths of hydroxyl amine and am oxime.

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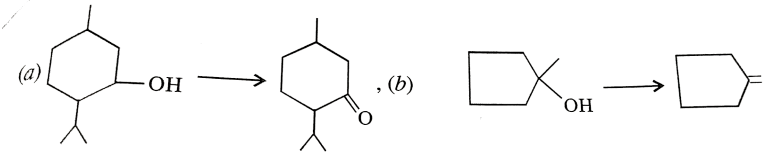
35. Suggest the suitable reagens for the following conversions:



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Question From Board

1. What happens when ethylbenzene is heated with acidified $K_2Cr_2O_7$?

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2. Why are aldehydes more reavtice than ketones towards nucleophilic addition reactions ?

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3. Convert acetone to teriary butyl alcohol?

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4. What is Tollen's reagent?

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5. How are formalin and trioxane related to methanal?

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6. Write chemical equation to illustrate Rosenmund's reduction.

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7. How will you perpare ethlamine from acetaldehyde ?

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8. How will you convert ethanol to propanone ?

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9. Give a chemical test to distinguish between benzaldehyde and acetone.

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10. Give a chemical test to distinguish between methanol and ethanol.

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11. Write IUPAC name of the compound $CH_3 - \underset{\underset{CH_3}{|}}{CH} - CO - \underset{\underset{CH_3}{|}}{CH} - CH_3$

.

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

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13. How will you convert acetaldehyde into methane?

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14. Write IUPAC name of the compound : $CH_3COCH_2COCH_3$.

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15. Write the chemical equation for each of the following reactions :

(i) Rosenmud's reduction (ii) Cannizzaro's reaction.

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16. How will you convert ethanol to propanone ?

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17. Complete the following :

(i) $CH_3COCH_3 + HI \xrightarrow{\text{Red}P\,/\,423K}$

(ii) $CH_2 = CH_2 + PdCl_2 + H_2O \xrightarrow{CaCl_2}$

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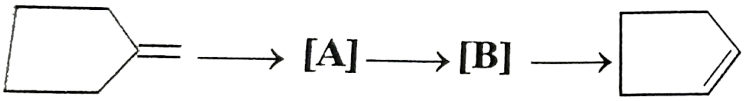
18. Complete the following with appropriate reagents



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19. How many asymmetric carbon atoms are created during the complete reduction of benzil $(PhCOCOPh)$ with $LiAlH_4$? Also wrie the number of possible stereoisomers formed as the product.

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20. Complete the following

(i) $3(CH_3)_2C = O \xrightarrow{[A]}$

(ii) $CH_3COCl + H_2 \xrightarrow{[B]}$

(iii) $[C] \xrightarrow[C_2H_5Ona]{NH_2/NH_2} CH_3CH_2CH_3$

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21. How will convert 2-Methyllpent-2-enal to

(a) 2-Methypentane , (b) 2-Methylpentanal?

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22. Name the reagent that can be used to convert

(i) A primary alcohol to an aldehyde

(ii) Butan-2-one to butan -2-ol.

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23. Why are lower members of aldehydes easily miscrible with water?

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24. Give a test to distinguish between proponal and propanone.

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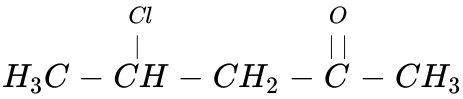
25. Write the IUPAC name of the following compound :



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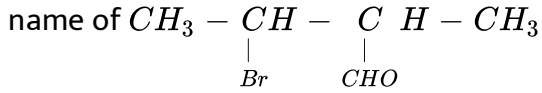
26. Write IUPAC name of 

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27. What happens when methanal is treated with methyl megnesium bromide and then hydrolysed?

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28. Complete the following

(i) $CH_3 - \underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}} - OH \xrightarrow[H_2SO_4]{\text{heat}} ? \xrightarrow[(\text{Ozonolysis})]{O_3} \xrightarrow{H_2, Ni} ?$

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29. Give the structure of 3-Oxopentanal.

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30. How will you prepare benzaldehyde from toluene?

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31. Write the structural formula of 1-Phenlpentan-1-one.

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32. Write the chemical equation for each of the following reactions :

(i) Rosenmud's reduction (ii) Cannizzaro's reaction.

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33. How will you convert cyclohexanol to cyclohexanone?

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34. Give IUPAC name of the organic compound : $(CH_3)_2 = CH - \overset{\overset{O}{||}}{C} - CH_3.$

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35. Write the chemical equations for the following conversions (in not more than 2 steps)

(i) Acetaldehyde to butane-1,3-diol , (ii)Acetone to propene

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36. Complete the following reactions by identifying A,B and C.

(i) $A + H_2(g) \xrightarrow{Pb/BaSO_4} (CH_3)_2CHCHO$

(ii) $CH_3 - \underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}} - \underset{\underset{O}{||}}{C} - CH_3 + NaOI \rightarrow B + C$

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37. How would you prepare but-2-enal from ethanol?

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38. Draw structure of 4-Chloropentanal.

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39. Give a simple test to distinguish between :

(i) Pentan-2-one and Pentan-3-one. , (ii) Benzaldehyde and acetophenone.

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

(i) Propane-1-ol to propanal.

(ii) Pent-3-en-2-ol to pen-3-en-2-one.

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41. How wil l you convert ethyl cyanide to 1- phenylpropanone?

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42. 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.

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43. Give a simple test to distinguish between :

(i) Pentan-2-one and Pentan-3-one. , (ii) Benzaldehyde and acetophenone.

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44. Illustrate Cross-aldol condensation with a suitable example.

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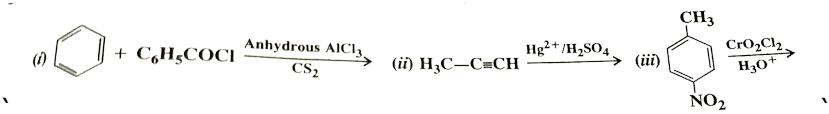
45. Write the structures of the main products of the following reactions.



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46. Write the IUPAC name of

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

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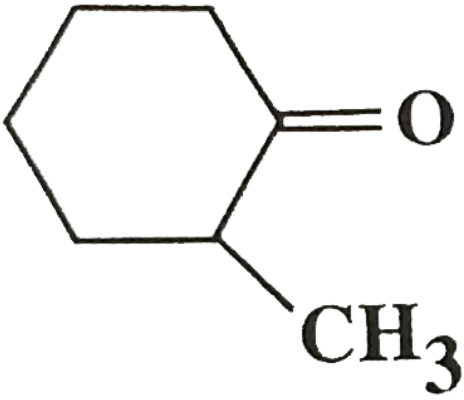
47. Write the IUPAC name of the following

(i) $(CH_3)_2CHCHO$, (ii)

(ii) 

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48. Complete the following

$2CH_3CHO \xrightarrow{\text{Dil NaOH}} A \xrightarrow[-H_2O]{\text{heat}} B.$

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49. What happens when :

(i) Acetaldehyde reacts with NH_2OH , (ii) Acetone reacts with $NH_2 - NH_2$.

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

$CH_3CHO, CH_3CH_2OH, CH_3OCH_3, CH_3CH_2CH_3$

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51. How will you convert propanone to propan-2-ol?

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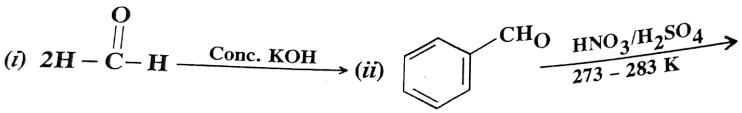
52. Complete the following reactions :



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53. Why is acetaldehyde more reactive than acetone towards nucleophilic addition reactions ?

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54. $(CH_3)_3C - CHO$ does not undergo aldol condensation due to

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55. Write chemical equation to illustrate the following reactions:

(i) Wolff Kishner reduction , (ii) Aldol condensation

(iii) Cannizzaro reaction.

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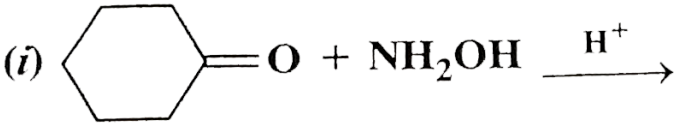
56. Write the products of the following reactions:

(i) 

(ii) $2C_6H_5CHO + NaOH(\text{conc.}) \rightarrow$

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57. Write the IUPAC name of $CH_3 - \underset{\underset{NH_2}{|}}{C}H - CH_2 - CHO.$

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58. Out of $CH_3CH_2COCH_2CH_3$ and $CH_3CH_2CH_2COCH_3$ which gives iodoform test ?

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59. How will you convert benzoyl chloride into benzaldehyde?

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60. Complete the following reactions

(i) $CH_3 - \overset{\overset{O}{||}}{C} - CH_3 \xrightarrow[\text{ether(dry)}]{CH_3MgBr} A \xrightarrow{H_3O^+} B$ (ii)

$CH_3 - CH_2 - CH_2 - CHO \xrightarrow{Ni\,/\,H_2} A$

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61. An organic compound [A], whose molecular formula is C_3H_6O, gives iodoform reaction and forms compound [B]. Compound [B], when heated with silver powder, converts into compound [C}. Compound [C] reacts with dil. Sulphuric acid and mercuric sulphate to obtain compound [D], which gives Aldol condensation reaction. Write down the names of all compounds from [A] to [D] and also write the chemical equations for each step.

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62. How will you convert propanone to propene ?

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63. Predict the product of reaction ?

$$CH_3 - \underset{\underset{CH_3}{|}}{C} = O \xrightarrow{\text{HCN}} ?$$

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64. Write the structures of the main products when CH_3CH_2CHO reacts with the following reagents :

(i) $Zn - Hg/\text{Conc. } HCl$, (ii) $H_2N - OH/H^+$, (iii)HCN

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65. Distinguish between the following :

(i) $CH_3 - CO - CH_2CH_3$ and $CH_3 - CH_2 - CH_2 - CHO$

(ii) Ethanal and ethanoic acid.

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

$$C_6H_5COCl \xrightarrow{H_2 / Pd - BaSO_4} [A] \xrightarrow{\text{NaOH(conc.)}} B + C \xrightarrow{CH_3MgBr / H_3O^+} [D]$$

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67. (a) Write the reagent used in the following :

$$C_6H_5COCH_3 \xrightarrow{?} C_6H_5CH_{12}CH_3$$

(b) Arrange the following compounds in increasing order of reactivity towards nucleophilic addition.

$CH_3CHO, C_6H_5CHO, HCHO$

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68. Predict the product of the folllowing reaction :

$$CH_3 - \underset{\underset{CH_3}{|}}{C} = O \xrightarrow{H_2N.NHCOOCH_2} ?$$

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69. How can aromatic aldehydes and ketones be prepared by the following reaction ?

(i) Reimer-Tiemann reaction , (ii) Friedal Craft reaction , (iii) Etard reaction.

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70. Explain the structure of carbonyl group.

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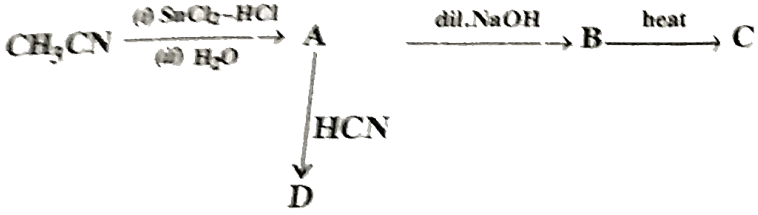
71. Write the structures of A, B, C and D in the following reactions :



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72. Write the product of the following reaction.

$$CH_3CH_2CH = CHCH_2CN \xrightarrow[(ii)\ H_2O]{(i)\ (\text{di-isobutyl})_2AlH}$$

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73. A and B are functional isomers of compound C_3H_6O. On heating with $NaOH$ and I_2 isomer A froms yellow percipitate of iodoform whereas isomer B does not form any precipitate. Write the formulae of A and B.

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74. Draw the structure of semicarbozide of ethanal.

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75. Why are α-hydrogen atom of aldehydes and ketones acidic in nature?

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76. Oxidation of aldehydes is easier than that of ketones. Explain.

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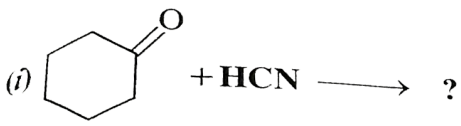
77. Write the products of the following reactions :

(i) 

(ii) $CH_3 - CH = CH - CN \xrightarrow[(b)\, H_2O]{(a)\, DiBAL - H} ?$

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78. Give simple chemical tests to distinguish between Butanal and butan-2-one.

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79. Write the reactions involved in the following :

(i) Etard reaction , (ii) Stephen's reduction

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80. Give the mechanism of cyanohydrin formation when carbonyl compounds react with HCN in the presence of alkali.

(b) Why CH_3CHO is more reactive than CH_3COCH_3 towards reaction with HCN?

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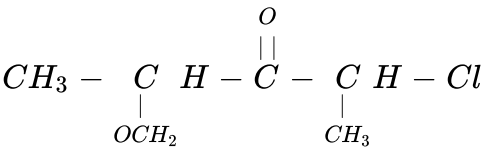
81. Write the IUPAC name of the following compound



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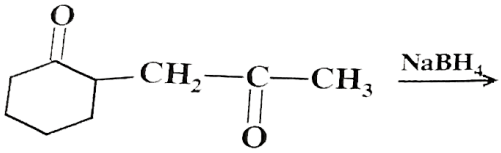
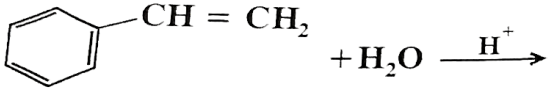
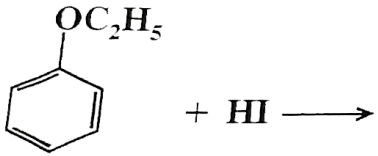
82. Write the structure of the main products of the following reactions :

(i) 

(ii) 

(iii) 

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83. Write the structures of the cross-aldol products between ethanal and propanal.

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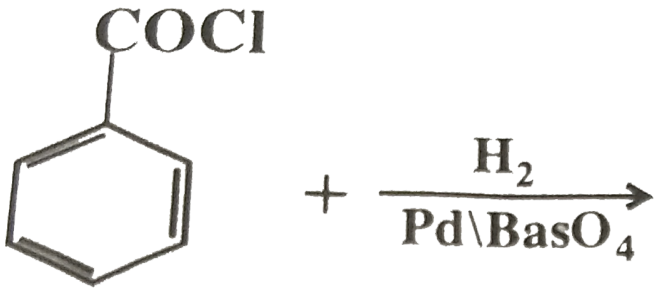
84. Identify the reactiona nd write the IUPAC name of the product formed.



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85. Ethanal gives Aldol condensation. Give reason.

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86. Name the oxidising agent in Etard's reaction.

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Higher Order Thinking Skills

1. A compound 'X' (C_2H_4O) on oxidation gives 'Y' $(C_2H_4O_2)$. The compound 'X' undergoes haloform reaction. Write the structure of 'X' and 'Y'. Name the product when 'X' is treated with $NaOH$.

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2. One mole of symmetrical alkene upon ozonolysis gives two moles of an aldehyde having the molecular mass $44u$. Predict the alkene.

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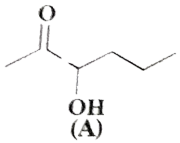
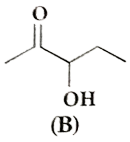
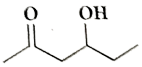
3. Out of the following compounds, which will be dehydrated most readily?



(A)



(B)



(C)

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4. Give the structure of the compounds in the following reactions

$$CH_2 = CH - CH_2OH \xrightarrow[CH_2Cl_2]{CrO_3.2C_5H_5N} [A] \xrightarrow[H^+]{CH_3OH} \underset{C_5H_{10}O_2}{[B]} \xrightarrow[(\text{Cold,dil})]{KMnO_4/OH^-} \underset{(C_5H_{12}O_4)}{[C]}$$

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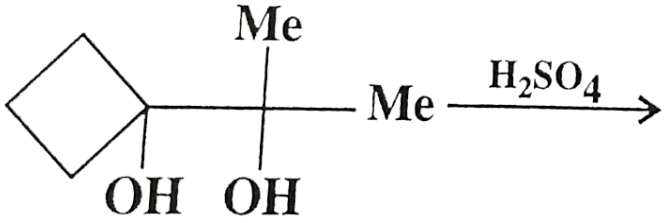
5. Complete the following



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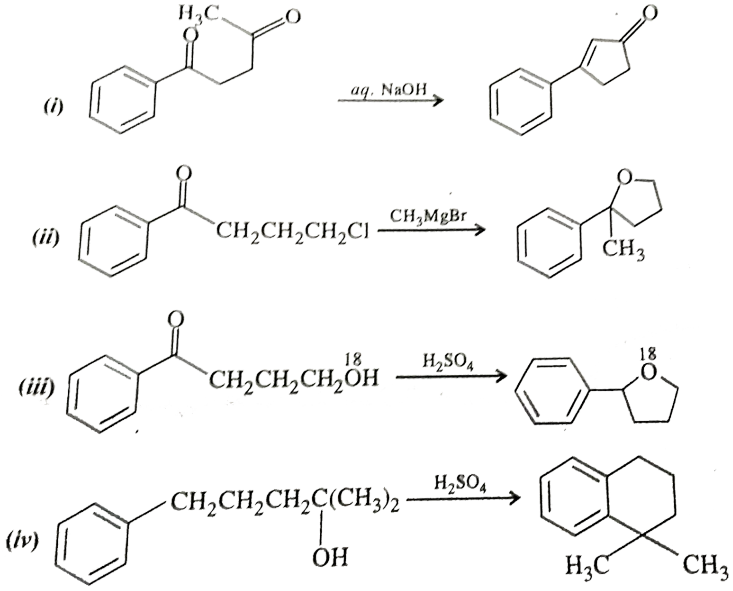
6. How will you bring about the following conversions ?



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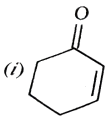
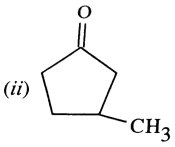
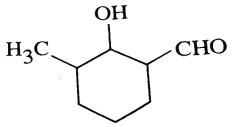
Practice Test

1. Write IUPAC names of the following compounds.

(i) 

(ii) 

(iii) 

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2. Write the following isomer of $C_5H_{10}O$ which does not have α-hydrogen.

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3. Identify the product hydration of $CH_3CH_2CH_2C \equiv CCH_3$ with $HgSO_4 / H_2SO_4$.

