



10. When ethyl alcohol is passed over red hot copper at the formula of the product formed is

- 1)  $\text{CH}_3\text{CHO}$       2)  $\text{CH}_3\text{COCH}_3$       3)  $\text{C}_2\text{H}_4$       4)  $\text{CH}_3\text{COOH}$

11. Compound formed when a mixture of vapours of formic and acetic acid is passed over 'MnO' at  $300^\circ\text{C}$  is

- 1) Acetone      2) Acetaldehyde      3) Acetic anhydride      4) Aldol

12. When a mixture of calcium acetate and calcium formate is heated, we get

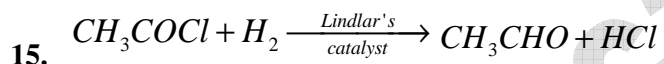
- 1) Acetone      2) Acetic acid      3) Acetaldehyde      4) Methanol

13. Which of the following reactions is called Rosenmund reaction?

- 1) Aldehydes are reduced to alcohols  
2) Acids are converted to acid chlorides  
3) Alcohols are reduced to hydrocarbons  
4) Acid chloride are reduced to Aldehydes

14. Rosenmund's reduction is used for the preparation of

- 1) Carboxylic acid      2) Aldehydes      3) Esters      4) Carbohydrates



The above reaction is known as

- 1) Aldol condensation      2) Clemmenson's reduction  
3) Rosenmund's reduction      4) Carbyl Amine reaction

16. Which of the following is a nucleophilic addition reaction?

- 1)  $\text{CH}_3\text{CHO} + \text{NaHSO}_3 \rightarrow \text{CH}_3\text{CH}(\text{OH})\text{SO}_3\text{Na}$   
2)  $\text{CH}_3\text{CHO} + \text{NH}_2\text{OH} \rightarrow \text{CH}_3\text{-CH=NOH}$   
3)  $3(\text{CH}_3\text{CHO}) \rightarrow (\text{CH}_3\text{CHO})_3$   
4)  $\text{CH}_3\text{CHO} + 3\text{I}_2 + 4\text{NaOH} \rightarrow \text{HCOONa} + \text{CHI}_3 + 3\text{H}_2\text{O} + 3\text{NaI}$

17. Cyanohydrine is the product of following

- 1) Acetic acid +  $\text{SOCl}_2$       2) Ethyl alcohol +  $\text{PCl}_3$   
3) Carbonyl compound +  $\text{HCN}$       4) Carbonyl compound +  $\text{NH}_2\text{OH}$

18. The molecular formula of acetaldehyde semicarbazone is

- 1)  $\text{CH}_3\text{-CH=N-CO-NH-NH}_2$       2)  $\text{CH}_3\text{-CH=N-NH-CONH}_2$   
3)  $\text{CH}_3\text{-CH=N-OH}$       4)  $\text{CH}_3\text{-CH=N-NH}_2$

19. Which of the following compound undergoes 'Aldol' condensation

- 1)  $\begin{array}{c} \text{H}-\text{C}-\text{H} \\ || \\ \text{O} \end{array}$       2)  $\begin{array}{c} \text{CH}_3-\text{C}-\text{H} \\ || \\ \text{O} \end{array}$       3)  $\begin{array}{c} \text{CH}_3-\text{C}-\text{CH}_3 \\ || \\ \text{O} \end{array}$       4) both 2 and 3

20. The following does not undergo aldol condensation in the presence of alkali

- 1)  $\text{CH}_3\text{CHO}$       2)  $\text{CH}_3\text{COCH}_3$       3)  $\text{CH}_3\text{CH}_2\text{CHO}$       4)  $\text{CCl}_3\text{CHO}$

21.  $\text{CH}_3\text{CHO} \xrightarrow{\text{OH}^-} \text{CH}_3\text{CH}(\text{OH})\text{CH}_2\text{CHO}$  represents

- 1) Cannizaro's reaction      2) Benzoin's condensation  
3) Aldol condensation      4) Perkin's reaction

22.  $\text{CH}_3-\text{CHO} \xrightarrow{\text{OH}^-} \text{A}$ . Then IUPAC name of 'A' is

- 1) Aldol      2) Prop-1-ene-2 ol  
3) 4-hydroxy-4methyl 2-pentanone      4) 3-hydroxy Butanal

23. Aldehydes and Ketones which do not have methyl groups adjacent to the carbonyl group do not undergo.

- 1) Oxidation      2) reduction  
3) Haloform reaction      4) condensation reaction

