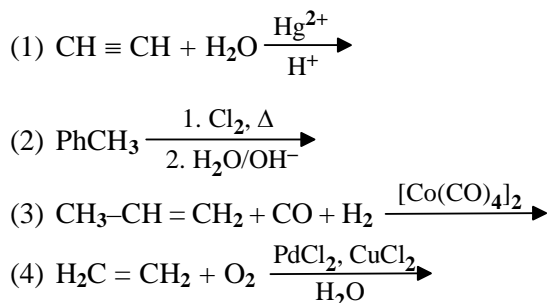


Functional Group-II (Aldehydes & Ketones) (A)

Choose the correct answers :

1. Match list I and list II and select the correct answer using the codes given below.

List I (Reactants)



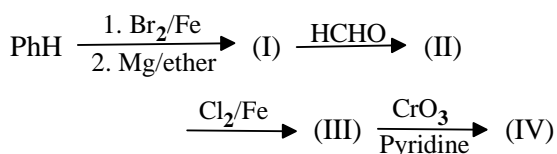
List II (Products)

1. CH_3CHO
2. PhCHO
3. $\text{CH}_3\text{CH}_2\text{CH}_2\text{CHO}$

Codes : (1) (2) (3) (4)

(1)	1	1	2	3
(2)	3	2	1	1
(3)	1	2	3	1
(4)	2	3	1	1

2. In the following sequence of reactions, the final product is



- (1) *p*-chlorobenzaldehyde
 - (2) *p*-chlorobenzyl alcohol
 - (3) *p*-chlorobenzoic acid
 - (4) Salicylaldehyde.
3. The reaction of $\text{CO} + \text{HCl}$ in the presence of AlCl_3 with benzene to form benzaldehyde is called as
- (1) Meerwein-Ponndorf-Verley reduction
 - (2) Cannizzaro reaction
 - (3) Gatterman-Koch reaction
 - (4) Baeyer-Villegier reaction.
4. The reaction of RCN with RMgX , followed by hydrolysis gives
- (1) An aldehyde
 - (2) A ketone
 - (3) 2° alcohol
 - (4) 3° alcohol

5. Consider the following substances :

1. HCHO
2. CH_3CHO
3. $\text{CH}_3\text{CH}_2\text{COCH}_3$
4. $\text{CH}_3\text{CH}_2\text{COCH}_2\text{CH}_3$

Correct order of reactivity towards nucleophilic addition reaction is

- (1) $1 > 2 > 3 > 4$
- (2) $1 > 3 > 2 > 4$
- (3) $1 > 2 > 4 > 3$
- (4) $1 > 4 > 2 > 3$

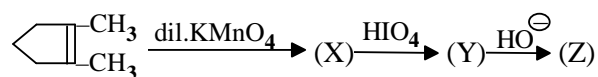
6. Consider the following substances:

1. $\text{C}_6\text{H}_5\text{CHO}$
2. $\text{C}_6\text{H}_5\text{COCH}_3$
3. $\text{C}_6\text{H}_5\text{COC}_6\text{H}_5$

The correct order of reactivity towards nucleophilic addition reaction is

- (1) $3 > 2 > 1$
- (2) $1 > 2 > 3$
- (3) $1 > 3 > 2$
- (4) $3 > 1 > 2$

7. Identify the final product (Z) in the following sequence of reactions.



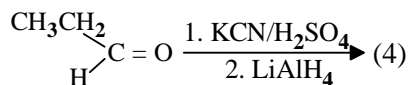
- (1)
- (2)
- (3)
- (4)

8. All aldehydes can be made to undergo the Cannizzaro's reaction by treatment with aluminium ethoxide. Under these conditions, the acid and alcohol are combined to form an ester. The reaction is called as
- (1) Claisen reaction
 - (2) Perkin reaction
 - (3) Aldol condensation
 - (4) Tischenko reaction

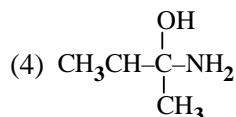
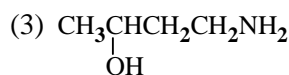
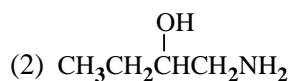
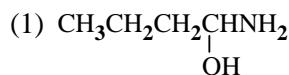
9. $(\text{CH}_3)_2\text{C}=\text{CHCOCH}_3$ can be oxidised to $(\text{CH}_3)_2\text{C}=\text{CHCOOH}$ by

- (1) Chromic Acid (2) NaOI
(3) Cu at 300°C (4) KMnO_4

10. In the reaction,



Identify (4).



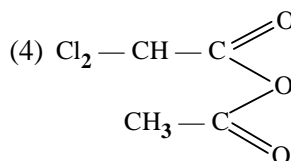
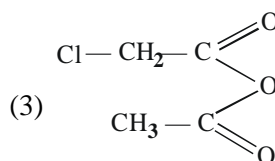
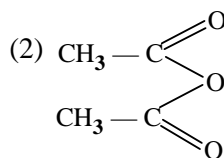
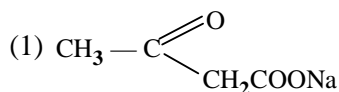
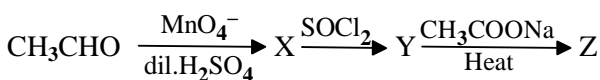
11. Which of the following compounds is resistant to nucleophilic attack by OH^- ions

- (1) Methyl acetate
(2) Acetonitrile
(3) Acetamide
(4) Diethyl ether

12. A compound 'A' having the molecular formula, $\text{C}_5\text{H}_{12}\text{O}$, on oxidation gives a compound 'B' with molecular formula $\text{C}_5\text{H}_{10}\text{O}$. Compound 'B' gave a 2,4-DNP derivative, but did not give the haloform test and gives negative tollen's test. The structure of the compound A is

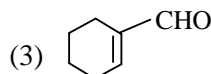
- (1) $\text{CH}_3\text{COCH}_2\text{CH}_2\text{CH}_3$
(2) $\text{CH}_3\text{CHOHCH}_2\text{CH}_3$
(3) $\text{CH}_3\text{CH}_2\text{COCH}_2\text{CH}_3$
(4) $\text{CH}_3\text{CH}_2\text{CHOHCH}_2\text{CH}_3$.

13. Identify Z in the series :



14. Which of the following compounds will undergo self aldol condensation in the presence of cold dilute alkali ?

- (1) $\text{CH}_2=\text{CH}\cdot\text{CHO}$
(2) $\text{CH}\equiv\text{C}\cdot\text{CHO}$

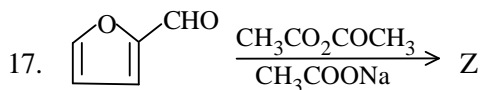


15. The general order of reactivity of carbonyl compounds for nucleophilic addition reactions is

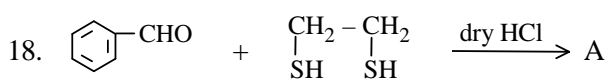
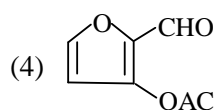
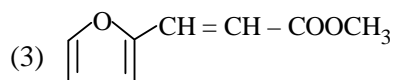
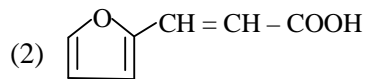
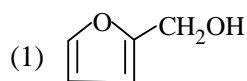
- (1) $\text{H}_2\text{C}=\text{O} > \text{RCHO} > \text{ArCHO} > \text{R}_2\text{C}=\text{O} > \text{Ar}_2\text{C}=\text{O}$
(2) $\text{ArCHO} > \text{Ar}_2\text{C}=\text{O} > \text{RCHO} > \text{R}_2\text{C}=\text{O} > \text{H}_2\text{C}=\text{O}$
(3) $\text{Ar}_2\text{C}=\text{O} > \text{R}_2\text{C}=\text{O} > \text{ArCHO} > \text{RCHO} > \text{H}_2\text{C}=\text{O}$
(4) $\text{H}_2\text{C}=\text{O} > \text{R}_2\text{C}=\text{O} > \text{Ar}_2\text{C}=\text{O} > \text{RCHO} > \text{ArCHO}$

16. Amongst the following the compound having the most acidic alpha-hydrogen is

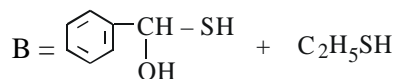
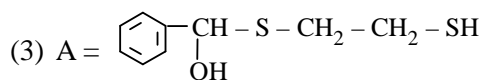
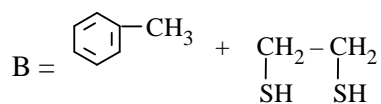
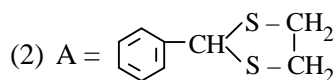
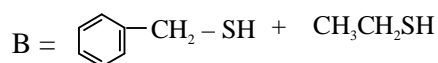
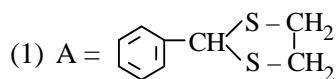
- (1) CH_3CHO
(2) CH_3COCH_3
(3) $\text{CH}_3\text{CO}\cdot\text{O}\cdot\text{COCH}_3$
(4) $\text{CH}_3\text{COCH}_2\text{COCH}_3$



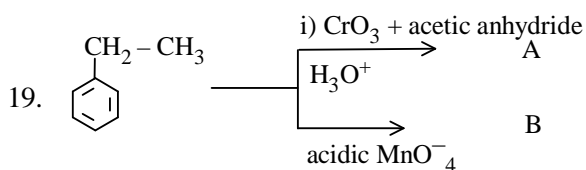
Z may be



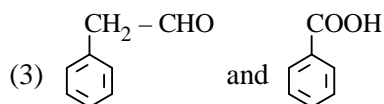
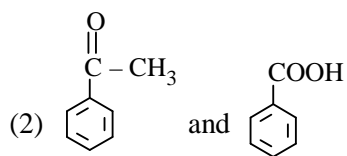
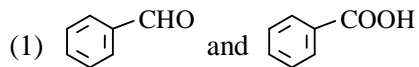
$\xrightarrow[\text{Ni}]{\text{Raney}}$ B. Here A and B are



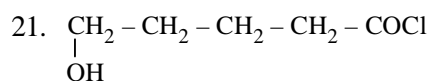
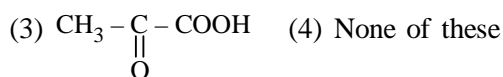
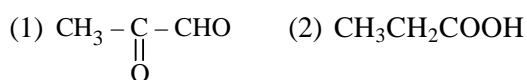
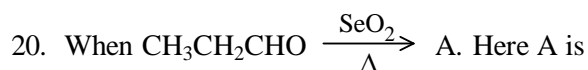
(4) None of these



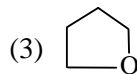
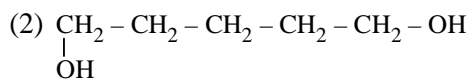
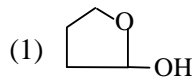
Here A and B are respectively



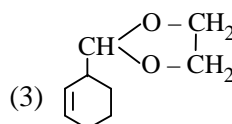
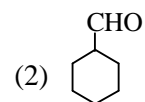
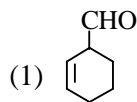
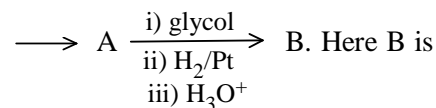
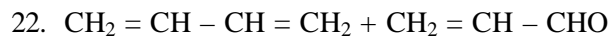
(4) All of these



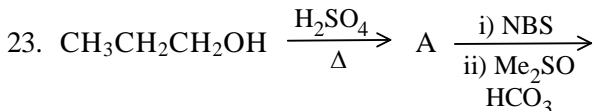
Here the product formed is



(4) None of these



(4) None of these



B. Here B is

- (1) $\text{CH}_2 = \text{CH} - \text{CH}_2 - \text{OH}$
 (2) $\text{CH}_2 = \text{CH} - \text{CH}_2 - \text{OSMe}_2$
 (3) $\text{CH}_2 = \text{CH} - \text{CHO}$
 (4) All of these
24. We know that HCN is a weak electrolyte hence its dissociation $\text{HCN} \rightleftharpoons \text{H}^+ + \text{CN}^-$ is reversible. Its reaction with R_2CO can be enhanced on adding
 (1) H_2O (2) NaCN
 (3) Both of these (4) None of these
25. Which of the following does not undergo benzoin condensation
 (1) $\text{C}_6\text{H}_5\text{CHO}$
 (2) *p*-methoxy $\text{C}_6\text{H}_4\text{CHO}$
 (3) *p*-methyl $\text{C}_6\text{H}_4\text{CHO}$
 (4) $\text{C}_6\text{H}_5\text{CH}_2\text{CHO}$
26. *m*-chlorobenzaldehyde on reaction with conc. KOH at room temperature gives
 (1) Potassium meta chlorobenzoate and *m*-hydroxy benzaldehyde
 (2) *m*-hydroxy benzaldehyde and *m*-chlorobenzylalcohol
 (3) *m*-chlorobenzylalcohol and hydroxy benzylalcohol
 (4) Potassium metachlorobenzoate and *m*-chloro benzylalcohol
27. Treatment of propionaldehyde with dil. NaOH solution gives
 (1) $\text{CH}_3\text{CH}_2\text{COOCH}_2\text{CH}_2\text{CH}_3$
 (2) $\text{CH}_3\text{CH}_2\text{CHOHCH}(\text{CH}_3)\text{CHO}$
 (3) $\text{CH}_3\text{CH}_2\text{CHOHCH}_2\text{CH}_2\text{CHO}$
 (4) $\text{CH}_3\text{CH}_2\text{COCH}_2\text{CH}_2\text{CHO}$.
28. An organic compound of molecular formula, $\text{C}_3\text{H}_6\text{O}$, forms 2, 4-dinitrophenylhydrazone, but gives negative tollen's test. The compound is
 (1) $\text{CH}_2 = \text{CH} - \text{CH}_2 - \text{OH}$
 (2) $\text{CH}_3\text{CH}_2\text{CHO}$
 (3) CH_3COCH_3
 (4) $\text{CH}_2 = \text{CH} - \text{OCH}_3$

29. Match list I (organic compounds oxidized by HIO_4) with list II (products of HIO_4 oxidation) and select the correct answer using the codes given below the lists.

List I

- (a) CH_3COCHO
 (b) 1,2-cyclohexanedione
 (c) $\text{PhCH}(\text{OH})\text{CHO}$
 (d) $\text{CH}_3\text{CH}_2\text{CH}(\text{OH})\text{COCH}_3$

List II

- (1) $\text{PhCH} = \text{O} + \text{HCOOH}$
 (2) $\text{CH}_3\text{CH}_2\text{CHO} + \text{HOOCCH}_3$
 (3) $\text{HOOC}(\text{CH}_2)_4\text{COOH}$
 (4) $\text{CH}_3\text{COOH} + \text{HCOOH}$

Codes : (a) (b) (c) (d)

- (1) 4 3 1 2
 (2) 4 3 2 1
 (3) 3 4 1 2
 (4) 3 2 1 4

30. Match list I (organic compounds oxidized by HIO_4) with list II (products of HIO_4 oxidation) and select the correct answer using the codes given below the lists.