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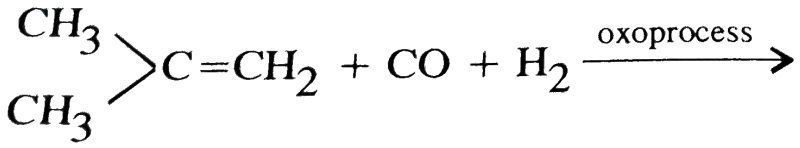
4. Complete the following reaction :



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5. Write the name of the catalyst used in Wacker Process.

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6. What is Etard's reagent?

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7. Which product do you expect when non-terminal alkynes are subjected to hydroboration-oxidation?

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Some Typical Conversions

1. Ethanal to lactic acid

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2. Acetaldehyde to acetone

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3. Ethanal to 2-hydroxybut-3-enoicacid

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4. Formaldehyde to acetaldehyde

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5. Acetaldehyde to formaldehyde

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6. Formaldehyde to n-butane

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7. Ethanol to butan-2-one

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8. Acetadehyde to crotonic acid

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9. Propanal to propyne

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10. Propyne to methyl acetate

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11. Propanone to iodoform

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12. Formaldehyde to urotropine

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13. Acetone to tertiary butyl alcohol

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14. Ethanal to propan-2-ol

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15. Methyl cyanide to ethanal

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16. Acetaldehyde to acetoxime

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17. Acetaldehyde to butan-2-one

Watch Video Solution

18. Acetaldehyde to butan-1,3 diol

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19. Acetaldehyde to butan-1-ol

Watch Video Solution

20. Acetaldehyde to but-2-enoic acid

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21. How will you convert propanone to propene ?

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22. Propanal to butanone

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23. Benzalchloride to cinnamaldehyde

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24. Propene to propanone

Watch Video Solution

25. Acetophenone to 2-phenylbutan-2-ol

Watch Video Solution

26. Benzaldehyde to benzophenone

Watch Video Solution

27. Ethanal to 3-hydroxybutanal

Watch Video Solution

28. Benzene to acetophenone

Watch Video Solution

29. Ethanol to acetone

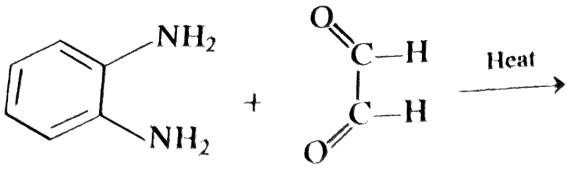
Watch Video Solution

30. Propene to propanone

Watch Video Solution

Completion Reactions

1. Complete the following reaction

(i) 

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2. $(CH_3COO)_2Ca + (HCOO)_2Ca \xrightarrow{\text{Heat}}$

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3. Predict the product :

$6HCHO + 4NH_3 \xrightarrow{\text{Heat}}$

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4. $CH_3CHO + HOCH_2CH_2OH \rightarrow$

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5. $2CCl_3CHO + Ca(OH)_2 \rightarrow$

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6. $2CH_3 - \overset{CH_3}{\underset{CH_3}{\overset{|}{\underset{|}{C}}}} - CHO + NaOH \rightarrow$

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7. $CH_3COCl + H_2 \xrightarrow[\text{Quinoline}]{Pd\,/\,BaSO_4}$

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8. $C_6H_5CHO + NH_3 \rightarrow$

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9. Complete the following reaction with appropriate structure.

$$C_6H_5 - CHO + CH_3 - COOC_2H_5 \xrightarrow[C_2H_5OH\text{and heat}]{NaOC_2H_5\text{in absolute}} \text{(A)}$$

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10. $2(CH_3)_2CO + NH_3 \rightarrow$

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11. $C_6H_5COCH_3 \xrightarrow[HCl]{Zn\,/\,Hg}$

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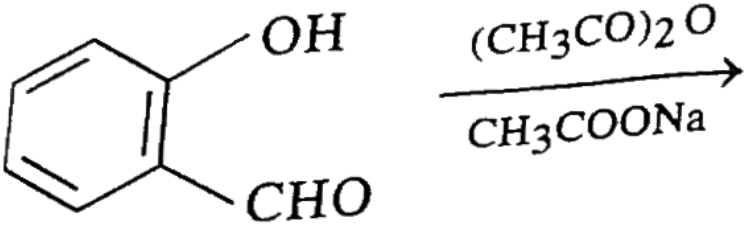
12. Complete the following reaction



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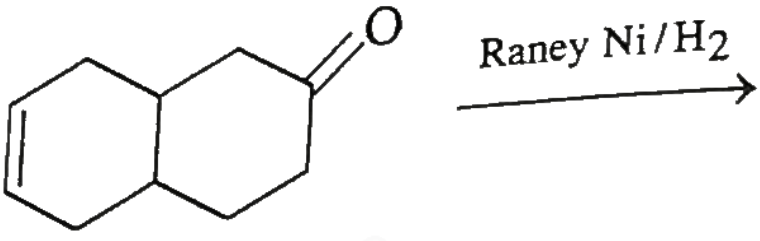
13. Complete the following reaction



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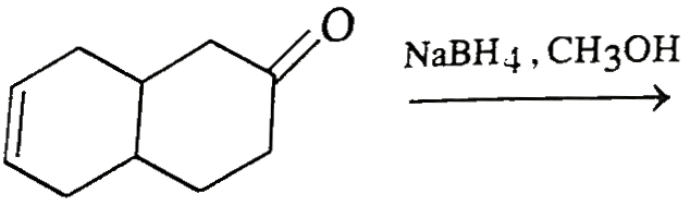
14. Complete the following reaction



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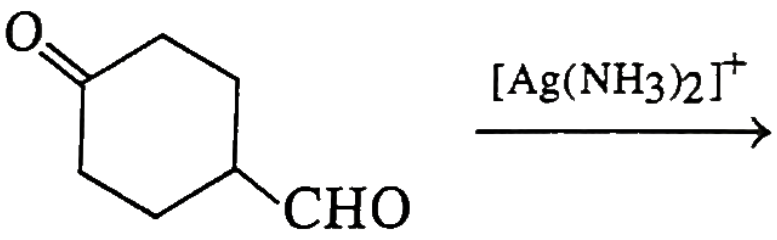
15. Complete the following reaction



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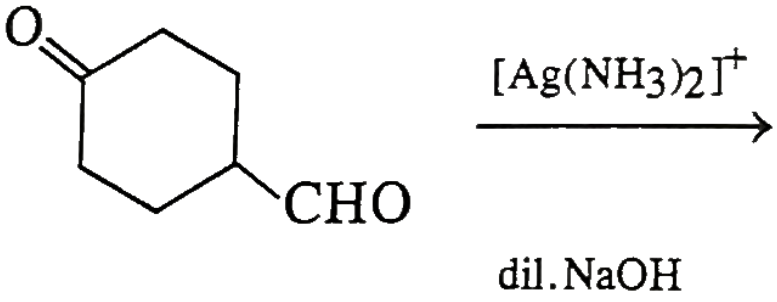
16. Complete the following reaction



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17. $C_6H_5CHO + CH_3CH_2CHO \xrightarrow{\text{dil.NaOH}}$

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Completion Of The Missing Links

1. $CH \equiv CH \xrightarrow[Hg^{2+}]{H_2SO_4\,(dil\,)} [A] \xrightarrow[H_2O\,/\,H^+]{CH_3MgBr} [B] \xrightarrow{H_2Cr_2O_7\,/\,H_2SO_4} [C]$

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2. $CH_3COCH \xrightarrow[\text{Heat}]{I_2\,/\,NaOH} [A] \xrightarrow{Ag\,/\,\text{Heat}} [B] \xrightarrow[Hg^{2+}]{H_2SO_4\,(al\,)} [C]$

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3. $(CH_3)_2 + HCN \rightarrow [A] \xrightarrow{H_3O^+} [B] \xrightarrow[\text{Heat}]{H_2SO_4} [C]$

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4. $CH_3CHO \xrightarrow{Ag_2O} [A] \xrightarrow{PCl_5} [B] \xrightarrow[Pd\,/\,BaSO_4]{H_2} [C] \xrightarrow[H_2O\,/\,H^+]{CH_3MgBr} [D]$

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5. $CH_3CH_2CH_2Br \xrightarrow{\text{KOH(alc)}} [A] \xrightarrow{Br_2} [B] \xrightarrow[NaNH_2]{\text{KOH(alc)}} [C]$

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6. $CH_3CH_2CHO \xrightarrow[H_2O]{CH_3MgBr} [A] \xrightarrow[\text{Heat}]{H_2SO_4} [B] \xrightarrow{H_2O} [C] \xrightarrow{\text{KOH(alc)}} [D]$

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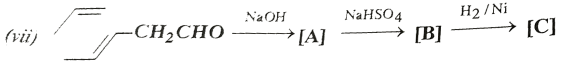
7. Complete the following reaction



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8. Complete the reaction and identify A, B, C, D

$$CH_3CHO \xrightarrow{NH_2-NH_2} [A] \xrightarrow{KOH} [B] \xrightarrow{Br_2/hv} [C] \xrightarrow{\text{KOH(alc)}} [D]$$

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9.

$$HC \equiv CH \xrightarrow{HgSO_4/H_2SO_4} [A] \xrightarrow{\text{Oxidation}} [B] \xrightarrow{PCl_5} [C] \xrightarrow[Pd/BaSO_4]{H_2} [D] \xrightarrow[H_3O^+]{CH_3MgBr} [E]$$

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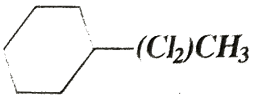
10. Complete the following reaction

(x) 

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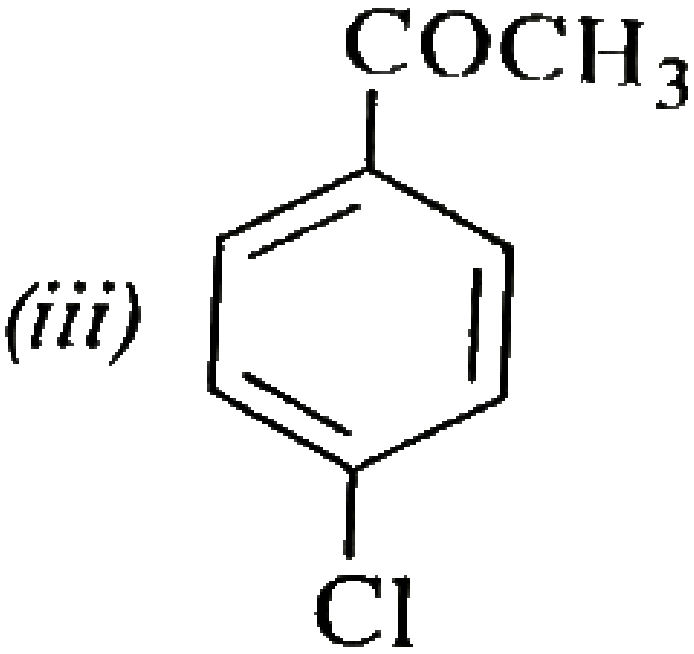
Nomenclature And Isoerism

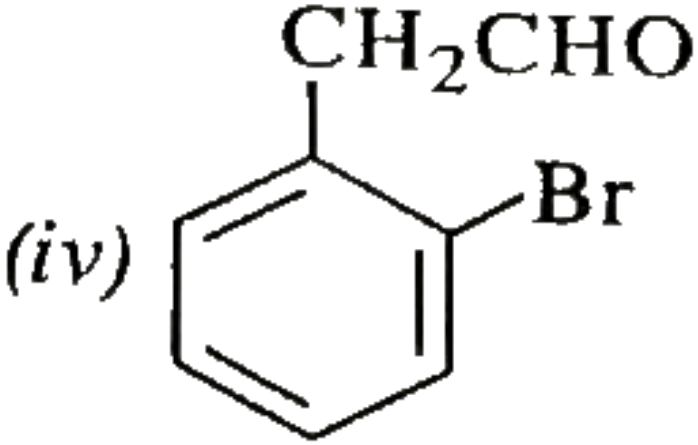
1. Write the IUPAC names of :

(i) $CH_3CH_2CH_2\underset{\underset{CH_3}{|}}{C}HCH_2CHO$

(ii) $CH_3CO\underset{C_2H_5}{C}HCH_2CH_2Cl$

(iii)



(iv) 

(iv)

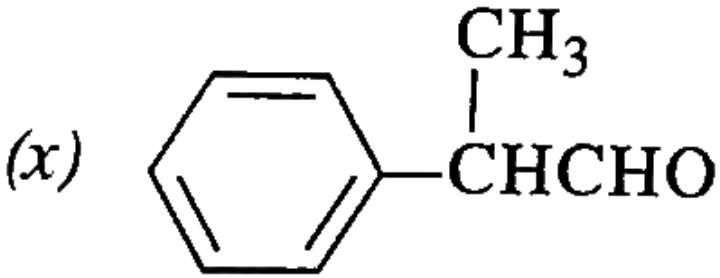
(v) $CH_3 - \underset{\underset{CH_3}{|}}{C}\,H - \overset{\overset{O}{||}}{C} - \underset{\underset{CH_3}{|}}{C}\,H - OC_2H_5$

(vi) $CH_3 - \underset{\underset{CH_3}{|}}{C}\,H - CO - \underset{\underset{CH_3}{|}}{C}\,H - CH_3$

(vii) $CH_3 - \underset{\underset{C_6H_5}{|}}{C}\,H - \overset{\overset{O}{||}}{C} - \underset{\underset{CH_3}{|}}{C}\,HOCH_2CH_3$

(viii) $CH_3 - \underset{\underset{CH_3}{|}}{C}\,H - \overset{\overset{O}{||}}{C} - \underset{\underset{CH_3}{|}}{C}\,H - Br$

(ix) $OCH.CHO$

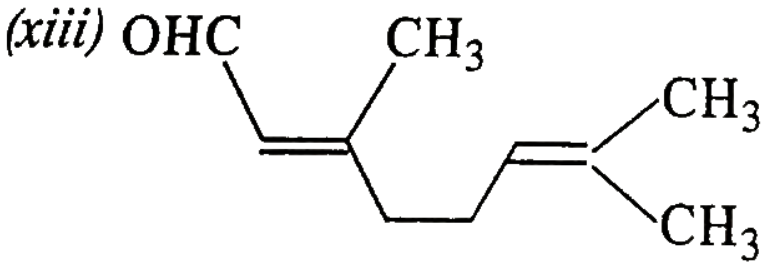
(x) 

(x)

(xi) $CH_3 - \underset{\underset{NH_2}{|}}{C}\ H - \underset{\underset{OH}{|}}{C}\ H - \underset{\underset{O}{||}}{C} - C_2H_5$

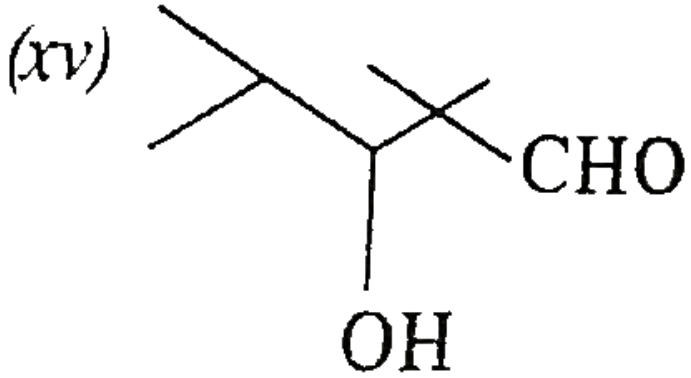
(xii) $CH_3 - CH_2 - \underset{\underset{CH_3}{|}}{CH} - CH_2CHO$

(xiii)



(xiv) $CH_3 - \underset{\underset{CH_3}{|}}{C}\ H - CH_2 - CH_2 - \underset{\underset{O}{||}}{C} - CH_2Cl$

(xv)



(xvi) $CH_3 - CH_2 - CH = CH - \overset{\overset{O}{||}}{C} - H$

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2. Write sturcutre of the following compounds :

(i) Mesityl oxide , (ii) Pinacol

(iii) Pinacolone , (iv) Acetaldol

(v) Methyl vinyl ketone

(vi) Phorone

(vii) 3-Phenylprop-2-enal

(viii) 1-Phenylpropan-1-one.

(ix) 3-Methylbutanal

(x) p-Nitropropiophenone.

(xi) p-Methyl benzaldehyde.

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3. Write chain and functional isomers of C_4H_8O.

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4. Why do aliphatic aldehydes not show chain isomerism?

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5. Write IUPAC name of the compound : $CH_3COCH_2COCH_3$.

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6. Write the IUPAC name of compound

$$(CH_3)_2C - \underset{OH}{\underset{|}{CH}} - CH_2 - \underset{CHO}{\underset{|}{CH}} - CH(CH_3)_2$$

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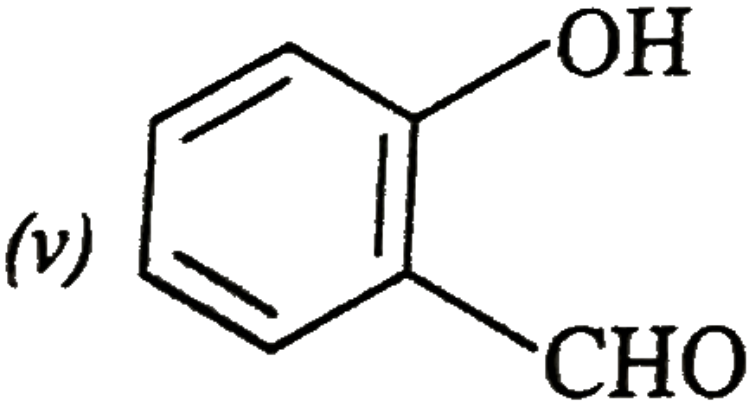
7. Write the IUPAC name of the following compounds:

(i) $CH_3 - \underset{CH_3}{\underset{|}{CH}} - CO - \underset{CH_3}{\underset{|}{CH}} - CH_3$

(ii) $CH_3COCH_2COCH_3$

(iii) $H_3C - \overset{O}{\overset{||}{C}} - CH_2 - \overset{Cl}{\overset{|}{CH}} - CH_3$

(iv) $CH_3 - \underset{\underset{OH}{|}}{CH_2} - \overset{\overset{O}{||}}{C} - CH_3$



(v)

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Preparation Of Carbonyl

1. What happens when the following are dry distilled

(i) Calcium formate

(ii) Calcium acetate and calcium formate

(iii) Calcium benzoate?

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2. Predict the products when the following are subjected to ozonolysis ?

(i) $CH_3CH = CH_2$, (ii) $CH_3CH = CHCH_3$

(iii) $(CH_3)_2$.

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3. Write the brief notes on the following

(i) Gattermann Koch reaction

(ii) Rosenmund reduction.

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4. How is toulene converted into benzaldehyde?

Watch Video Solution

5. Why is Grignard reagent not successful in the preparation of ketones from acid chlorides?

Watch Video Solution

6. How is benzaldehyde preparaed from :

(i) Toluene , (ii) Benzoic acid ?