24. Acetaldehyde reacts with chlorine to form

- 1) Chloral      2) Acetyl chloride      3) Chloric acid      4) Chloretone

25. Match the following

**List-A**

Aldehyde

1. Formaldehyde

2. Acetaldehyde

3. Propionaldehyde

4. Isobutyraldehyde

**List-B**

Oxidised product of Aldehyde

A. Acetic Acid

B. Propanoic acid

C. Isobutyric acid

D. methanoic acid

1) 1-D, 2-A, 3-B, 4-C

2) 1-A, 2-D, 3-C, 4-B

3) 1-A, 2-C, 3-D, 4-B

4) 1-D, 2-B, 3-C, 4-A

26. The IUPAC name of  $\beta$ -methyl valeraldehyde is
- 1) 2-methyl pentanal
  - 2) 3-methyl pentanal
  - 3) 2-methyl butanal
  - 4) 2-methyl butanal
27. The IUPAC name of crotonaldehyde is \_\_\_\_
- 1) Butanal
  - 2) But-2-enal
  - 3) But-1-enal
  - 4) None of these
28. Two isomeric compounds 'A' and 'B' have the formula  $C_3H_6Cl_2$ . With aq.KOH solution 'A' gives propionaldehyde and 'B' gives acetone. Then A and B are
- 1)  $CH_3-CCl_2-CH_3$  and  $CH_3-CH_2-CHCl_2$
  - 2)  $CH_3-CHCl-CHCl_2$  and  $CH_3-CH_2-CHCl_2$
  - 3)  $CH-CH_2-CHCl_2$  and  $CH_3-CCl_2-CH_3$
  - 4) None
29. An alkene on ozonolysis gives acetaldehyde and acetone. The alkene in question is
- 1)  $CH_3-CH=\overset{\overset{CH_3}{|}}{C}-CH_3$
  - 2)  $CH_3-CH=CH-CH_2-CH_3$
  - 3)  $CH_2=CH-CH_3$
  - 4)  $(CH_3)_2C=C(CH_3)_2$
30. A compound 'X' has the formula  $C_2Cl_3OH$ . It gives a red precipitate of  $Cu_2O$  with Fehling solution. Then 'X' is
- 1) Chloral
  - 2) Chloretone
  - 3) Chloropicrin
  - 4) Chloroform
31.  $CH_3CHO \xrightarrow{LiAlH_4} A \xrightarrow{H^+/170^\circ C} B \xrightarrow{\text{excess HBr}} C$  In the above series of reaction 'C' is
- 1)  $CH_3-CH_2-OH$
  - 2)  $CH_2=CH_2$
  - 3)  $CH_3-CH_2 Br$
  - 4)  $CO_2$
32.  $CH_3-CHO \xrightarrow{LiAlH_4} X \xrightarrow{HI} Z$ . Then 'Z' is
- 1)  $CH_3-CH_2-OH$
  - 2)  $CH_3COOH$
  - 3)  $CH_3-CH_3$
  - 4)  $C_2H_5I$

**KEY**

- 1) 4      2) 2      3) 4      4) 2      5) 3      6) 3      7) 2      8) 1      9) 3      10) 1
- 11) 2    12) 3      13) 4      14) 2    15) 3    16) 1    17) 3    18) 2    19) 4    20) 4
- 21) 3    22) 4      23) 3      24) 1    25) 1    26) 2    27) 2    28) 3    29) 1    30) 1
- 31) 3    32) 4

**SUBTOPIC – II: KETONES**

**1. Ketones can not be prepared by**

- 1) Rosenmund's reaction
- 2) The hydrolysis of terminal gem dihalides
- 3) The oxidation of primary alcohols
- 4) All of these

**2. When propyne is treated with aqueous sulphuric acid in presence of Mercuric sulphate, the major product is**

- 1) Propanal
- 2) Propyl Hydrogen Sulphate
- 3) Propanol
- 4) Propanone

**3. Isopropyl alcohol on oxidation forms**

- 1) Acetaldehyde
- 2) Ethylene
- 3) Ether
- 4) Acetone

**4. Iso propyl alcohol in presence of Cu at 300°C gives the following**

- 1) Acetaldehyde
- 2) Acetone
- 3) Formaldehyde
- 4) Benzaldehyde

**5. Compound formed when vapours of acetic acid passed over 'MnO' at 300°C.**

- 1) Acetone
- 2) Acetaldehyde
- 3) Acetyl chloride
- 4) Ketol

**6. Calcium acetate on heating gives the compound with formula**

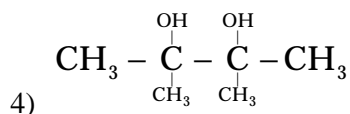
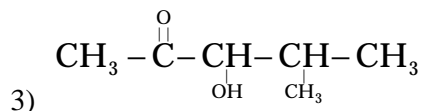
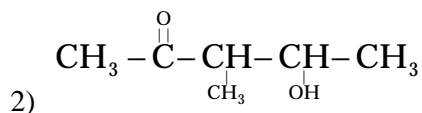
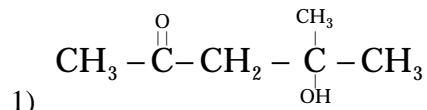
- 1)  $\text{CH}_3\text{COCH}_3$
- 2)  $\text{CH}_3\text{COOH}$
- 3)  $\text{CH}_3\text{OH}$
- 4)  $\text{CH}_3\text{COOCH}_3$