List I

- (a) $\text{CH}_3\text{CH}_2\underset{\text{OH}}{\underset{|}{\text{CH}}}-\underset{\text{OH}}{\underset{|}{\text{CH}}}-\text{CH}_2-\text{CH}_3 \xrightarrow{\text{HIO}_4}$
 (b) $\text{PhCH}_2\underset{\text{OH}}{\underset{|}{\text{CH}}}-\underset{\text{OH}}{\underset{|}{\text{CH}}}-\text{CH}_3 \xrightarrow{\text{HIO}_4}$
 (c) $\underset{\text{OH}}{\underset{|}{\text{CH}_2}}-\underset{\text{OH}}{\underset{|}{\text{CH}_2}} \xrightarrow{\text{HIO}_4}$

- (d) $\underset{\text{OH}}{\underset{|}{\text{CH}_2}}-\underset{\text{OH}}{\underset{|}{\text{CH}}}-\underset{\text{OH}}{\underset{|}{\text{CH}_2}} \xrightarrow{\text{HIO}_4}$

List II

1. $2 \text{H}_2\text{C} = \text{O} + \text{HCOOH}$
 2. $2 \text{CH}_3\text{CH}_2\text{CH} = \text{O}$
 3. $2 \text{H}_2\text{C} = \text{O}$
 4. $\text{PhCH}_2\text{CH} = \text{O} + \text{CH}_3\text{CH} = \text{O}$

Codes : (a) (b) (c) (d)

- (1) 2 4 3 1
 (2) 4 2 3 1
 (3) 2 4 1 3
 (4) 2 3 1 4

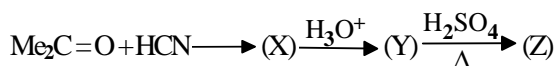
31. Match list I with list II and select the correct answer using the codes given below.

<i>List I</i>	<i>List II</i>
(a) Formalin	(1) Trimer of HCHO
(b) trioxane	(2) Compounds of the general formula, $R_2C = C = O$
(c) Ketene	(3) A tetramer of acetaldehyde
(d) Metaldehyde	(4) 40% aqueous solution of HCHO

Codes :

	(a)	(b)	(c)	(d)
(1)	1	4	2	3
(2)	4	1	2	3
(3)	4	1	3	2
(4)	1	4	3	2

32. Aldehydes having no α -hydrogen undergo disproportionation in presence of sodium or potassium hydroxide to give corresponding alcohol and acid. The reaction is known as
- (1) Wurtz reaction
 - (2) Cannizzarro's reaction
 - (3) Friedel-Craft reaction
 - (4) Claisen reaction.
33. Identify the final product (Z) in the following sequence of reactions.



- (1) $(CH_3)_2C(OH)COOH$
 - (2) $CH_2 = C(CH_3)COOH$
 - (3) $HOCH_2CH(CH_3)COOH$
 - (4) $CH_3CH = CHCOOH$
34. Match list I with list II and select the correct answers using codes given below.

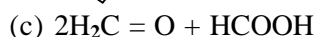
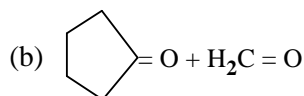
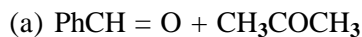
<i>List I</i>	<i>List II</i>
(a) Hypnone	(1) Insecticide
(b) Pyrene	(2) Internal antiseptic
(c) Urotropine	(3) Urinary problem
(d) Salol	(4) Perfumery
	(5) Fire extinguisher

Codes :

	(a)	(b)	(c)	(d)
(1)	1	3	4	5
(2)	4	5	3	2
(3)	2	5	1	3
(4)	1	4	3	5

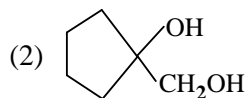
35. Match list I (products obtained on oxidation with HIO_4) and list II (compounds that give products by HIO_4 oxidation) and select the correct answer using the codes given below the lists.

List I

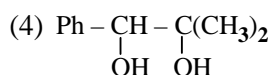


List II

- (1) Cyclopentane-1,2-diol



- (3) Glycerol



Codes :

	(a)	(b)	(c)	(d)
(1)	2	4	1	3
(2)	2	4	3	1
(3)	4	2	3	1
(4)	4	2	1	3

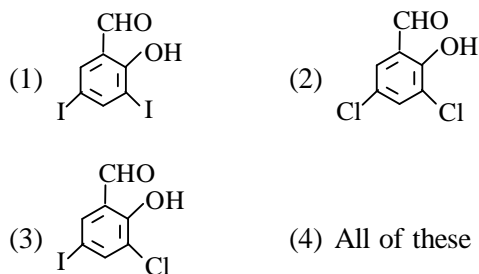
36. Acetaldehyde reacts with HCN followed by hydrolysis forms a compound which shows

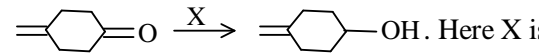
- (1) Optical isomerism
- (2) Geometrical isomerism
- (3) Metamerism
- (4) Tautomerism

37. A compound 'A' has a molecular formula C_2Cl_3OH . It reduces Fehling's solution and on oxidation gives a monocarboxylic acid B. A is obtained by action of chlorine on ethyl alcohol. A is

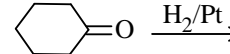
- | | |
|--------------|------------------------|
| (1) Chloral | (2) $CHCl_3$ |
| (3) CH_3Cl | (4) Chloro acetic acid |

38. Sali cylaldehyde on reaction with ICl gives

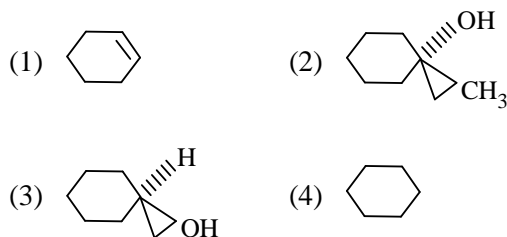


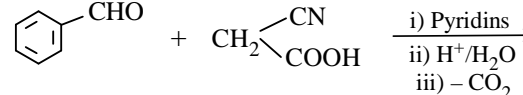
39.  Here X is

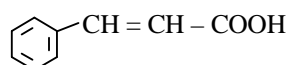
- (1) LiAlH_4 (2) NaBH_4
 (3) Both (1) & (2) (4) Zn/HCl

40. 

The product formed in this reaction is

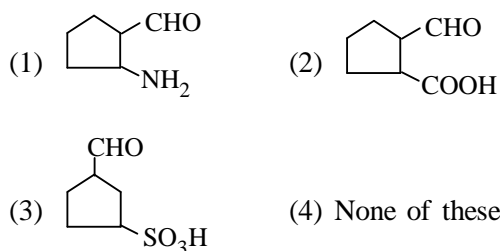


41. 



This reaction is

- (1) Beyervilliger oxidation
 (2) Perkin condensation
 (3) Benzoinn condensation
 (4) Knovennegel reaction
42. Wolff Kishner reduction can be used on which of the following compounds to reduce $-\text{CHO}$ gp to $-\text{CH}_3$ group



43. When HCN is made to react with Benzaldehyde

- (1) Only *d*-isomer is formed
 (2) Only *l*-isomer is formed
 (3) Enantiomeric mixture is formed
 (4) Meso compound is formed

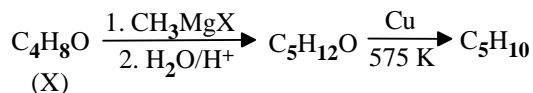
44. When a mixture of Benzaldehyde and Formaldehyde is reacted with NaOH then we get predominantly

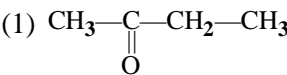
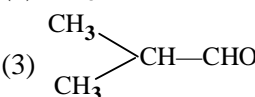
- (1) $\text{C}_6\text{H}_5\text{CH}_2\text{OH} + \text{HCOONa}$
 (2) $\text{C}_6\text{H}_5\text{COONa} + \text{CH}_3\text{OH}$
 (3) $\text{C}_6\text{H}_5\text{COOH} + \text{CH}_3\text{ONa}$
 (4) None of these

45. Phorone is obtained by condensation of

- (1) Two molecules of acetaldehyde
 (2) Two molecules of acetone
 (3) Two molecules of CH_3CHO + one molecule of CH_3COCH_3
 (4) 3 molecules of acetone

46. Identify X in the sequence



- (1) 
 (2) $\text{CH}_3-\text{CH}_2-\text{CH}_2-\text{CHO}$
 (3) 
 (4) None of these

47. Oxidation of CH_3CHO by SeO_2 produces

- (1) Ethanoic acid (2) Methanoic acid
 (3) Glyoxal (4) Oxalic acid

48. Which of the following does not give HCHO on heating

- (1) Formalin (2) Trioxane
 (3) Paraldehyde (4) Paraformaldehyde

49. Which of the following will react with water

- (1) CHCl_3 (2) Cl_3CCHO
 (3) CCl_4 (4) $\text{ClCH}_2\text{CH}_2\text{Cl}$

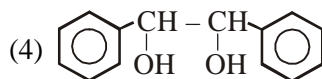
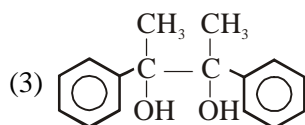
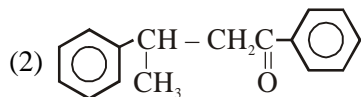
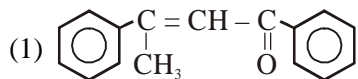
50. A new C-C bond formation is possible in

- (1) Cannizaro reaction
 (2) Friedel Craft reaction
 (3) Clemmenson reduction
 (4) None of these

CBSE

FUNCTIONAL GROUP-II (A)

1. Acetophenone when reacted with a base, C_2H_5ONa , yields a stable compound which has the structure:

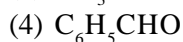
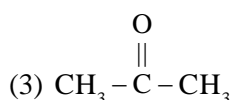


2. Reduction of aldehydes and ketones into hydrocarbons using zinc amalgam and conc. HCl is called

- (1) Cope Reduction
- (2) Dow Reduction
- (3) Wolff-Kishner Reduction
- (4) Clemmensen Reduction

3. Which one of the following on treatment with 50% aqueous sodium hydroxide yields the corresponding alcohol and acid

- (1) C_6H_5CHO
- (2) $CH_3CH_2CH_2CHO$



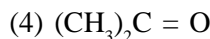
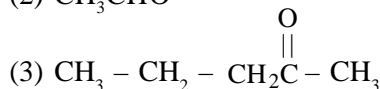
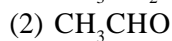
4. The product formed in Aldol condensation is

- (1) a beta-hydroxy aldehyde or a beta-hydroxy ketone
- (2) an alpha-hydroxy aldehyde or ketone
- (3) an alpha, beta unsaturated ester
- (4) a beta-hydroxy acid

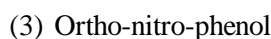
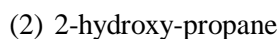
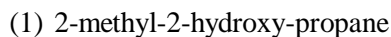
5. A carbonyl compound reacts with hydrogen cyanide to form cyanohydrin which on hydrolysis forms a racemic mixture of α -hydroxy acid. The carbonyl compound is

- (1) diethyl ketone
- (2) formaldehyde
- (3) acetaldehyde
- (4) acetone

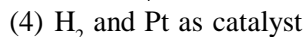
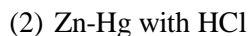
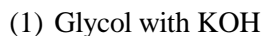
6. Nucleophilic addition reaction will be most favoured in



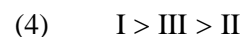
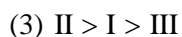
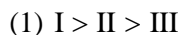
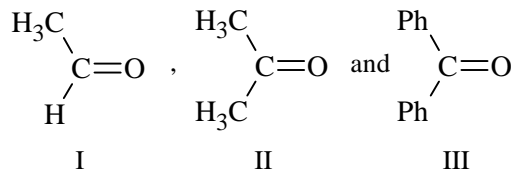
7. Which one of the following can be oxidised to the corresponding carbonyl compound ?



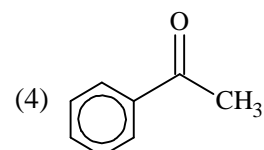
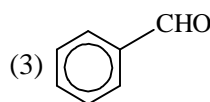
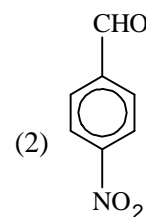
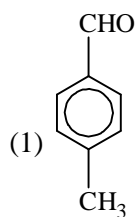
8. Clemmensen reduction of a ketone is carried out in the presence of which of the following ?



9. The order of reactivity of phenyl magnesium bromide ($PhMgBr$) with the following compounds:

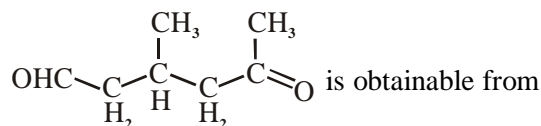


10. Which one is most reactive towards Nucleophilic addition reaction?

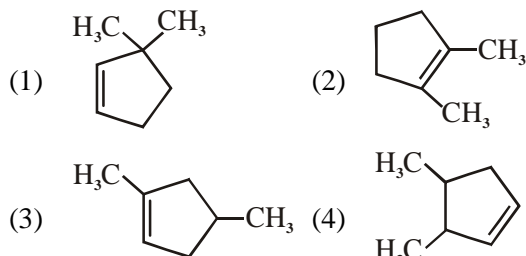


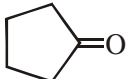
DPMT

11. A single compound of the structure:



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



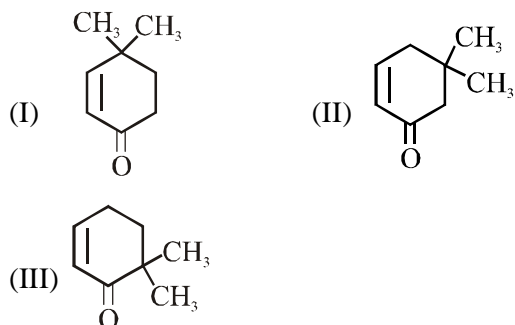
12. Treatment of cyclopentanone  with methyl lithium gives which of the following species?

