

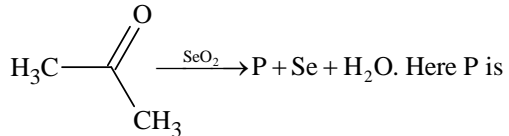
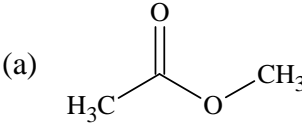
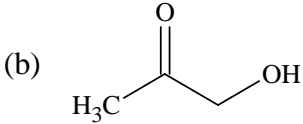
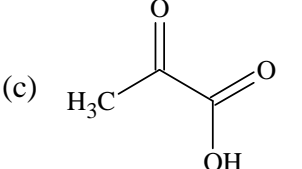
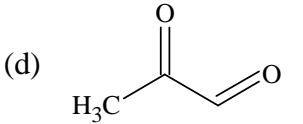
Aldehyde & Ketones

LEVEL - I

- Which of the following gives ketone on oxidation?
 - $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$
 - $\text{CH}_3\cdot\text{CHOHCH}_3$
 - $(\text{CH}_3)_2\text{CHCH}_2\text{OH}$
 - $(\text{CH}_3)_3\text{COH}$
- On heating calcium acetate and calcium formate, the product formed is
 - CH_3COCH_3
 - CH_3CHO
 - $\text{HCHO} + \text{CaCO}_3$
 - $\text{CH}_3\text{CHO} + \text{CaCO}_3$
- $(\text{HCOO})_2\text{Ca} \xrightarrow{\text{dry distillation}} \text{X} + \text{Y}$ Compounds X and Y are
 - Formaldehyde and water
 - Acetaldehyde and water
 - Formaldehyde and calcium carbonate
 - Acetaldehyde and calcium carbonate
- When propyne is treated with dil. H_2SO_4 in presence of HgSO_4 the major product is
 - Propanal
 - Acetaldehyde
 - Acetone
 - Butanone
- During reduction of carbonyl compounds by hydrazine and KOH, the first intermediate formed is
 - $\text{RC} \equiv \text{N}$
 - RCONH_2
 - $\text{RCH} = \text{NH}$
 - $\text{RCH} = \text{NNH}_2$
- $\text{C}_2\text{H}_5\text{COCl} + \text{H}_2 \xrightarrow{\text{Pd/BaSO}_4} \text{X} + \text{Y}$ Compounds X and Y are
 - CH_3CHO and HCl
 - $\text{C}_2\text{H}_5\text{CHO}$ and HCl
 - CH_3COCH_3 and HCl
 - $\text{CH}_3\text{COC}_2\text{H}_5$ and HCl
- Oxidation of toluene with CrO_3 in the presence of $(\text{CH}_3\text{CO})_2\text{O}$ gives a product 'A' which on treatment with aqueous NaOH , produces
 - 2,4-diacetyltoluene
 - $\text{C}_6\text{H}_5\text{COONa}$
 - $(\text{C}_6\text{H}_5\text{CO})_2\text{O}$
 - $\text{C}_6\text{H}_5\text{CHO}$
- In this reaction:

$$\text{CH}_3\text{CHO} + \text{HCN} \longrightarrow \text{CH}_3\text{CH}(\text{OH})\text{CN} \xrightarrow{\text{H}_2\text{O}} \text{CH}_3\text{CH}(\text{OH})\text{COOH}$$
 an asymmetric centre is generated. This acid obtained would be
 - 50% D + 50% L-isomer
 - L-isomer
 - 20% D + 80% L-isomer
 - D-isomer
- Which of the following is most reactive towards nucleophilic addition reactions?
 - HCHO
 - CH_3CHO
 - $\text{C}_2\text{H}_5\text{CHO}$
 - $\text{CH}_3\cdot\text{CO}\cdot\text{CH}_3$

QUESTION BANK-CH-2

10. The most reactive compound towards formation of cyanohydrin on treatment with KCN followed by acidification is:
 (a) Benzaldehyde (b) *p*-Nitrobenzaldehyde
 (c) Phenylacetaldehyde (d) *p*-Hydroxybenzaldehyde
11. $\text{CH}_3\text{CH} = \text{CHCHO}$ is oxidized to $\text{CH}_3\text{CH} = \text{CHCOOH}$ using
 (a) Alkaline KMnO_4 (b) Selenium dioxide
 (c) Ammonical AgNO_3 (d) All
12. Schiff's reagent is
 (a) Magenta solution decolourised with sulphurous acid
 (b) Magenta solution decolourised with chlorine
 (c) Ammonical cobalt chloride solution
 (d) Ammonical manganese sulphate solution
13. 
 (a)  (b) 
 (c)  (d) 
14. Which one of the following pairs is not correctly matched?
 (a) $> \text{C} = \text{O} \longrightarrow > \text{CH}_2$ Clemmensen reduction
 (b) $> \text{C} = \text{O} \longrightarrow > \text{CHOH}$ Wolff-Kishner reduction
 (c) $-\text{COCl} \longrightarrow -\text{CHO}$ Rosenmund reduction
 (d) $-\text{C} \equiv \text{N} \longrightarrow -\text{CHO}$ Stephen reduction
15. If 3-hexanone is reacted with NaBH_4 followed by hydrolysis with D_2O , the product will be
 (a) $\text{CH}_3\text{CH}_2\text{CH}(\text{OH})\text{CH}_2\text{CH}_2\text{CH}_3$ (b) $\text{CH}_3\text{CH}_2\text{CD}(\text{OH})\text{CH}_2\text{CH}_2\text{CH}_3$
 (c) $\text{CH}_3\text{CH}_2\text{CH}(\text{OD})\text{CH}_2\text{CH}_2\text{CH}_3$ (d) $\text{CH}_3\text{CH}_2\text{CD}(\text{OD})\text{CH}_2\text{CH}_2\text{CH}_3$
16. Treatment of propionaldehyde with dil. NaOH solution gives
 (a) $\text{CH}_3\text{CH}_2\text{COOCH}_2\text{CH}_2\text{CH}_3$ (b) $\text{CH}_3\text{CH}_2\text{CHOHCH}(\text{CH}_3)\text{CHO}$
 (c) $\text{CH}_3\text{CH}_2\text{CHOHCH}_2\text{CH}_2\text{CHO}$ (d) $\text{CH}_3\text{CH}_2\text{COCH}_2\text{CH}_2\text{CHO}$
17. Which compound undergoes aldol condensation?
 (a) Acetaldehyde (b) Phenylacetaldehyde
 (c) Ethyl methyl ketone (d) All

18. Base catalysed aldol condensation occurs with
 (a) benzaldehyde` (b) 2-methyl propionaldehyde
 (c) 2,2-dimethyl propionaldehyde (d) none
19. Aldol condensation will not observed in
 (a) Chloroal (b) Phenylacetaldehyde
 (c) Hexanal (d) Nitromethane
20. A mixture of benzaldehyde and formaldehyde 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
21. In the reaction below

$$\text{H}_5\text{C}_2-\overset{\text{O}}{\parallel}{\text{C}}-\text{CH}_3 + \text{I}_2 + \text{X} \longrightarrow \text{Y} + \text{CHI}_3 + \text{H}_2\text{O} + \text{NaI}$$
 Identify compounds X and Y
 (a) NaOH and C₂H₅ONa (b) NaOH and C₂H₅COOH
 (c) NaOH and C₂H₅COONa (d) None
22. Which of the following reagents cannot be used to distinguish between pentanal and pentanone-2?
 (a) Tollen's reagent (b) Fehling solution
 (c) I₂ in NaOH (d) Br₂ in carbon tetrachloride
23. In the given reaction, X is $\text{CH}_3\text{CHO} + \text{CH}_2(\text{COOH})_2 \xrightarrow[\text{heat}]{\text{Pyridine}} \text{X}$
 (a) CH₃COOH (b) C₂H₅COOH
 (c) CH₃CH = CH·COOH (d) COOH·CH = CH·COOH
24. Which of the following reaction can produce R – CO – Ar?
 (a) ArCOCl + H – Ar $\xrightarrow{\text{AlCl}_3}$ (b) COCl₂ + RMgX \longrightarrow
 (c) R + CrO₃ \longrightarrow (d) RCOCl + H – Ar $\xrightarrow{\text{AlCl}_3}$
25. Which of the following compounds is oxidized to prepare methyl ethyl ketone?
 (a) 2-Propanaol (b) 1-Butanol
 (c) 2-Butanol (d) *tert*-Butyl alcohol