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7. How are the following preparations carried out

(i) Benzaldehyde from benzoyl chloride

(ii) Acetophenone from benzene

(iii) Ethanal from but-2-ene

(iv) Benzaldehyde from toluene?

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8. Write the names and strcutures of the products of following reactions :

(i) Oxidation of toluene with chromium trioxide and acetic anhydride

(ii) Reductive ozonolysis of $2,3$-dimethylbut-2-ene

(iii) Heating ethane with water gas in the presence of oxocatalyst

(iv) Hydration of propyne with dilute H_2SO_4 and $HgSO_4$.

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9. Complete the following :

(i) $(CH_3COO)_2Ca \xrightarrow{\text{Heat}}$, (ii) $CH_3CH_2OH \xrightarrow{\text{Cu}/573K}$, (iii) $CH_3CHO \xrightarrow{NaOH\,(\text{dil})}$, (iv) $C_6H_5COCl \xrightarrow[Pd/BaSO_4]{H_2}$

(v) $C_6H_5COCl \xrightarrow{(CH_3)_2/Cd}$

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10. Which alkene upon reductive ozonolysis gives only one product?

(b) What is the product of reaction between ethanoyl chloride and dimethyl cadmium?

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11. Write the brief note on:

Gattermann's Koch reaction

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12. (a) Illustrate Rosenmund's readuction with an example.

(b). Give the industrial preparation of formaldehyde.

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13. Complete the following conversions?

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14. How will you carry the following conversions ?

(i) Ethyl alcohol to acetone

(ii) Benzene to acetophenone

(iii) Benzoic acid to henzaldehyde.

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15. How will you convert benzoyl chloride into benzaldehyde?

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Properties Of Carbon

1. (a) You are provided with the following four reagents $LiAlH_4$, $I_2/NaOH$, $NaHSO_3$ and Schiff's reagent. Which two reagents can be sued to distinguish between the compound in each of the following pairs:

(i) CH_3CHO and CH_3COCH_3

(ii) CH_3CHO and C_6CH_5CHO

(iii) $C_6H_5COCH_3$ and $C_6H_5COC_6H_5$

(b) Write a note on Cannizzaro reaction

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2. Complete the following

$2HCHO + NaOH \rightarrow$

$CH_3CHO + H_3 \xrightarrow{Pd/BaSO_4}$

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3. (a) Formaldehyde gives Cannizzar's reaction while acetaldehyde does not. Explain

(b) complete the follows :

(i) $C_6H_5COCH_3 \xrightarrow{Zn/Hg/HCl}$

(ii) $C_6H_5CHO \xrightarrow{NaOH}$

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4. (a) How will you convert :

(i) Benzoyl chloride to benzaldehyde

(ii) Propanone to 2-propanol ?

(b) Name the structure of the product formed when formaldehyde reacts with semicarbazide $(NH_2CONHNH_2)$.

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5. (a) What happens when propanone is heated with H_2 in the presence of Raney nickel?

(b) Give the structures of A. B and C in C in the following :

$$CH_3CHO \xrightarrow[H_2SO_7]{K_2Cr_2O_7} A \xrightarrow{PCl_5} B \xrightarrow[\text{Anhyd. } AlCl_3]{C_6H_6} C.$$

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6. (a) Convert acetone to tertiary butyl alcohol.

(b) What happens when glycerol is treated with Fenton's reagent ?

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7. Give a test to distinguish between ethanal and propanal.

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8. Formaldehyde undergoes Cannizzaro's reaction while acetaldehyde gives aldol condensation. Explain.

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9. Complete the following

$$CH_3COCH_3 + HI \xrightarrow{\text{Red}P\,/\,423K}$$

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10. Name the reagent that can be used to convert

(i) A primary alcohol to an aldehyde

(ii) Butan-2-one to butan -2-ol.

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11. Why are lower members of aldehydes easily soluble water?

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12. How will you convert propanone to tertiary butyl alcohol ?

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13. How will you distinguish between aldehydes and ketones?

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14. How will you prepare benzaldehyde from toluene?

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15. What is Tollen's reagent?

Watch Video Solution

16. WOLFF~KISHNER REDUCTION

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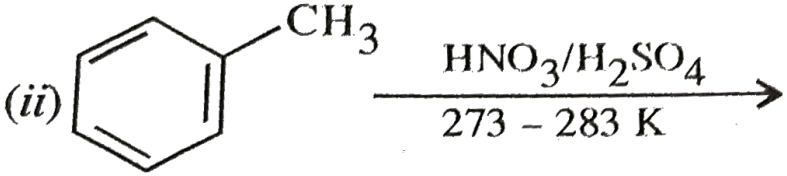
17. Complete the following reactions :

(i) $2H - \overset{\overset{O}{||}}{C} - H \xrightarrow{\text{Conc.KOH}}$

(ii) 

(ii)

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18. Why is acetaldehyde more reactive than acetone towards nucleophilic addition reactions ?

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19. $(CH_3)_3C - CHO$ does not undergo aldol condensation due to

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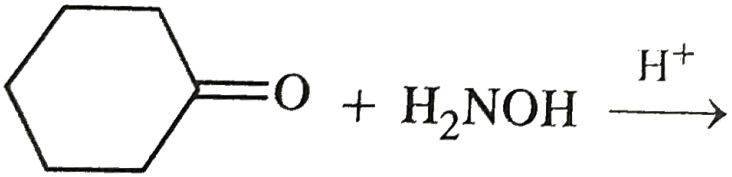
20. Complete the reaction



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21. Out of $CH_3CH_2COCH_2CH_3$ and $CH_3CH_2CH_2COCH_3$ which gives iodoform test ?

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22. Complete the following reactions

(i) $$CH_3 - \overset{\overset{O}{||}}{C} - CH_3 \xrightarrow[\text{ether(dry)}]{CH_3MgBr} A \xrightarrow{H_3O^+} B$$ (ii)

$$CH_3 - CH_2 - CH_2 - CHO \xrightarrow{Ni\,/\,H_2} A$$

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23. Write the structure of the main products when ethanal (CH_3CHO) reacts with the following regents :

(i) HCN , (ii) $NH_2 - NH_2\,/\,H^+$, (iii) $LiAlH_4$

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24. Arrange the following in order of increasing reactivity towards nucleophilic addition reactions

$C_6H_5COCH_3, CH_3CHO, CH_3COCH_3.$

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25. Discuss oxidation and reduction reactions of aldehydes and ketones.

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26. How will you distinguish between the following ?

$C_6H_5 - CH = CH - COCH_3$ and

$C_6H_5 - CH = CH - COCH_2CH_3$

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27. How will you distinguish between propanal and propanone?

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28. Write chemical equation involved in Cannizzaro's reaction.

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29. Why is acetaldehyde more reactive than acetone towards nucleophilic addition reactions ?

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30. How will you convert methanol into ethanal ?

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31. How will you convert propanone to propene ?

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32. Wrie test to distinguish

(i) Ethanol and ethanal

(ii) Propanal and propanal and propanone.

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33. (i) Explain Rosenmund reduction with equation

(ii) How does propane react with hydrazine? Give equation.

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Multiple Choice

1. The reagent which can be used to distinguish acetopheone from benzophenone is :

A. 2, 4-Dinitrophenone hydrazine

B. Benedict solution

C. Tollen's reagent

D. I_2 and Na_2CO_3.

Answer: D

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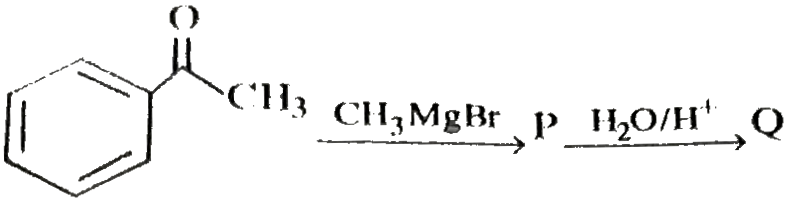
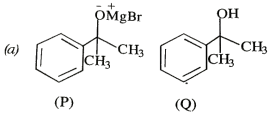
2.



In above reaction P and Q are

A.



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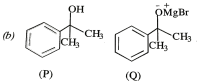
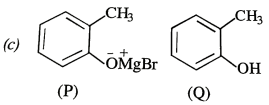
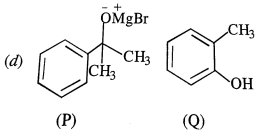


C.



D. 

Answer: A

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3. Mesitylene is prepared from :

A. CH_3CHO and conc. HNO_3

B. CH_3COCH_3 and conc. H_2SO_4

C. CH_3COCH_3 and conc. HCl

D. CH_3CHO and conc. H_2SO_4.

Answer: B

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4. $(CH_3)_2C = CHCOCH_3$ can be oxidised to $(CH_3)_2C = CHCOOH$ by

A. Chromic acid

B. $NaOI.$

C. Cu at $300^\circ C$

D. $KMnO_4.$

Answer: B

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5. The most stable among the following is :

A. $CH_3CH(OH)_2$

B. $ClCH_2CH(OH)_2$

C. $(CH_3)_2C(OH)_2$

D. $CCl_3CH(OH)_2.$

Answer: B

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6. Oppenaur oxidation is the reverse process of :

A. Wolff-Kishner reduction

B. Rosenmund's reduction

C. Clemmensen reduction

D. Meerwein-Pondorf-Verely reduction.

Answer: D

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7. In the reaction $CH_3CHO + CH_2(COOH)_2 \xrightarrow[\text{Heat}]{\text{Pyridine}} A$

The compound A is :

A. CH_3COOH

B. C_2H_5COOH

C. $CH_3CH = CHCOOH$

D. $COOHCH = CHCOOH.$

Answer: C

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8. Benzaldehyde reacts with alcoholic KCN to give :

A. $C_6H_5CH(OH)CN$

B. $C_6H_5CH(OH)COC_6H_5$

C. $C_6H_5CH(OH)COOH$

D. $C_6H_5CH(OH)CH(OH)C_6H_5$

Answer: B

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9. Which of the following will undergo aldol condensation?

A. $CH_2 = CHCHO$

B. $CH \equiv CCHO$

C. C_6H_5CHO

D. CH_3CH_2CHO?

Answer: D

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10. Which type of isomerism is shown by pentaone?

A. Chain isomerism

B. Position isomerism

C. Functional isomerism

D. All of these

Answer: D

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11. Paraldehyde is formeed by the polymerisation of:

A. CH_3CHO

B. $HCHO$

C. CH_3OH

D. $CH_3CH_2CHO.$

Answer: A

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12. Aromatic aldehydes in the presence of CN^- ion give acyloins. The reaction is known as :

A. Perkin reaction

B. Benzoin condensation

C. Clasien condensation

D. Cannizzaro's reaction

Answer: B

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13. Which of the following methods is used to convert ketone into hydrocarbon :

A. Aldol condensation

B. Reimer Tieman reaction

C. Cannizzaro reaction

D. Wolff-Kishner reduction?

Answer: D

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14. Oxidation of actaldehyde with SeO_2 form :

A. Ethanoic acid

B. Methanoic acid

C. Glyoxal

D. Oxalic acid

Answer: C

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15. During reduction of carbonyl compounds by H_2NNH_2 and KOH, the first intermediane is :

A. $PC \equiv N$

B. $RCONH_2$

C. $RCH = NH$

D. $RCH = \mathrm{NNH_2}$

Answer: D

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16. Which will not give formaldehyde on heating or upon distillation ?

A. Formalin

B. Trioxane

C. Paraldehyde

D. Paraformaldehyde?

Answer: C

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17. When ethanal is heated with Fehling's solution, it gives a precipitate of :

A. Cu

B. CuO

C. Cu_2O

D. $Cu + Cu_2O + CuO$

Answer: C

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18. Acetone on heating with conc. H_2SO_4 gives :

A. Mesitylene

B. Mesityl oxide

C. Phorone

D. Xylene.

Answer: A

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19. Which alkene on ozonolysis gives CH_3CH_2CHO and $CH_3\underset{\underset{O}{||}}{C}CH_3$?

A. $CH_3CH_2CH = C(CH_3)_2$

B. $CH_3CH_2CH = CHCH_2CH_3$

C. $CH_3CH_2CH = CHCH_2CH_3$

D. $CH_3 - \underset{\underset{CH_3}{|}}{C} = CHCH_3$?

Answer: A

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20. Toluene reacts with chromyl chloride to form :

A. Benzoic acid

B. Benzene

C. Benzaldehyde

D. Benzophenone.

Answer: C

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21. The reagent used for the separation of acetaldehyde from acetophenone is

A. $NaHSO_3$

B. $C_6H_5NHNH_2$

C. NH_2OH

D. $NaOH / I_2$.

Answer: A

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22. Which can be oxidized to the corresponding carbonyl compound?

A. 2-hydroxypropane

B. o-nitrophenol

C. phenol

D. 2-methyl-2-hydroxypropane.

Answer: A

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23. The product of the following reaction are

$$CH_3C = C.CH_2CH_3 = \xrightarrow[(ii)\,Hydrolysis]{(i)\,O_3} ?$$

A. $CH_3COOH + CO_2$

B. $CH_3COOH + HOOCCH_2CH_3$

C. $CH_3CHO + CH_3CH_2CHO$

D. $CH_3COOH + CH_3COCH_3.$

Answer: B

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24. Nucleophilic addition reaction will be most favoured in

A. CH_3CHO

B. $CH_3CH_2CH_2 - \overset{O}{\overset{||}{C}} - CH_3$

C. $(CH_3)_2C = O$

D. CH_3CH_2CHO.

Answer: A

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25. A carbonyl compound reacts with hydrogen cyanide to form cyanohydrin which on hydrolysis forms a recemic mixrture of α-hydroxy acid. The carbonyl compound D.

A. Formaldehyde

B. Acetaldehyde

C. Acetone

D. Diethylketone.

Answer: B

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26. Which of the compounds with molecular formula C_5H_{10}yields acetone on ozonolysis ?

A. 3-Methylbut-1-ene

B. Cyclopentane.

C. 3-Methylbut-1-ene

D. 2,3-Dimethylbut-2-ene

Answer: D

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27. Which of the following on treatment with aqueus sodium hydroxide will give corresponding alcohol and acid?

A. C_6H_5CHO

B. $CH_3CH_2CH_2CHO$

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

D. $C_6H_5CH_2CHO$

Answer: A

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28. On heating calcium acetate and calcium formate, the product formed is :

A. formadehyde

B. Acetaldehyde

C. Acetone

D. None of these

Answer: B

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29. The compound that neither forms semicarbazone nor oxime is

A. $HCHO$

B. CH_3COCH_2Cl

C. CH_3CHO

D. $CH_3CONHCH_3$

Answer: D

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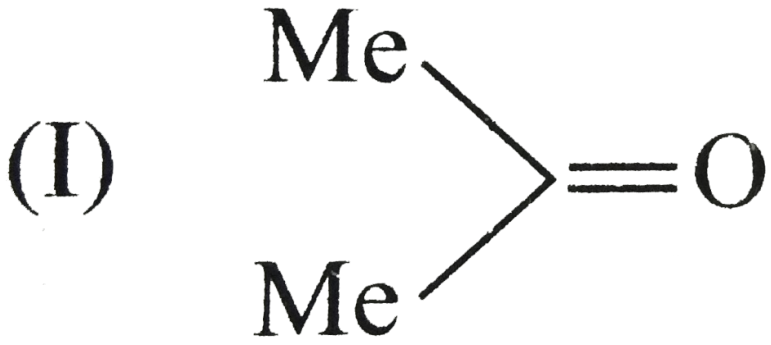
30. The order of reactivity of phenyl magnesium bromide with the following compounds is :

(I)



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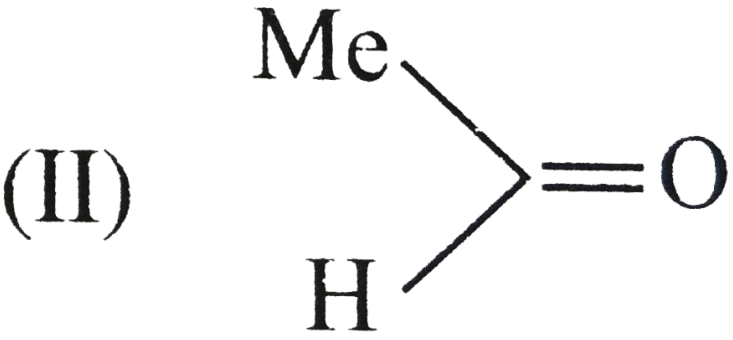
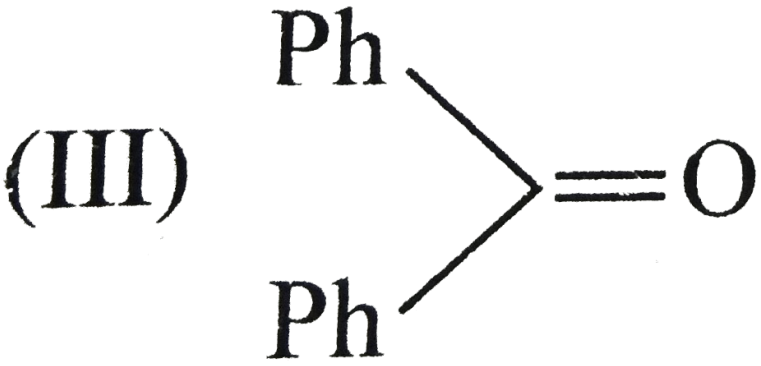


(III)



A. $III > II > I$

B. $II > I > III$

C. $I > III > II$

D. $I > II > III$

Answer: D

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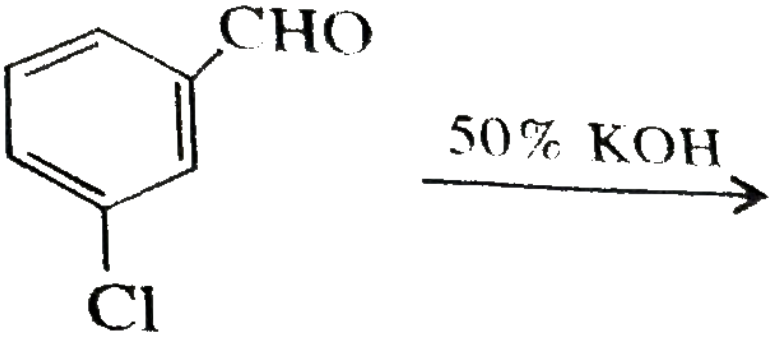
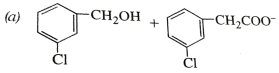
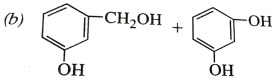
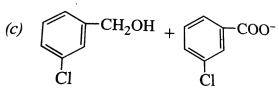
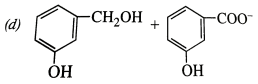
31. Predict the product in the given reaction :



A. 

B. 

C. 

D. 

