ALDEHYDES, KETONES AND CARBOXYLIC ACIDS

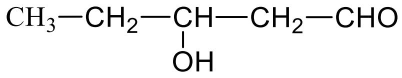
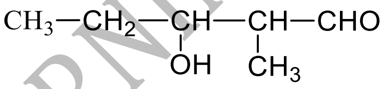
CHEMISTRY

Single Correct Answer Type

1. On heating with aqueous alkali, chloroform yields:
a) HCHO b) HCOOH c) CH_3OH d) CO_2 and H_2O

2. A keto ester (A) with molecular formula $C_6H_{10}O_3$ on treatment with NaOH + I_2 does not give iodoform but on boiling with dilute KOH gives a compound (B) with molecular formula $C_4H_5O_3K$ which upon acidification followed by heating undergoes decarboxylation to give acetone. The keto ester (A) is
a) $CH_3COCH_2CH_2COOCH_3$ b) $CH_3COCH_2COOC_2H_5$
c) $CH_3CH_2OCH_2COOCH_3$ d) $CH_3 - COCH(CH_3)COOCH_3$

3. In the reaction, $HCHO + NH_3 \rightarrow X, X$ is
a) *meta*-formaldehyde b) *para*-formaldehyde c) urotropine d) None of these

4. $CH_3CH_2 - CHO \xrightarrow[\text{alkali}]{\text{Dil.}}$ product
The product in the above reaction is
a) CH_3CH_2COOH b) $CH_3CH_2 - CH_2OH$
c) 
$CH_3-CH_2-\underset{OH}{CH}-CH_2-CHO$
d) 
$CH_3-CH_2-\underset{OH}{CH}-\underset{CH_3}{CH}-CHO$

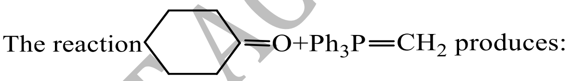
5. One mole of an organic compound requires 0.5 mole of oxygen to produce an acid. The compound may be:
a) Alcohol b) Ether c) Ketone d) Aldehyde

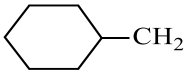
6. Acetic acid reacts with PCl_5 to form
a) $CH_2ClCOOH$ b) $CHCl_2COOH$ c) CH_3COCl d) CH_3COOCl

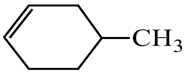
7. The calcium salt of the final oxidation product of ethanol on dry distillation gives:
a) Formaldehyde b) Acetaldehyde c) Acetone d) Formic acid

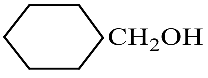
8. Coal-tar is obtained as by product during :
a) Destructive distillation of wood
b) Destructive distillation of coal
c) Destructive distillation of bones
d) None of the above

9. CH_3COOH and C_6H_5COOH can be distinguished by:
a) Flame test b) Solubility in water c) Physical state d) All of these

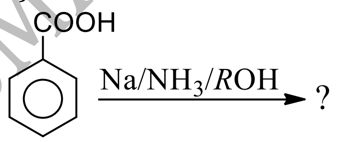
10. 
The reaction $=O + Ph_3P=CH_2$ produces:
a) 

b) 

c) 

d) 

11. Methylene chloride on hydrolysis yields:
a) HCHO b) CH_3CHO c) CH_3COCl d) None of these

12. 