LEVEL – II

1. In the reaction sequence

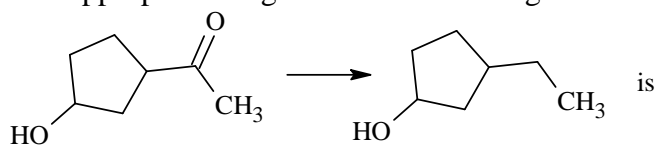
$$\text{Glycerol} \xrightarrow{\text{KHSO}_4/\Delta} \text{X} \xrightarrow{\text{Zn-Hg}/\text{conc.HCl}/\Delta} \text{Y} \xrightarrow{\text{NBS}/\text{CCl}_4} \text{Z}; (\text{Z}) \text{ will be}$$

 (a) 1-Bromopropane (b) 2-Bromopropane
 (c) 3-Bromopropene (d) 1,2-Dibromopropane

QUESTION BANK-CH-4

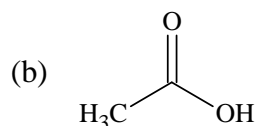
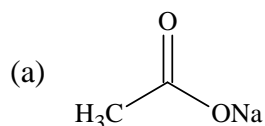
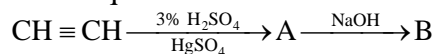
2. $C_6H_6 + CO + HCl \xrightarrow{\text{Anhy. AlCl}_3} X + HCl$. Compound X is
 (a) $C_6H_5CH_3$ (b) $C_6H_5CH_2Cl$
 (c) C_6H_5CHO (d) C_6H_5COOH
3. $(CH_3)_2CO \xrightarrow[\text{(HCl)}]{NaCN} A \xrightarrow[\Delta]{H_3O^+} B$
 In the above sequence of reactions, A and B are
 (a) $(CH_3)_2C(OH)CH_3$, $(CH_3)_2C(OH)COOH$ (b) $(CH_3)_2C(OH)CN$, $(CH_3)_2C(OH)_2$
 (c) $(CH_3)_2C(OH)CN$, $(CH_3)_2CHCOOH$ (d) $(CH_3)_2C(OH)CN$, $(CH_3)C=O$
4. The general order of reactivity of carbonyl compounds for nucleophilic addition reactions is:
 (a) $H_2C=O > R_2C=O > Ar_2C=O > RCHO > ArCHO$
 (b) $H_2C=O > RCHO > R_2C=O > ArCHO > Ar_2C=O$
 (c) $ArCHO > Ar_2C=O > RCHO > R_2C=O > H_2O=O$
 (d) $Ar_2C=O > R_2C=O > ArCHO > RCHO > H_2C=O$
5. Which of the following chemical system has most acidic hydrogen?
 (a) 3-Hexanone (b) 2,4-Hexanedione
 (c) 2,5-Hexanedione (d) 2,3-Hexanedione
6. Which of the following compounds would not form a silver mirror with Tollne's reagent?
 (a) $R \cdot CHO$ (b) $Ar \cdot CHO$
 (c) $CH_3 \cdot CO \cdot R$ (d) $RCHOHCOR$
7. An organic compound of molecular formula C_3H_6O did not give a silver mirror with Tollen's reagent, but gave an oxime with hydroxylamine. It may be
 (a) $CH_2=CHCH_2OH$ (b) CH_3CH_2CHO
 (c) CH_3COCH_3 (d) $CH_2=CH \cdot O \cdot CH_3$

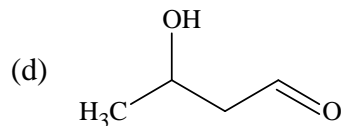
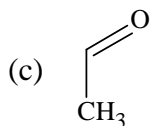
8. The appropriate reagent for the following transformation



- (a) $Zn(Hg) \cdot HCl$ (b) NH_2NH_2, OH^-
 (c) H_2/Ni (d) $NaBH_4$

9. Predict the product 'B' in the sequence of reaction

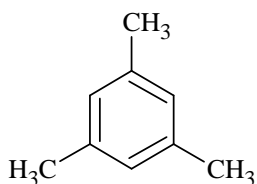




10. Aldol condensation between which of the following compounds followed by dehydration gives methylvinyl ketone?

- (a) HCHO and CH₃COCH₃ (b) HCHO and CH₃CHO
(c) 2CH₃CHO (d) 2CH₃COCH₃

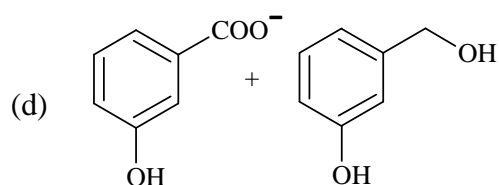
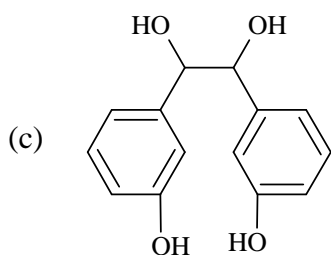
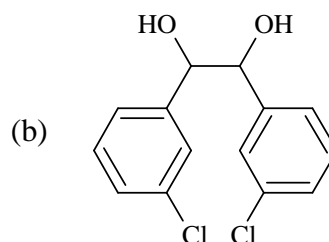
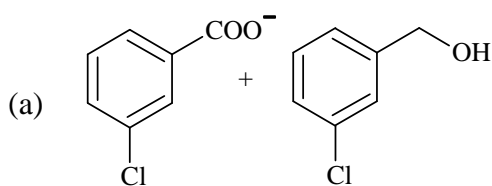
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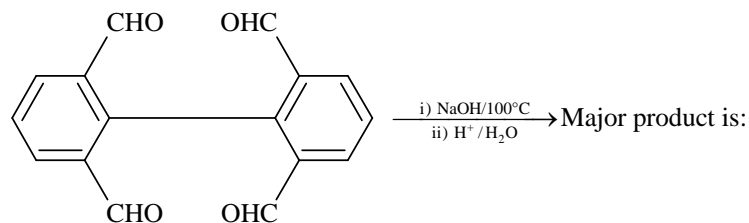
The above compound describes a condensation polymer which can be obtained in two ways. Either treating 3 molecules of acetone (CH₃COCH₃) with conc. H₂SO₄ or passing propyne (CH₃C ≡ CH) through a red hot tube. The polymer is

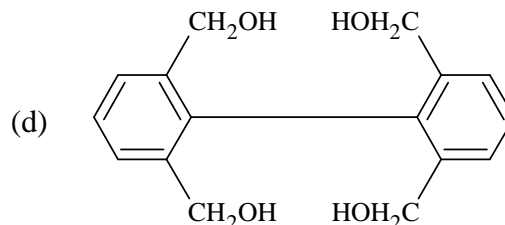
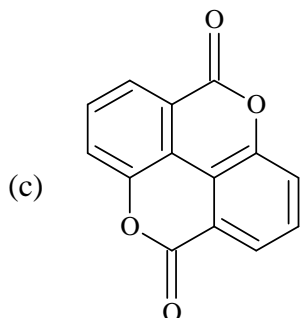
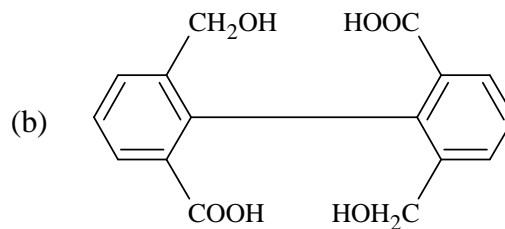
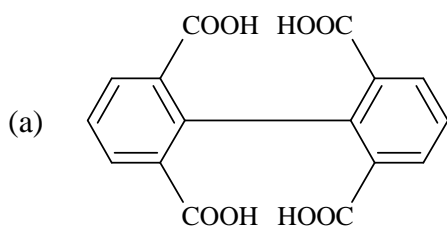
- (a) Phorone (b) Mesityl oxide
(c) Diacetyl alcohol (d) Mesitylene

12. When *m*-chlorobenzaldehyde is treated with 50% KOH solution, the product(s) obtained is(are)

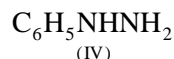
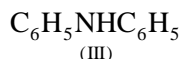
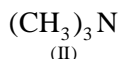
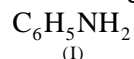


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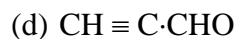
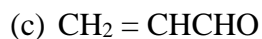




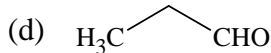
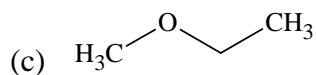
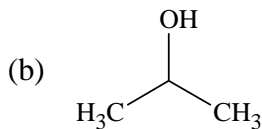
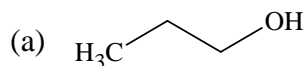
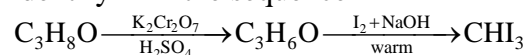
14. Among the following compounds, which will react with acetone to give a product containing C = N – bond?