7. Acetone can not be obtained from
- 1) Hydrolysis of isopropylidene chloride
  - 2) Hydration of propyne
  - 3) Dehydrogenation of isopropyl alcohol
  - 4) Hydrolysis of ester
8. The formation of cyanohydrin with acetone is an example for
- 1) nucleophilic addition
  - 2) nucleophilic substitution
  - 3) electrophilic addition
  - 4) electrophilic substitution
9. Acetone adds up the following without the formation of water molecule
- 1)  $\text{NH}_3$
  - 2) 2, 4 - DNP
  - 3)  $\text{H}_2\text{NOH}$
  - 4)  $\text{HCN}$
10. Aromatic aldehydes react with aromatic primary amines to give
- 1) Amides
  - 2) Schiff's bases
  - 3) Oximes
  - 4) Cyanohydrins
11. When acetone is treated with  $\text{Ba}(\text{OH})_2$  it gives
- 1) Mesitylene
  - 2) Diacetone alcohol
  - 3) Urotropine
  - 4) Mercaptol
12.  $2\text{CH}_3\text{COCH}_3 \xrightarrow{\text{dryHCl}} \text{'X'}$ . 'X' is
- 1) Mesityl oxide
  - 2) Phorone
  - 3) Acetic acid
  - 4) Mesitylene
13. The enol form of acetone contains
- 1)  $9\sigma, 9\pi$  bonds
  - 2)  $10\sigma, 8\pi$
  - 3)  $8\sigma, 10\pi$
  - 4)  $9\sigma, 1\pi$
14. The IUPAC name of methyl isopropyl ketone
- 1) 3-methyl-2-pentanone
  - 2) 3-methyl butan-2-one
  - 3) 2-pentanone
  - 4) 2-methyl pentanone
15. The first oxidation product of the following alcohol is a ketone with the same number of carbon atoms
- 1)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$
  - 2)  $(\text{CH}_3)_2\text{CHCH}_2\text{OH}$
  - 3)  $\text{CH}_3\text{CH}(\text{OH})\text{CH}_3$
  - 4)  $(\text{CH}_3)_3\text{C} - \text{OH}$
16. 2, 2-dichloro propane treated with aq. KOH gives an unstable product. It is
- 1)  $\text{CH}_3\text{COCH}_3$
  - 2)  $\text{CH}_3\text{CH}(\text{OH})\text{CH}_3$
  - 3)  $\text{CH}_3\text{C}(\text{OH})_2\text{CH}_3$
  - 4)  $\text{CH}_3\text{CH}(\text{OH})\text{CH}_2\text{CHO}$

17. On ozonolysis 2-methyl-2-butene gives

- 1) 2moles of  $\text{CH}_3\text{-CHO}$                       2) 2moles of  $\text{CH}_3\text{COCH}_3$   
 3)  $\text{CH}_3\text{CHO}$  &  $\text{CH}_3\text{COCH}_3$               4)  $\text{CH}_3\text{CHO}$  &  $\text{HCHO}$

18. Which of the products formed when acetone is reacted with barium hydroxide solution?



19.  $\text{CH}_3\text{-CHO} + \text{CH}_3\text{-CO-CH}_3 \xrightarrow[\Delta]{\text{Ba(OH)}_2}$  the possible products are

- 1)  $\text{CH}_3 - \text{CH(OH)} - \text{CH}_2 - \text{CO} - \text{CH}_3$   
 2)  $\text{CH}_3 - \text{CH(OH)} - \text{CH}_2 - \text{CHO}$   
 3)  $(\text{CH}_3)_2\text{C(OH)-CH}_2\text{-CO-CH}_3$     4) All

20. The reaction of acetaldehyde and acetone in the presence of dilute alkali is called

- 1) Crossed aldol condensation              2) Perkin condensation  
 3) Aldol condensation                      4) Benzoin condensation

21. Which of the following aldehyde will undergo Cannizzaro's reaction?

- 1) Ethanal                                      2) 2-Methylpropanal  
 3) 2,2-Dimethylpropanal                  4) Phenylacetaldehyde

22.  $(\text{CH}_3)_2\text{C}=\text{O} \xrightarrow{\text{Zn-Hg/ConHCl}} \text{X}$