Answer: C

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32. Acetone is treated with excess of ethanol in the presence of hydrochloric acid. The product obtained is

A. $CH_3CH_2CH_2-\overset{\overset{O}{||}}{C}-CH_3$

B. $CH_3CH_2CH_2-\overset{\overset{O}{||}}{C}-CH_2CH_2CH_3$

C. $(CH_3)_2C\begin{matrix}\diagup OH \\ \diagdown OC_2H_5\end{matrix}$

D. $(CH_3)_2C\begin{matrix}\diagup OC_2H_5 \\ \diagdown OC_2H_5\end{matrix}$

Answer: D

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33. CH_3CHO and $C_6H_5CH_2CHO$ can be distinguished chemically by

A. Benedict's test

B. Iodoform test

C. Tollen's reagent test

D. Fehling's solution test.

Answer: B

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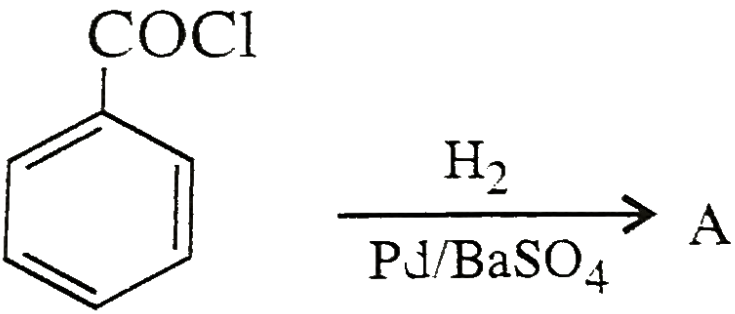
34. Consider the following reaction :



The product A is :

A. C_6H_5CHO

B. C_6H_5OH

C. $C_6H_5COCH_3$

D. $C_6H_5Cl.$

Answer: A

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35. Which of the following compounds will give a yellow precipitate with iodine alkali?

A. Acetophenone

B. Methyl acetate

C. Acetamide

D. 2-Hydroxypropane.

Answer: A

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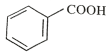
36. Reaction by which benzaldehyde cannot be prepared is :

A. (a)  + Zn/Hg and conc. HCl

B. (b)  + CrO_2Cl_2 in CS_2 followed by H_3O^+

C. (c)  + H_2 in the presence of $Pd/BaSO_4$

D. (d)  + CO + HCl in the presence of Anhydrous $AlCl_3$

Answer: A

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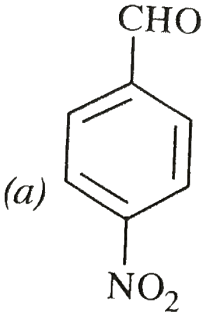
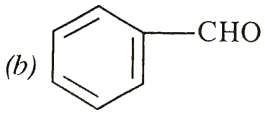
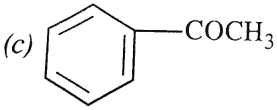
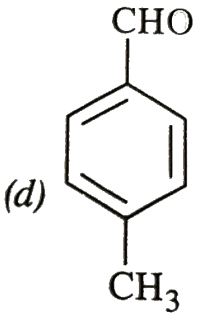
37. Which one is most reactive towards nucleophilic addition reaction?

A. 

B. 

C. 

D. 

Answer: A

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38. Which of the following cannot be used to increase the number of carbon atoms in an organic compound?

A. Grignard's reagent

B. Cannizzaro's reaction

C. Aldol condensation

D. All of these

Answer: B

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39. $CH_3COC_2H_5 ovreset(C_6H_5CO_3H) \rightarrow A \xrightarrow[\text{reaction}]{\text{Tischenko}} B$

Identify A and B.

A. CH_3COOC_2, CH_3CH_2OH

B. $CH_3COOC_2H_5, CH_3CHO$

C. $CH_3CHO, CH_3COOC_2H_5$

D. None of these

Answer: B

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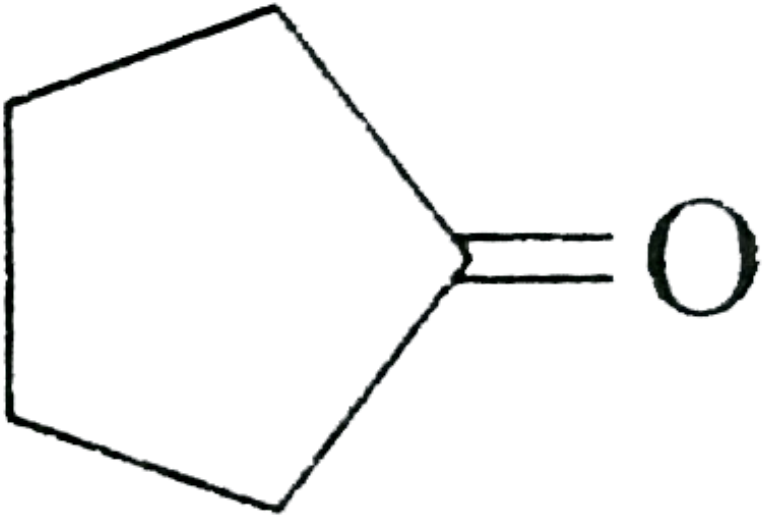
40. Treatment of cyclopentanone



with methyl lithium gives which of the following species?

A. Cyclopentanoyl radical

B. Cyclopentanoyl biradical

C. Cyclopentanoyl anion

D. Cyclopentanoyl cation

Answer: C

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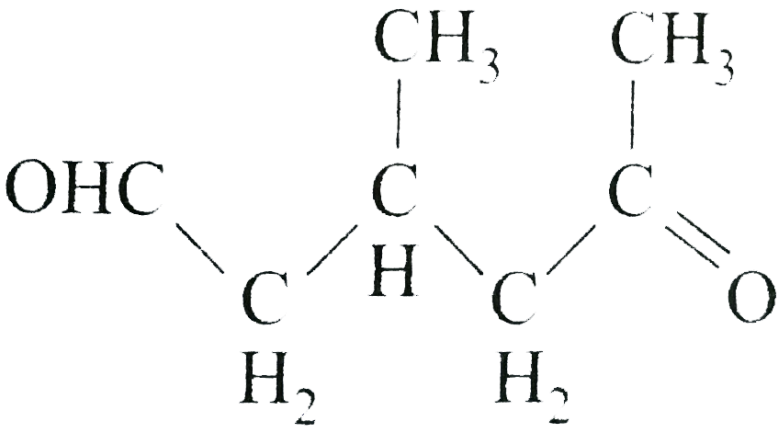
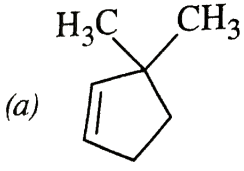
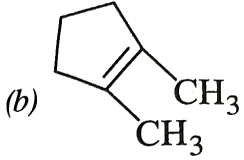
41. A single compound of the structure.

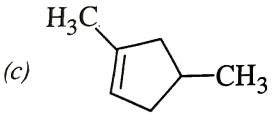


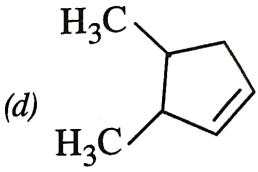
is obtained from ozonolysis of which of the following cyclic compounds?

A.



B. 

C. 

D. 

Answer: C

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42. An organic compound 'X' having molecular formula $C_5H_{10}O$ yield phenylhydrazone and gives negative response to the iodoform test and Tollens test . It produces n-pentane on reduction. 'X' could be

A. 3-pentanone

B. n-amyl alcohol

C. pentanal

D. 2-pentanone

Answer: A

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43. By which one of the following reactions ketones cannot be prepared ?

A. Hydration of alkynes

B. Hydrolysis of gem-dihalides

C. Dry distillation of calcium carboxylates

D. Stephen's reaction

Answer: D

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44. Which one of the following undergoes nitration reactions most readily?

A. Acetophenone

B. Benzonitrile

C. Benzaldehyde

D. Benzene

Answer: D

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45. The correct statement regrarding a carbonyl compound with a hydrogen atom on the its alpha-carbon is:

A. a carbonyl compound with a hydrogen atom on its alphacarbon rapidly equilibrium with its corresponding enol and this process is known as carboylation

B. a carbonyl compound with a hydrogen atom on its alpha carbon rapidly equilibrium with its corresponding enol and this process is known as keto-enol tautomerism

C. a carbonyl compound with a hydrogen atom on its alpha carbon naver equilibrium with its corresponding enol

D. a carbonyl compound with a hydrogen atom on its alpha carbon rapidly equilibrates with its corresponding enol and this process is known as aldehyde-ketone equilibrium

Answer: B

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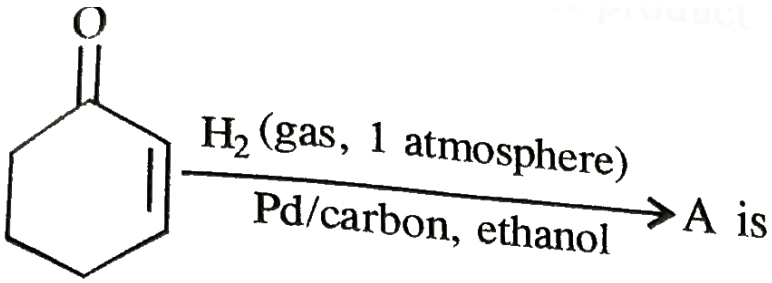
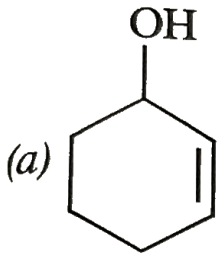
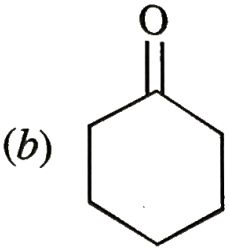
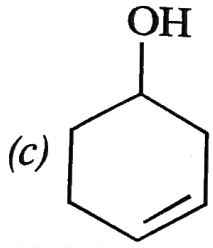
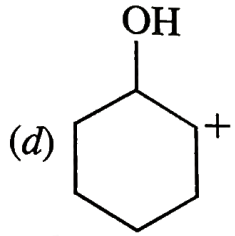
46. The correct structure of the product 'A' formed in the reaction



A. 

B. 

C. 

D. 

Answer: B

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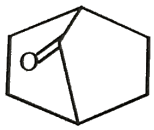
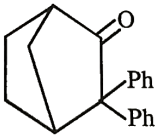
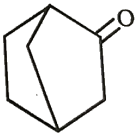
47. Which among the given molecules can exhibit tautomerism ?



I



II



III

A. III only

B. Both I and III

C. Both I and II

D. Both II and III

Answer: A

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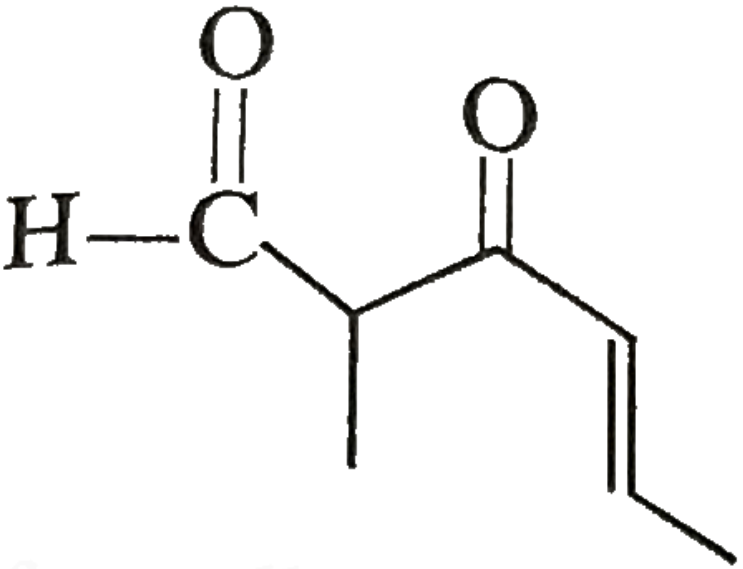
48. IUPAC name of the compound



A. 5-formylhex-2-en-3-one

B. 5-methyl-4-oxohex-2-en-5-al

C. 3-keto-2-methylhex-5-enal

D. 3-keto-2-methylhex-4-enal.

Answer: D

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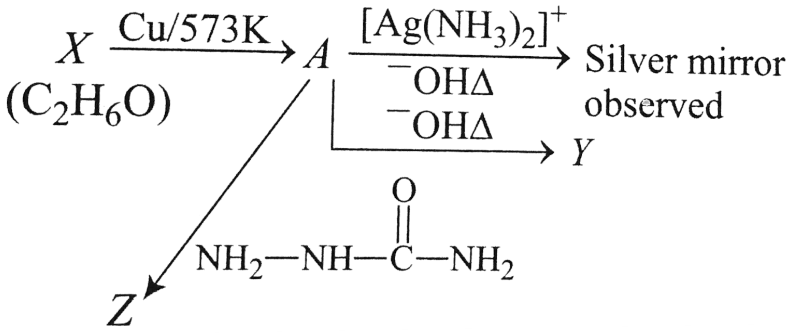
49. Consider the reaction



Identify A, X, Y and Z

A. A-Methoxymethane, X-Ethanoic acid, Y-Acetate ion, Z-hydrazine.

B. A-Methoxymethane, X-Ethanol, Y-Ethanoic acid, Z-Semicarbazone

C. A-Ethanal, X-Ethanol, Y-But-2-enal, Z-Semicarbazone.

D. A-Ethanol, X-Acetaldehyde, Y-Butanone, Z-Hydrazone.

Answer: B

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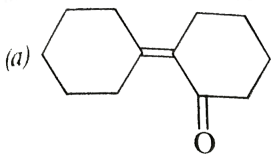
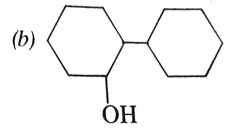
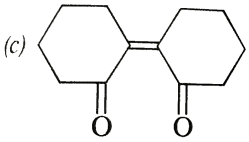
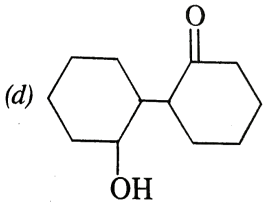
50. Of the following which is the product formed when cyclohexanone undergoes aldol condensation followed by heating?

A. 

B. 

C. 

D. 

Answer: A

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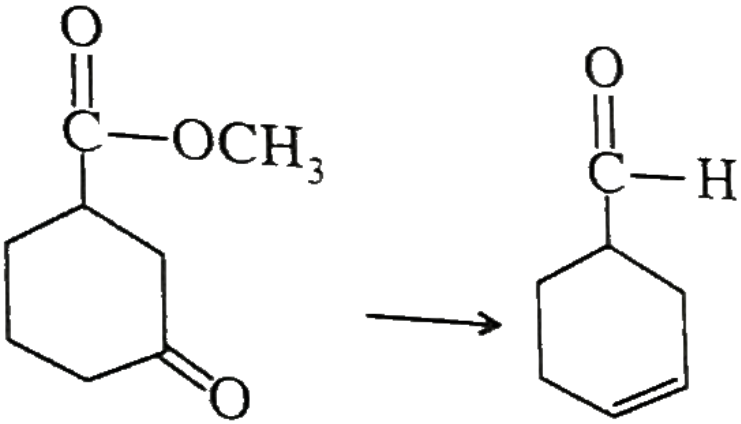
51. Give the correct sequence of reagents used for the following conversion.



A. DIBAL-H, $NaBH_4$, H_3O^+ / Δ

B. H_3O^+ / Δ, $NaBH_4$, DIBAL-H

C. $NaBH_4$, DIBAL-1, H_3O^+ / Δ

D. DIBAL-H, H_3O^+ / Δ, $NaBH_4$

Answer: C

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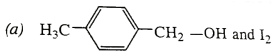
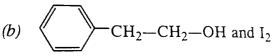
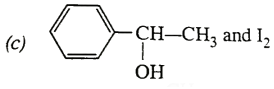
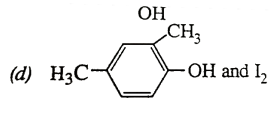
52. Compound A, $C_8H_{10}O$, is found to react with $NaOI$ (produced by reacting Y with $NaOH$) and yields a yellow precipitate with characteristic smell.

A and Y are respectively

A. 

B. 

C. 

D. 

Answer: C

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53. $CH_3 - \underset{\underset{CH_3}{|}}{C} = CH - CH_2 - \underset{\underset{O}{||}}{C} - CH_3 \xrightarrow{H_2/Pd/C}$

Number of stereoisomers formed in the given reaction is

A. 2

B. 4

C. 8

D. 6

Answer: A

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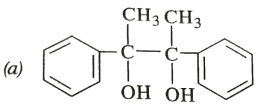
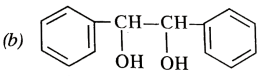
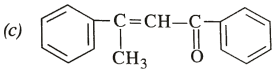
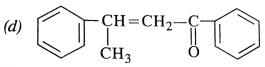
54. Acetophenone when reacted with a base C_2H_5ONa yields a stable compound which has the structure

A. 

B. 

C. 

D. 

Answer: C

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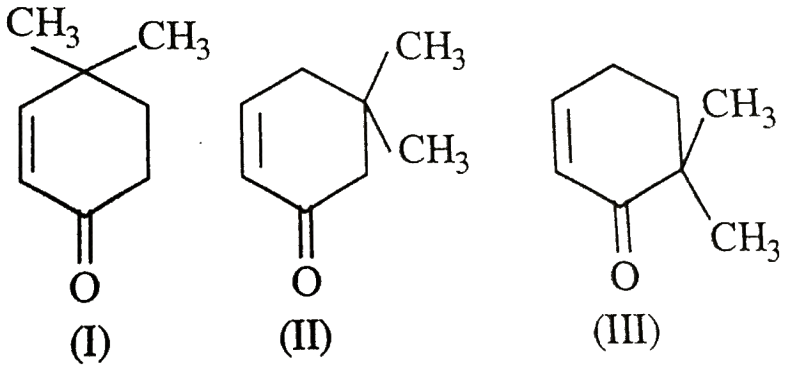
55. Give :



Which is the given compound can exhibit tautomerism?

A. II and III

B. I, II and III

C. I and II

D. I and III

Answer: B

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56. When a mixture of benzaldehyde and acetophenone is treated with dilute $NaOH$ at $293K$, it form

A. 2, 3-diphenylpropanal

B. 1, 1-diphenylpropan-2-one-1-ol

C. 1, 3-diphenylprop-2-en-1-one

D. 1, 2-diphenylprop-2-en-1-one

Answer: C

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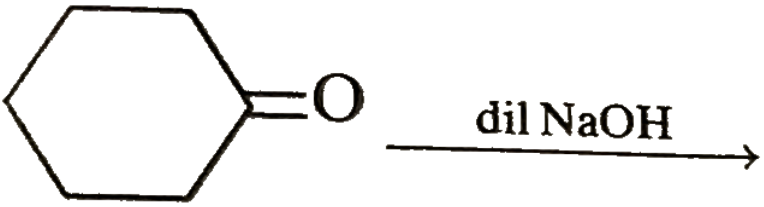
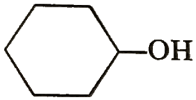
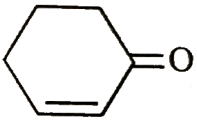
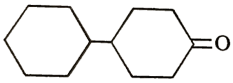
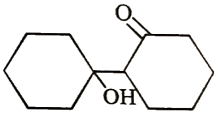
57. Which of the following represents the product formed in the given reaction?