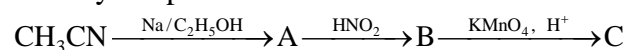
- (a) only I
(b) only IV
(c) I and IV
(d) I, III and IV
15. An organic compound X on treatment with acidified $K_2Cr_2O_7$ gives compound Y which reacts with I_2 and sodium carbonate to form tri-iodomethane. The compound X can be
(a) CH_3OH
(b) $CH_3 \cdot CO \cdot CH_3$
(c) CH_3CHO
(d) $CH_3CH(OH)CH_3$
16. A substance $C_4H_{10}O$ yields on oxidation a compound, C_4H_8O which gives an oxime and a positive iodoform test. The original substance on treatment with conc. H_2SO_4 gives C_4H_8 . The structure of the compound is
(a) $CH_3CH_2CH_2CH_2OH$
(b) $CH_3CHOHCH_2CH_3$
(c) $(CH_3)_3COH$
(d) $CH_3CH_2 - O - CH_2CH_3$
17. Which of the following statements regarding chemical properties of acetophenone are wrong?
I. It is reduced to methylphenylcarbinol by sodium and ethanol
II. It is oxidized to benzoic acid and acidified $KMnO_4$
III. It does not undergo electrophilic substitution like nitration at meta position
IV. It does not undergo iodoform reaction with iodine and alkali
(a) I and III
(b) II and IV
(c) III and IV
(d) I and II
18. A compound possessing α -hydrogen atom, in the presence of dilute alkali forms β -hydroxyaldehyde. This product on heating with dilute acid forms an unsaturated crotonaldehyde. The compound is
(a) CH_3CHO
(b) CH_3CH_2CHO



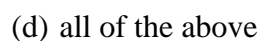
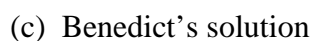
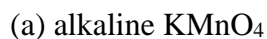
19. Identify X in the sequence



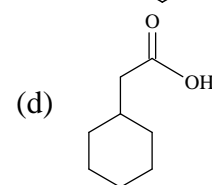
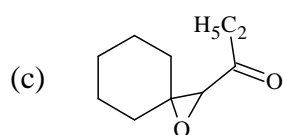
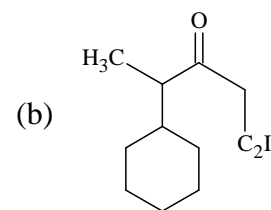
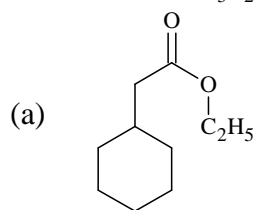
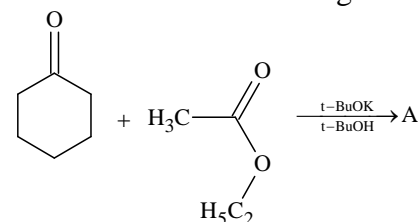
20. Identify the product C in the series



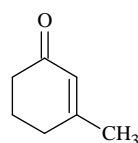
21. In the reaction



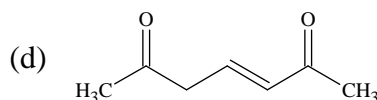
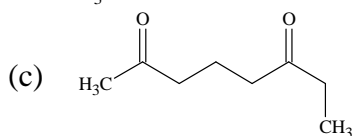
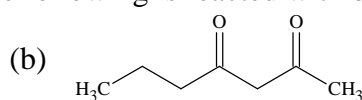
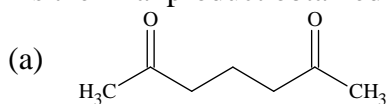
22. What is A in the following reaction?



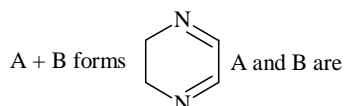
23.



is the final product obtained when one of the following is reacted with base.

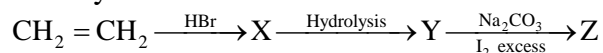


24.



- (a) $\text{H}_2\text{N} - \text{CH}_2\text{CH}_2 - \text{NH}_2$, CH_3CHO
 (b) CH_3CHO , $\text{NH}_2 - \text{NH}_2$
 (c) $\text{H}_2\text{N} - \text{CH}_2\text{CH}_2 - \text{NH}_2$, $\text{CHO} - \text{CHO}$
 (d) HCHO , CH_3NH_2

25. Identify Z in the series



- (a) $\text{C}_2\text{H}_5\text{I}$ (b) $\text{C}_2\text{H}_5\text{OH}$
 (c) CHI_3 (d) CH_3CHO

LEVEL - III

- Reduction with aluminium isopropoxide in excess of isopropyl alcohol is called Meerwein Ponndorff Verley reduction (MPV). What will be the final product when cyclohex-2-enone is selectively reduced in MPV reaction?

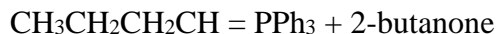
(a) Cyclohexanol (b) Cyclohex-2-enol
 (b) Cyclohexanone (d) Benzene
- Identify X in the sequence

$$\text{C}_4\text{H}_8\text{O} \xrightarrow[\text{ii) H}_2\text{O}/\text{H}^+]{\text{i) CH}_3\text{MgI}} \text{C}_5\text{H}_{12}\text{O} \xrightarrow[575\text{K}]{\text{Cu}} \text{C}_5\text{H}_{10}$$

(a) $\text{CH}_3 \cdot \text{CO} \cdot \text{CH}_2\text{CH}_3$ (b) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CHO}$
 (c) $(\text{CH}_3)_2\text{CHCHO}$ (d) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{OH}$
- A new carbon-carbon bond formation is possible in

I. Cannizzaro reaction
 II. Friedel Craft reaction
 III. Clemmensen reduction
 IV. Riemer-Tiemann reaction

(a) II (b) II and IV
 (c) All (d) None
- Which alkene is formed from the following yield carbonyl pair?

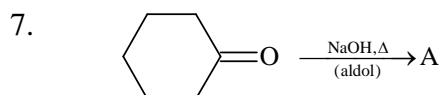


- (a) 3-Methyl-3-heptene
(b) 4-Methyl-3-heptene
(c) 5-Methyl-3-heptene
(d) 1-Methyl-5-heptene

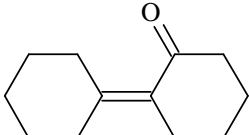
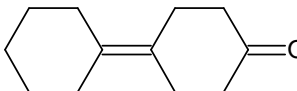
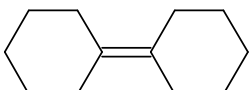
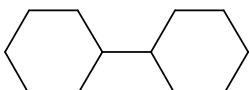
5. An organic compound 'A' has the molecular formula $\text{C}_3\text{H}_6\text{O}$. It undergoes iodoform test. When saturated with HCl it gives 'B' of molecular formula $\text{C}_9\text{H}_{14}\text{O}$. 'A' and 'B' respectively are
(a) Propanal and mesitylene
(b) Propanone and mesityl oxide
(c) Propanone and 2,6-dimethyl-2,5-heptadien-4-one
(d) Propane and mesitylene oxide

6. Compound 'A' (molecular formula $\text{C}_3\text{H}_8\text{O}$) is treated with acidified potassium dichromate to form a product 'B' (molecular formula $\text{C}_3\text{H}_6\text{O}$). 'B' forms a shining silver mirror on warming with ammonical silver nitrate. 'B' when treated with an aqueous solution of $\text{H}_2\text{NCONHNH}_2 \cdot \text{HCl}$ and sodium acetate gives a product 'C'. Identify the structure of 'C'.