Here 'X' is

- 1)  $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{OH}$                       2)  $\text{CH}_3\text{-C(OH)-CH}_3$   
 3)  $\text{CH}_3\text{-CH}_2\text{-CHO}$                       4)  $\text{CH}_3\text{-CH}_2\text{-CH}_3$

23. In Stephen's reduction which of the following group is converted to -CHO group

- 1)  $-\text{CH}_2\text{OH}$               2)  $-\text{COCl}$               3)  $-\text{CN}$               4)  $-\text{NC}$

24. Two isomeric compounds 'A' and 'B' have the formula  $C_3H_6Cl_2$ . With aq KOH solution 'A' gives propionaldehyde and 'B' gives acetone. Then 'A' and 'B' are

- 1)  $CH_3-CCl_2-CH_3$  and  $CH_3-CH_2-CHCl_2$
- 2)  $CH_3-CHCl-CHCl_2$  and  $CH_3-CH_2-CHCl_2$
- 3)  $CH_3-CH_2-CHCl_2$  and  $CH_3-CCl_2-CH_3$
- 4)  $CH_3-CHCl-CHCl_2$  and  $CH_3-CCl_2-CH_3$

25. An organic compound  $CH_3CH(OH)CH_3$  on treatment with acidified  $K_2Cr_2O_7$  gives compound 'Y' which reacts with  $I_2$  and sodium carbonate to form triiodomethane. The compound 'Y' is

- 1)  $CH_3OH$
- 2)  $CH_3COCH_3$
- 3)  $CH_3CHO$
- 4)  $CH_3CH(OH)CH_3$

26. The molecular weight of acetone is M. The molecular weight of diacetone alcohol is

- 1) M
- 2) M/2
- 3) 2M
- 4) 3M

27. Compound 'A' with formula  $C_3H_6O$  forms phenyl hydrazone and gives negative Tollen's test. Compound 'A' on reduction gives propane. Then compound 'A' is

- 1) a primary alcohol
- 2) an aldehyde
- 3) a ketone
- 4) a secondary alcohol

28.  $CH_3C \equiv CH \xrightarrow[H^2SO_4, 60^\circ]{HgSO_4} B$ . Then 'B' is

- 1) Acetone
- 2) Trichloroacetone
- 3) Acetaldehyde
- 4) Chloral

29. Identify the final product Z in the following reaction sequence



- 1)  $(CH_3)_2C(OH)COOH$
- 2)  $CH_2 = C(CH_3)COOH$
- 3)  $HO-CH_2-CH(CH_3)COOH$
- 4)  $CH_3-CH=CHCOOH$



KEY

- 1) 4      2) 4      3) 4      4) 2      5) 1      6) 1      7) 4      8) 1      9) 4      10) 2
- 11) 2    12) 1      13) 4      14) 2    15) 3    16) 3    17) 3    18) 1    19) 4    20) 1
- 21) 3    22) 4      23) 3      24) 3    25) 2    26) 3    27) 3    28) 1    29) 2

SUB TOPIC – III: AROMATIC ALDEHYDES

1. The solvent used in Etard's reaction during the formation of benzaldehyde from toluene is
- 1) acetic acid      2) water      3) liq.NH<sub>3</sub>      4) CS<sub>2</sub>
2. The final product obtained when toluene is subjected to side chain chlorination followed by hydrolysis at 737 K is
- 1) Phenol      2) Benzaldehyde      3) Acetophenone      4) Chlorobenzene
3. The product formed in Gattermann-Koch formylation reaction is
- 1) Chlorobenzene    2) Benzoyl chloride    3) Benzaldehyde    4) Acetophenone
4. Which of the following can be used as formulating agent in the presence of AlCl<sub>3</sub>?
- 1) HCOOH + HCl    2) CO + HCl      3) CO + Cl<sub>2</sub>      4) HCl + O<sub>2</sub>
5. Etard's reaction involves the preparation of benzaldehyde from
- 1) Toluene      2) Ethyl benzene      3) Benzoyl chloride    4) Sodium benzoate
6. Oxidation of toluene with CrO<sub>3</sub> in the presence of (CH<sub>3</sub>CO)<sub>2</sub>O gives a product A which on treatment with aq. NaOH produce
- 1) C<sub>6</sub>H<sub>5</sub>CHO      2) C<sub>6</sub>H<sub>5</sub>COONa      3) (C<sub>6</sub>H<sub>5</sub>CO)<sub>2</sub>O      4) (CH<sub>3</sub>CO)<sub>2</sub>O
7. Benzaldehyde can be prepared by
- 1) Etard reaction      2) Gattermann-koch formylation
- 3) Oxidation of benzyl alcohol      4) All the above
8. Chloroacetaldehyde and acetyl chloride are\_\_\_\_
- 1) Position isomers      2) Chain isomers
- 3) Metamers      4) Functional group isomers