- (1) Cyclopentanonyl radical
- (2) Cyclopentanonyl biradical
- (3) Cyclopentanonyl anion
- (4) Cyclopentanonyl cation

13. An organic compound 'X' having molecular formula $\text{C}_5\text{H}_{10}\text{O}$ yields phenyl hydrozone and gives negative response to the Iodoform test and Tollen's test. It produces n-pentane on reduction 'X' could be:

- (1) 3-pentanone
- (2) n-amyl alcohol
- (3) pentanal
- (4) 2-pentanone

14. Given :



Which of the given compounds can exhibit tautomerism ?

- (1) I and III
- (2) I, II and III
- (3) I and II
- (4) I and III

1. Aldol condensation *does not* occur between:

- (1) two different aldehydes
- (2) two different ketones
- (3) an aldehyde and a ketone
- (4) an aldehyde and an ester

2. In which of the following reactions, the product obtained is chiral?

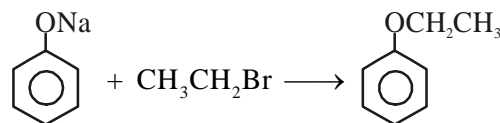
- (1) $\text{CH}_3\text{COCH}_3 \xrightarrow{\text{NaBH}_4}$
- (2) $\text{CH}_3\text{COCl} \xrightarrow{\text{Rosenmund reduction}}$
- (3) $\text{CH}_3\text{CH}_2\text{COCH}_2\text{CH}_3 \xrightarrow{\text{Sn, HCl}}$
- (4) $\text{CH}_3\text{CH}_2\text{COCH}_3 \xrightarrow{\text{LiAlH}_4}$

3. Which of the following compounds gives blood red coloration when its Lassaigne's extract is treated with alkali and ferric chloride?

- (1) Thiourea
- (2) Diphenyl sulfide
- (3) Phenyl hydrazine
- (4) Benzamide

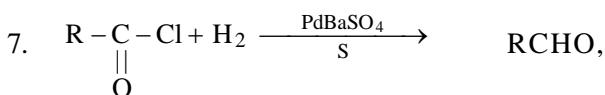
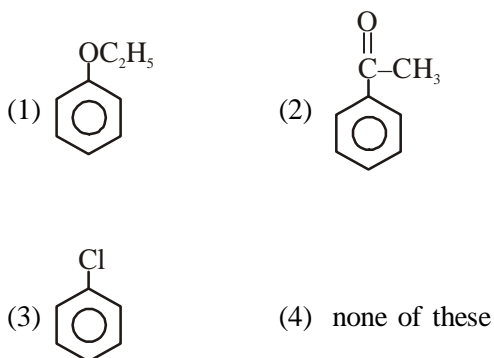
4. Compound A undergoes Cannizzaro reaction and B undergoes positive iodoform test. Therefore,

- (1) A = Acetaldehyde B = 1-Pentanal
- (2) A = $\text{C}_6\text{H}_5\text{CH}_2\text{CHO}$ B = 3-Pentanone
- (3) A = Formaldehyde B = 2-Pentanone
- (4) A = Propionaldehyde B = 1-Pentanol

5.  the type of reaction is]

- (1) electrophilic substitution
- (2) nucleophilic substitution
- (3) free radical substitution
- (4) none of these

6. Most reactive towards electrophilic substitution is

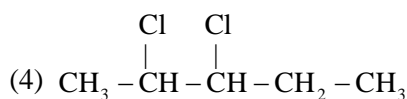
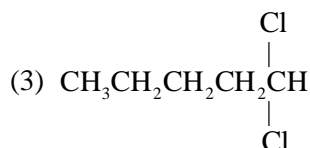
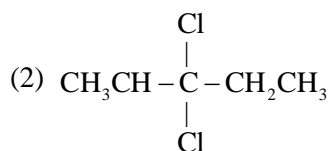
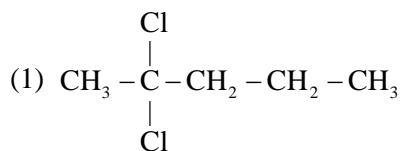


the name of reaction is

- (1) Cannizzaro reaction
 (2) Rosenmund reduction
 (3) Clemenson reduction
 (4) Wolf-Kischner reduction
8. Toulene by etard reaction gives
- (1) Ortho cresol (2) Boracic acid
 (3) Benyl alcohol (4) Benzaldehyde
9. In which of the following reactions carbon-carbon bond formation takes place?

- (1) Cannizzaro (2) Riemer tiemann
 (3) HVZ reaction (4) Schmidt reaction

10. A compound A \rightarrow $\text{C}_5\text{H}_{10}\text{Cl}_2$ on hydrolysis gives $\text{C}_5\text{H}_{10}\text{O}$ which react with NH_2OH , reduces idoform but does not give Fehling test A is



11. Compound 'A' undergoes formation of cyanohydrin which on hydrolysis gives lactic acid ($\text{CH}_3\text{CHOHCOOH}$). Therefore, compound 'A' is:

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

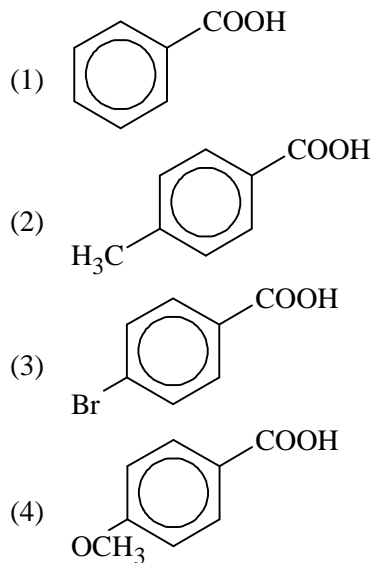
12. Which of the following statement is **not** correct?

- (1) Aldehydes and ketones undergo nucleophilic additions.
 (2) Aldehydes and ketones undergo electrophilic substitutions.
 (3) Aldehydes and ketones contain polar carbonyl groups.
 (4) Lower members of aldehydes and ketones are soluble in water due to hydrogen bonding.

13. In Tollen's test, aldehydes :

- (1) are oxidised to acids
 (2) are reduced to alcohol
 (3) neither reduced nor oxidised
 (4) precipitate Ag^+ as AgCl

14. Lowest pka is associated with



15. Of the following compounds, the oxime of which shows geometrical isomerism, is:

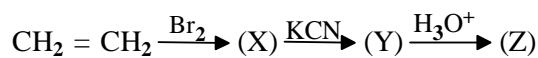
- (1) acetone (2) diethylketone
 (3) formaldehyde (4) benzaldehyde

Functional Group-II (Carboxylic Acids & Acid Derivatives) (B)

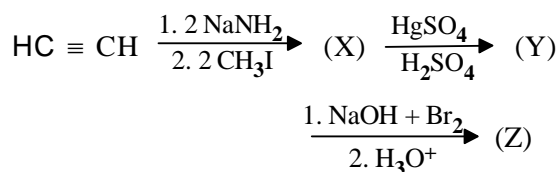
Choose the correct answers :

- Pick out the correct statement.
 - Unsaturated fatty acids have lower melting points than the corresponding saturated acids
 - Trans-isomer has higher m.p. than the cis-isomer of fatty acid
 - Acetic acid in vapour state has a molecular mass of 120
 - The C–O bond in RCOOH is larger than in ROH.

- Identify the final product in the following sequence of reactions.



- $\text{CH}_2\text{BrCH}_2\text{COOH}$
 - $\text{HOOCCH}_2\text{COOH}$
 - $\text{HOOCCH}_2\text{CH}_2\text{COOH}$
 - $\text{HOOCCH}(\text{CH}_3)\text{COOH}$
- What is (Z) in the following sequence of reactions?



- $\text{CH}_3\text{CH}_2\text{CH}_2\text{CHO}$
 - $\text{CH}_3\text{CH}_2\text{COCH}_3$
 - $\text{CH}_3\text{CH}_2\text{COOH}$
 - None of these
- Consider the following acids:

- HCN
- HCOOH
- CH_3COOH
- $\text{Cl-CH}_2\text{-COOH}$

The acid strengths of these acids are such that

- $4 > 2 > 3 > 1$
 - $2 > 3 > 1 > 4$
 - $4 > 2 > 1 > 3$
 - $2 > 3 > 4 > 1$
- Phenol is a weaker acid than acetic acid because
 - Phenoxide ion is better stabilized by resonance than acetate ion
 - Acetate ion is better stabilized by resonance than phenoxide ion
 - Phenol is less soluble in water than acetic acid
 - Both phenoxide ion and acetate ion are stable

- Consider the methyl substituted benzoic acids.
 - PhCOOH
 - o*- $\text{CH}_3\text{C}_6\text{H}_4\text{COOH}$
 - p*- $\text{CH}_3\text{C}_6\text{H}_4\text{COOH}$
 - m*- $\text{CH}_3\text{C}_6\text{H}_4\text{COOH}$

The increasing order of acidity is

- $1 < 2 < 3 < 4$
 - $2 < 3 < 4 < 1$
 - $3 < 4 < 1 < 2$
 - $3 < 4 < 2 < 1$
- Consider the following acids.
 - PhCOOH
 - m*- $\text{HOC}_6\text{H}_4\text{COOH}$
 - o*- $\text{HOC}_6\text{H}_4\text{COOH}$
 - p*- $\text{HOC}_6\text{H}_4\text{COOH}$
 Arrange these in decreasing order of their acidities
 - $3 > 2 > 1 > 4$
 - $3 > 2 > 4 > 1$
 - $1 > 2 > 3 > 4$
 - $2 > 3 > 1 > 4$

- Carbonation of methylmagnesium bromide gives an organic compound. This compound is also obtained by

- Oxidation of methyl alcohol
- Hydrolysis of methyl isocyanide with a mineral acid
- Hydrolysis of methyl formate with dilute mineral acid
- None of these

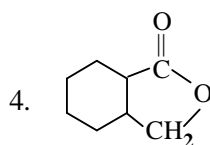
- Match list I with list II and select the correct answer using the codes given below the lists.

List I (Reactions)

- $\text{CH}_2=\text{CHCOOH} + \text{H}_2/\text{Ni} \longrightarrow$
- $\text{trans-CH}_3\text{CH}=\text{CHCOOH} + \text{Br}_2/\text{CCl}_4 \longrightarrow$
- $\text{C}_6\text{H}_5\text{CH}(\text{OH})\text{CH}_2\text{COOH} + \text{H}^+ \xrightarrow{\Delta}$
- $\textit{o}\text{-HOCC}_6\text{H}_4\text{CH}_2\text{OH} + \text{H}^+ \xrightarrow{\Delta}$

List II (Products)

- trans-PhCH=CHCOOH
- racemic-2,3-dibromobutanoic acid
- $\text{CH}_3\text{CH}_2\text{COOH}$



Codes :	(1)	(2)	(3)	(4)
(1)	3	4	2	1
(2)	2	3	1	4
(3)	3	2	1	4
(4)	3	2	4	1

10. Consider the following substances :

- (1) $C_6H_5COCH_2COCH_3$
- (2) $(C_2H_5OCO)_2CH_2$
- (3) $CH_3COCH_2COOC_2H_5$
- (4) $CH_3COCH_2COCH_3$

Place these dicarbonyl compounds in decreasing order of their enol content.

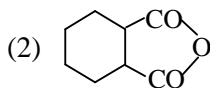
- (1) $1 > 2 > 3 > 4$
- (2) $1 > 4 > 2 > 3$
- (3) $1 > 4 > 3 > 2$
- (4) $4 > 3 > 2 > 1$

11. Match the list I with list II and select the correct answer using the codes given below the lists.

List I

(Reactions of $LiAlH_4$ with acid derivatives)

- (1) $C_6H_5CH_2COOCH_3$

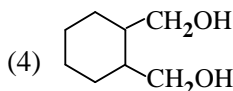


- (3) $PhCOCl$
- (4) $PhCH_2CONHMe$

List II

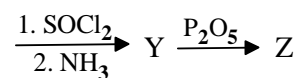
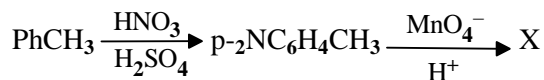
(Products)

- (1) $PhCH_2CH_2NHMe$
- (2) $PhCH_2OH$
- (3) $C_6H_5CH_2CH_2OH + HOCH_3$



Codes :	(1)	(2)	(3)	(4)
(1)	3	4	1	2
(2)	3	4	2	1
(3)	1	2	3	4
(4)	2	3	1	4

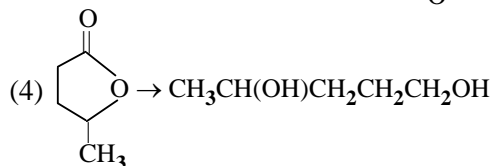
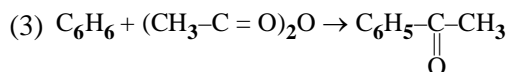
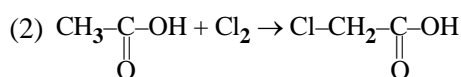
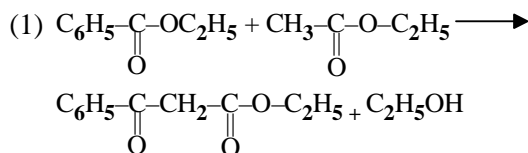
12. Identify the final product.



- (1) $p-O_2NC_6H_4COOH$
- (2) $p-O_2NC_6H_4CN$
- (3) $p-O_2NC_6H_4CONH_2$
- (4) None of these

13. Match the reactions given under list I with the reagents given under list II and select the correct answer using the codes given below the lists.