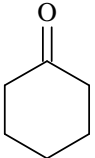
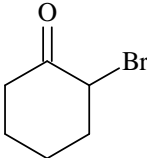
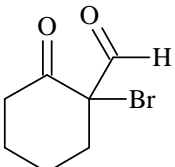
- (a) $\text{CH}_3\text{CH}_2\text{CH} = \text{NNHCONH}_2$
(b) $(\text{CH}_3)_2\text{C} = \text{NNHCONH}_2$
(c) $(\text{CH}_3)_2\text{C} = \text{NCONHNH}_2$
(d) $\text{CH}_3\text{CH}_2\text{CH} = \text{NCONHNH}_2$

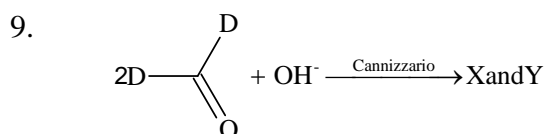


A can be:

- (a) 
- (b) 
- (c) 
- (d) 

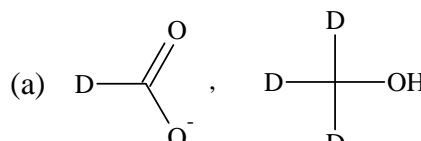
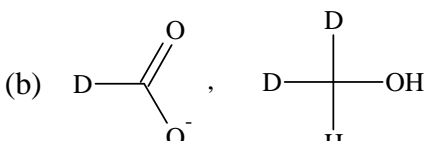
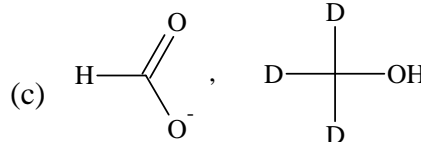
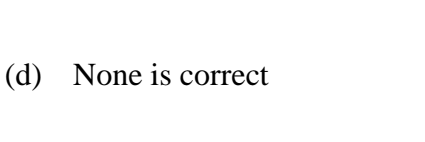
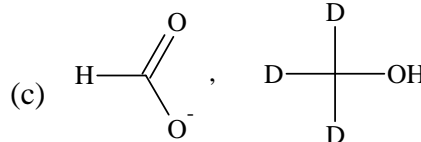
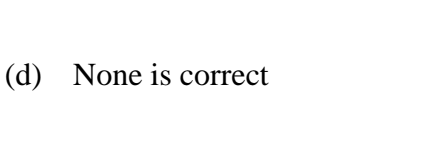
8. Greatest amount of hydration is in:

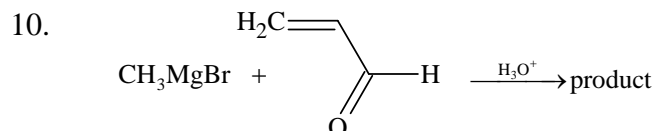
- (a) 
- (b) 
- (c) 
- (d) Equal



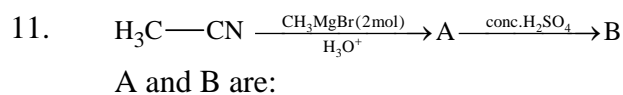
(Y is alcohol, D is deuterium)

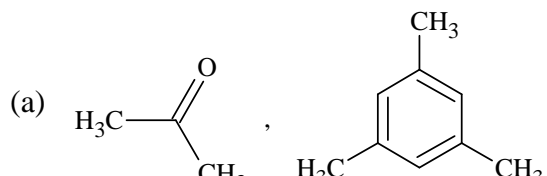
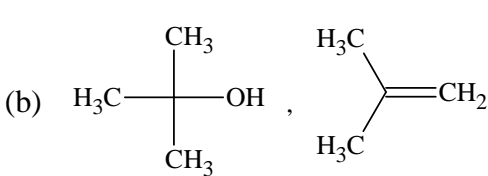
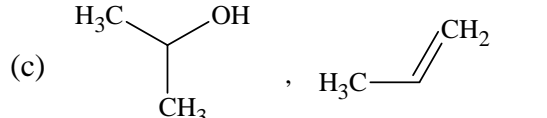
X and Y will have structure

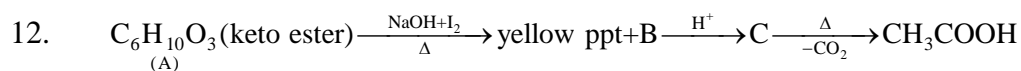
- (a)  , 
- (b)  , 
- (c)  , 
- (d) None is correct



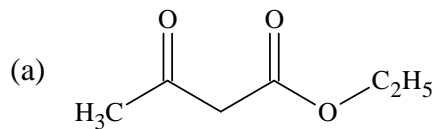
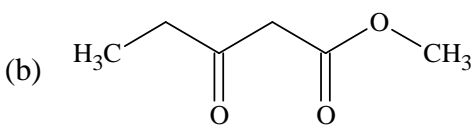
- (a) 
- (b) 
- (c) 
- (d) None is correct



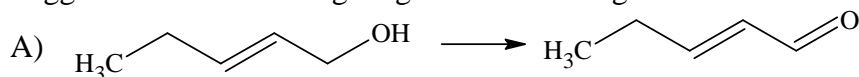
- (a) 
- (b) 
- (c) 
- (d) None is correct

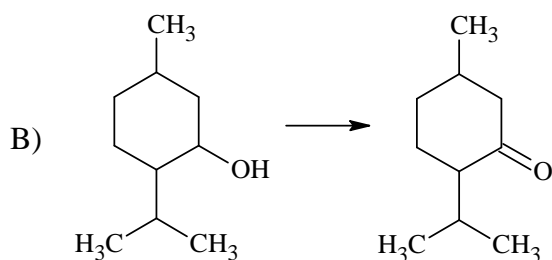


Hence A is:

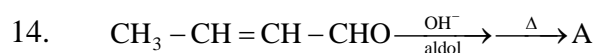
- (a) 
- (b) 
- (c) Both are correct
- (d) None is correct

13. Suggest suitable oxidizing reagents for allowing conversions:





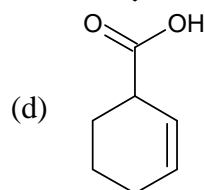
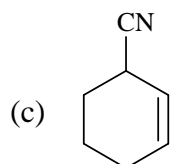
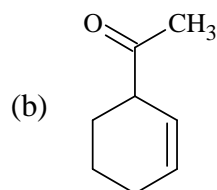
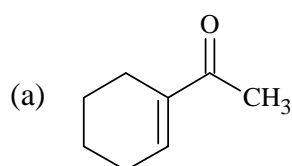
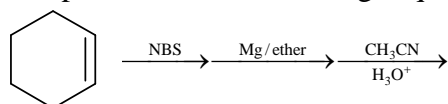
- (a) MnO_2 in A and CrO_3 (in glacial acetic acid) in B
 (b) CrO_3 in A and MnO_2 in B
 (c) both correct
 (d) both incorrect



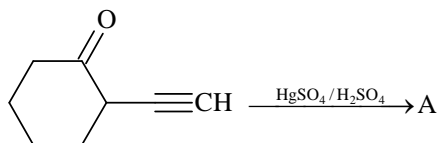
A is

- (a) $\text{CH}_3(\text{CH}=\text{CH})_3\text{CHO}$ (b) $\text{CH}_3\text{CH}_2\text{CH}_2(\text{CH}=\text{CH})_2\text{CHO}$
 (c) $\text{CH}_3(\text{CH}_2\text{CH}_2)_2\text{CH}=\text{CH}-\text{CHO}$ (d) none is correct

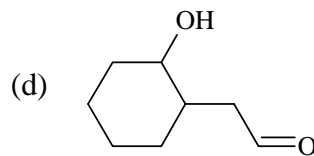
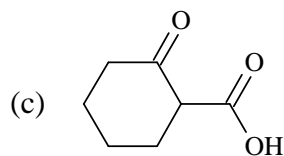
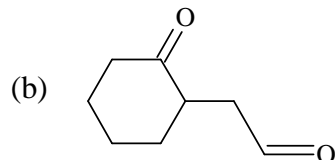
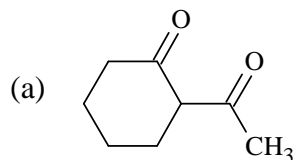
15. End product of the following sequence of reactions is:



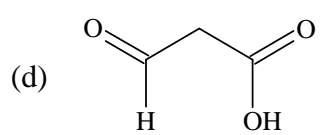
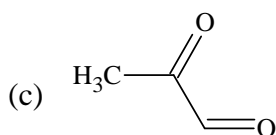
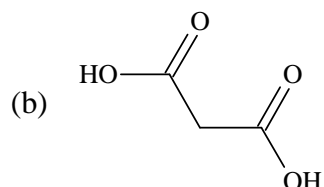
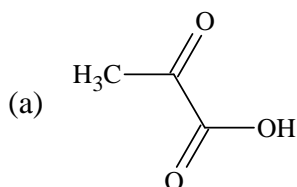
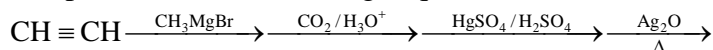
- 16.