9. Benzaldehyde can be prepared by oxidation of toluene by

- 1) Acidic  $\text{KMnO}_4$       2)  $\text{K}_2\text{Cr}_2\text{O}_7$       3)  $\text{CrO}_2\text{Cl}_2$       4) All

10. Hydrogenation of benzoyl chloride in the presence of Pd and  $\text{BaSO}_4$  gives

- 1) Benzyl Alcohol      2) Benzaldehyde      3) Benzoic acid      4) Phenol

11. In Etard reaction of preparation of Benzaldehyde the reagent used is

- 1) Chromyl chloride      2) Acetyl chloride      3) Water      4) Benzyl nitrate

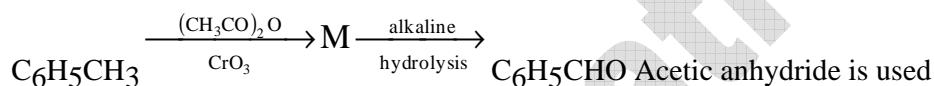
12. Benzaldehyde is obtained from toluene by

- 1) Rosenmund's reduction      2) Cannizzaro reaction  
3) Kolbe's reaction      4) Etard reaction

13.  $\text{C}_6\text{H}_6 + \text{CO} + \text{HCl} \xrightarrow{\text{Anhyd. AlCl}_3} \text{X} + \text{HCl}$  compound X is

- 1)  $\text{C}_6\text{H}_5\text{CH}_3$       2)  $\text{C}_6\text{H}_5\text{CH}_2\text{Cl}$       3)  $\text{C}_6\text{H}_5\text{CHO}$       4)  $\text{C}_6\text{H}_5\text{COOH}$ .

14. In the reaction



- 1) As a catalyst      2) As an oxidising agent  
3) To form a non-oxidizable derivative of benzaldehyde  
4) To help the reaction to proceed smoothly

15. For cannizzaro's reaction. Which is necessary?

- 1) Presence of  $\alpha$ -C      2) Absence of  $\alpha$ -C  
3) Presence of  $\alpha$ -H      4) Absence of  $\alpha$ -H

16. The reaction



- 1) Cannizzaro reaction      2) Aldol condensation  
3) Claisen - Schmidt condensation      4) Benzoin condensation

17.  $\text{C}_6\text{H}_5\text{CHO} + \text{HCN} \rightarrow \text{C}_6\text{H}_5\text{CH}(\text{CN})\text{OH}$  the product would be

- 1) Racemate      2) Optically active      3) A meso compound      4) Ethyl formate

18. Benzaldehyde reacts with  $\text{NH}_3$  to give

- 1) Phenyl Cyanide      2) Hydrobenzamide      3) Aniline      4) Benzamide

19. Which of the following does not undergo benzoin condensation?

- |                         |                             |
|-------------------------|-----------------------------|
| 1) Benzene carbaldehyde | 2) p - Toluene carbaldehyde |
| 3) Phenylethanal        | 4) 4 - Methoxybenzaldehyde  |

20. Reaction of  $C_6H_5CHO$  with  $CH_3NH_2$  gives

- |                             |                               |
|-----------------------------|-------------------------------|
| 1) $C_6H_5COOH$             | 2) $C_6H_5 - N = NCl + 2H_2O$ |
| 3) $C_6H_5 - CH = N - CH_3$ | 4) $C_6H_5NH_2$               |

21. Nitration of acetophenone using nitrating mixture produces mainly

- |                           |                           |
|---------------------------|---------------------------|
| 1) o - nitro acetophenone | 2) p - nitro acetophenone |
| 3) m - nitro acetophenone | 4) m - nitrobenzoic acid  |

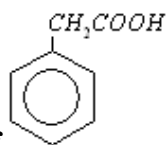
### KEY

- 1) 4      2) 2      3) 3      4) 2      5) 1      6) 1      7) 4      8) 4      9) 3      10) 2
- 11) 1    12) 4      13) 3      14) 3      15) 4      16) 2      17) 2      18) 4      19) 3      20) 3
- 21) 3

### SUB TOPIC – IV: CARBOXYLIC ACIDS

1. IUPAC name of  $\beta$  - Chloro -  $\alpha$  -methyl butyric acid

- |                                    |                                    |
|------------------------------------|------------------------------------|
| 1. 3-chloro-2 methyl Butanoic acid | 2. 2-chloro-3-methyl Butanoic acid |
| 3. 2-chloro-3- methyl-Butan-4-acid | 4. 3-chloro-isopentanoic acid      |



2. IUPAC name of

- |                                 |                           |
|---------------------------------|---------------------------|
| 1) Benzoic acid                 | 2) 2-phenyl ethanoic acid |
| 3) Benzene 1, 2 carboxylic acid | 4) 1-phenyl ethanoic acid |