A. (a) 

B. (b) 

C. (c) 

D. (d) 

Answer: D

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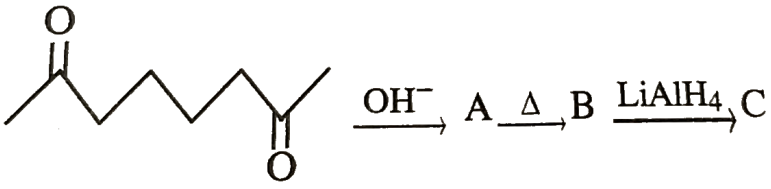
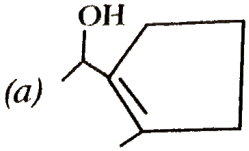
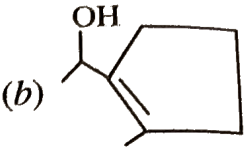
58. Identify C in the following



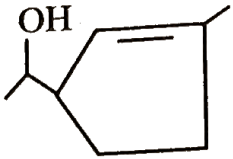
A. (a)



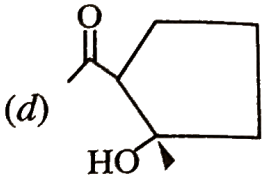
B. (b)



C.



D. (d)



Answer: B

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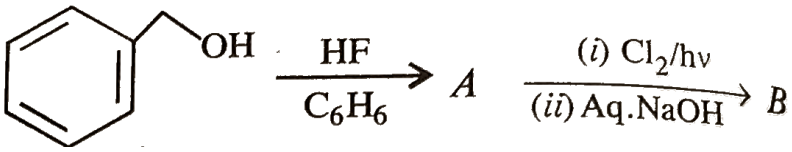
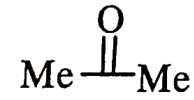
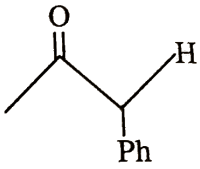
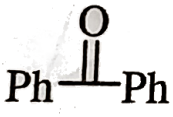
59. In the given reaction sequnece,

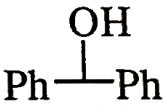


The compound 'B' is

A. (a) 

B. (b) 

C. (c) 

D. (d) 

Answer: C

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60. Which of the following reactions will not result in the formation of carbon- carbon bond?

A. Cannizzaro's Reaction

B. Wurtz Reaction

C. Reimer - Tiemann Reaction

D. Friedel-Crafts Reaction.

Answer: A

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Select The Correct Answer

1. Treatment of propionadehyde with dilute NaOH gives :

A. $CH_3CH_2COOCH_2CH_2CH_3$

B. $CH_3CH_2CHOHCH(CH_3)CHO$

C. $CH_3CH_2CHOHCH_2CH_2CHO$

D. $CH_3CH_2COCH_2CH_2CHO$.

Answer: B

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2. Which undergoes aldol condensation in the presence of dilute NaOH?

A. Salicylaldehyde

B. Benzophenone

C. Benzaldehyde

D. Acetaldehyde and formaldehyde mixture.

Answer: D

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3. The major product of the following reaction :

$(CH_3O)_2CO \xrightarrow[\text{hydrolysis}]{C_2H_5MgBr\,/\,\text{excess}}$ is :

A. $(C_2H_5)_3COH$

B. $(CH_3)_3COH$

C. $C_2H_5COC_2H_5$

D. $HCOOH.$

Answer: A

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4. Carbonyl compounds undergo nucleophilic addition because of :

A. electronegativity difference of carbon and oxygen atoms

B. electromeric effect.

C. more stable anion with negative charge on oxygen and less stables carbocation

D. none of these

Answer: C

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5. Which of the following statement about $OHCH_2CH(OH)CHO$ is not correct? It

A. is an isomer of 1, 3-dihydoxypropanone

B. contains a tertory alcoholic group

C. has the same empirical formula as glucose

D. can show optical isomerism.

Answer: B

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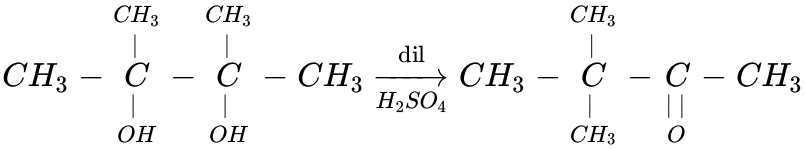
6. The conversation :



is called :

A. Beckmann rearrangement.

B. Pinacol-Pinacolone rearrangement

C. Claisen rearrangement

D. Fries rerragement.

Answer: B

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7. Which of the following will not undergo cannizzaro's reaction on heating with an alkali solution?

A. CCl_3CHO

B. $(CH_3)_3CCHO$

C. $HCHO$

D. C_6H_5CHO

Answer: A

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8. The end product (C) of the following reaction is :

$$CH_3COOH \xrightarrow{CaCO_3} A \xrightarrow{\text{Heat}} B \xrightarrow{NH_2OH}$$

A. Acetaldoxmine

B. Formaldoxime

C. Methyl nitrate

D. Acetoxmine

Answer: D

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9. The compound X on treatment with acidified $K_2Cr_2O_7$ gives compound Y which reacts with I_2 and Na_2CO_3 to form tri-iodomethane. The compound X is :

A. CH_3OH

B. CH_3COCH

C. CH_3CHO

D. $CH_3CHOHCH_3$

Answer: D

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10. In the presence of aluminimum ethoxide aldehydes are converted into esters. The reaction is called

A. Schmidt reaction

B. Aldol condensation

C. Beckmann rearragement

D. Tischenko reaction.

Answer: D

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11. The general formula of $C_nH_{2n}O_2$ could be for open chain

A. diketones

B. carboxylic acids

C. diols

D. Dialdehydes.

Answer: B

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12. Acetyl bromide reacts with excess of CH_3MGI followed by treatement with a saturated solution of NH_4C1 gives:

A. 2-Methylpropan-2-ol

B. Acetamide

C. Acetone

D. Acetyl iodide

Answer: A

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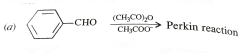
13. Which of the followng correctly matched?

A. 

B. $2HCHO \xrightarrow{NaOH}$ Aldol condensation

C. $2CH_3CHO \xrightarrow{NaOH}$ Cannizzaro Reaction

D. `CH_(3)CH_(2)CHO overset(I_(2)//NaOH)rarr"Iodoform reaction".

Answer: A

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14. The best reagent to covert pent-3-en-2-ol into pent-3-en-2-one is :

A. acidic permaganate

B. acidic dichromate

C. chromic anhydride in glacial acetic acid

D. pyridinium chlorochromate.

Answer: D

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15. The increasing order of the rate of HCN addition of compound a-d is

(i) $HCHO$

(ii) CH_3COCH_3

(iii) $PhCOCH_3$

(iv) $PhCOPh$

A. $A < B < C < D$

B. $D < B < C < A$

C. $D < C < B < A$

D. $C < D < B < A$

Answer: C

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16. In the following sequence of reactions, the alkene affords the compound B:

$$CH_3CH = CHCH_3 \xrightarrow{O_3} A \xrightarrow[Zn]{H_2O} B$$

The compound B is

A. CH_3CHO

B. CH_3CH_2CHO

C. CH_3COCH_3 and conc. HCl

D. $CH_3CH_2CH_3$

Answer: A

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17. Which of the following is not the mechanism of Cannizzaro reaction ?

$$2PhCHO \xrightarrow{\overset{\Theta}{OH}} PhCH_2OH + PhCOO^{\Theta}$$

A. the attack of OH^- ion at the carbonyl group

B. the transfer of H^- ion to carbonyl group

C. the abstraction of of proton form the carbonyl group

D. the disproportionation of $PhCH_2OH$.

Answer: B

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18. One mole of symmetrical alkene upon ozonolysis gives two moles of an aldehyde having the molecular mass $44u$. Predict the alkene.

A. Propene

B. But-1-ene

C. But-2-ene

D. Ethene.

Answer: C

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19. Fehling A and Fehling B are :

A. $CuSO_4$ solution and NH_4OH solution

B. $CuSO_4$ solution and alkaline soluton of sodium potassium tartarate

C. $CuSO_4$ solution and alkaline solution ofsodium citrate

D. $CuSO_4$ solution and $NaOH$ solution.

Answer: B

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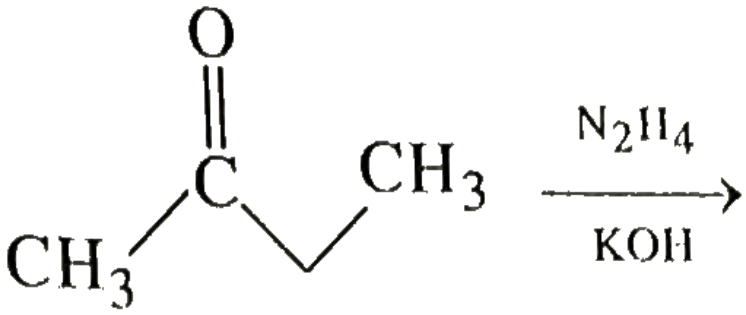
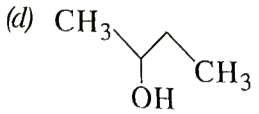
20. The product of the solution :



A. (a) CH_3, CH_3 > C=N—NH_2

B. (b) CH_3 — CH_3

C. (c) CH_3, C_2H_5 > CH—NH_2

D. 

Answer: B

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21. Tri chloro acetaldehyde was subjected to Cannizzaro's reaction by using $NaOH$. in product, one of the compound in mixture of the two is 2,2,2-tri chloro sodium acetate. The other compound is

A. 2, 2, 2-Trichloroethanol

B. Trichloromethanol

C. 2, 2, 2-Trichloropropanol

D. Chloroform.

Answer: A

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22. A carbonyl compound with molecular mass 86, does not reduce Fehling's solution but forms crystalline bisulphite derivative and gives iodoform test. The possible compound is

A. 2-pentanone and 3- pentanone

B. 2-pentanone and 3-methyl-2-butanone

C. 2-pentanone and pentanal

D. 3-pentanone and 3-methyl-2-butanone.

Answer: B

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23. Ethyl methyl ketone on treatement with a solution of sodium hypochlorite gives chloroform and

A. Sodium ethanoate

B. Sodium propanonate

C. Butan-2-ol

D. Ethanal

Answer: B

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24. Which of the following organic compound exhibits positive Fehling test as well as iodoform test?

A. Ethanol

B. Propanone

C. Butane-2-ol

D. Ethanal.

Answer: D

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25. Iodofrom can be prepared from all except

A. Isopropyl alcohol

B. 3-Methylbutan-2-one

C. Isobutyl alcohol

D. Ethyl methyl ketone

Answer: C

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26. One mole of alkene an ozonolysis gives two moles of butanone. The alkene is :

A. 2, 4-dimethylhex-2-ene

B. 2, 3-dimethylhex-3-ene

C. 3, 4-dimethylhex-3-ene

D. 2, 4-dimethylhex-2-ene

Answer: C

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27. Isopropyl benzene is oxidised in the presence of air to a compound 'A'. When compound 'A' is treated with dilute mineral acid, the armatic product formed is :

A. phenol

B. benzene

C. Benzaldehyde

D. acetophenone.

Answer: A

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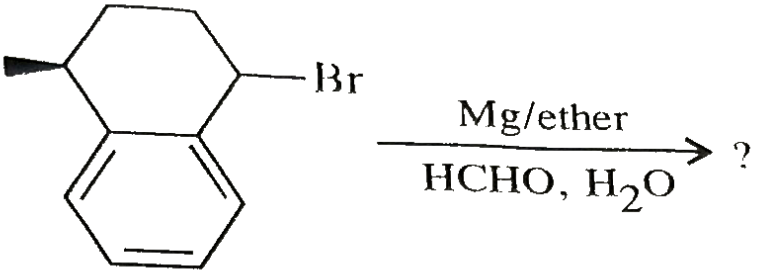
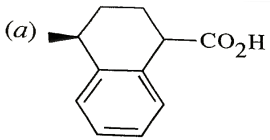
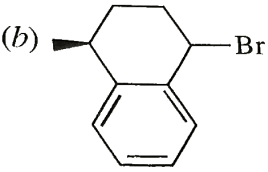
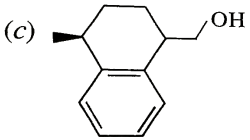
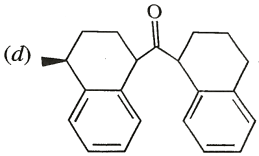
28. The product in the following reaction is :



A. 

B. 

C. 

D. 

Answer: C

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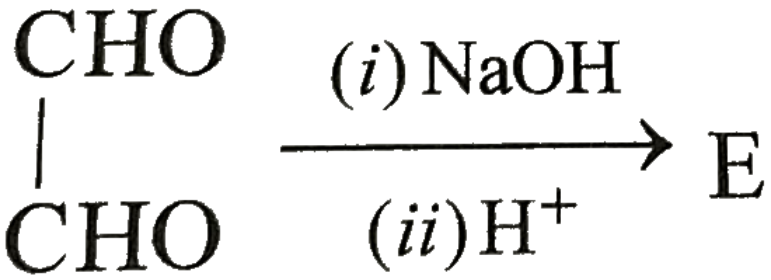
29. In the following reaction, the product E is :



A. $\begin{matrix} CH_2OH \\ | \\ CHO \end{matrix}$

B. $\begin{matrix} CHO \\ | \\ COOH \end{matrix}$

C. $\begin{matrix} CH_2OH \\ | \\ COOH \end{matrix}$

D. $\begin{matrix} COOH \\ | \\ COOH \end{matrix}$

Answer: C

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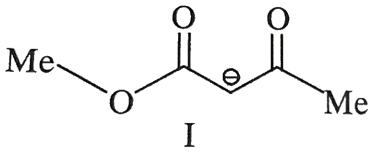
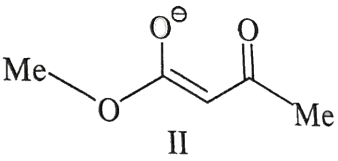
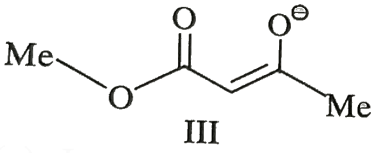
30. Among the following structures, the one which is not a resonating structure of others is :



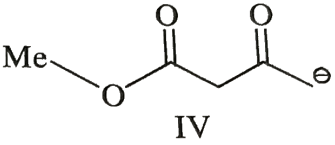
I



II



III



IV

A. I

B. II

C. III

D. IV

Answer: D

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31. Iodoform can be prepared from all except

A. butan-2-one

B. acetophenone

C. propan-2-ol

D. propan-1-ol

Answer: B

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32. CH_3CHO and $C_6H_5CH_2CHO$ can be distinguished chemically by

A. Benedict's test

B. Iodoform test

C. Tollen's test

D. Fehling's test

Answer: B

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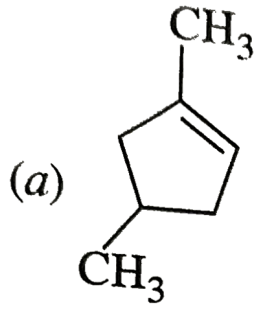
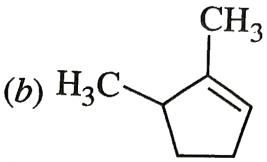
33. Which compund will yield 5-keto -2 methyl hexanal upon treatment with O_3?

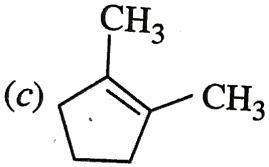
A.



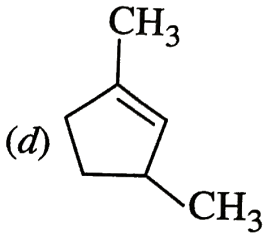
B.



C.



D.



Answer: D

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34. In the following squence of reactions

$\text{Toluene} \xrightarrow{KMnO_4} A \xrightarrow{SoCl_2} B \xrightarrow[BaSo_4]{H_2/Pd}$, C the product C is

A. $C_6H_5CH_2OH$

B. C_6H_5CHO

C. C_6H_5COOH

D. $C_6H_5CH_3$

Answer: B

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35. In which of the following, the product is not correct?

A. $CH_3CHO \xrightarrow{LiAlH_4} CH_3CH_2OH$

B. $CH_3COCH_3 \xrightarrow[HCl]{Zn-Hg} CH_3 - \underset{\underset{OH}{|}}{C}H - CH_3$

C. $CH_3CH_2CHO \xrightarrow[(ii)\,KOH\,,\,(OH-CH_2-CH_2-OH)]{(i)\,NH_2-NH_2} CH_3CH_2CH_3$

D. $CH_3CH_2CHO \xrightarrow{KMnO_4} CH_3CH_2COOH$

Answer: B

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36. Identify X and Y in the following sequence.

$$X \xrightarrow{Zn} Y \xrightarrow[Zn-Hg]{O_3} (CH_3)_2CO + H_2O$$

A. $(CH_3)_2CHCH_2Br, CH_3CH = CHCH_3$

B. $(CH_3)_2CHBrCH_2Br, (CH_3)_2C = CH_2$

C. $(CH_3)_2CHBrCH_3, CH_3CH = CHCH_3$

D. $(CH_3)_2CBrCH_2Br, (CH_3)_2C = CH_2$

Answer: D

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37. Among the following compounds, which will not repond to cannizzaro's reaction, upon treatement with alkali?

A. Cl_3CCHO

B. Me_3CCHO

C. C_6H_5CHO

D. $HCHO$

Answer: A

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38. The product formed when acetone is heat with $Ba(OH)_2$ is :

A. 4-Methylpent-3-en-one

B. 3-Methylpent-3-en-one

C. Hex-3-en-2-one

D. 4-Hydroxy-4-Methylpentan-2-one

Answer: A

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39. Reduction of ketones canot be carried out with which of the following reagents?