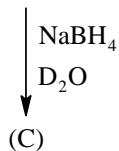
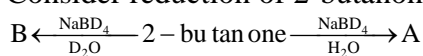
A is:



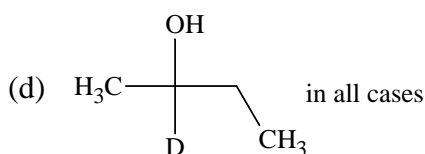
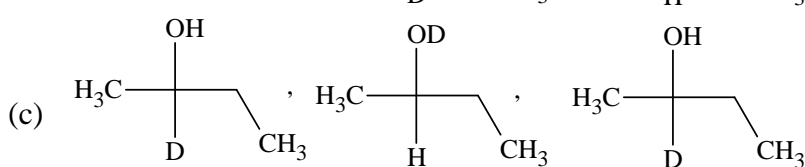
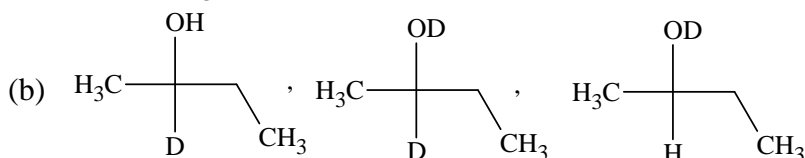
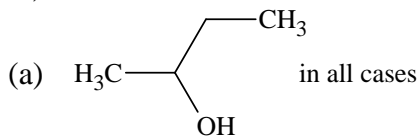
17. End product of the following sequence of reaction is:



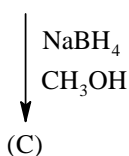
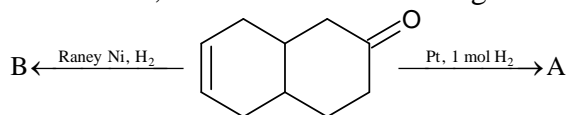
18. Consider reduction of 2-butanone

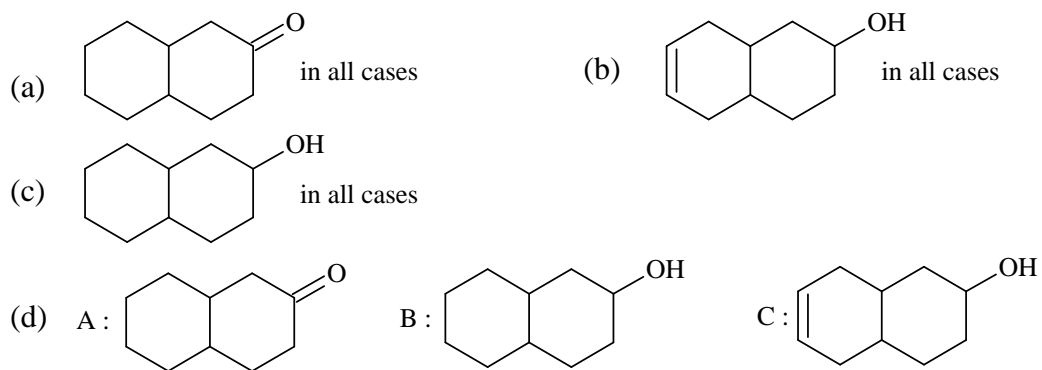


A, B and C are

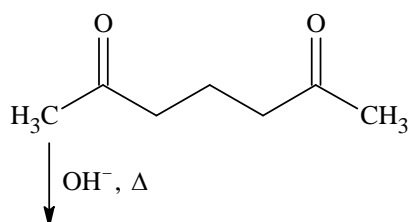


19. What are A, B and C in the following?

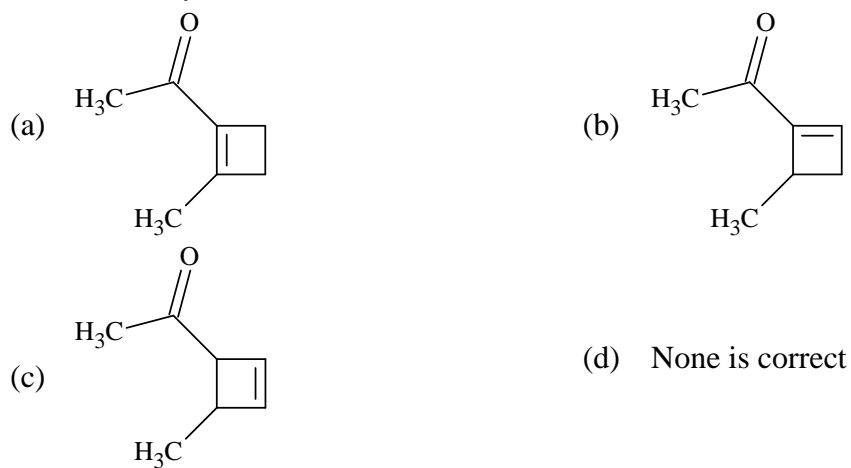




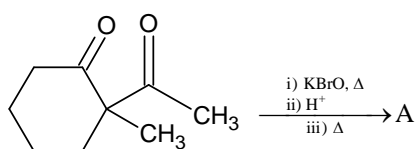
20.



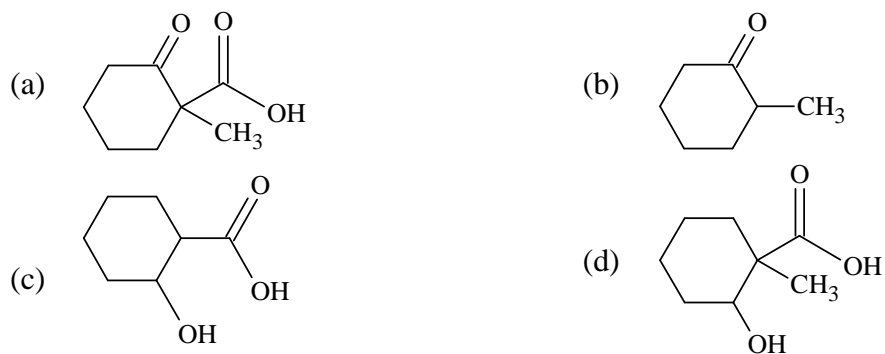
A (formed by aldol condensation) is:

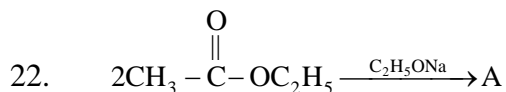


21.



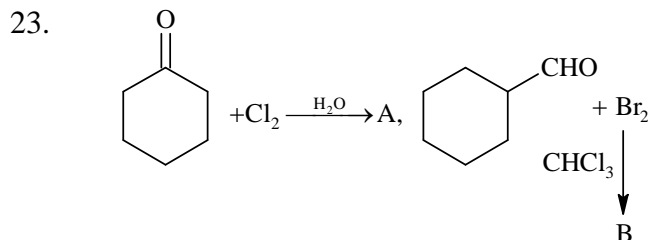
A is:



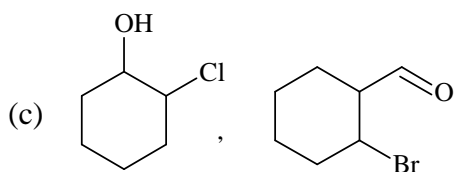
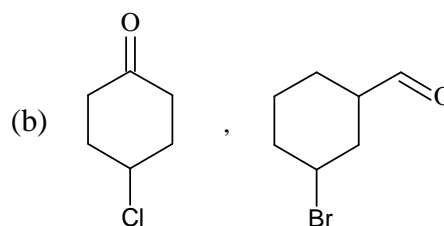
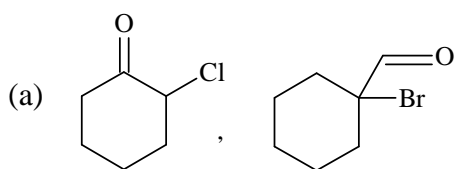


A is formed by Claisen condensation; which is/are true about A?