List I



List II

- (1) Anhydrous $ZnCl_2$
- (2) $C_2H_5O^-$
- (3) P
- (4) $LiAlH_4$

Codes :	(1)	(2)	(3)	(4)
(1)	3	2	4	1
(2)	3	2	1	4
(3)	2	3	1	4
(4)	None of these			

14. The weakest acid is

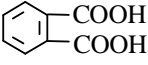
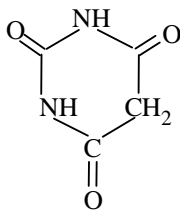
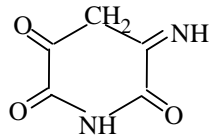
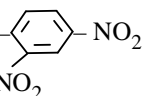
- (1) F_3CCOOH
- (2) Br_3COOH
- (3) Cl_3CCOOH
- (4) H_3CCOOH

15. Consider the following substances:

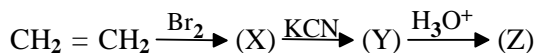
- (1) NO_2CH_2COOH
- (2) $ClCH_2COOH$
- (3) $BrCH_2COOH$
- (4) CH_3COOH

The correct sequence of acidity is

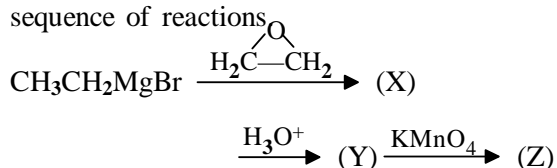
- (1) $2 < 1 < 3 < 4$
- (2) $3 < 2 < 1 < 4$
- (3) $4 < 3 < 2 < 1$
- (4) $4 < 3 < 1 < 2$

16. Formic acid is a stronger acid than acetic acid. This is due to the fact that
- (1) Formic acid is a reducing agent
 - (2) Formic acid molecule is of smaller size
 - (3) There is no alkyl group attached to carboxylic carbon in formic acid
 - (4) Formic acid does not undergo association.
17. Correct order of decreasing acidities of H_2O , ROH , $\text{HC}\equiv\text{CH}$, NH_3 and RH is
- (1) $\text{H}_2\text{O} > \text{HC}\equiv\text{CH} > \text{ROH} > \text{NH}_3 > \text{RH}$
 - (2) $\text{H}_2\text{O} > \text{ROH} > \text{HC}\equiv\text{CH} > \text{NH}_3 > \text{RH}$
 - (3) $\text{HC}\equiv\text{CH} > \text{ROH} > \text{H}_2\text{O} > \text{RH} > \text{NH}_3$
 - (4) $\text{NH}_3 > \text{H}_2 > \text{ROH} > \text{RH} > \text{HC}\equiv\text{CH}$
18. Fumaric acid (trans $\text{HO}_2\text{CCH}=\text{CHCHO}_2\text{H}$)
- (1) Has zero dipole moment
 - (2) Exhibits geometrical isomerism
 - (3) Exhibits optical isomerism
 - (4) Has a tendency to undergo dehydration to form an anhydride
19. What is the end product in the following reaction?
- $$\text{Acetamide} \xrightarrow{\text{P}_2\text{O}_5} \text{A} \xrightarrow{\text{H}_2\text{O}} \text{B}$$
- (1) CH_3NH_2
 - (2) $\text{C}_2\text{H}_5\text{NH}_2$
 - (3) CH_3CN
 - (4) $\text{CH}_3\text{COONH}_4$
20. The product obtained when acetic acid is treated with phosphorus trichloride is
- (1) $\text{CH}_3-\overset{\text{O}}{\parallel}{\text{C}}-\text{O}-\text{PCl}_2$
 - (2) $\text{CH}_3-\overset{\text{O}}{\parallel}{\text{C}}-\text{O}-\text{Cl}$
 - (3) $\text{CH}_3-\overset{\text{O}}{\parallel}{\text{C}}-\text{Cl}$
 - (4) $\text{Cl}-\text{CH}_2-\overset{\text{O}}{\parallel}{\text{C}}-\text{O}-\text{H}$
21. Reaction of $\text{R}-\overset{\text{O}}{\parallel}{\text{C}}-\text{NH}_2$ with a mixture of Br_2 and KOH gives $\text{R}-\text{NH}_2$ as the main product. The intermediates involved in this reaction are :
- (1) $\text{R}-\overset{\text{O}}{\parallel}{\text{C}}-\text{NH}_2$
 - (2) $\text{R}-\text{N}=\text{C}=\text{O}$
 - (3) $\text{R}-\text{NHBr}$
 - (4) $\text{R}-\overset{\text{O}}{\parallel}{\text{C}}-\text{N} \begin{matrix} \diagup \text{Br} \\ \diagdown \text{Br} \end{matrix}$
22. Which of the following will not yield a cyclic compound on heating
- (1) $\text{CH}_2 \begin{matrix} \diagup \text{COOH} \\ \diagdown \text{COOH} \end{matrix}$
 - (2) $\begin{matrix} \text{CH}_2-\text{COOH} \\ | \\ \text{CH}_2-\text{COOH} \end{matrix}$
 - (3) $\text{CH}_2 \begin{matrix} \diagup \text{CH}_2-\text{COOH} \\ \diagdown \text{CH}_2-\text{COOH} \end{matrix}$
 - (4) 
23. Which of the following is correct sequence for acidic hydrolysis
- (1) $(\text{CH}_3)_3\text{COOCH}_3 > (\text{CH}_3)_2\text{CHCOOCH}_3 > \text{CH}_3\text{CH}_2\text{COOCH}_3$
 - (2) $(\text{Me})_2\text{CHCOOCH}_3 > \text{Me}_3\text{CCOOCH}_3 > \text{MeCH}_2\text{COOCH}_3$
 - (3) $\text{MeCH}_2\text{COOCH}_3 > \text{Me}_2\text{CHCOOCH}_3 > \text{Me}_3\text{CCOOCH}_3$
 - (4) $\text{MeCH}_2\text{COOCH}_3 > \text{Me}_2\text{CHCOOCH}_3 > \text{Me}_2\text{CHCOOCH}_3$
24. Out of the following which undergoes easy decarboxylation
- (1) $\text{C}_6\text{H}_5-\overset{\text{O}}{\parallel}{\text{C}}-\text{CH}_2\text{COOH}$
 - (2) $\text{C}_6\text{H}_5-\overset{\text{O}}{\parallel}{\text{C}}-\text{COOH}$
 - (3) $\text{C}_6\text{H}_5\text{CH}(\text{OH})\text{COOH}$
 - (4) $\text{C}_6\text{H}_5\text{CH}(\text{NH}_2)\text{COOH}$
25. When urea is made to react with malonic esters it forms
- (1) 
 - (2) 
 - (3) Both of these
 - (4) None of these
26. Benzoic acid and formic acid can be distinguished by adding which of the following
- (1) NaHCO_3
 - (2) $\text{AgNO}_3 + \text{NH}_4\text{OH}$
 - (3) 
 - (4) None of these

27. Identify the final product in the following sequence of reactions.



- (1) $\text{CH}_2\text{BrCH}_2\text{COOH}$
 (2) $\text{HOOCCH}_2\text{COOH}$
 (3) $\text{HOOCCH}_2\text{CH}_2\text{COOH}$
 (4) $\text{HOOCCH}(\text{CH}_3)\text{COOH}$
28. Identify the final product in the following sequence of reactions



- (1) $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$
 (2) $\text{CH}_3\text{CH}(\text{CH}_3)\text{COOH}$
 (3) $\text{CH}_3\text{CH}_2\text{COOH}$
 (4) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{OH}$
29. Consider the following acids:

1. HCN 2. HCOOH
 3. CH_3COOH 4. $\text{Cl}-\text{CH}_2-\text{COOH}$

The acid strengths of these acids are such that

- (1) $4 > 2 > 3 > 1$
 (2) $2 > 3 > 1 > 4$
 (3) $4 > 2 > 1 > 3$
 (4) $2 > 3 > 4 > 1$
30. Place the following in the correct order of acidity.
1. $\text{CH} \equiv \text{C}-\text{COOH}$
 2. $\text{CH}_2 = \text{CHCOOH}$
 3. $\text{CH}_3\text{CH}_2\text{COOH}$
- (1) $1 > 2 > 3$
 (2) $3 > 2 > 1$
 (3) $2 > 1 > 3$
 (4) $1 > 3 > 2$

31. Arrange the following carboxylic acids in the decreasing order of their acidities.

1. PhCOOH
 2. $o\text{-O}_2\text{NC}_6\text{H}_4\text{COOH}$
 3. $p\text{-O}_2\text{NC}_6\text{H}_4\text{COOH}$
 4. $m\text{-O}_2\text{NC}_6\text{H}_4\text{COOH}$
- (1) $2 > 4 > 3 > 1$ (2) $2 > 4 > 1 > 3$
 (3) $2 > 3 > 4 > 1$ (4) $1 > 2 > 3 > 4$

32. An ester, $\text{C}_6\text{H}_{11}\text{COOCH}_2\text{C}_6\text{H}_{11}$, on reduction with H_2 in presence Pd/C gives

- (1) $\text{C}_6\text{H}_{11}\text{CH}_2\text{OH}$ (2mol)
 (2) $\text{C}_6\text{H}_{11}\text{COOH} + \text{C}_6\text{H}_{11}\text{CH}_3$
 (3) $\text{C}_6\text{H}_{11}\text{CH}_2\text{OCH}_2\text{C}_6\text{H}_{11}$
 (4) $\text{C}_6\text{H}_{11}\text{COCH}_2\text{C}_6\text{H}_{11}$

33. Lactic acid or oxidation with alk. KMnO_4 gives

- (1) Tartaric acid (2) Pyruvic acid
 (3) Cinnamic acid (4) Propionic acid

34. Match list (I) with list II and select the correct answer using the codes given below the lists.

List I (Reactions)

- (a) $\text{PhCOCl} + \text{CH}_3\text{COONa} \longrightarrow$
 (b) $\text{RCOOR}' + \text{R}''\text{OH} \longrightarrow$
 (c) $\text{RCONH}_2 + \text{R}'\text{OH} \longrightarrow$
 (d) $(\text{RCO})_2\text{O} + 2\text{PhNH}_2 \longrightarrow$

List II (Products)

- (1) $\text{PhCOOCOCH}_3 + \text{NaCl}$
 (2) No reaction
 (3) $\text{RCONHPh} + \text{RCOO}^- \text{PhNH}_3^+$
 (4) $\text{RCOOR}'' + \text{R}'\text{OH}$

Codes : (a) (b) (c) (d)

- (1) 2 1 3 4
 (2) 1 2 4 3
 (3) 1 4 2 3
 (4) 1 3 2 4

35. Consider the following acids:

- (1) MeCH_2COOH
 (2) Me_2CHCOOH
 (3) Me_3CCOOH
 (4) Et_3CCOOH

Correct order of the rate of esterification of these acids with MeOH is

- (1) $1 > 2 > 3 > 4$ (2) $2 > 1 > 3 > 4$
 (3) $2 > 3 > 4 > 1$ (4) $2 > 3 > 1 > 4$

36. Match list I with list II and select the correct answer using the codes given below the lists.

List I

(Reactions)

- (a) $\text{RCOCl} + \text{R}'\text{MgX}$
 (b) $\text{RCOCl} + \text{R}'_2\text{Cd}$
 (c) $\text{CH}_3\text{COOC}_2\text{H}_5 + \text{CH}_3\text{MgI}$
 (d) $\text{RCN} + \text{R}'\text{MgX}$

List II

(Products)

1. RCOR'
 2. $\text{RC(OH)R}'_2$
 3. $(\text{CH}_3)_3\text{COH}$
 4. $\text{RC(OH)R}'_2$

Codes : (a) (b) (c) (d)

- (1) 4 2 1 3
 (2) 2 3 1 4
 (3) 4 2 3 1
 (4) None of these

37. One mL of an organic compound was dissolved in ethanol and a very small drop of dilute alkali was added to it and then a drop of phenolphthalein was added. The red colour of the indicator was seen. The mixture was then heated. The colour disappeared in a few minutes. The organic compound is most likely to be

- (1) An aldehyde (2) A ketone
 (3) A carboxylic acid (4) An ester.

38. An anhydride and an ester can be distinguished with

- (1) $\text{C}_2\text{H}_5\text{OH}$ (2) NH_3
 (3) Water (4) aq. NaOH .

39. Consider the following acids:

1. PhCOOH 2. $o\text{-ClC}_6\text{H}_4\text{COOH}$
 3. $m\text{-ClC}_6\text{H}_4\text{COOH}$ 4. $p\text{-ClC}_6\text{H}_4\text{COOH}$

Arrange these acids in the increasing order of acidity.

- (1) $4 < 1 < 3 < 2$ (2) $4 < 1 < 2 < 3$
 (3) $1 < 4 < 3 < 2$ (4) $1 < 3 < 4 < 2$

40. Carboxylic acids readily dissolve in aqueous sodium bicarbonate, liberating carbon dioxide. Which one of the following is correct?

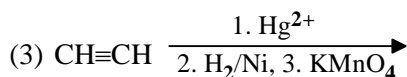
- (1) Free carboxylic acid and its conjugate base are of comparable stability
 (2) The free carboxylic acid is more stable than its conjugate base

- (3) The conjugate base of the carboxylic acid is more stable than the free carboxylic acid
 (4) The conjugate base of the carboxylic acid is less stable than the free carboxylic acid

41. Formic acid is a stronger acid than acetic acid. This is due to the fact that

- (1) Formic acid is a reducing agent
 (2) Formic acid molecule is of smaller size
 (3) There is no alkyl group attached to carboxylic carbon in formic acid
 (4) Formic acid does not undergo association.

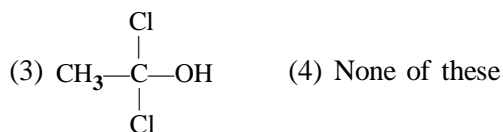
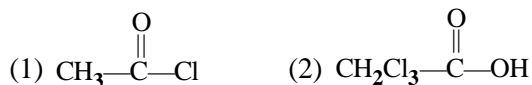
42. The industrial method for the manufacture of CH_3COOH is



43. Correct order of decreasing acidities of H_2O , ROH , $\text{HC}\equiv\text{CH}$, NH_3 and RH is

- (1) $\text{H}_2\text{O} > \text{HC}\equiv\text{CH} > \text{ROH} > \text{NH}_3 > \text{RH}$
 (2) $\text{H}_2\text{O} > \text{ROH} > \text{HC}\equiv\text{CH} > \text{NH}_3 > \text{RH}$
 (3) $\text{HC}\equiv\text{CH} > \text{ROH} > \text{H}_2\text{O} > \text{RH} > \text{NH}_3$
 (4) $\text{NH}_3 > \text{H}_2 > \text{ROH} > \text{RH} > \text{HC}\equiv\text{CH}$.