A. Hydrogen in the presence of palladiun deposited over barium sulphate in the presence of quinoline

B. Sodium borohydride or lithium aluminimum hydride

C. Zinc amalgam and conc. HCl

D. Hydrazine and KOH in ethylene glycol.

Answer: A

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40. The condensation reacton between one equivalent of acetone and two equivalents of benzaldehyde in presence of dilute alkali leads to the formation of

A. benzalacetophenone

B. benzylideneacetone

C. dibenzylideneaceton

D. benzoic acid and acetic acid

Answer: C

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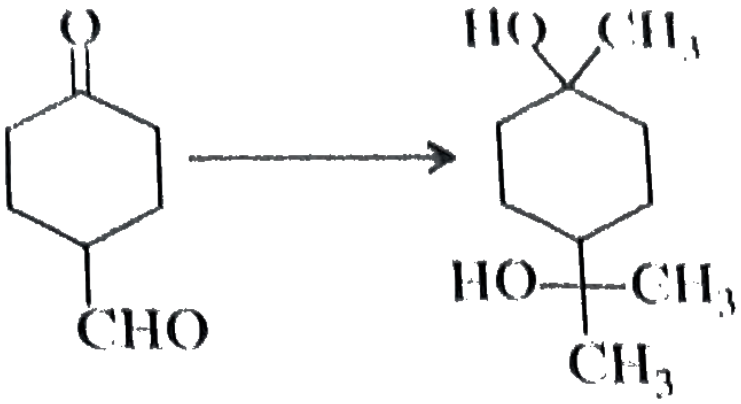
41. The correct sequence of the following conversion is :



A. $CH_3MgBr, \left[Ag(NH_3)_2\right] + OH^-, H^+/CH_3OH$

B. $\left[Ag(NH_3)_2\right]^+ OH^-, CH_3MgBr, H^+/CH_3OH$

C. $\left[Ag(NH_3)_2\right]^+ OH^-, H^+/CH_3OH, CH_3MgBr$

D. $CH_2MgBr, H^+/CH_3OH, \left[Ag(NH_3)_2\right]^+ OH^-$

Answer: C

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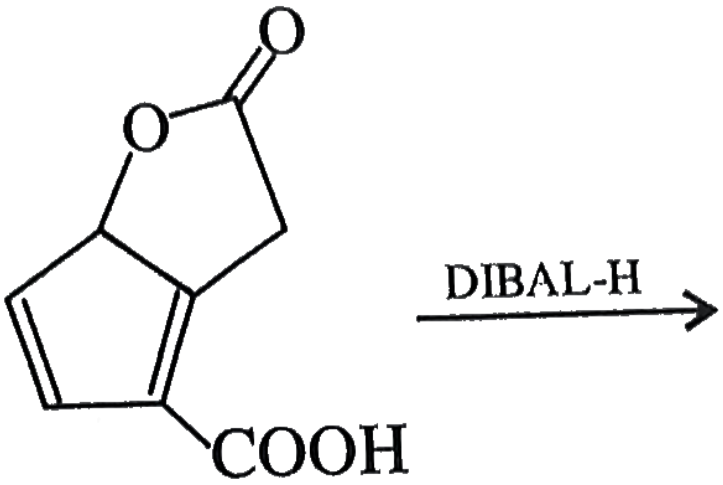
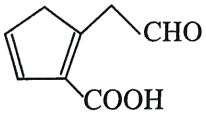
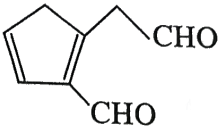
42. The major product obtained in the following reaction is



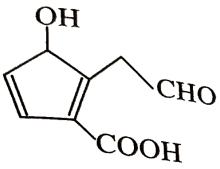
A. (a)



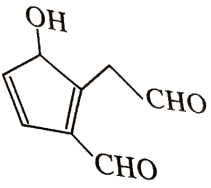
B. (b)



C. (c)



D. (d)



Answer: D

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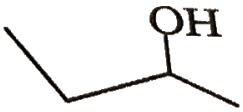
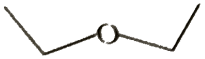
43. In the following sequence of reactions

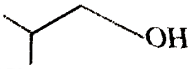
$$\underset{(N)}{C_4H_{10}O} \xrightarrow[H_2SO_4]{K_7Cr_2O_7} C_4H_8O \xrightarrow[\text{warm}]{I_2/NaOH} CHI_3$$

The compound N may be :

A. (a) 

B. 

C. (c) 

D. (d) 

Answer: B

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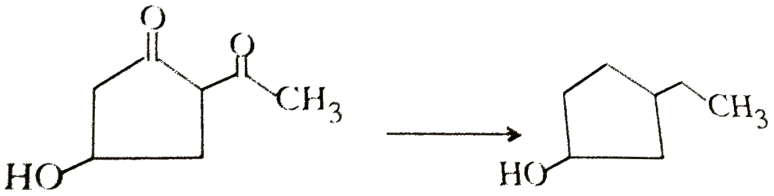
44. The appropriate reagent for the following transformation is



A. $Zn - Hg / HCl$

B. $H_2N - NH_2, KOH /$ ethylene glycol

C. Ni / H_2

D. $NaNH_4$

Answer: B

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Comprehension I

1. In carbonyl compounds, the carbonyl group is polar as well as in sp^2 hybridisation state. As a result, these compounds are highly reactive in

nature and take part in the addition reactions. The mechanism of these reactions is nucleophilic in nature and is catalyseed in the weakly acidic medium. The extent of nycleophilic addition is influenced by two factors. These are steric effect of the groups attached to the carbonyl carbon atom. Both tend to decrease the reactivity of these compounds in the nuclephilic addition reactions.

Which of the following statements regarding carbonyl compounds is not correct?

A. The addition reactions occurring across the $> C = O$ bond are of electrophilic type.

B. The addition reactions occurring across the $> C = O$ bond are of nucleophilic type.

C. Aldehydes undergo addition reactions more readily than ketones.

D. The addition reactions shown by $> C = O$ group are catalysed by acids.

Answer: A

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2. In carbonyl compounds, the carbonyl group is polar as well as in sp^2 hybridisation state. As a result, these compounds are highly reactive in nature and take part in the addition reactions. The mechanism of these reactions is nucleophilic in nature and is catalyseed in the weakly acidic medium. The extent of nycleophilic addition is influenced by two factors. These are steric effect of the groups attached to the carbonyl carbon atom. Both tend to decrease the reactivity of these compounds in the nuclephilic addition reactions.

Which of the following statement is not true for carbonyl $(>C=O)$ group?

A. The carbon atom of the carbonyl group is sp^2-hybridised

B. The $C=O$ bond length is longer than $C=C$ bond length.

C. The dipole moments of aldehydes and ketones lie in the range $2\cdot 3$ to $2\cdot 8D$.

D. The portion of the molecule immediately surrounding the carbonyl group is planar.

Answer: B

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3. In carbonyl compounds, the carbonyl group is polar as well as in sp^2 hybridisation state. As a result, these compounds are highly reactive in nature and take part in the addition reactions. The mechanism of these reactions is nucleophilic in nature and is catalyseed in the weakly acidic medium. The extent of nycleophilic addition is influenced by two factors. These are steric effect of the groups attached to the carbonyl carbon atom. Both tend to decrease the reactivity of these compounds in the nuclephilic addition reactions.

Important properties of carbon compounds are : nucleophilic addition and acidity of α-hydrogen atoms. ,

Which factor is most useful in explaning these two ?

A. Presence of carbon-oxygen double bond.

B. Resonance in carbonyl group.

C. Ability of oxygen to accommodate negative charge.

D. All are equally important.

Answer: C

View Text Solution

Comprehension 2

1. The α-hydrogen atom attached to the carbonyl group is acidic in nature because the carbanion which is left gets resonance stabilished. As a result, these compounds take part in the aldol condensation reactions. The carbanion acts as a nucleophile in these reactions. The compounds in which α-hydrogen is not acidic take part in the Cannizzaro's reaction. In this reaction, one molecule of the carbonyl compound under consideration is reduced to primary alcohol while the other is oxidised

simutaneously to the carboxylic acid.

An organic compound 'A' of the molecular formula $C_5H_{10}Cl_2$ is hydrolysed to compound 'B' $C_5H_{10}O$ which gives an oxime with hydroylamine and yellow precipitate with a mixture of iodine and sodium hydroxide. The compound 'A' should be :

A. $CH_3CH_2CCl_2CH_2CH_3$

B. $CH_3CH_2CH_2CCl_2CH_3$

C. $CH_3CH_2CH_2CH_2CHCl_2$

D. $CH_3CH_2CH_2CHClCH_2Cl.$

Answer: B

View Text Solution

Comprehension 3

1. The α-hydrogen atom attached to the carbonyl group is acidic in nature because the carbanion which is left gets resonance stabilished. As a

result, these compounds take part in the aldol condensation reactions. The carbanion acts as a nucleophile in these reactions. The compounds in which α-hydrogen is not acidic take part in the Cannizzaro's reaction. In this reaction, one molecule of the carbonyl compound under consideration is reduced to primary alcohol while the other is oxidised simutaneously to the carboxylic acid.

A mixture of cinnamaldehyde and crotonaldehyde is treated with concentrated alkali.

$$C_6H_5\overset{\beta}{C}H=\overset{\alpha}{C}HCHO+\overset{\gamma}{C}H_3\overset{\beta}{C}H=\overset{\alpha}{C}HCHO \xrightarrow{OH^-}$$

Which statement is true about the above reaction ?

A. Aldol condensation takes place and α-carbon atom of crotonaldehyde provides the carbanion

B. Aldol condensatin takes place and β-carbon atom of crotonaldehyde provides the carbanion

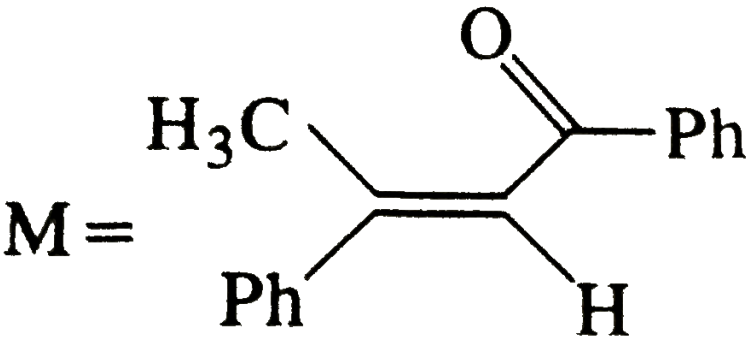
C. Aldol condensation takes place and γ-carbon atom of crotonaldehyde provides the carbanion

D. Aldol condensation takes place and α-carbon and cinnamicaldehyde provides the carbanion.

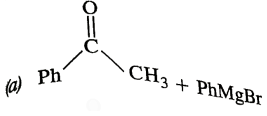
Answer: C

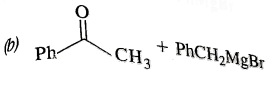
View Text Solution

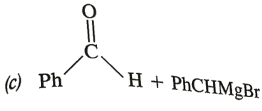
2. A tertiary alcohol [H] upon acid catalysed dehydration gives a product [I]. Ozonolysis of [I] leads to compounds [J] to [K]. The compound [J] upon reactions with KOH gives benzyl alcohol a compound [L] wheras [K} on reaction with KOH gives only [M]. The compund [M] has the formula.

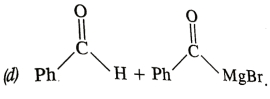


The compound [H] is formed by the reaction og :

A. 

B. 

C. 

D. 

Answer: B

View Text Solution

Comprehension 4

1. The α-hydrogen atom attached to the carbonyl group is acidic in nature because the carbanion which is left gets resonance stabilished. As a result, these compounds take part in the aldol condensation reactions. The carbanion acts as a nucleophile in these reactions. The compounds in which α-hydrogen is not acidic take part in the Cannizzaro's reaction. In

this reaction, one molecule of the carbonyl compound under consideration is reduced to primary alcohol while the other is oxidised simutaneously to the carboxylic acid.

Compound A (molecular formula C_3H_8O) is treated with acidified dichromate to form a product B (molecular formula C_3H_6O). B forms shining silver mirror on warning with ammoniacl silver nitrate. B when treated with an aqueous solution of $H_2NCOHNH_2HCl$ and sodium acetate gives a product C. The structure of C is :

A. $CH_3CH_2CH = NNHCONH_2$

B. $(CH_3)_2C = NNHCONH_2$

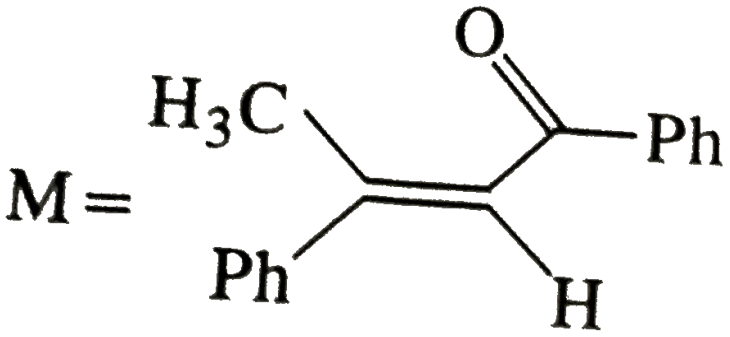
C. $(CH_3)_2C = NCONHNH_2$

D. $CH_3CH_2CH = NCONHNH_2$.

Answer: A

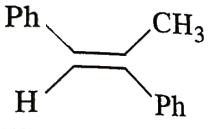
View Text Solution

2. A tertiary alcohol [H] upon acid catalysed dehydration gives a product [I]. Ozonolysis of [I] leads to compounds [J] to [K]. The compound [J] upon reactions with KOH gives benzyl alcohol a compound [L] wheras [K} on reaction with KOH gives only [M]. The compund [M] has the formula.

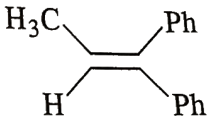


The structure of compound [I] is

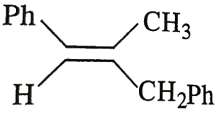
A. (a)



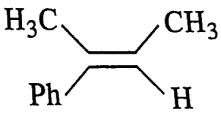
B. (b)



C. (c)



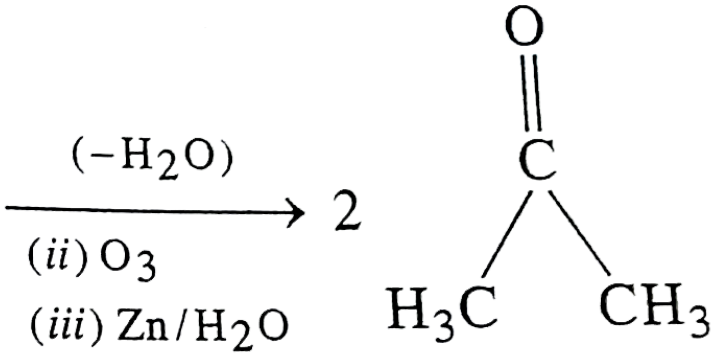
D. (d)



Answer: A

View Text Solution

3. An acylic hydrocarbon P, having molecular formula C_6H_{10}, gives acetone as the only organic product through the following sequnence of reactions in which Q is an intermediate organic compound

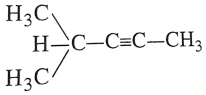


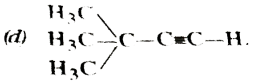
The structure of compound P is

A. $CH_3CH_2CH_2CH_2 - C = C - H$

B. $H_3CH_2C - C \equiv C - CH_2OH$

C. (c)



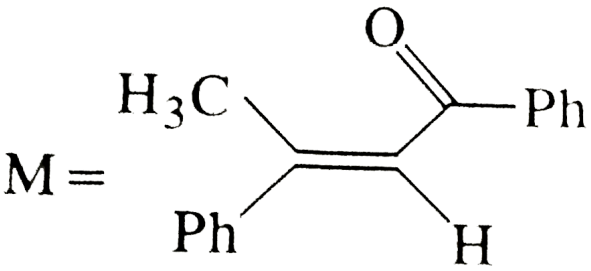
D. 

Answer: D

View Text Solution

Comprehension 5

1. A tertiary alcohol [H] upon acid catalysed dehydration gives a product [I]. Ozonolysis of [I] leads to compounds [J] to [K]. The compound [J] upon reactions with KOH gives benzyl alcohol a compound [L] wheras [K} on reaction with KOH gives only [M]. The compund [M] has the formula.



The structure of compounds $[J]$, $[K]$ and $[L]$ are respectively :

A. $PhCOCH_3$, $PhCH_2COCH_3$ and $PhCH_2COO^-K^+$

B. $PhCHO$, $PhCH_2CHO$ and $PhCH_2COO^-K^+$

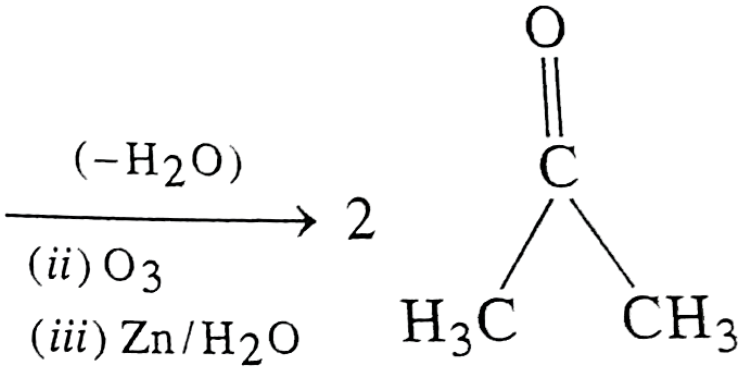
C. $PhCOCH_3$, $PhCH_2CHO_2$ and $CH_3COO^-K^+$

D. $PhCHO$, $PhCOCH_3$ and $PhCOO^-K^+$.

Answer: D

View Text Solution

2. An acylic hydrocarbon P, having molecular formula C_6H_{10}, gives acetone as the only organic product through the following sequnence of reactions in which Q is an intermediate organic compound



The structure of the compound Q is

A. 

B. 

C. 

D. $CH_3CH_2CH_2\overset{OH}{\overset{|}{C}}HCH_2CH_3.$

Answer: B

View Text Solution

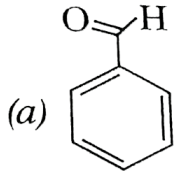
3. In the following reaction sequence, the compound J is an intermediate.

$$I \xrightarrow[CH_3COONa]{(CH_3CO)_2O} \xrightarrow[\substack{(ii)\ SOCl_2 \\ (iii)\ \text{anhyd. } AlCl_3}]{(i)\ H_2, Pd/C}$$

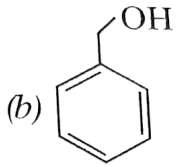
'J' $(C_9H_8O_2)$ gives effervescence on treatment with $NaHCO_3$ and a positive Baeyer's test.

The compound I is

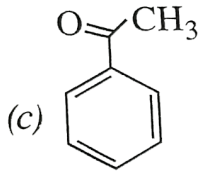
A.