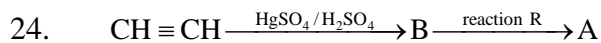
- (a) A forms oximes (b) A shows tautomerism
(c) A shows iodoform test (d) All true



A and B are:



(d) None is correct



A, B and reaction R are:

- (a) $\text{CH}_3 - \overset{\text{O}}{\parallel} \text{C} - \text{Cl}$, CH_3CHO
Rosenmund (Pd/BaSO_4 , H_2)
(c) CH_3CN , CH_3CHO ,
Stephen (SnCl_2/HCl)

- (b) CH_3COOH , LiAlH_4
hydroboration oxidation
(d) $\text{CH} \equiv \text{CH}$, CH_3CHO
hydroboration oxidation

25. Which is/are correct statement(s)?

- (a) in presence of conc. H_2SO_4 , CH_3CHO changes to cyclic trimer-paraldehyde which is a hypnotic.
(b) at room temperature, HCHO forms cyclic trimer-trioxan
(c) in presence of $\text{Ba}(\text{OH})_2$, HCHO forms hexose
(d) bakelite is the polymer of HCHO and urea

Answers

Aldehyde & Ketones

LEVEL - I

- | | | | | | |
|----|-----|-----|-----|-----|-----|
| 1. | (b) | 10. | (b) | 19. | (a) |
| 2. | (d) | 11. | (c) | 20. | (a) |
| 3. | (c) | 12. | (a) | 21. | (c) |
| 4. | (c) | 13. | (d) | 22. | (d) |
| 5. | (d) | 14. | (b) | 23. | (c) |
| 6. | (b) | 15. | (c) | 24. | (d) |
| 7. | (d) | 16. | (b) | 25. | (c) |
| 8. | (a) | 17. | (d) | | |
| 9. | (a) | 18. | (b) | | |

LEVEL - II

- | | | | | | |
|----|-----|-----|-----|-----|-----|
| 1. | (c) | 10. | (a) | 19. | (b) |
| 2. | (c) | 11. | (d) | 20. | (a) |
| 3. | (a) | 12. | (a) | 21. | (d) |
| 4. | (b) | 13. | (b) | 22. | (c) |
| 5. | (b) | 14. | (c) | 23. | (a) |
| 6. | (c) | 15. | (d) | 24. | (c) |
| 7. | (c) | 16. | (b) | 25. | (c) |
| 8. | (b) | 17. | (c) | | |
| 9. | (d) | 18. | (a) | | |

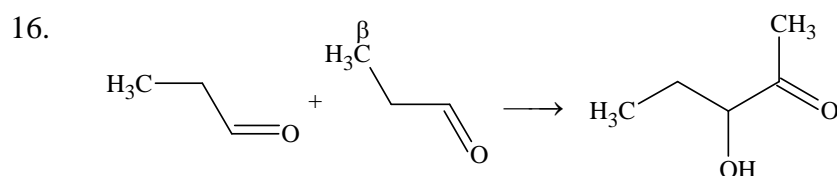
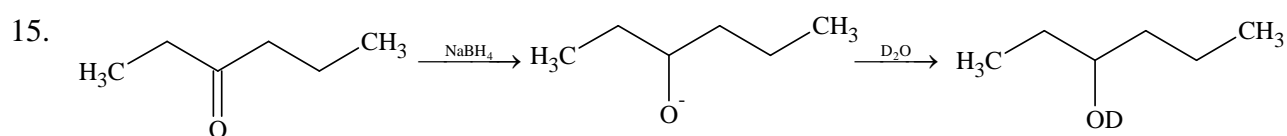
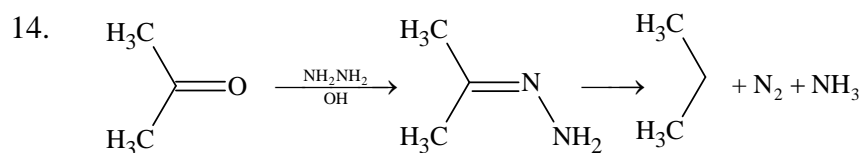
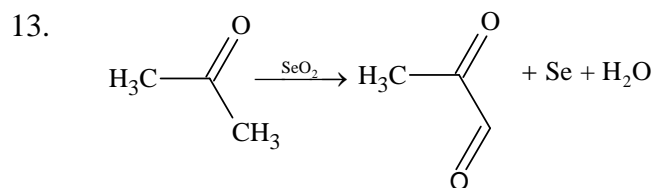
LEVEL - III

- | | | | | | |
|----|-----|-----|-----|-----|---------------|
| 1. | (b) | 10. | (c) | 19. | (d) |
| 2. | (a) | 11. | (b) | 20. | (a) |
| 3. | (b) | 12. | (a) | 21. | (b) |
| 4. | (a) | 13. | (a) | 22. | (d) |
| 5. | (c) | 14. | (a) | 23. | (a) |
| 6. | (a) | 15. | (b) | 24. | (a), (c), (d) |
| 7. | (a) | 16. | (b) | 25. | (a), (b), (c) |
| 8. | (c) | 17. | (b) | | |
| 9. | (a) | 18. | (b) | | |

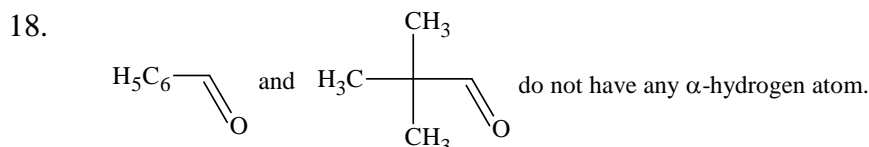
Hints & Solutions

LEVEL - I

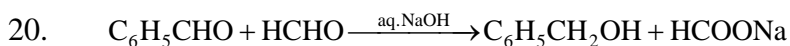
8. The reaction involves the synthesis of chiral centre. In the laboratory, the stereospecificity of reaction cannot be controlled. Hence, we get both the enantiomeric forms (racemic mixture).
9. Carbon is most electron-deficient and least crowded in HCHO. Thus formaldehyde will be most easily attacked by nucleophile.
10. Presence of electron withdrawing group in the *p*-position to the -CHO group increases nucleophilic addition.
11. Silver ion (Tollen's reagent) is a mild oxidizing agent, hence it does not oxidize carbon-carbon double bond.
12. Schiff's reagent is magenta (a pink coloured dye) solution whose colour has been discharged by sulphur dioxide ($\text{H}_2\text{SO}_3 \rightarrow \text{H}_2\text{O} + \text{SO}_2$).



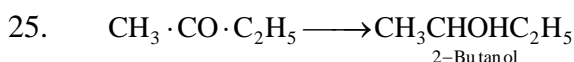
17. CH_3CHO , $\text{C}_6\text{H}_5\text{CH}_2\text{CHO}$ and $\text{C}_6\text{H}_5\text{COCH}_3$ all have α -hydrogen atom, hence undergoes aldol condensation.



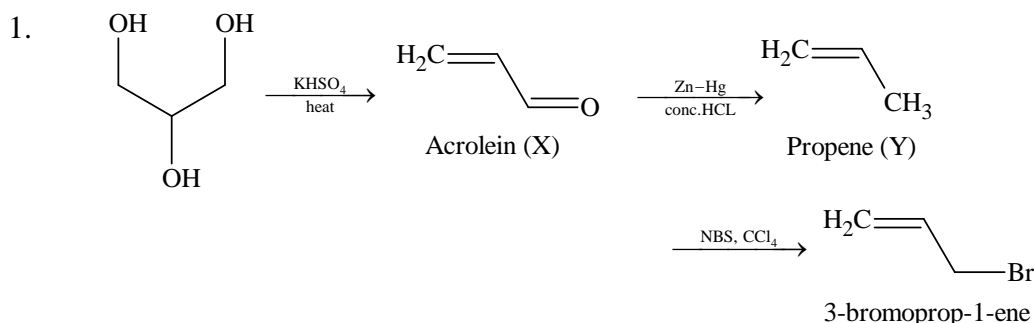
19. Chloral, $\text{Cl}_3\text{C}\cdot\text{CHO}$, does not have α -hydrogen atom.