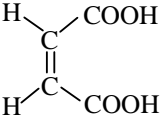
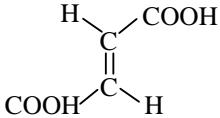
44. In presence of iodine catalyst, chlorine reacts with acetic acid to form



45. Fumaric acid ($\text{trans HO}_2\text{CCH}=\text{CHCO}_2\text{H}$)

- (1) Has zero dipole moment
 (2) Exhibits geometrical isomerism
 (3) Has a tendency to undergo dehydration to form an anhydride
 (4) All of these

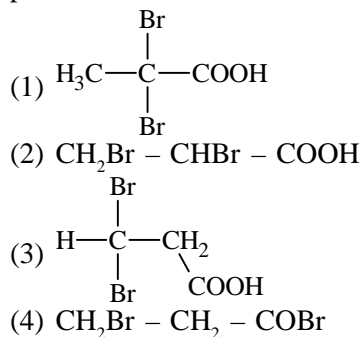
46. Formic and acetic acids may be distinguished by reaction with
 (1) Sodium
 (2) dil. acid permanganate
 (3) 2,4-dinitrophenylhydrazine reagent
 (4) Sodium ethoxide
47. Phthalimide is subjected to Hofmann's bromamide reaction. The product obtained is
 (1) Anthranilic acid (2) Sulphanilic acid
 (3) Salicylic acid (4) Phthalic acid
48. Consider the following reactions :

$$\text{CH}_3\text{COOH} \xrightarrow{\text{CaCO}_3} \text{A} \xrightarrow{\text{Heat}} \text{B}$$
 compound B is
 (1) An ether (2) An alcohol
 (3) An aldehyde (4) A ketone
49. $\text{CH}_3\text{COOC}_2\text{H}_5 \xrightarrow[\text{H}_3\text{O}^+]{2\text{CH}_3\text{MgBr}}$ X. X is
 (1) $\text{CH}_3\text{COOCH}_3$ (2) $(\text{CH}_3)_3\text{COH}$
 (3) $(\text{CH}_3)_2\text{C}=\text{O}$ (4) None of these
50. Below are given some statements concerning formic acid. Which of them is true ?
 (1) It is weaker acid than acetic acid
 (2) It is a reducing agent
 (3) When its calcium salt is heated, it forms a ketone
 (4) It is an oxidizing agent
51. Carboxylic acids do not give nucleophilic addition reactions characteristic of aldehydes and ketones even though they contain $> \text{C}=\text{O}$ group. It is because of
 (1) Acidic character
 (2) Resonance
 (3) Dimeric structure
 (4) + I effect of R group
52. Acetic acid on heating with urea gives
 (1) Acetamide, carbon dioxide and ammonia
 (2) Ammonium carbonate and carbon
 (3) Ammonium acetate, acetamide and carbon dioxide
 (4) None of these
53. Tamarind contains
 (1) (+) Tartaric acid (2) (-) Tartaric acid
 (3) (\pm) Tartaric acid (4) Citric acid
54. Which of the following has highest K_{a1} value
 (1)  (2) 
 (3) both equally acidic (4) None of these
55. Hydrolysis of an ester gives a carboxylic acid which on Kolbe's electrolysis yields ethane. The ester is
 (1) Ethyl methanoate (2) Methyl ethanoate
 (3) Methyl methanoate (4) Methyl propanoate
56. The reactivity order of
 (i) RCOCl , (ii) RCONH_2
 (iii) $\text{R}-\overset{\text{O}}{\parallel}{\text{C}}-\text{O}-\overset{\text{O}}{\parallel}{\text{C}}-\text{R}$ (iv) RCOOR'
 for hydrolysis is
 (1) $i > ii > iii > iv$ (2) $i > iii > ii > iv$
 (3) $i > iv > ii > iii$ (4) $i > iii > iv > ii$
57. When carboxylic acid is warmed with hydrazoic acid in presence of conc. H_2SO_4 it produces
 (1) Acid amide (2) Primary amine
 (3) Alkyl cyanide (4) Secondary amine
58. Which of the following does react with hydroxime
 (1) $\text{R}-\overset{\text{O}}{\parallel}{\text{C}}-\text{O}-\text{H}$ (2) $\text{H}-\overset{\text{O}}{\parallel}{\text{C}}-\text{OH}$
 (3) $\text{R}-\overset{\text{O}}{\parallel}{\text{C}}-\text{R}$ (4) None of these
59. $\text{CH}_3\text{CHO} \xrightarrow{\text{Al}(\text{OC}_2\text{H}_5)_3} \text{A} \xrightarrow{\text{C}_2\text{H}_5\text{ONa}} \text{B}$
 A and B respectively are
 (1) CH_3COOH , $\text{CH}_3\text{COOC}_2\text{H}_5$
 (2) $\text{CH}_3\text{COOC}_2\text{H}_5$, $\text{CH}_3\text{COCH}_2\text{COOC}_2\text{H}_5$
 (3) CH_3COOH , $\text{C}_2\text{H}_5\text{OH}$
 (4) None of these
60. The acidic strength order of methoxy benzoic acid and benzoic acid is
 (1) $o > p > m > \text{benzoic}$
 (2) $o = m > \text{benzoic} > p$
 (3) $p > o = m > \text{benzoic}$
 (4) $p > m > o > \text{benzoic}$

CBSE

FUNCTIONAL GROUP-II (B)

1. Propionic acid with $\text{Br}_2 \mid \text{P}$ yields a dibromo product. Its structure would be:



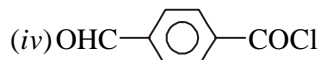
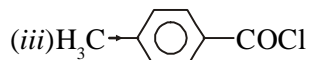
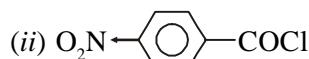
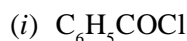
2. The relative reactivities of acyl compounds towards nucleophilic substitution are in the order of

- (1) Acyl chloride > Acid anhydride > Ester > Amide
- (2) Ester > Acyl chloride > Amide > Acid anhydride
- (3) Acid anhydride > Amide > Ester > Acyl chloride
- (4) Acyl chloride > Ester > Acid anhydride > Amide

3. Which of the following presents the correct order of the acidity in the given compounds?

- (1) $\text{FCH}_2\text{COOH} > \text{CH}_3\text{COOH} > \text{BrCH}_2\text{COOH} > \text{ClCH}_2\text{COOH}$
- (2) $\text{BrCH}_2\text{COOH} > \text{ClCH}_2\text{COOH} > \text{FCH}_2\text{COOH} > \text{CH}_3\text{COOH}$
- (3) $\text{FCH}_2\text{COOH} > \text{ClCH}_2\text{COOH} > \text{BrCH}_2\text{COOH} > \text{CH}_3\text{COOH}$
- (4) $\text{CH}_3\text{COOH} > \text{BrCH}_2\text{COOH} > \text{ClCH}_2\text{COOH} > \text{FCH}_2\text{COOH}$

4. Consider the following compounds

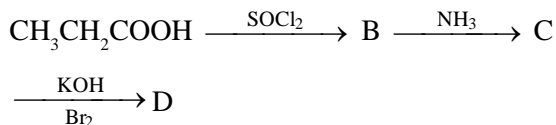


- (1) (i) > (ii) > (iii) > (iv)
- (2) (iv) > (ii) > (i) > (iii)
- (3) (ii) > (iv) > (i) > (iii)
- (4) (ii) > (iv) > (iii) > (i)

5. The IUPAC name of is

- (1) 2-ethyl-3-methylbutanoyl chloride
- (2) 2, 3-dimethylpentanoyl chloride
- (3) 3, 4-dimethylpentanoyl chloride
- (4) 1-chloro-1-oxo-2, 3-dimethylpentane

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



The structure of D would be

- (1) $\text{CH}_3\text{CH}_2\text{NHCH}_3$ (2) $\text{CH}_3\text{CH}_2\text{NH}_2$
- (3) $\text{CH}_3\text{CH}_2\text{CH}_2\text{NH}_2$ (4) $\text{CH}_3\text{CH}_2\text{CONH}_2$

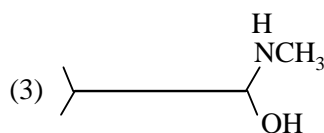
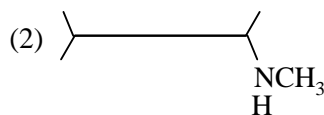
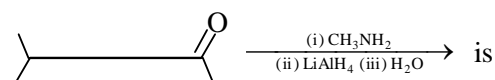
7. Self condensation of two moles of ethyl acetate in presence of sodium ethoxide yields

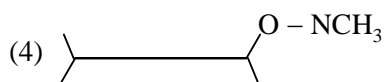
- (1) methyl acetoacetate
- (2) ethyl propionate
- (3) ethyl butyrate
- (4) acetoacetic ester

8. The best method for the separation of naphthalene and benzoic acid from their mixture is

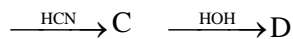
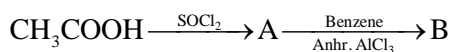
- (1) Sublimation (2) Chromatography
- (3) Crystallisation (4) Distillation

9. The major organic product formed from the following reaction

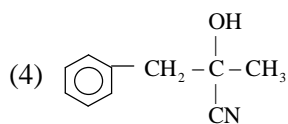
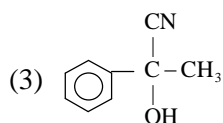
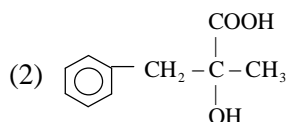
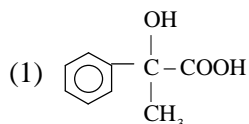




10. In a set of reactions acetic acid yielded a product D.



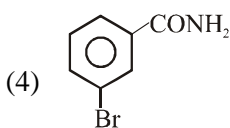
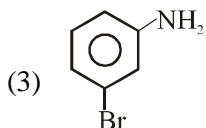
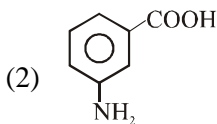
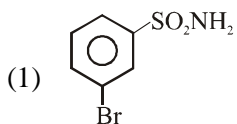
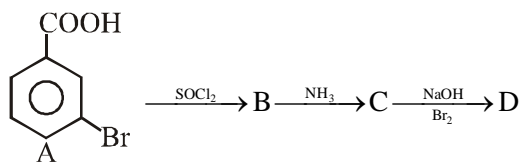
The structure of D would be



11. Among the given compounds, the most susceptible to nucleophilic attack at the carbonyl group is:

- (1) CH_3COCl
- (2) $\text{CH}_3\text{COOCH}_3$
- (3) CH_3CONH_2
- (4) $\text{CH}_3\text{COOCOCH}_3$

12. In a set of reactions m-bromobenzoic acid gave a product D. Identify the product D.



13. Match the compounds given in List - I with List - II and select the suitable option using the code given below.

List - I	List - II
(a) Benzaldehyde	(i) Phenolphthalein
(b) Phthalic anhydride	(ii) Benzoin condensation
(c) Phenyl benzoate	(iii) Oil of wintergreen
(d) Methyl salicylate	(iv) Fries rearrangement

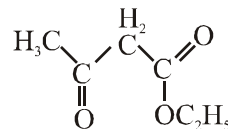
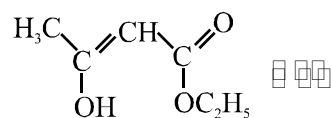
Code:

(a)	(b)	(c)	(d)
(1) (ii)	(i)	(iv)	(iii)
(2) (iv)	(i)	(iii)	(ii)
(3) (iv)	(ii)	(iii)	(i)
(4) (ii)	(iii)	(iv)	(i)

14. Which of the following will not be soluble in sodium hydrogen carbonate?

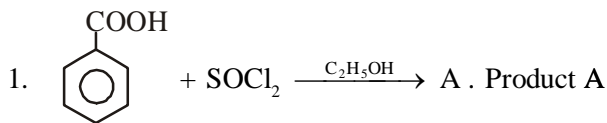
- (1) *o*-Nitrophenol
- (2) Benzenesulphonic acid
- (3) 2,4,6-trinitrophenol
- (4) Benzoic acid

16. The enolic form of ethyl acetoacetate as below has:

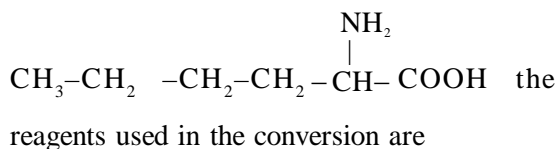
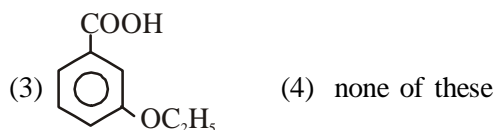
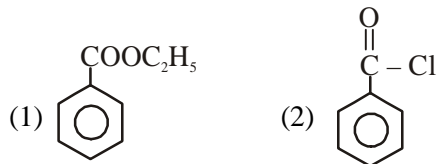


- (1) 9 sigma bonds and 2 pi-bonds
- (2) 9 sigma bonds and 1 pi-bond
- (3) 18 sigma bonds and 2 pi-bonds
- (4) 16 sigma bonds and 1 pi-bond

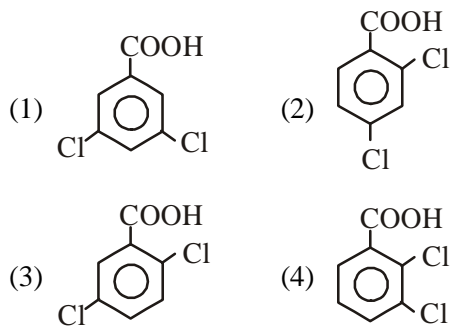
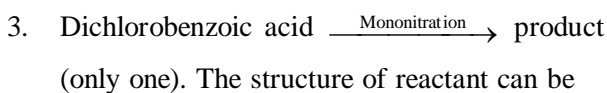
DPMT



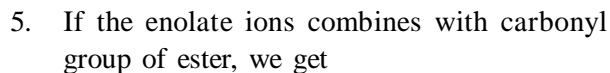
is



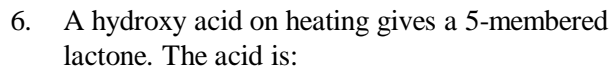
- (1) (i) PBr₃/(ii) NH₃
 (2) (i) red P, Br₂/(ii) NH₃ (excess)
 (3) (i) PBr₃, NaCN/(ii) LiAlH₄
 (4) none of these



- (I) RCOCl (II) RCOOR
 (III) RCONH₂ (IV) (RCO)₂O
 (1) I > IV > II > III
 (2) I > II > III > IV
 (3) I > III > II > IV



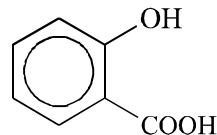
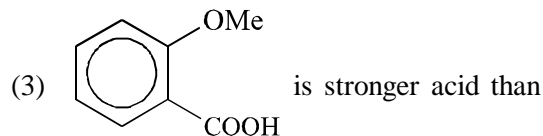
- (1) aldol
 (2) α,β-unsaturated ester
 (3) β-keto aldehyde
 (4) acid



- (1) CH₂OHCH₂CH₂COOH
 (2) CH₃CHOHCH₂COOH
 (3) CH₃CH₂CHOHCOOH
 (4) CH₃CHOHCHOHCOOH

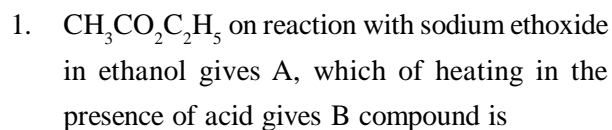


- (1) o-Nitrobenzoic acid is stronger than 3, 5 dinitrobenzoic acid in H₂O
 (2) Branched carboxylic acids are more acidic than unbranched acids

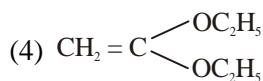
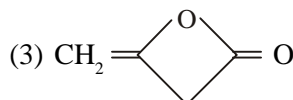


- (4) Butanoic acid is stronger acid than succinic acid

AIIMS



- (1) CH₃COCH₂COOH
 (2) CH₃COCH₃



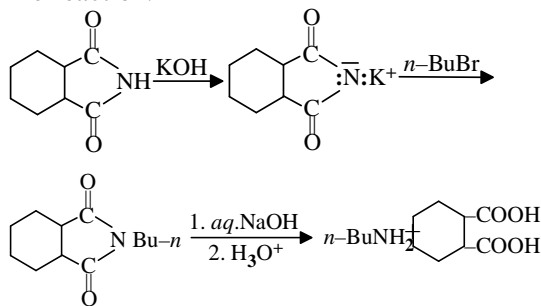
Functional Group-III

Cyanides, Isocyanides, Nitro Compounds & Amines

Choose the correct answers :

- When aniline is treated with fuming sulphuric acid at 475K, it gives
 - (1) Sulphanilic acid
 - (2) Aniline sulphate
 - (3) *o*-aminobenzenesulphonic acid
 - (4) *m*-aminobenzenesulphonic acid.
- When aniline is treated with bromine-water, it forms
 - (1) 2-bromoaniline
 - (2) 4-bromoaniline
 - (3) Mixture of 2-and 4-bromoanilines
 - (4) 2,4,6-tribromoaniline.
- When nitrobenzene is treated with Br₂ in presence of FeBr₃, the major product formed is *m*-bromonitrobenzene. Statements which are related to obtain *m*-isomer are:
 - (1) The electron-density on meta carbon is more than that on ortho and para positions
 - (2) The intermediate carbonium ion formed after initial attack of Br⁺ at the meta position is least destabilized
 - (3) Loss of aromaticity, when Br⁺ attacks at the ortho and para positions, and not at meta position
 - (4) Easier loss of H⁺ to regain aromaticity from the meta position than from the ortho and para positions.