3. Which of the following is a pair of functional isomers?

- |                                     |                                   |
|-------------------------------------|-----------------------------------|
| 1) $CH_3COCH_3$ , $CH_3CHO$         | 2) $C_2H_5CO_2H$ , $CH_3CO_2CH_3$ |
| 3) $C_2H_5CO_2H$ , $CH_3CO_2C_2H_5$ | 4) $CH_3CO_2H$ , $CH_3CHO$        |

4. The weaker acid among the following is  
 1)  $CH_3COOH$       2)  $ClCH_2COOH$       3)  $Cl_3COOH$       4)  $(CH_3)_2CHCOOH$
5. The correct order of decreasing acid strength of trichloroacetic acid (A), trifluoro acetic acid (B), acetic acid (C) and formic acid (D) is  
 1)  $A > B > C > D$       2)  $A > C > B > D$       3)  $B > A > D > C$       4)  $B > D > C > A$
6. Which of the following orders is true regarding the acidic nature of  $COOH$ ?  
 1) Formic acid > Acetic acid > Propanoic acid  
 2) Formic acid > Acetic acid < Propanoic acid  
 3) Formic acid < Acetic acid < Propanoic acid  
 4) Formic acid < Acetic acid > Propanoic acid
7. On hydrolysis an ester gave a carboxylic acid. The 'K' salt of that acid on Kolbe's electrolysis gave ethane. That ester is  
 1) methyl ethanoate      2) methyl methanoate      3) ethyl methanoate      4) ethyl propanoate
8.  $CH_3OH \xrightarrow[(ii) Rh; \Delta]{(i) X} CH_3COOH$ . In this reaction 'X' is  
 1)  $CO_2$       2)  $CO$       3)  $MgO$       4)  $C$
9.  $C_6H_5CONH_2 \xrightarrow[\Delta]{H_3O^+} A + NH_3$  What is A?  
 1)  $C_6H_6$       2)  $C_6H_5COOH$       3)  $C_6H_5NH_2$       4)  $C_6H_5CN$
10.  $CH_3-Mg-Br + CO_2 \rightarrow X \xrightarrow{H_3O^+} Y$ . In this reaction 'Y' is  
 1)  $HCOOH$       2)  $CH_3COOH$       3)  $C_2H_5COOH$       4)  $HCHO$
11. Methyl cyanide on hydrolysis gives following  
 1) Acetic acid      2) Acetaldehyde      3) Acetone      4) Methyl amine
12. The reaction of  $CH_3MgBr$  on dry ice followed by acid hydrolysis gives  
 1) acetic acid      2) formic acid      3) acetone      4) acetaldehyde
13.  $C_6H_5COOC_2H_5 \xrightarrow[\Delta]{H_3O^+} A + C_2H_5OH$ , What is A?  
 1)  $C_6H_6$       2)  $C_6H_5NH_2$       3)  $C_6H_5C_2H_5$       4)  $C_6H_5COOH$

14. Toluene  $\xrightarrow{KMnO_4 / KOH / H_3O^{\oplus}}$  A. What is A?  
 1) Acetic acid      2) Benzene      3) Benzoic acid      4) Benzaldehyde
15. Which of the following has highest boiling point?  
 1)  $C_2H_5OH$       2)  $CH_3COOH$       3)  $CH_3COCH_3$       4)  $HCOOCH_3$
16.  $CH_3 - \overset{\overset{O}{\parallel}}{C} - OH + X \rightarrow$  Fruity smell compound. Then 'X' is  
 1) Aldehyde      2) Chloroform      3) Alcohol      4) Base
17. The products formed when  $PCl_5$  reacts with acetic acid are  
 1)  $CH_3COCl, H_3PO_3$       2)  $CH_3COCl, H_3PO_4$   
 3)  $CH_3COCl, HCl$       4)  $CH_3COCl, POCl_3, HCl$
18. An organic compound A gives effervescences on treatment with aqueous saturated sodium bicarbonate. 'A' can be  
 1) An alkane      2) An alkyl halide  
 3) A carboxylic acid      4) A ketone
19. An organic compound reacts (i) with metallic sodium to liberate hydrogen and (ii) with  $Na_2CO_3$  solution to liberate  $CO_2$ . The compound is  
 1) an alcohol      2) a carboxylic acid      3) an ether      4) an ester
20. Which compound will give brisk effervescence of  $CO_2$  on treatment with  $NaHCO_3$ ?  
 1) Ethyl alcohol      2) acetaldehyde      3) acetone      4) acetic acid
21. Acetic acid reacts with ethanol in the presence of  $H_2SO_4$  to form 'X' and water. Which of the following is 'X'?  
 1)  $CH_3CH_2COOC_2H_5$       2)  $CH_3COCH_3$   
 3)  $CH_3COC_2H_5$       4)  $CH_3COOC_2H_5$
22. Which hydrogen atom of acetic acid is replaced by  $Cl_2$  in presence of P?  
 1)  $\alpha$  - hydrogen      2) carboxylic hydrogen  
 3) Both      4) oxygen of carboxy group