22. Br_2 in CCl_4 reacts neither with pentanol nor with pentanone-2.



LEVEL - II

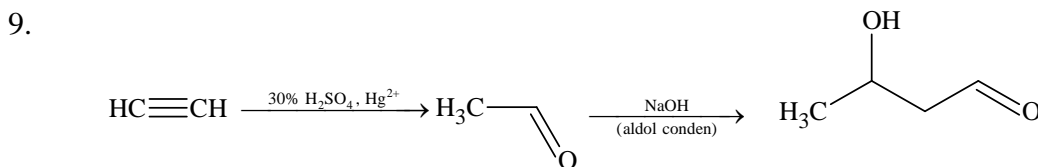


An aryl group, due to $-I$ effect is expected to speed up the reaction, however, due to resonance it stabilizes the reactant very much and thus causes net deactivation.

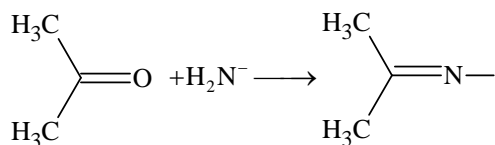
5. 2, 4-Hexanedione has $-\text{CH}_2$ group surrounded on both sides by electronegative ($> \text{C} = \text{O}$) group, hence it is acidic in nature; the carbanion ($\text{CH}_3 - \overset{\text{O}}{\parallel}{\text{C}} - \overset{-}{\text{C}}\text{H} - \overset{\text{O}}{\parallel}{\text{C}} - \text{CH}_2\text{CH}_3$) once formed stabilizes due to resonance.

6. Aromatic aldehydes as well as α -hydroxy ketones are oxidisable by Tollen's reagent.

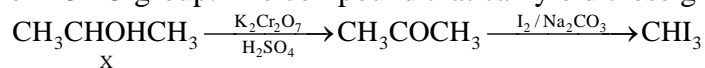
8. Since the starting compound has an $-\text{OH}$ group which is sensitive to acid (HCl), $\text{Zn}(\text{Hg})$ and HCl can't be used for reduction.



14. Only primary amines will react with acetone to form $\text{C} = \text{N} - \text{bond}$

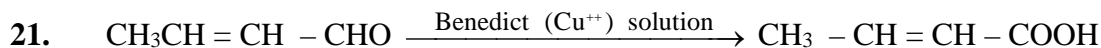
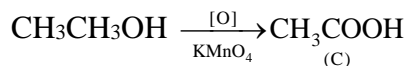
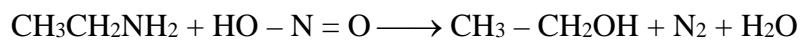
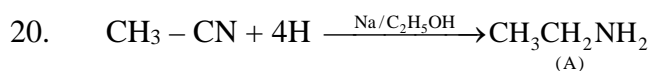
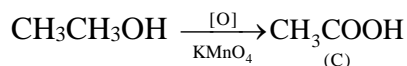
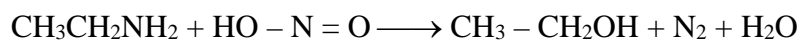
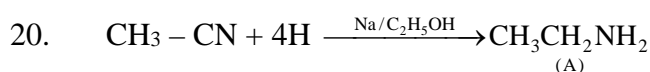


15. Since the compound Y responds haloform reaction, it must have $-\text{COCH}_3$, $-\text{CHOHCH}_3$ or $-\text{CHO}$ group. The compound that can yield these grouping is $\text{CH}_3\text{CHOH}\cdot\text{CH}_3$.

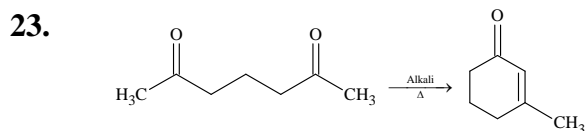
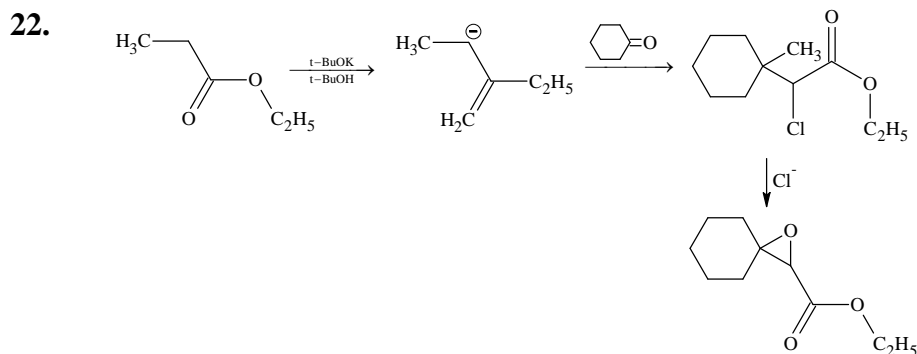


16. $\text{CH}_3\text{CH}=\text{CHCH}_3 \xleftarrow{(\text{C}_4\text{H}_8)} \text{CH}_3\text{CHOHCH}_2\text{CH}_3 \xrightarrow{(\text{O})} \text{CH}_3\cdot\text{CO}\cdot\text{CH}_2\text{CH}_3$
(C₄H₈) (C₄H₁₀O) C₄H₈O

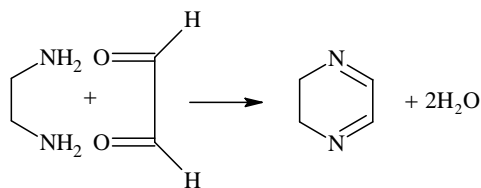
17. $\text{C}_6\text{H}_5\text{COCH}_3$ undergoes electrophilic substitution as well as haloform reaction.



Benedict solution (solution of CuSO_4 , sodium carbonate and sodium citrate) is specific for oxidation of aldehydes.

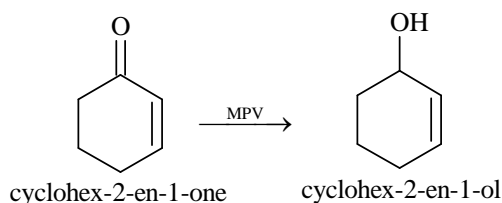


24.



LEVEL - III

1.

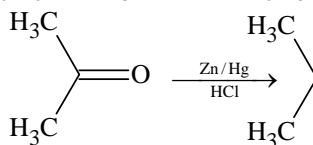


2. Remember that alkenes (C_5H_{10}) are obtained by heating *ter*-alcohols with copper at 575 K. Hence $\text{C}_5\text{H}_{12}\text{O}$ should be *tert* alcohol and thus X should be ketone.

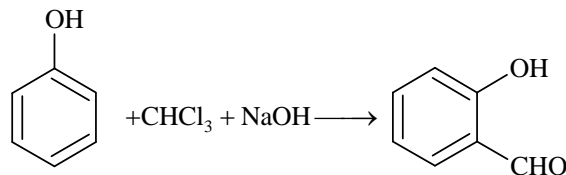
3. I. Cannizzaro reaction: $2\text{HCHO} \longrightarrow \text{HCOONa} + \text{CH}_3\text{OH}$

II. Friedel Craft reaction: $\text{C}_6\text{H}_6 + \text{CH}_3\text{Cl} \longrightarrow \text{C}_6\text{H}_5\text{CH}_3$

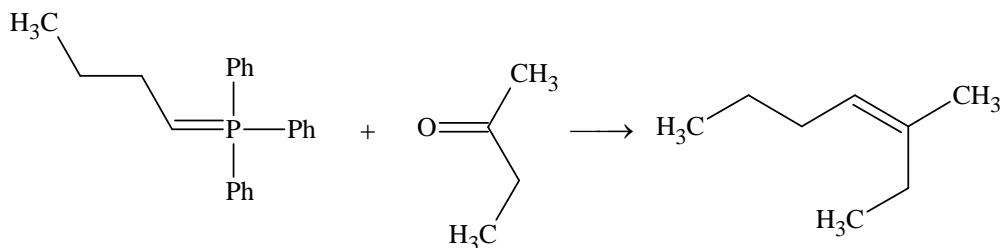
III. Clemmensen reduction:



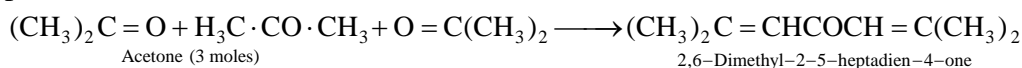
IV. Reimer-Tiemann reaction:



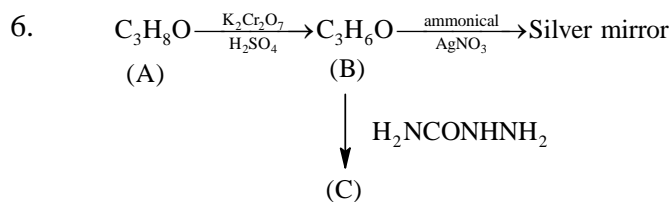
4.