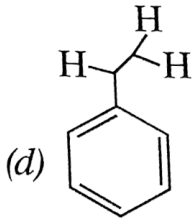


B.



C.



D. 

Answer: A

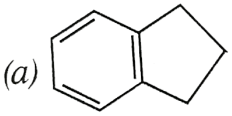
View Text Solution

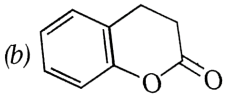
4. In the following reaction sequence, the compound J is an intermediate.

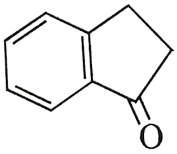
$$I \xrightarrow[CH_3COONa]{(CH_3CO)_2O} \xrightarrow[\substack{(ii)\ SOCl_2 \\ (iii)\ \text{anhyd. } AlCl_3}]{(i)\ H_2, Pd/C}$$

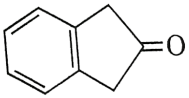
'J' $(C_9H_8O_2)$ gives effervescence on treatment with $NaHCO_3$ and a positive Baeyer's test.

The compound K is

A. 

B. 

C. (c) 

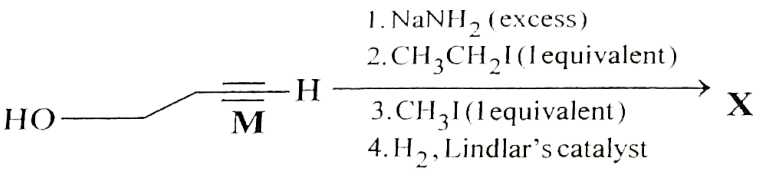
D. (d) 

Answer: C

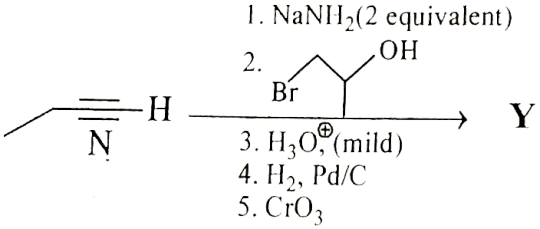
View Text Solution

Comprehension 6

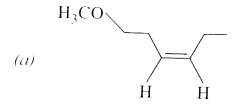
1. Schemes 1 and 2 decribe sequential transformation of alkynes M and N. Consider only the major products formed in each step for both the schemes.

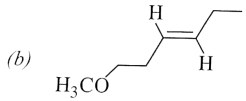


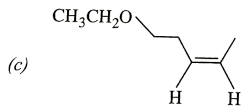
Scheme-2

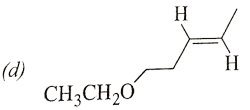


The product X is :

A. 

B. 

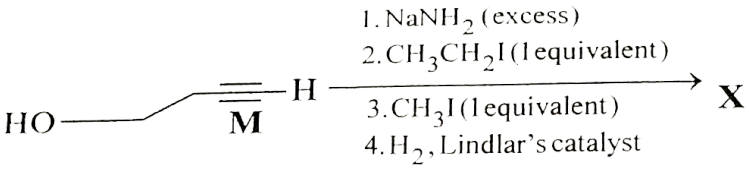
C. 

D. 

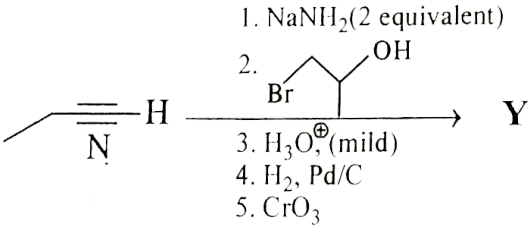
Answer: A

View Text Solution

2. Schemes 1 and 2 decribe sequential transformation of alkynes M and N. Consider only the major products formed in each step for both the schemes.



Scheme-2



The correct statement with respect to product Y is :

A. It gives a positive Tollen's test and is a functional isomer of X.

B. It gives a positive Tollen's test and is a geometrical isomer of X.

C. It gives a positive iodoform test and is a functional isomer of X.

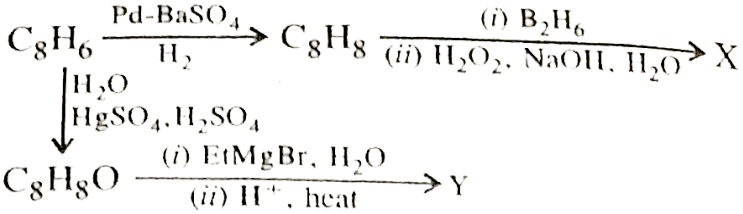
D. It gives a positive iodoform test and is a geometrical isomer of X.

Answer: C

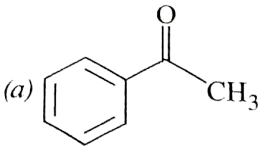
View Text Solution

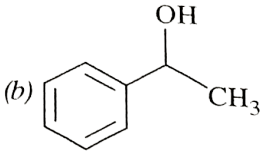
Comprehension 7

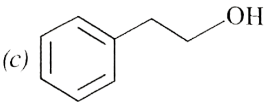
1. In the following

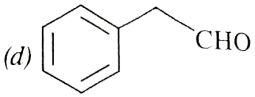


Compound X is

A. 

B. 

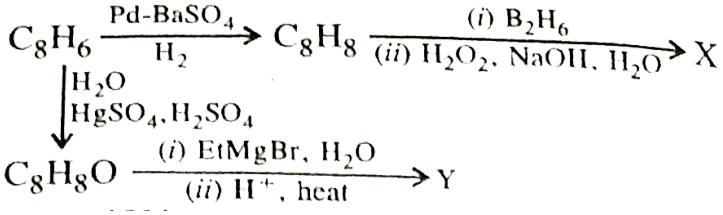
C. 

D. 

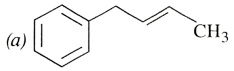
Answer: C

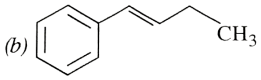
View Text Solution

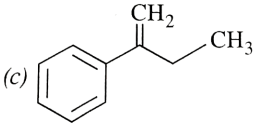
2. In the following

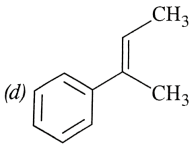


The major compound Y is

A. 

B. 

C. 

D. 

Answer: D

View Text Solution

Asseration Reason Type Question

1. Assertion : Carbonyl compounds take part in nucleophilic addition reactions.

Reason : These reactions are initiated by nucleophilic attack at the electron deficient carbon atom.

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

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

C. If assertion is correct but reason is incorrect.

D. If assertion as well as reason are both incorrect.

Answer: A

View Text Solution

2. Assertion : Lower members of carbonyl compounds are water soluble.

Reason : These compounds are of polar nature.

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

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

C. If assertion is correct but reason is incorrect.

D. If assertion as well as reason are both incorrect.

Answer: B

View Text Solution

3. Assertion : All aldehydes donot take part in aldol condensation.

Reason : In th aldol condensation, carbanion is generated by the abstraction ofα-H atopm by the base.

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

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

C. If assertion is correct but reason is incorrect.

D. If assertion as well as reason are both incorrect.

Answer: B

View Text Solution

4. Assertion : Fehling reagent is a test for all aliphatic aldehydes.

Reason : Aliphatic aldehydes can be easily oxidised even with mild oxidising agents.

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

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

C. If assertion is correct but reason is incorrect.

D. If assertion as well as reason are both incorrect.

Answer: A

View Text Solution

5. Assertion : Acetone is less reactive towards nucleophilic addition than acetaldehyde.

Reason : The alkyl groups hinder the nucleophilic attack on carbonyl carbon atom.

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

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

C. If assertion is correct but reason is incorrect.

D. If assertion as well as reason are both incorrect.

Answer: A

View Text Solution

6. Assertion : Pentan-2-one and pentan-3-one can be distinguished by iodoform test.

Reason : Only methylketines take part in iodoform reaction.

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

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

C. If assertion is correct but reason is incorrect.

D. If assertion as well as reason are both incorrect.

Answer: A

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7. Assertion : The addition of ammonia derivatives to carbonyl compounds is carried in weakly acidic medium.

Reason : In weakly acidic medium attacking nucleophile is also protonated.

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

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

C. If assertion is correct but reason is incorrect.

D. If assertion as well as reason are both incorrect.

Answer: C

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8. Assertion : $LiAlH_4$ is more reactive and less selctive than $NaBH_4$ as a reducing agent.

Reason : $LiAlH_4$ reduces both aldehydic group and double bond in conjugate position while $NaBH_4$ does not.

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

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

C. If assertion is correct but reason is incorrect.

D. If assertion as well as reason are both incorrect.

Answer: A

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9. Assertion : It is not so easy to oxidise primary alcohols to aldehydic stage.

Reason : Aldehydes are prone to furthr oxidation to carbonxylic acids.

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

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

C. If assertion is correct but reason is incorrect.

D. If assertion as well as reason are both incorrect.

Answer: A

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10. Assertion : Alcohols are more boinling than aldehyes of comparable molecular masses.

Reason : Stric hindrance is more than in acetaldehyde.

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

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

C. If assertion is correct but reason is incorrect.

D. If assertion as well as reason are both incorrect.

Answer: C

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11. Assertion : Benzaldehyde is less reactive towards nucleophilic addition than acetaldehyde.

Reason : In benzaldehydes, steric hindrance is more than in acetaldehyde.

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

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

C. If assertion is correct but reason is incorrect.

D. If assertion as well as reason are both incorrect.

Answer: A

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12. Assertion : Acid chlorides can not be converted to ketones by reacting with Grignard reagents.

Reason : Ketones further react with Grignard reagents to give tertiary alcohols.

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

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

C. If assertion is correct but reason is incorrect.

D. If assertion as well as reason are both incorrect.

Answer: A

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13. Assertion: Hydroxyketones are not directly used in Grignard reaction.

Reason : Griganard reagnts react with hydroxyl group.

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

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

C. If assertion is correct but reason is incorrect.

D. If assertion as well as reason are both incorrect.

Answer: A

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14. Assertion: Isobutanal does not give iodoform test.

Reason : It does not have α-hydrogen.

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

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

C. If assertion is correct but reason is incorrect.

D. If assertion as well as reason are both incorrect.

Answer: C

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15. Assertion : Chloral hydrate is a stable compound.

Reason : It is stable due to high molecualr mass.

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

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

C. If assertion is correct but reason is incorrect.

D. If assertion as well as reason are both incorrect.

Answer: C

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16. Assertion : Aldehydes or ketones on heating with hydrazine and KOH or pot, tert butoxide in high boiling solvent such as ethylene glycol give the reduced product.

Reason : The reaction is known as Clemmensen's readuction.

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

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

C. If assertion is correct but reason is incorrect.

D. If assertion as well as reason are both incorrect.

Answer: B

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17. Assertion : α-hydrogen atoms in aldehydes or ketones are acidic.

Reason : Anions formed aftrt the loss of α-hydrogen atoms are stablished due to inductive effect.

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

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

C. If assertion is correct but reason is incorrect.

D. If assertion as well as reason are both incorrect.

Answer: C

Watch Video Solution

18. Assertion : Pentan-2-one and pentan-3-one can be distinguished with the help of iodoform test.

Reason : Pentan-2-one is a methyl ketones but pentan-3-one is not.

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

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

C. If assertion is correct but reason is incorrect.

D. If assertion as well as reason are both incorrect.

Answer: A

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19. Assertion : $RCOCl$ is reduced to $RCHO$ with H_2 using $Pd/BaSO_4$ catalyst contaning a small amount of sulphur.

Reason : RCHO is further reduced to RCH_2OH.

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

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

C. If assertion is correct but reason is incorrect.

D. If assertion as well as reason are both incorrect.

Answer: C

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20. Assertion : Grignard's synthesis is always carried in ethereal solution.

Reason : Water is polar solvent.

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

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

C. If assertion is correct but reason is incorrect.

D. If assertion as well as reason are both incorrect.

Answer: B

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21. Assertion : Cannizzaro's reaction is a disproportionation reaction.

Reason : It is a hydric ion transfer reaction.

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

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

C. If assertion is correct but reason is incorrect.

D. If assertion as well as reason are both incorrect.

Answer: A

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22. Assertion: $(CH_3)_3CCOC(CH_3)_3$ and acetone can be distanguished by the reaction with $NaHSO_3$.

Reason : HSO_3 is the nucleophile in bisulphite addition.

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

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

C. If assertion is correct but reason is incorrect.

D. If assertion as well as reason are both incorrect.

Answer: B

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23. Assertion : Aldol condensation can be catalysed both by acids and bases.

Reason : β- hydroxy aldehydes or ketones readily undergo acid catalysed dehydration.

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

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

C. If assertion is correct but reason is incorrect.

D. If assertion as well as reason are both incorrect.

Answer: B

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24. Assertion : Mixture of benzaldehyde and acetaldehyde in hot alkaline medium gives cinnamaldehyde.

Reason : Benzaldehyde is strong electrophile than acetaldehyde.

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

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

C. If assertion is correct but reason is incorrect.

D. If assertion as well as reason are both incorrect.

Answer: A

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25. Assertion : Aromatic aldehydes and formaldehyde undergo Cannizzaro reaction

Reason : Aromatic aldehydes are almost as reactive as formaldehyde.

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

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

C. If assertion is correct but reason is incorrect.

D. If assertion as well as reason are both incorrect.

Answer: C

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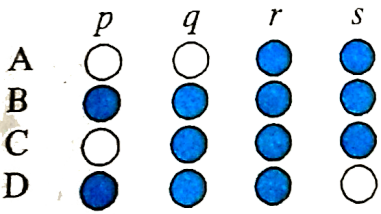
26. Match the following columns

Column I	Column II
(A) $PhCH=O$	*(p)* Positive iodoform test
(B) $CH_3CH=O$	*(q)* Reduces Fehling's solution
(C) $HCH=O$	*(r)* Positive Tollen's reagent test
(D) $CH_3-\underset{OH}{\underset{\vert}{CH}}-\overset{O}{\overset{\Vert}{C}}-CH_3$	*(s)* Positive Schiff's reagent test.



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27. Match the following columns

Column I	Column II
(A) $HCHO$	(p) Aldol condensation
(B) CH_3CHO	(q) Cannizzaro's reaction
(C) CH_3COCH_3	(r) Haloform reaction
(D) CH_3CH_2CHO	(s) Tischenko reaction.

	p	q	r	s
A	○	●	○	○
B	●	○	●	●
C	●	○	●	○
D	●	○	○	●

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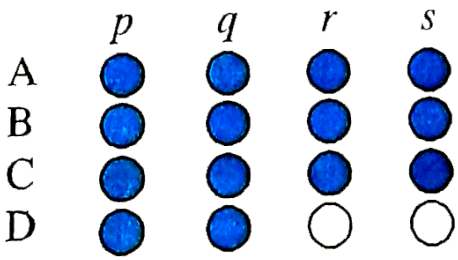
28. Match the following columns

Column I	Column II
(A) NH_2NH_2	(p) HCHO
(B) $NaHSO_3$	(q) CH_3CHO
(C) CH_3MgBr/H_3O^+	(r) CH_3COCH_3
(D) Fehling's solution	(s) C_6H_5CHO



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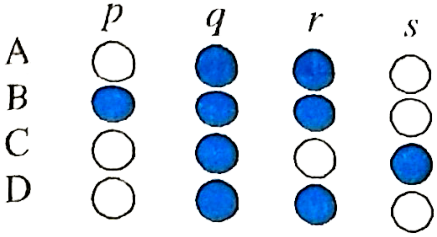
Match The Coloumn

1. Match the following columns

Column I		Column II
(A)	$Zn/Hg/HCl$	(p) Wolff Kishner reduction
(B)	NH_2NH_2/KOH	(q) Aldehydes
(C)	Strong NaOH	(r) Ketones
(D)	$C_6H_5NHNH_2$	(s) Cannizzaro's reaction



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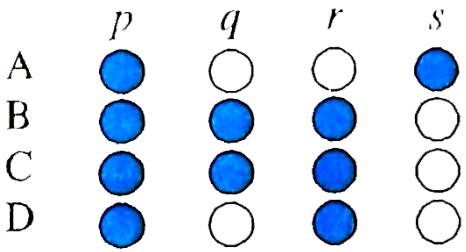
2. Match the following columns

Column I	Column II
(A) Alkanes	(p) van der waals' forces
(B) Alcohols	(q) Hydrogen bonding
(C) Aldehydes	(r) Dipolar interaction
(D) Ketones	(s) Low reactivity



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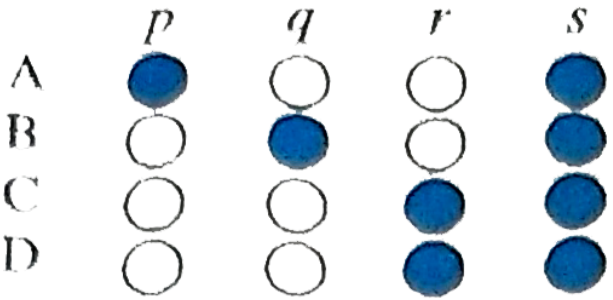
Column I		Column II	
(A)	Rosenmund's reduction	(p)	Acid chlorides
(B)	Reimer Tiemann Reaction	(q)	Phenols
(C)	Oxo process	(r)	Alkenes
(D)	Wacker process	(s)	Aldehydes

3.



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Interger

1. Total number of acyclic isomers having formula C_3H_6O :

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2. Isomeric aldehydes and ketones having the formula $C_5H_{10}O$ are :

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3. $4.4g$ of CH_3CHO upon oxidation with Tollen's reagenet form acid with mass equal to :

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4. In the compound $CH_3CH_2COCH_3$, the number of hydrogen atoms taking part in aldol condensation is :

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5. Total number of nitrogen atoms present in urotropine is :

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Others

1. m-Chlorobenzaldehyde on reaction with conc. KOH at room temperature gives:

A. Potassium m-benzaldehyde and m-chlorobenzyl alochol

B. m-Hydroxy benzaldehyde and m-chlorobenzyl alcohol

C. m-chlorobenzyl alcohol and m-hydroxy benzyl alcohol

D. Potassium m-chlorobenzoate and m-chlorobenzyl alcohol.

Answer: D

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2. Base catalysed aldol condensation occurs with:

A. Benzaldehyde

B. 2-Methylpropionaldehyde

C. N//A

D. It gives a positive iodoform test and is a geometrical isomer of X.

Answer: B

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3. An organic compoun having molecular formula C_3H_6O does not react with 2,4-dintrophenol hydrazine and does not react Na metal. The compound is expected to be:

A. CH_3CH_2CHO

B. $CH_2 = CHCH_2OH$

C. CH_3COCH_3

D. $CH_2 = CH - O - CH_3$

Answer: D

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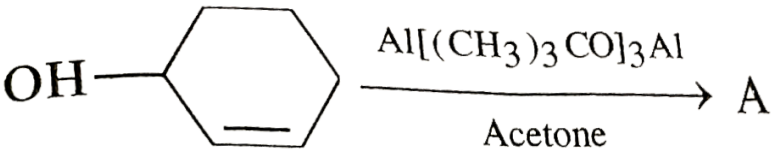
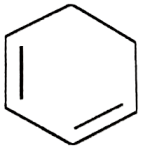
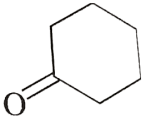
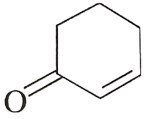
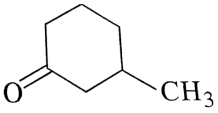
4. 