4. The reaction:



is called

- (1) Carbylamine reaction
- (2) Hofmann reaction

- (3) Gabriel phthalimide synthesis
- (4) Cope reaction

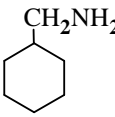
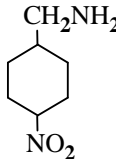
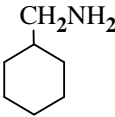
5. Examine the following two structures for the anilinium ion and choose the correct statement from the ones given below.



- (1) II is not an acceptable canonical structure, because carbonium ions are less stable than ammonium ions
 - (2) II is not an acceptable canonical structure, because it is non aromatic
 - (3) II is not an acceptable canonical structure, because the nitrogen has 10 valence electrons
 - (4) II is an acceptable canonical structure
6. Consider the following amines:
 - (a) *n*-butylamine
 - (b) Ethyldimethyl amine
 - (c) Diethylamine
 The correct sequence of boiling points is
 - (1) a > c > b
 - (2) a > b > c
 - (3) b > c > a
 - (4) None of these
 7. The correct order of basic strength of
 - (a) NH₃
 - (b) RNH₂
 - (c) R₂NH
 - (d) R₃N

Where R is CH₃ group is (in aq. medium)

- (1) c > b > a > d
 - (2) b > c > d > a
 - (3) c > b > d > a
 - (4) None of these
8. The conjugate acid of HO(CH₂)₃ NH₂ is
 - (1) H₂O⁺(CH₂)₃NH₂
 - (2) HO(CH₂)₃NH₃⁺
 - (3) O⁻(CH₂)₃NH₂
 - (4) HO(CH₂)₃NH⁺
 9. Place the following in the decreasing order of basicity.
 - (a) Ethylamine
 - (b) 2-aminoethanol

- (c) 3-aminopropan-1-ol
 (1) $a > c > b$ (2) $a > b > c$
 (3) $b > a > c$ (4) None of these
10. Consider the following compounds :
 a. $\text{H}_2\text{C} = \text{CHCH}_2\text{NH}_2$
 b. $\text{CH}_3\text{CH}_2\text{CH}_2\text{NH}_2$
 c. $\text{HC} \equiv \text{CCH}_2\text{NH}_2$
 The increasing order of basicity is
 (1) $c < a < b$ (2) $c < b < a$
 (3) $b < a < c$ (4) None of these
11. Consider the following substances :
 a.  b. 
 c. 
- The decreasing order of basicity is
 (1) $c > a > b$ (2) $a > b > c$
 (3) $a > c > b$ (4) None of these
12. Place the following amines :
 (a) $p\text{-CH}_3\text{OC}_6\text{H}_4\text{NH}_2$
 (b) $\text{C}_6\text{H}_5\text{NH}_2$
 (c) $o\text{-CH}_3\text{OC}_6\text{H}_4\text{NH}_2$
 (d) $m\text{-CH}_3\text{OC}_6\text{H}_4\text{NH}_2$
 In decreasing order of basicity.
 (1) $a > b > c > d$
 (2) $b > a > c > d$
 (3) $a > c > b > d$
 (4) None of these
13. Arrange the following anilines in decreasing order of basicity.
 (a) $\text{C}_6\text{H}_5\text{NH}_2$ (b) $o\text{-CH}_3\text{C}_6\text{H}_4\text{NH}_2$
 (c) $m\text{-CH}_3\text{C}_6\text{H}_4\text{NH}_2$ (d) $p\text{-CH}_3\text{C}_6\text{H}_4\text{NH}_2$
 (1) $d > a > b > c$ (2) $d > c > a > b$
 (3) $a > b > c > d$ (4) None of these
14. Place the following aromatic amines in the decreasing order of their basicities.
 (a) PhNH_2 (b) Ph_2NH
 (c) cyclohexyl- NH_2

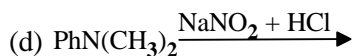
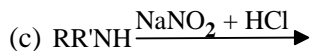
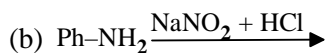
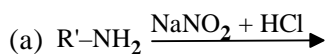
- (1) $c > a > b$ (2) $c > b > a$
 (3) $a > b > c$ (4) $a > c > b$
15. Consider the following aromatic amines:
 (a) $\text{C}_6\text{H}_5\text{-NH}_2$
 (b) $o\text{-NO}_2\text{C}_6\text{H}_4\text{NH}_2$
 (c) $p\text{-NO}_2\text{C}_6\text{H}_4\text{NH}_2$
 (d) $m\text{-NO}_2\text{C}_6\text{H}_4\text{NH}_2$
 The correct sequence of basicity is
 (1) $a > c > b > d$ (2) $a > d > c > b$
 (3) $a > d > c > b$ (4) $d > c > b > a$
16. Nitration of aniline with conc. H_2SO_4 and conc. HNO_3 gives *o*- and *p*-nitroaniline and another compound X. X is
 (1) *m*-nitroaniline
 (2) Benzoquinone
 (3) Hydroxy benzoquinone
 (4) None of these
17. Which of the following reactions will occur ?
 (a) $\text{ArN}_2^+ + \text{CuBr} \rightarrow \text{ArBr}$
 (b) $\text{ArN}_2^+ + \text{Cyclohexane-OH} \rightarrow \text{Ar-Cyclohexane-OH}$
 (c) $\text{ArN}_2^+ + \text{H}_3\text{PO}_2 \xrightarrow{\text{H}_2\text{O}} \text{ArH}$
 (d) $\text{ArN}_2^+ + \text{I}^- \longrightarrow \text{ArI}$
- Select the correct answer using the codes given below
- Codes :**
 (1) a, b and d (2) a, c and d
 (3) a, b and c (4) b, c and d.
18. Aromatic diazonium group can be replaced by various groups/atoms. In this context, match list I with list II and select the correct answer using the codes given below the lists.
- | <i>List I</i> | <i>List II</i> |
|-----------------------------|-------------------|
| (Reagent/reaction type) | (Replacement) |
| (a) H_3PO_2 | 1. Hydrogen |
| (b) Sandmeyer reaction | 2. Hydroxyl group |
| (c) Boiling with water | 3. Aryl group |
| (d) Gomberg reaction | 4. Chlorine |
- Codes:** (a) (b) (c) (d)
 (1) 4 3 2 1
 (2) 1 4 2 3

(3) 1 2 3 4

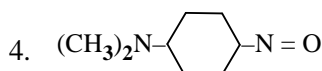
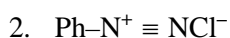
(4) None of these

19. Match list I with list II and select the correct answer using the codes given below.

List I (Reactions)



List II (Products)



Codes: (a) (b) (c) (d)

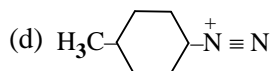
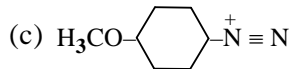
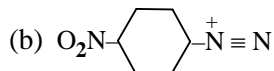
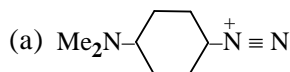
(1) 5 2 1 4

(2) 5 2 3 4

(3) 1 2 3 4

(4) None of these

20. Consider the following ions:



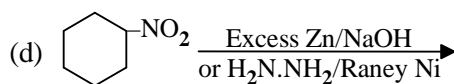
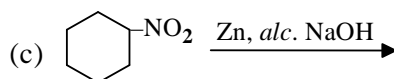
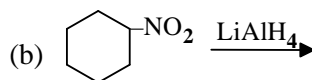
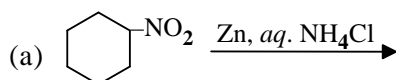
The reactivities of these ions in diazo coupling reactions (under similar conditions) will be such that

(1) $a < d < b < c$ (2) $a < c < d < b$

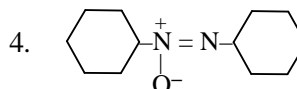
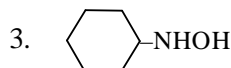
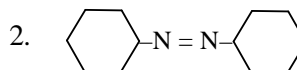
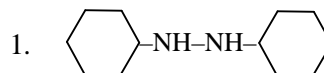
(3) $c < a < b < d$ (4) None of these

21. Match list I with list II and select the correct answer using the codes give below the lists.

List I (Reduction reactions)



List II (Reduction Products)



Codes: (a) (b) (c) (d)

(1) 3 2 1 2

(2) 2 3 1 4

(3) 3 2 2 1

(4) None of these

22. Match list I (condition of reaction of nitrobenzene) with list II (products formed) and select the correct answer using the codes given below.

List I

List II

(a) Sn and HCl 1. Hydrazobenzene

(b) Zn and NH_4Cl 2. Azoxybenzene

(c) Methanolic NaOMe 3. Phenyl hydroxylamine

(d) Zn and KOH 4. Aniline

Codes: (a) (b) (c) (d)

(1) 4 3 1 2

(2) 4 3 2 1

(3) 3 4 1 2

(4) None of these

23. Which of the following will give a positive carbylamine test ?

a. H_3CNH_2 b. $H_3C-NH-CH_3$

c. $(CH_3)_3N$ d. $C_6H_5NH_2$

Select the correct answer using the codes given below.

- (1) a and c (2) b and d
 (3) c and d (4) a and d
24. Bromination of aniline gives 2,4,6-tribromoaniline; whereas the nitration of aniline with mixed acids gives *m*-nitroaniline. In the case of nitration, the *m*-derivative is formed because
- (1) In the presence of strong acids, the amino group is protonated to -NH_3^+ , which is *m*-orienting
 - (2) *m*-nitroaniline is thermodynamically more stable than the ortho and para-isomers
 - (3) Nitro group cannot enter ortho and para positions, due to steric factor
 - (4) The mechanism for bromination and nitration are different

25. Match list I (containing the organic compounds) with their nature from list II. Select the correct answer using the codes given below the lists.

List I

- Acetamide
- Benzonitrile
- Trimethylamine
- Phenol

List II

- Acidic
- Basic
- Neutral

Codes: (a) (b) (c) (d)

- | | | | | |
|-----|---------------|---|---|---|
| (1) | 1 | 2 | 3 | 3 |
| (2) | 3 | 3 | 1 | 2 |
| (3) | 3 | 3 | 2 | 1 |
| (4) | None of these | | | |

26. Match the compounds in list I with the appropriate test that will be answered by each one of them in list II from the combinations shown.

Selects the correct answer using the codes given below the list .

List I

- Propyne
- Ethyl benzoate
- Acetaldehyde
- Aniline

List II

1. Reduces Fehling's solution
2. Forms a precipitate with AgNO_3 in ethanol

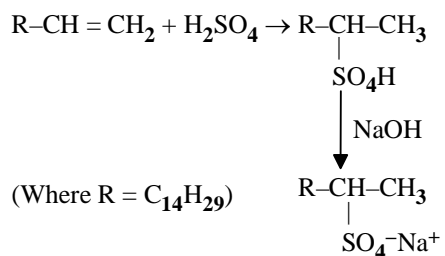
3. Insoluble in water, but dissolves in aqueous NaOH upon heating
4. Dissolves in dilute HCl in the cold and is reprecipitated by the addition of alkali

Codes: (a) (b) (c) (d)

- | | | | | |
|-----|---------------|---|---|---|
| (1) | 3 | 2 | 1 | 4 |
| (2) | 2 | 3 | 1 | 4 |
| (3) | 2 | 3 | 4 | 1 |
| (4) | None of these | | | |

27. Primary, secondary and tertiary amines can be distinguished by the use of
- (1) Nitrous acid
 - (2) Bromine water
 - (3) Hydrogen peroxide
 - (4) Phosphorus pentachloride
28. The decreasing order of the basic character of three amines and ammonia is
- (1) $\text{NH}_3 > \text{CH}_3\text{NH}_2 > \text{C}_2\text{H}_5\text{NH}_2 > \text{C}_6\text{H}_5\text{NH}_2$
 - (2) $\text{C}_2\text{H}_5\text{NH}_2 > \text{CH}_3\text{NH}_2 > \text{NH}_3 > \text{C}_6\text{H}_5\text{NH}_2$
 - (3) $\text{C}_6\text{H}_5\text{NH}_2 > \text{C}_2\text{H}_5\text{NH}_2 > \text{CH}_3\text{NH}_2 > \text{NH}_3$
 - (4) $\text{CH}_3\text{NH}_2 > \text{C}_2\text{H}_5\text{NH}_2 > \text{C}_6\text{H}_5\text{NH}_2 > \text{NH}_3$

29. In the following 2- reaction sequence

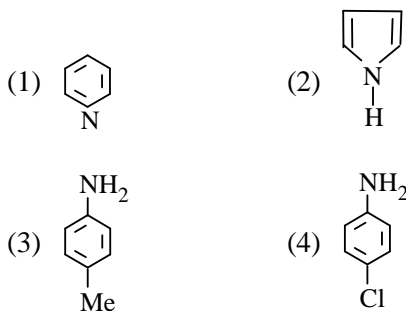


the end product would be useful as

- (1) A fertilizer
- (2) An explosive
- (3) A detergent
- (4) None of these

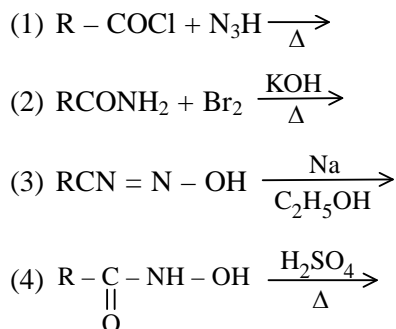
30. The basic strength of ammonia, *p*, *s*, *t* ethylamine in aqueous medium is
- (1) $p > s > t > \text{NH}_3$
 - (2) $s > p > t > \text{NH}_3$
 - (3) $s > t > p > \text{NH}_3$
 - (4) $s > p > \text{NH}_3 > t$
31. The basic strength of amines (methyl) and ammonia in air is
- (1) $\text{NH}_3 > p > s > t$
 - (2) $p > s > t > \text{NH}_3$

- (3) $s > p > t > \text{NH}_3$
 (4) None of these
32. Which of the following will have highest K_b value.