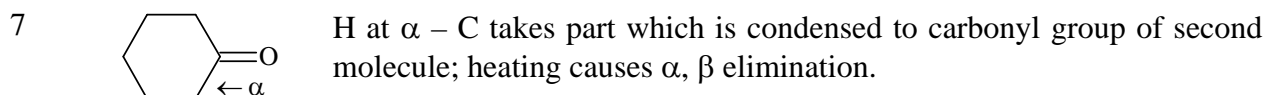
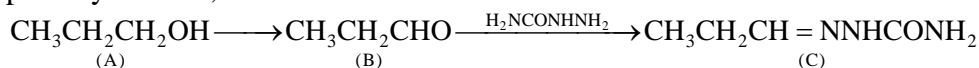
5. Since the compound A has the molecular formula $\text{C}_3\text{H}_6\text{O}$ and undergoes iodoform test, it should be $\text{CH}_3\cdot\text{CO}\cdot\text{CH}_3$. Further reaction of B with HCl gives $\text{C}_9\text{H}_{14}\text{O}$ having three times the number of carbon atoms in A, former should be trimer of acetone, i.e. it should be phorone.



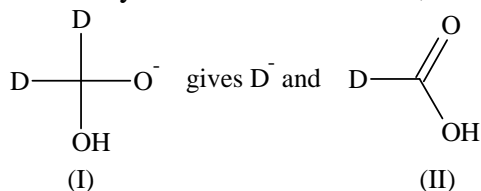
QUESTION BANK-CH-20



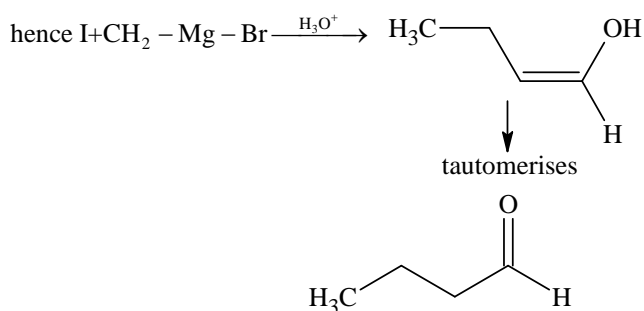
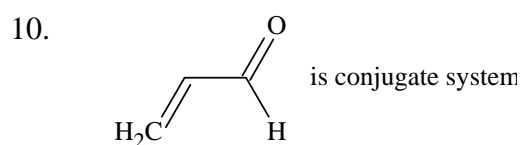
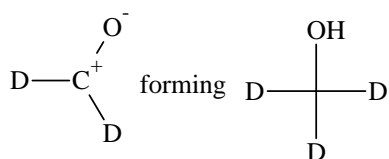
Since B reduces ammonical silver nitrate, it should be an aldehyde and hence A as primary alcohol, which should be $C_2H_5CH_2OH$. Hence



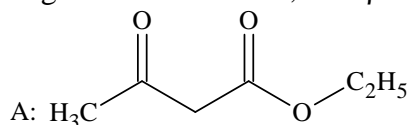
9. Proton hydride transfer reaction, intermediate I.

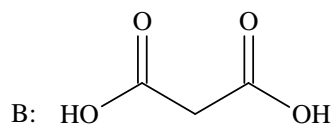


II gives H^+ and $D-C=O \bullet D^-$ and H^+ are joined to



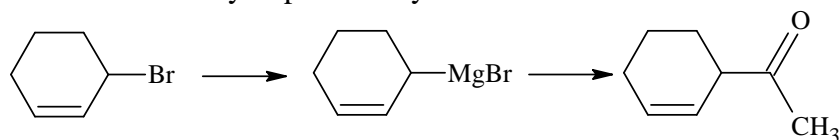
12. A gives iodoform test; A is β -keto ester, hence A is



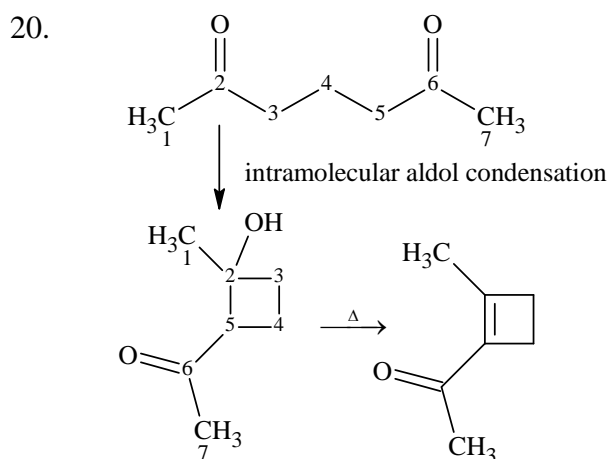
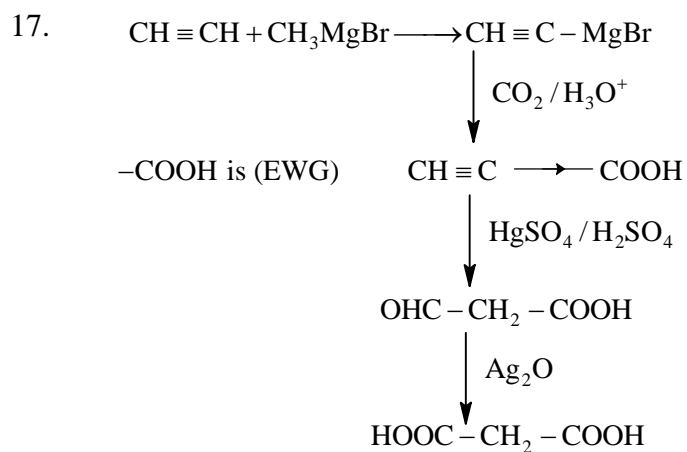
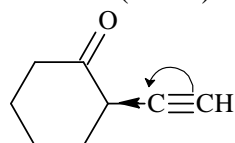


14. α -H is vinylic hence H of $-\text{CH}_3$ is involved in aldol condensation

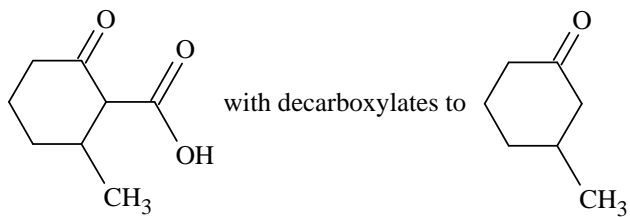
15. Substitution at allylic position by NBS



16. $\text{C}=\text{O}$ is (EWG) hence π electron transfer is towards ring.

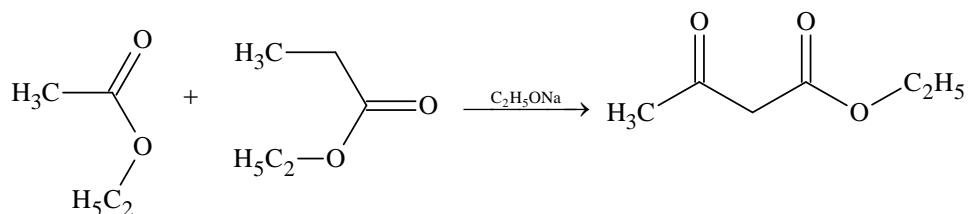


21. Intermediate is



(when β -keto acid is heated, CO_2 is lost)

22.



A has carbonyl group

A has active ($-\text{CH}_2$) group w.r.t. (EWG)

A has $\text{CH}_3-\overset{\text{O}}{\parallel}{\text{C}}-$