The compound A is :

A. (a) 

B. (b) 

C. (c) 

D. (d) 

Answer: C

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5. In the Cannizzaro reaction given below:

$2Ph - CHO \xrightarrow{\overset{\ominus}{OH}} Ph - CH_2OH + PhCO_2^-$ the slowest step is:

A. the attack of OH^- ion on carbonyl group

B. the transfer of H^- ion to carbonyl group

C. the abstraction of H^+ from the carboxylic acid

D. the disproportionation of $PhCH_2OH$.

Answer: B

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6. $CH_3CHO + NH_2OH \xrightarrow{-H_2O} CH_3CH = NOH$

The reaction is carried at :

A. $pH = 1$

B. $pH = 4.5$

C. $pH = 12$

D. Any pH.

Answer: B

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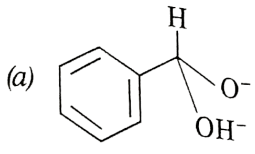
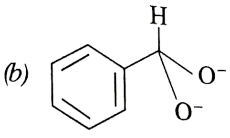
7. In Cannizzaro's reaction, which intermediate ion is best hydride $\left(H^{-}\right)$ ion donor ?

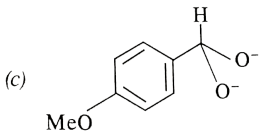
A.



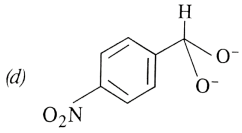
B.



C.



D.



Answer: D

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8. Which of the following will react with water?

A. Cl_3CCHO

B. $CHCl_3$

C. CCl_4

D. $Cl_2CH_2CH_2Cl$?

Answer: A

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9. The enol form of acetone after reacting with D_2O gives

A. $CH_3 - \overset{\overset{OD}{|}}{C} = CH_2$

B. $CD_3 - \overset{\overset{O}{||}}{C} - CD_3$

C. $CH_2 = \overset{\overset{OH}{|}}{C} - CH_2$

D. $CD_2 = \overset{\overset{OD}{|}}{C} - CH_3.$

Answer: B

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10. The product of oxymercuration of but-1-yne with $HgSO_4$ and H_2SO_4 will be :

A. $CH_3CH_2COCH_3$

B. $CH_3CH_2CH_2CHO$

C. CH_3CH_2CHO and $HCHO$

D. CH_3CH_2COOH and $HCOOH.$

Answer: A

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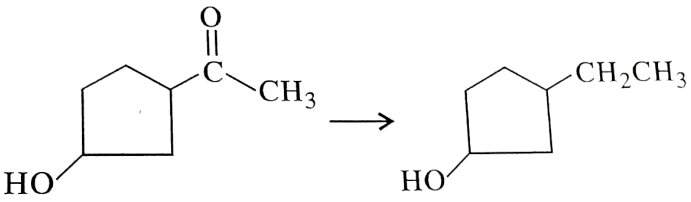
11. The reagent best suitable for the following transformation is :



A. NH_2NH_2, KOH

B. $Zn/Hg, HCl$

C. H_2/Ni

D. $NaBH_4$.

Answer: B

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12. Which of the following has most acidic hydrogen ?

A. Hexan-3-one

B. Hexan-2,4-dione

C. Hexana-2,5-dione

D. Hexan-2,3-dione ?

Answer: B

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13. A mixture of formaldehyde and benzaldehyde on heating with aqueous NaOH solution gives :

A. Benzyl alcohol and sodium formate

B. Sodium benzoate and methyl alcohol

C. Sodium benzoate and sodium formate

D. Benzyl alcohol and methyl alcohol.

Answer: A

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14. Compound 'A' (molecular formula C_3H_8O) is treated with acidified potassium dichromate to form a product 'B' (molecular formula C_3H_6O). 'B' forms a shinging silver mirror on warming with ammoniacal silver nitrate. 'B' when terated with an aqueous solution of $H_2NCONHNH_2$ ans sodium acetate gives a product 'C'. The structure of 'C' is :

A. $CH_3CH_2CH = NNHCONH_2$

B. $CH_3 - \underset{\underset{CH_3}{|}}{C} = NCONHNH_2$

C. $CH_3 - \underset{\underset{CH_3}{|}}{C} = NNHCONH_2$

D. $CH_3CH_2CH = NCONHNH_2.$

Answer: A

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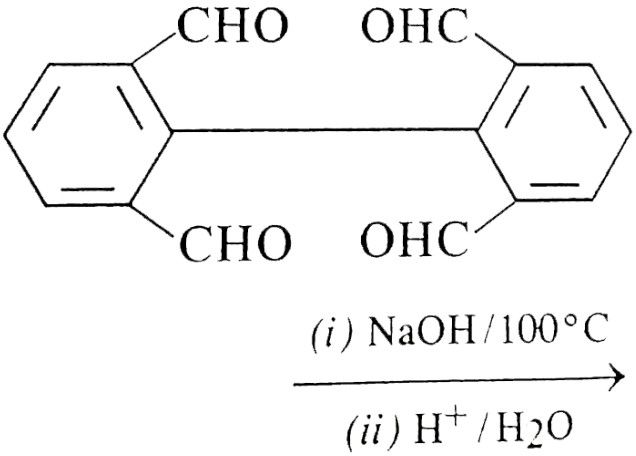
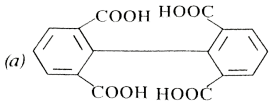
15. In the reaction :

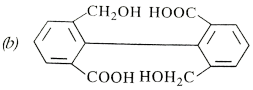


Major product is :

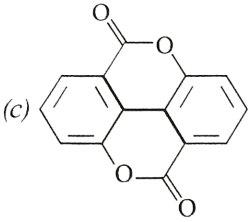
A.

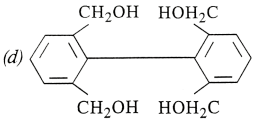


B.



C.



D. 

Answer: B

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16. The correct order of reactivity of PhMgBr with

$Ph-\underset{(I)}{\overset{\overset{O}{||}}{C}}-Ph$, $CH_3-\underset{(II)}{\overset{\overset{O}{||}}{C}}-H$ and $CH_3-\underset{(III)}{\overset{\overset{O}{||}}{C}}-CH_3$

A. $I > II > III$

B. $III > II > I$

C. $II > III > I$

D. $I > III > I$

Answer: C

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17. How will you convert butan-2-one to propanoic acid ?

A. With Tollen's reagent

B. With Fehling solution

C. $NaOH / I_2 / H^+$

D. $NaOH / NaI / H^+$

Answer: C

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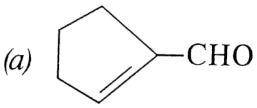
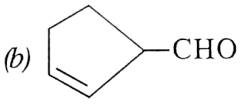
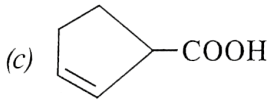
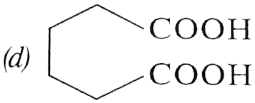
18. Cyclohexene on ozonolysis followed by reaction with zinc dust and water gives compound E. Compound E on furhter treatment with aqueous KOH yields compound F. Compound F is

A. 

B. 

C. (c) 

D. (d) 

Answer: A

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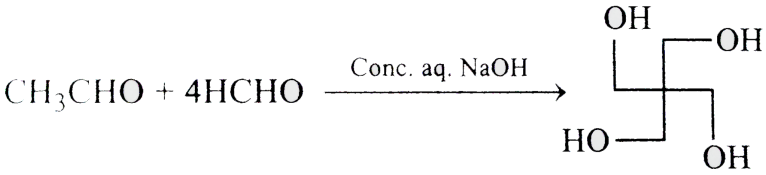
19. The number of adol reaction (s) that occurs in the given transformation is



A. 1

B. 2

C. 3

D. 4

Answer: C

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20. The major product H of the given reaction sequence is

$$CH_3 - CH_2CO - CH_3 \xrightarrow{\Theta_{CN}} G - \xrightarrow[Heat]{95\,\% H_2SO_4} H$$

A. $CH_3 - CH = \underset{\underset{CH_3}{|}}{C} - COOH$

B. $CH_3 - CH = \underset{\underset{CH_3}{|}}{C} - CN$

C. $CH_3 - CH_2 - \underset{\underset{CH_3}{|}}{\overset{\overset{OH}{|}}{C}} - COOH$

D. $CH_3 - CH = \underset{\underset{CH_3}{|}}{C} - CO - NH_2$

Answer: B

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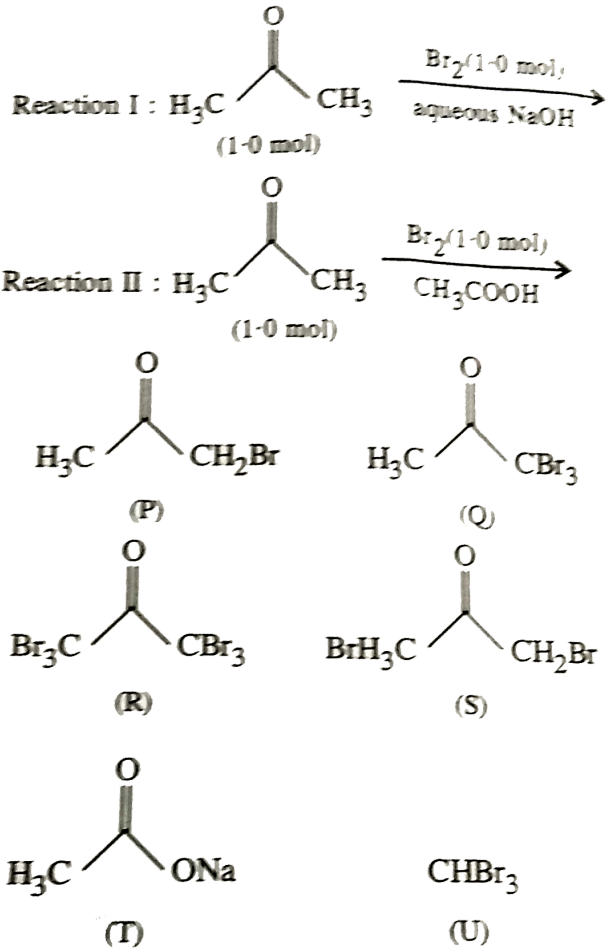
21. After completion of the reaction (I and II), the orgnanic compound(s) in the reaction mixtures is(are)



A. Reaction I : P and Reaction II : P

B. Reaction I : U, acetone and Reaction II : Q, acetone

C. Reaction I : T, U acetone and Reactioin II : P

D. Reaction T : R, acetone and Reaction II : S, acetone.

Answer: C

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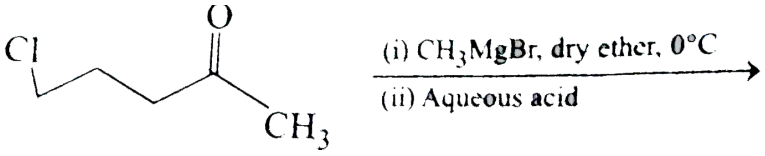
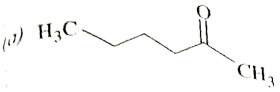
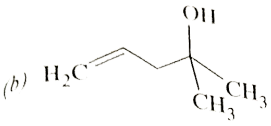
22. The major product in the following reaction is



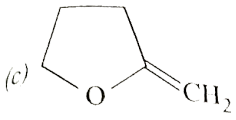
A.



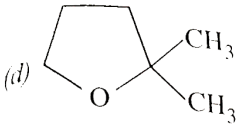
B.



C.



D.



Answer: D

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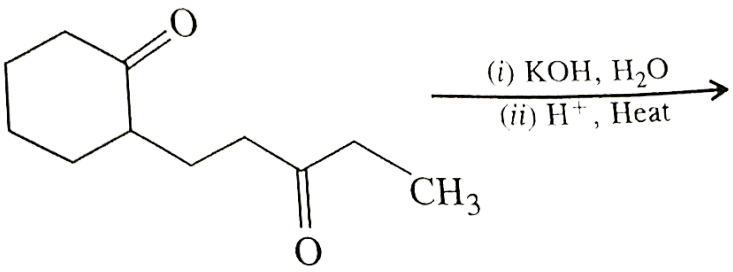
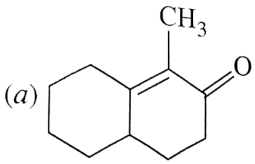
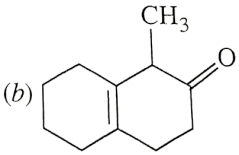
23. The major product of the following reaction is



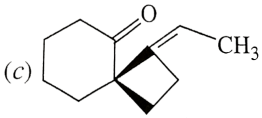
A.

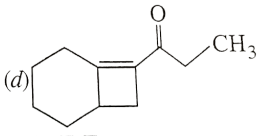


B.



C.



D. 

Answer: A

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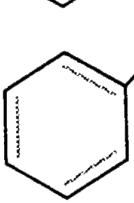
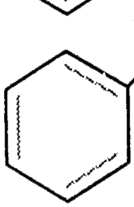
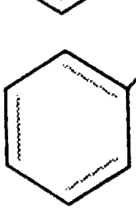
24. Among The following the number of reaction(s) that prouduce(s) benzadelhyde is

I.  $\xrightarrow[\text{Anhydrous } AlCl_3 / CuCl]{CO, HCl}$

II.  $\xrightarrow[100°C]{H_2O}$

III.  $\xrightarrow[Pd\text{-}BaSO_4]{H_2}$

IV.  $\xrightarrow[\text{Toluene, } -78°C]{\text{DIBAL-H}}$ H_2O

A. (I), (II), (IV)

B. (I), (II), (III), (IV)

C. (I), (IV)

D. (II), (IV)

Answer: B

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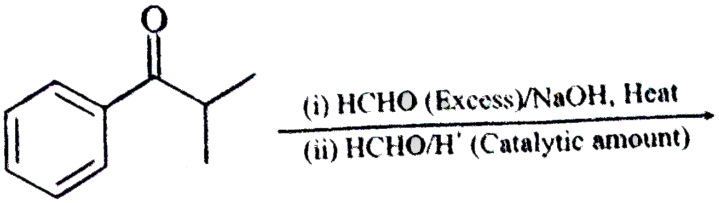
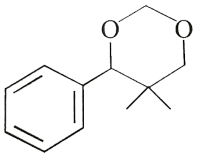
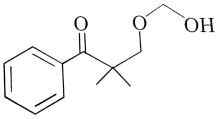
25. The major product of the following reaction sequence is



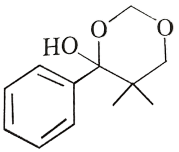
A. (a)



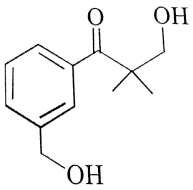
B. (b)



C. (c)



D. (d)



Answer: A

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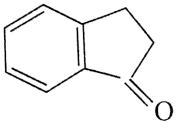
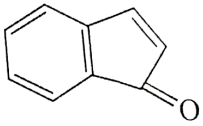
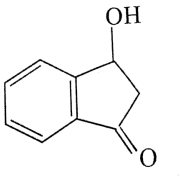
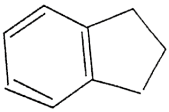
26. Treatment of benzene with $C\frac{\emptyset}{H}Cl$ in the presence of anhydrous $AlCl_3/CuCl$ followed by reaction with $Ac_2\frac{\emptyset}{N}aOAc$ gives a compound X. Reaction of X with $H_2/Pd/c$ followed by treatment with H_3PO_4 gives another compound Y. The compound Y is :

A. (a) 

B. (b) 

C. (c) 

D. (d) 

Answer: A

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27. Base catalysed aldol condensation occurs with

A. propionaldehyde

B. benzaldehyde

C. 2-methylpropionaldehyde

D. 2, 2-dimethylpropionaldehyde

Answer: A::C

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28. Which of the following compounds will recact with ethanolic KCN?

A. Ethyl chloride

B. Acetyl chloride

C. Chlorobenzene

D. Benzaldehyde.

Answer: A::D

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29. Which of the following are examples of aldol condensation ?

A. $2CH_3CHO \xrightarrow{\text{dil. NaOH}} CH_3CHOHCH_2CHO$

B. $2CH_3COCH_3 \xrightarrow{\text{dil.}NaOH} CH_3CHOHCH_3CH_2COCH_3$

C. $2HCHO \xrightarrow{\text{dil. NaOH}} CH_3OH$

D. $C_6H_5CHO + HCHO \xrightarrow{\text{dil. NaOH}} C_6H_5CH_2OH + HCOCH$

Answer: A::B

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30. A new carbon-carbon bond formation is possible in:

A. Cannizzaro's Reaction

B. Friedal Craft's reaction

C. Clemmensen reduction

D. Reimer-Tiemann reaction.

Answer: B::D

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31. Among the following compounds, which will react with acetone to give a product cotaining $> C = N -$?

A. $C_6H_5NH_2$

B. $(CH_3)_3N$

C. $C_6H_5NHC_6H_5$

D. $C_6H_5NHNH_2$.

Answer: A::D

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32. Which of the following will undergo aldol condensation?

A. Acetaldehyde

B. Propanaldehyde

C. Benzaldehyde

D. Trideutereo acetaldehyde

Answer: A::B

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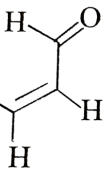
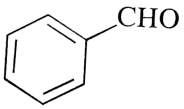
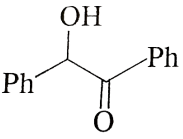
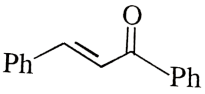
33. Positive Tollen's test is observed for

A. (a) 

B. (b) 

C. (c) 

D. (d) 

Answer: A::B::C

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34. The correct statement(s) about the following reaction sequence is (are)

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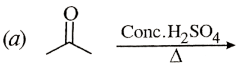
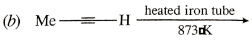
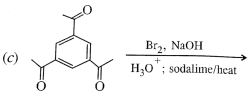
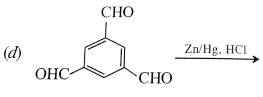
35. The reaction(s) leading to be formation of 1,3-trimethylbenzene is (are)

A. 

B. 

C. 

D. 

Answer: A::B::D

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