33. *p*- and secondary amines can be distinguished by
 (1) Br_2/KOH (2) HClO
 (3) HNO_2 (4) NH_3

34. Which of the following gives a *p*-amines with relation in number of carbon atoms



35. Aniline is a weaker base than ethyl amine because

- (1) Phenyl gp in aniline is a +R gp
 (2) Ethyl gp in ethyl amine decreases the electron density on nitrogen atom
 (3) The lone pair of electron on nitrogen atom in aniline is delocalized over aniline
 (4) Aniline is less soluble in water than ethylamine

36. A compound Z reacts with 3 moles of CH_3I and gives a product which on hydrolysis gives $[(\text{CH}_3)_4\text{N}]^+ \text{OH}^-$. Compound Z is

- (1) CH_3NH_2 (2) $(\text{CH}_3)_2\text{NH}$
 (3) $(\text{CH}_3)_3\text{N}$ (4) $(\text{CH}_3)_4\text{N}^+\text{Cl}^-$

37. Diazonium coupling reaction with aniline should be carried out in

- (1) Weakly basic medium
 (2) Weakly acidic medium
 (3) Strongly basic medium
 (4) Strongly acidic medium

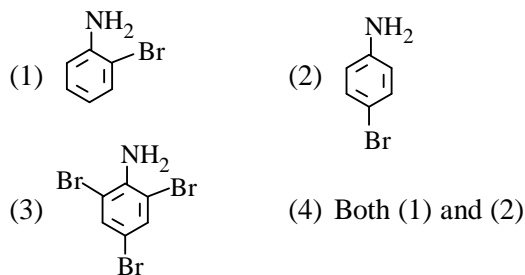
38. $\text{CH}_3\text{CH}_2\text{NH}_2$ contains a basic NH_2 gp but CH_3CONH_2 does not because

- (1) CH_3CONH_2 is amphoteric
 (2) In $\text{CH}_3\text{CH}_2\text{NH}_2$ the lone pair on N-atom is delocalized by resonance
 (3) Both of these
 (4) None of these

39. For CH_3CHO , CH_3NO_2 , CH_3COOH

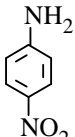
- (1) All have same chemical property
 (2) All have one common chemical behaviour
 (3) All are basic
 (4) None of these

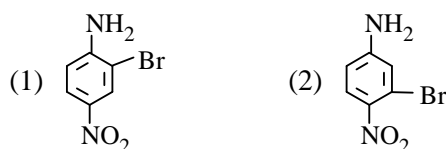
40. Bromine in CS_2 reacts with aniline to give



41. RNC cannot undergo

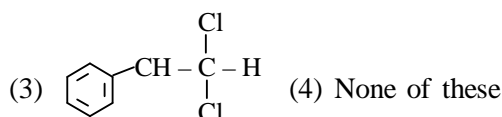
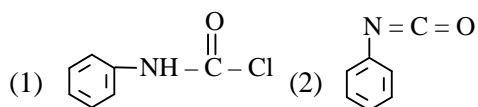
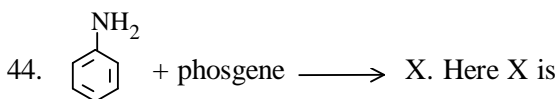
- (1) Acidic hydrolysis
 (2) Electrophilic, nucleophilic, addition on carbon
 (3) Base hydrolysis
 (4) Both (2) & (3)

42.  on bromination would yield





43. Which of the following has highest boiling point
 (1) Acetamide (2) Acetic anhydride
 (3) Acetic acid (4) Acetyl chloride



45. Ethylamine undergoes oxidation in the presence of KMnO_4 to give
 (1) CH_3COOH (2) $\text{CH}_3\text{CH}_2\text{OH}$
 (3) CH_3CHO (4) N-oxide
46. Baker Mulliken's test is used to detect the presence

- (1) $-\text{COOH}$ gp (2) $-\text{NO}_2$
 (3) $-\text{OH}$ (4) $-\text{NH}_2$

47. t-amines with different alkyl gp has a chiral nitrogen atom still it is optically inactive because
 (1) Chiral N-atoms cannot rotate plane polarized light
 (2) The lone pair prevents the rotation of plane polarized light
 (3) Both of these
 (4) None of these
48. The number of canonical forms of diazomethane is
 (1) 2 (2) 3
 (3) 4 (4) None of these
49. Pseudo acidic character is exhibited by
 (1) RCOOH (2) HCl
 (3) CH_3NO_2 (4) None of these
50. In CH_3NO_2 we can observe
 (1) H-bonding
 (2) α -halogenation reaction
 (3) Tautomerism
 (4) All of these

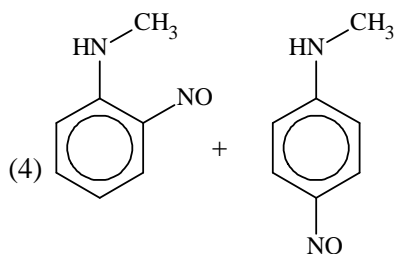
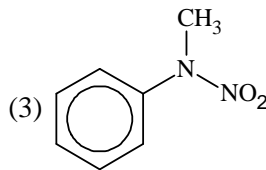
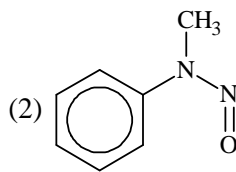
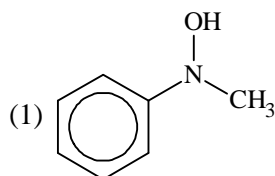
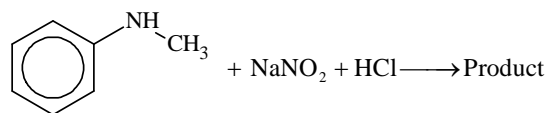
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FUNCTIONAL GROUP-III

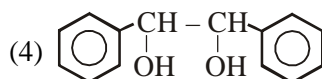
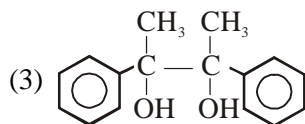
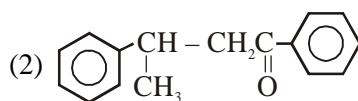
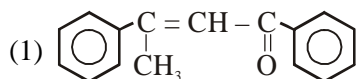
1. Nitrobenzene can be prepared from benzene using a mixture of conc. HNO_3 and conc. H_2S . In the mixture, nitric acid acts as a/an:

- (1) catalyst (2) reducing agent
 (3) acid (4) base

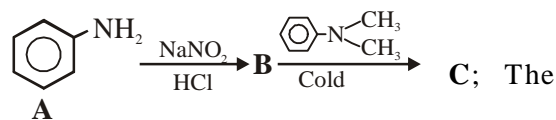
2. Predict the product



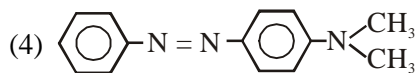
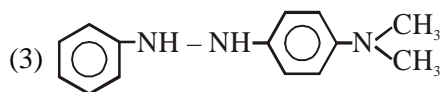
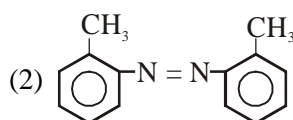
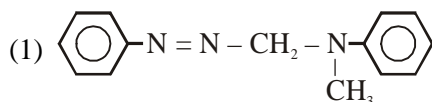
3. Acetophenone when reacted with a base, C_2H_5ONa , yields a stable compound which has the structure:



4. In a reaction of aniline a coloured product C was obtained.



structure of C would be



5. Which one of the following on reduction with lithium aluminium hydride yields a secondary amine?

- (1) Methylisocyanide (2) Acetamide
(3) Methyl Cyanide (4) Nitroethane

6. Which of the following is more basic than aniline?

- (1) p-Nitroaniline (2) Benzylamine
(3) Diphenylamine (4) Triphenylamine

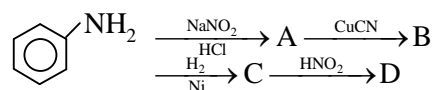
7. Electrolytic reduction of nitrobenzene in weakly acidic medium gives

- (1) Aniline
(2) p-Hydroxynaline

- (3) N-Phenylhydroxylamine

- (4) Nitrosobenzene

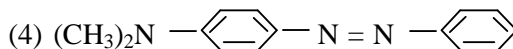
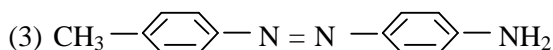
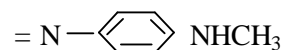
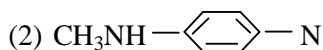
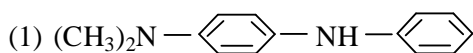
8. Aniline is a set of reactions yielded a product D.



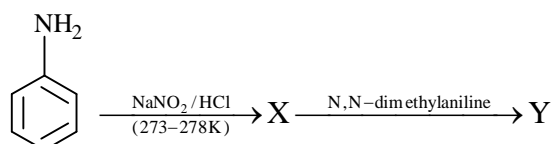
The structure of the product D would be

- (1) $C_6H_5CH_2OH$ (2) $C_6H_5CH_2NH_2$
(3) C_6H_5NHOH (4) $C_6H_5NHCH_2CH_3$

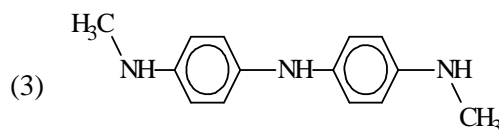
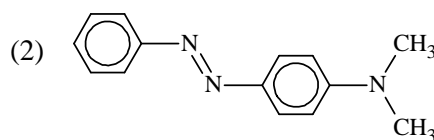
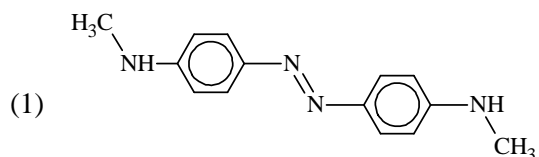
9. Aniline when diazotized in cold and then treated with dimethyl aniline gives a coloured product. Its structure would be

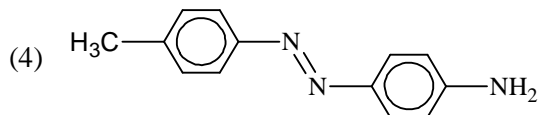


10. Aniline in a set of the following reactions yielded a coloured product 'Y'.

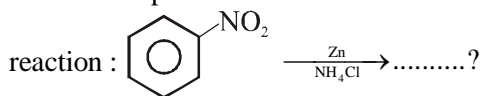


The structure of 'Y' would be:





11. Which of the following statements about primary amines is **'False'**
- (1) Alkyl amines are stronger bases than ammonia
 - (2) Alkyl amines are stronger bases than aryl amines
 - (3) Alkyl amines react with nitrous acid to produce alcohols
 - (4) Aryl amines react with nitrous acid to produce phenols
12. Acetamide is treated with the following reagents separately. Which one of these would yield methyl amine?
- (1) PCl_5
 - (2) $\text{NaOH} - \text{Br}_2$
 - (3) Sodalime
 - (4) Hot conc. H_2SO_4
13. What is the product obtained in the following reaction :

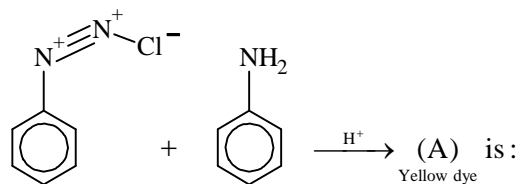


- (1)
- (2)
- (3)
- (4)

14. An organic compound 'A' on treatment with NH_3 gives 'B', which on heating gives 'C'. 'C' when treated with Br_2 in the presence of KOH produces ethylamine. Compound 'A' is:

- (1) $\text{CH}_3\text{CH}_2\text{COOH}$
- (2) CH_3COOH
- (3) $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$
- (4)

15. In the following reactions, the product (A) is:



- (1)
- (2)
- (3)
- (4)

16. Which of the following will be most stable diazonium salt RN_2^+X^- ?

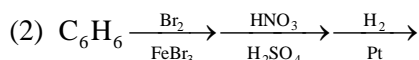
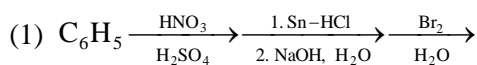
- (1) $\text{CH}_3\text{CH}_2\text{N}_2^+\text{X}^-$
- (2) $\text{C}_6\text{H}_5\text{CH}_2\text{N}_2^+\text{X}^-$
- (3) $\text{CH}_3\text{N}_2^+\text{X}^-$
- (4) $\text{C}_6\text{H}_5\text{N}_2^+\text{X}^-$

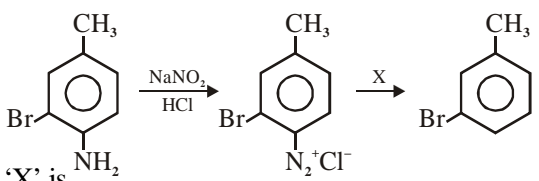
17. The electrolytic reduction of nitrobenzene in strongly acidic medium produces:

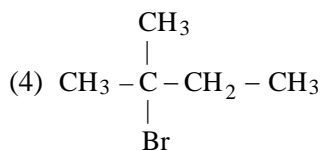
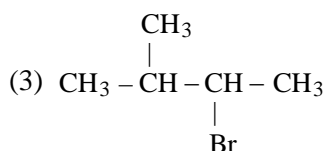
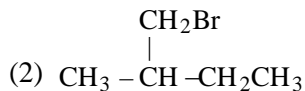
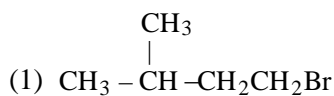
- (1) Azobenzene
- (2) Aniline
- (3) p-Aminophenol
- (4) Azoxybenzene