32. The catalyst used in the manufacture of acetic acid from acetaldehyde by the atmospheric oxygen is

- 1)  $(\text{CH}_3\text{COO})_2\text{Mn}$     2)  $(\text{CH}_3\text{COO})_2\text{Zn}$
- 3)  $\text{CH}_3\text{COOK}$         4)  $\text{CH}_3\text{COONa}$

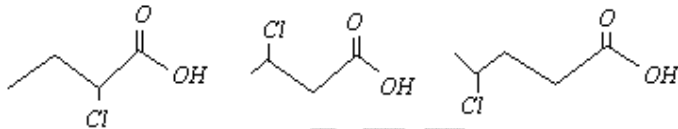
33. Which of the following is the correct order of strength of carboxylic acids?

- 1)  $\text{HCOOH} > \text{CH}_3\text{COOH} > \text{C}_2\text{H}_5\text{COOH} > (\text{CH}_3)_2\text{CHCOOH}$
- 2)  $\text{CCl}_3\text{COOH} > \text{CHCl}_2\text{COOH} > \text{CH}_2\text{ClCOOH} > \text{CH}_3\text{COOH}$
- 3)  $\text{CF}_3\text{COOH} > \text{CCl}_3\text{COOH} > \text{CBr}_3\text{COOH} > \text{Cl}_3\text{COOH}$
- 4) All of these

34. The decreasing strength of the acids is

- 1)  $\text{CHCl}_2\text{COOH} > \text{CH}_2\text{ClCOOH} > \text{CH}_3\text{COOH}$
- 2)  $\text{CH}_3\text{COOH} > \text{CH}_2\text{ClCOOH} > \text{CHCl}_2\text{COOH}$
- 3)  $\text{CH}_2\text{ClCOOH} > \text{CHCl}_2\text{COOH} > \text{CH}_3\text{COOH}$
- 4)  $\text{CH}_2\text{Cl}_2\text{COOH} > \text{CH}_3\text{COOH} > \text{CHCl}_2\text{COOH}$

35. The correct order of increasing acidic strength of the following acids is



I    II

III

- 1)  $\text{I} < \text{II} < \text{III}$         2)  $\text{I} < \text{III} < \text{II}$         3)  $\text{III} < \text{II} < \text{I}$         4)  $\text{II} < \text{III} < \text{I}$

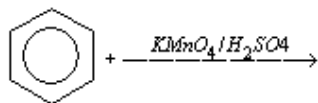
36. Which of the following orders is true regarding the acetic nature of monosubstituted acetic acid?

- 1) Fluoroacetic acid > Chloroacetic acid > Bromoacetic acid
- 2) Fluoroacetic acid < Chloroacetic acid < Bromoacetic acid
- 3) Fluoroacetic acid < Chloroacetic acid > Bromoacetic acid
- 4) Fluoroacetic acid < Chloroacetic acid < Bromoacetic acid

37. Assertion (A):  $\text{CH}_3\text{CN}$  on hydrolysis gives Acetic Acid

Reason (R): Cyanides on hydrolysis liberates ' $\text{NH}_3$ ' gas

- Both 'A' and 'R' are true and 'R' is the correct explanation of A
- Both 'A' and 'R' are true and 'R' is not the correct explanation of A
- 'A' is true but 'R' is false
- 'A' is false but 'R' is true.



38. A. What is A?

- Oxalic acid
- Malonic acid
- Succinic acid
- Adipic acid

39. Which of the following will not undergo Hell Volhard Zelinsky Reaction?

- $\text{CH}_3\text{COOH}$
- $\text{CH}_3\text{CH}_2\text{COOH}$
- 2,2-dimethyl propionic acid
- 2-methyl propionic acid

40.  $\text{CH}_3\text{-Mg-Br} + \text{CO}_2 \rightarrow \text{X} \xrightarrow{\text{H}_3\text{O}^+} \text{Y}$ . In this reaction 'Y' is

- $\text{HCOOH}$
- $\text{CH}_3\text{COOH}$
- $\text{C}_2\text{H}_5\text{COOH}$
- $\text{HCHO}$

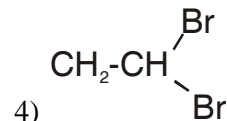
41.  $\text{CH}_3\text{COOH} \xrightarrow{\text{LiAlH}_4} \text{A} \xrightarrow[\text{H}_2]{\text{Ni}} \text{B}$