DPMT

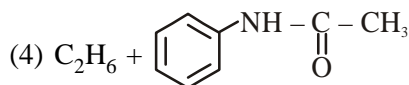
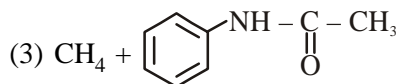
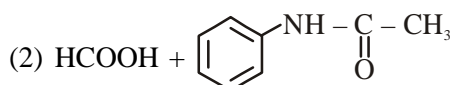
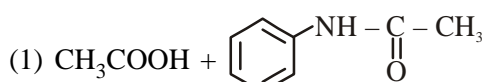
1. m-Bromoaniline can be prepared by



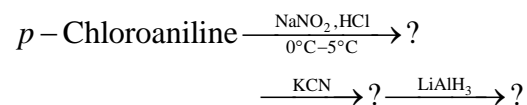
- (3) $m\text{-BrC}_6\text{H}_4\text{COOH} \xrightarrow{\text{SOCl}_2} \xrightarrow{\text{NH}_3} \xrightarrow[\text{H}^+]{\text{Br}_2, \text{NaOH}}$
- (4) $\text{C}_6\text{H}_5\text{NH}_2 \xrightarrow[\text{Cu}_2\text{Br}_2]{\text{NaNO}_2, \text{HCl}} \xrightarrow{\text{NaNH}_2}$
2. $\text{CH}_3\text{CH}_2\text{COONH}_4 \xrightarrow{\text{P}_2\text{O}_5/\Delta} ?$
- (1) $\text{CH}_3\text{CH}_2\text{CN}$ (2) $\text{CH}_3\text{CH}_2\text{CONH}_2$
 (3) $\text{CH}_3\text{CH}_2\text{NH}_2$ (4) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CN}$
3. 
- 'X' is
- (1) H_3PO_2 (2) H_3PO_3
 (3) H_3PO_4 (4) $(\text{HPO}_3)_3$
4. Potassium phthalimide reacts with A which on hydrolysis give iso-pentyl-amine what is A



5. Aniline reacts with acetic anhydride to give

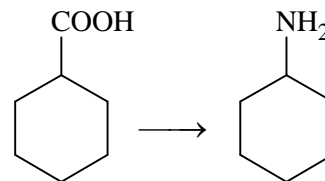


6. Number of isomeric primary amines obtained from $\text{C}_4\text{H}_{11}\text{N}$ are
- (1) 3 (2) 4
 (3) 5 (4) 6
7. Which of the following releases CO_2 by reaction with NaHCO_3 ?
- (1) CH_3CONH_2 (2) $\text{C}_2\text{H}_5\text{NH}_2$
 (3) $(\text{CH}_3)_3\text{N}^+\text{OH}^-$ (4) $\text{CH}_3\text{NH}_3^+\text{Cl}^-$
8. The final product in the following reaction sequence is:



- (1) $p\text{-Chlorobenzamide}$
 (2) $p\text{-Chlorophenol}$
 (3) $p\text{-Chlorobenzylamine}$
 (4) $p\text{-Chlorobenzyl alcohol}$

9. In the conversion

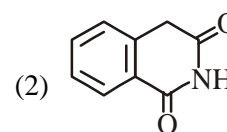
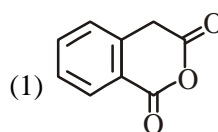
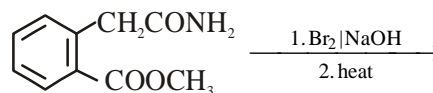


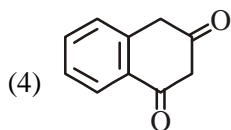
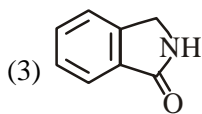
The sequence of the reagents used are :

- (1) (i) SOCl_2 (ii) N_3^- (iii) H_2O , heat
 (2) (i) SOCl_2 (ii) NH_3
 (3) (i) SOCl_2 (ii) NH_3 (iii) Heat
 (4) (i) SOCl_2 (ii) KCN (iii) LiAlH_4

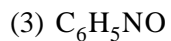
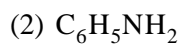
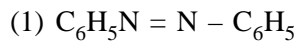
AIIMS

1. The following sequence of reactions of A gives





2. Nitrobenzene on treatment with zinc dust and aqueous ammonium chloride gives:



3. Among the following which one does *not* act as an intermediate in Hofmann rearrangement?



4. Pyridine is less basic than triethylamine because

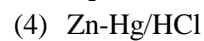
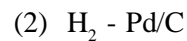
(1) Pyridine has aromatic character.

(2) Nitrogen in pyridine is sp^2 hybridized

(3) Pyridine is a cyclic system.

(4) In pyridine, lone pair of nitrogen is delocalized.

5. $C_6H_5CONHCH_3$ can be converted into $C_6H_5CH_2NHCH_3$ by



Assertion-Reason Type Questions (AIIMS)

Functional Group-II (A)

Each of the questions given below consists of two statements, an assertion (A) and reason (R). Select the number corresponding to the appropriate alternative as follows

- (1) If both A and R are true and R is the correct explanation of A, then mark 1
- (2) If both A and R are true but R is not the correct explanation of A, then mark 2
- (3) If A is true but R is false, then mark 3
- (4) If both A and R are false, then mark 4

1. **A.** Ethanal on treatment with selenium dioxide can be converted directly into glyoxal.
R. SeO_2 oxidises the methylene group adjacent to C = O group in aldehydes or ketones to carbonyl group.
2. **A.** —CHO group can be easily oxidised to —COOH group even with mild oxidant.
R. —COOH group can be easily reduced back to —CHO group by using LiAlH_4 .
3. **A.** Benzaldehyde is more reactive than ethanal towards nucleophilic attack.
R. All the carbon atoms of benzaldehyde molecule are sp^3 hybridised.
4. **A.** White precipitate of silver chloride get dissolved in NH_4OH soln.
R. NH_3 reacts with AgCl to form a solution complex with formula $[\text{Ag}(\text{NH}_3)_2]\text{Cl}$.
5. **A:** Friedel-Crafts reaction between benzene and acetic anhydride in the presence of anhydrous AlCl_3 yields acetophenone and not poly substituted products.
R: Acetophenone formed poisons the catalyst preventing further reaction.
6. **A:** Aldol condensation can be catalysed both by acids and bases.
R: β -hydroxyaldehydes or ketones readily undergo acid-catalysed dehydration.
7. **A:** Fehling's solution can be used to distinguish

benzaldehyde from acetaldehyde.

R: The C–H bond of CHO group in benzaldehyde is stronger than C–H bond of CHO group in acetaldehyde.

Functional Group-II (B)

Each of the questions given below consists of two statements, an assertion (A) and reason (R). Select the number corresponding to the appropriate alternative as follows

- (1) If both A and R are true and R is the correct explanation of A, then mark 1
- (2) If both A and R are true but R is not the correct explanation of A, then mark 2
- (3) If A is true but R is false, then mark 3
- (4) If both A and R are false, then mark 4

1. **A.** Picric acid does not contain —COOH group.
R. Picric acid is Trinitrophenol.
2. **A:** Ethyl acetate may give iodoform test.
R: Alkaline hydrolysis of ethyl acetate leads to the formation of sodium acetate and ethyl alcohol.
3. **A:** Although fluorine is more electronegative than chlorine, yet *p*-fluorobenzoic acid is a weaker acid than *p*-chlorobenzoic acid.
R: Due to matching size of $2p$ -orbitals of F and C, F has a stronger +R-effect than Cl.
4. **A:** Formic acid usually exists as a dimer but hydrogen fluoride exists as a polymer.
R: In case of formic acid, an intramolecular hydrogen bond is present, but in case of HF, intermolecular hydrogen bond is present.

Functional Group-III

Each of the questions given below consists of two statements, an assertion (A) and reason (R). Select the number corresponding to the appropriate alternative as follows

- (1) If both A and R are true and R is the correct explanation of A, then mark 1
- (2) If both A and R are true but R is not the correct explanation of A, then mark 2
- (3) If A is true but R is false, then mark 3

(4) If both **A** and **R** are false, then mark 4

- A:** Benzyl amine is more basic than aniline.
R: Positive inductive effect of phenyl group creates high electron density around N atom.
- A:** *o*-nitrophenol is more acidic than *p*-nitrophenol.
R: Nitro group has +M and -I effect.
- A:** 3° amine is proved to be less basic in aq. solution.
R: Conjugate acid of 3° amine is poorly solvated in aq. solution.
- A:** In order to convert R-Cl to pure R-NH₂, Gabriel-phthalimide synthesis can be used.
R: With proper choice of alkyl halides, phthalimide synthesis can be used to prepare 1°, 2° and 3° amines.
- A:** 4-Nitrochlorobenzene undergoes nucleophilic substitution more readily than chlorobenzene.

Answers of Assignment

Aldehydes and Ketones

- | | | | | |
|-----------|---------|---------|----------|-----------|
| 1. (3) | 2. (1) | 3. (3) | 4. (2,3) | 5. (1) |
| 6. (2) | 7. (2) | 8. (4) | 9. (2) | 10. (2) |
| 11. (4) | 12. (4) | 13. (2) | 14. (4) | 15. (1) |
| 16. (4) | 17. (2) | 18. (2) | 19. (3) | 20. (1) |
| 21. (1) | 22. (2) | 23. (3) | 24. (2) | 25. (4) |
| 26. (4) | 27. (2) | 28. (3) | 29. (1) | 30. (1) |
| 31. (2) | 32. (2) | 33. (2) | 34. (2) | 35. (3) |
| 36. (1) | 37. (1) | 38. (1) | 39. (3) | 40. (3) |
| 41. (4) | 42. (1) | 43. (3) | 44. (2) | 45. (4) |
| 46. (2,3) | 47. (3) | 48. (3) | 49. (2) | 50. (2,4) |

CBSE

FUNCTIONAL GROUP-II (A)

- | | | | | |
|---------|---------|---------|---------|---------|
| 1. (1) | 2. (4) | 3. (1) | 4. (1) | 5. (3) |
| 6. (2) | 7. (2) | 8. (2) | 9. (1) | 10. (2) |
| 11. (3) | 12. (3) | 13. (1) | 14. (2) | |

DPMT

FUNCTIONAL GROUP-II (A)

- | | | | | |
|---------|---------|---------|---------|---------|
| 1. (4) | 2. (4) | 3. (1) | 4. (3) | 5. (2) |
| 6. (1) | 7. (2) | 8. (4) | 9. (2) | 10. (1) |
| 11. (2) | 12. (2) | 13. (1) | 14. (3) | 15. (4) |

Carboxylic Acids and Acid Derivatives

- | | | | | |
|-----------|---------|---------|---------|-------------|
| 1. (1) | 2. (3) | 3. (3) | 4. (1) | 5. (2) |
| 6. (3) | 7. (1) | 8. (4) | 9. (3) | 10. (3) |
| 11. (2) | 12. (2) | 13. (3) | 14. (4) | 15. (3) |
| 16. (3) | 17. (2) | 18. (1) | 19. (4) | 20. (3) |
| 21. (1,2) | 22. (1) | 23. (1) | 24. (1) | 25. (1) |
| 26. (2) | 27. (4) | 28. (1) | 29. (4) | 30. (1) |
| 31. (3) | 32. (2) | 33. (2) | 34. (3) | 35. (1) |
| 36. (4) | 37. (4) | 38. (3) | 39. (3) | 40. (1,2,3) |
| 41. (3) | 42. (4) | 43. (2) | 44. (1) | 45. (1,2) |
| 46. (2) | 47. (1) | 48. (4) | 49. (2) | 50. (2) |
| 51. (2) | 52. (4) | 53. (1) | 54. (1) | 55. (2) |
| 56. (4) | 57. (2) | 58. (3) | 59. (2) | 60. (2) |

CBSE

FUNCTIONAL GROUP - II(B)

1. (1)	2. (1)	3. (3)	4. (3)	5. (2)
6. (2)	7. (4)	8. (1)	9. (2)	10. (1)
11. (1)	12. (3)	13. (1)	14. (1)	15. (1)
16. (3)				

DPMT

FUNCTIONAL GROUP - II (B)

1. (1)	2. (2)	3. (2)	4. (1)	5. (3)
6. (1)	7. (1)			

AIIMS

FUNCTIONAL GROUP - II (B)

1. (2)

Cyanides, Isocyanides, Nitro-compounds and Amines

1. (1)	2. (4)	3. (1,2)	4. (3)	5. (3)
6. (1)	7. (3)	8. (2)	9. (1)	10. (1)
11. (1)	12. (1)	13. (2)	14. (1)	15. (3)
16. (1)	17. (2)	18. (2)	19. (1)	20. (2)
21. (4)	22. (1)	23. (4)	24. (1)	25. (4)
26. (2)	27. (1)	28. (2)	29. (3)	30. (4)
31. (4)	32. (1)	33. (3)	34. (3)	35. (3)
36. (1)	37. (2)	38. (4)	39. (2)	40. (3)
41. (3)	42. (1)	43. (1)	44. (2)	45. (4)
46. (2)	47. (4)	48. (3)	49. (3)	50. (4)

CBSE

FUNCTIONAL GROUP - III

1. (4)	2. (2)	3. (4)	4. (1)	5. (2)
6. (1)	7. (1)	8. (4)	9. (2)	10. (4)
11. (2)	12. (1)	13. (3)	14. (4)	15. (3)

DPMT

FUNCTIONAL GROUP - III

1. (3)	2. (1)	3. (1)	4. (1)	5. (1)
6. (2)	7. (4)	8. (3)	9. (1)	

AIIMS

FUNCTIONAL GROUP - III

1. (3)	2. (4)	3. (4)	4. (2)	5. (3)
--------	--------	--------	--------	--------

Assertion & Reason Type Questions (AIIMS)

Functional Group-II (A)

- | | | | | |
|--------|--------|--------|--------|--------|
| 1. (1) | 2. (3) | 3. (3) | 4. (1) | 5. (3) |
| 6. (2) | 7. (1) | | | |

Functional Group-II (B)

- | | | | |
|--------|--------|--------|--------|
| 1. (2) | 2. (1) | 3. (1) | 4. (3) |
|--------|--------|--------|--------|

Functional Group-III

- | | | | | |
|--------|--------|--------|--------|--------|
| 1. (3) | 2. (4) | 3. (1) | 4. (3) | 5. (2) |
| 6. (1) | 7. (3) | 8. (1) | | |