In this reaction A and B respectively are

- $\text{CH}_3\text{OH}$  &  $\text{CH}_4$
- $\text{C}_2\text{H}_5\text{OH}$  &  $\text{C}_2\text{H}_6$
- $\text{CH}_3\text{CHO}$  &  $\text{C}_2\text{H}_5\text{OC}_2\text{H}_5$
- $\text{C}_2\text{H}_5\text{OH}$  &  $\text{CH}_3\text{OCH}_3$

42.  $\text{CH}_3\text{-COOH} \xrightarrow{\text{AgOH}} \text{A} \xrightarrow{\text{Br}_2/\text{CCl}_4} \text{B}$ . In the above reaction 'B' is

- $\text{CH}_3\text{-CH}_2\text{-Br}$
- $\text{CH}_3\text{-CH}_3$
- $\text{CH}_3\text{-Br}$



43.  $\text{CH}_3\text{-COOH} + \text{N}_3\text{H} \xrightarrow[\Delta]{\text{H}_2\text{SO}_4} \text{A}$ . In the above reaction A is

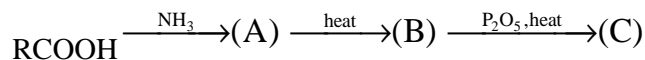
- $\text{CH}_3\text{-COONH}_4$
- $\text{CH}_3\text{-CO-NH}_2$
- $\text{CH}_3\text{-NH}_2$
- none

44. The relative order of esterification of acids is

- $\text{RCH}_2\text{COOH} > \text{R}_2\text{CHCOOH} > \text{R}_3\text{CCOOH}$
- $\text{RCH}_2\text{COOH} < \text{R}_2\text{CHCOOH} < \text{R}_3\text{CCOOH}$
- $\text{RCH}_2\text{COOH} < \text{R}_3\text{CCOOH} < \text{R}_2\text{CHCOOH}$
- $\text{R}_3\text{CCOOH} > \text{RCH}_2\text{COOH} > \text{R}_2\text{CHCOOH}$



45. The product 'C' in the following reaction is



- 1) RNH<sub>2</sub>                      2) RCN                      3) RNC                      4) RCONH<sub>2</sub>

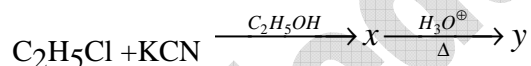
46. The order of increasing acid strength is

- 1) C<sub>2</sub>H<sub>5</sub>OH < C<sub>6</sub>H<sub>5</sub>OH < CH<sub>3</sub>COOH < HCOOH  
 2) C<sub>2</sub>H<sub>5</sub>OH < HCOOH < CH<sub>3</sub>COOH < C<sub>6</sub>H<sub>5</sub>OH  
 3) C<sub>2</sub>H<sub>5</sub>OH < HCOOH < C<sub>6</sub>H<sub>5</sub>OH < CH<sub>3</sub>COOH  
 4) C<sub>2</sub>H<sub>5</sub>OH < C<sub>6</sub>H<sub>5</sub>OH < HCOOH < CH<sub>3</sub>COOH

47. The organic compounds A and B react with sodium metal and release H<sub>2</sub> gas A and B react with each other to give ethyl acetate. Then A and B are

- 1) CH<sub>3</sub>COOH and C<sub>2</sub>H<sub>5</sub>OH  
 2) HCOOH and C<sub>2</sub>H<sub>5</sub>OH  
 3) CH<sub>3</sub>COOH and CH<sub>3</sub>OH  
 4) CH<sub>3</sub>COOH and HCOOH

48. In the reaction sequence,



What is the molecular formula of Y?

- 1) C<sub>3</sub>H<sub>6</sub>O<sub>2</sub>                      2) C<sub>3</sub>H<sub>5</sub>N                      3) C<sub>2</sub>H<sub>4</sub>O<sub>2</sub>                      4) C<sub>2</sub>H<sub>6</sub>O

49. Oxidation product of 'X' with molecular formula C<sub>2</sub>H<sub>4</sub>O is Y with molecular formula C<sub>2</sub>H<sub>4</sub>O<sub>2</sub>. The compound Y is

- 1) Acetic acid                      2) formic acid                      3) propionic acid                      4) butyric acid

50. Acetic acid is reacted with metallic sodium to form hydrogen and "X". When 'X' is heated with soda lime, 'Y' and sodium carbonate are formed. 'Y' is

- 1) C<sub>2</sub>H<sub>6</sub>COOH                      2) CH<sub>4</sub>                      3) CH<sub>3</sub>COONa                      4) CH<sub>3</sub>CONH<sub>2</sub>