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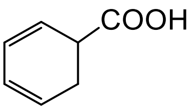
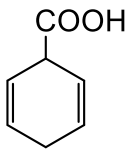
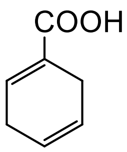
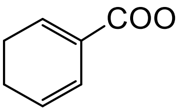
a) 

b) 

c) 

d) 

13. Which of the following compounds does not have a carboxyl group?

a) Methanoic acid b) Ethanoic acid c) Picric acid d) Benzoic acid

14. 2,4-dichlorophenoxy acetic acid is used as a:
a) Fungicide b) Insecticide c) Herbicide d) Moth repellent

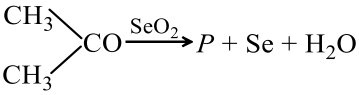
15. Which one of the following is reduced with zinc and hydrochloric acid to give the corresponding hydrocarbon?
a) Ethyl acetate b) Acetic acid c) Acetamide d) Butan-2-one

16. 3-pentanol on reaction with aluminium tertiary butoxide in the presence of acetone gives
a) 3-pentanal b) 2-pentanal c) 3-pentanone d) 2-pentanone

17. Bakelite is obtained from phenol by reacting with:
a) HCHO b) $(CH_2OH)_2$ c) CH_3CHO d) CH_3COCH_3

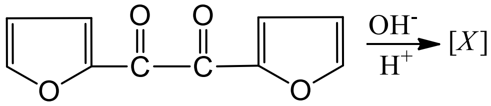
18. The silver salt of a fatty acid on refluxing with an alkyl halide gives an
a) Acid b) Ester c) Ether d) Amine

19. In the reaction, *P* is:



$(CH_3)_2CO \xrightarrow{SeO_2} P + Se + H_2O$

a) CH_3COCHO b) CH_3COOCH_3 c) CH_3COCH_2OH d) None of these

20.


Product is

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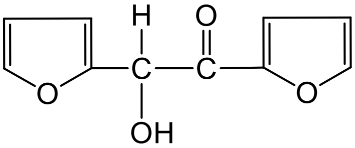

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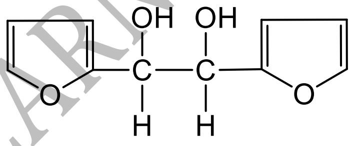

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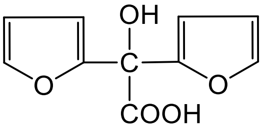

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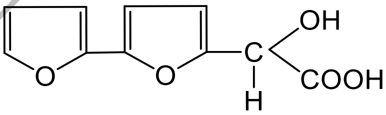


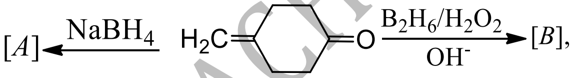
21. Which will give Hofmann bromamide reaction?

a)

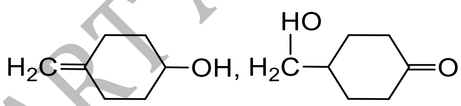

$\phi CH(OH)CONH_2$

b) CH_3CONH_2 c) H_2NCONH_2 d) All of these

22. Distillation involves all the following processes except:
a) Change of state b) Boiling c) Condensation d) Evaporation

23.


[*A*] and [*B*] are

a)


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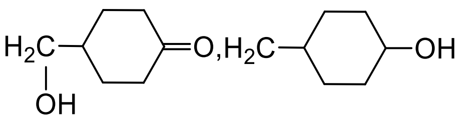
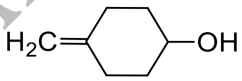
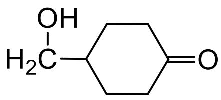


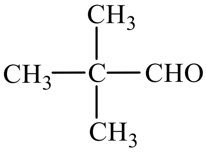
c) both


d) both


24. The reaction,
$CH_3CHO + H_2N—NH_2 \rightarrow CH_3CH{=}N{\cdot}NH_2$ is:
a) Elimination b) Addition c) Addition-elimination d) None of these

25. Which of the following would undergo aldol condensation?

a) CCl_3CHO

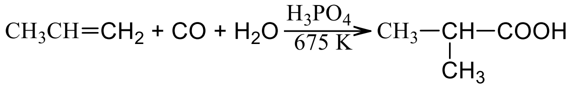
b)


$CH_3—C(CH_3)_2—CHO$

c) CH_3CH_2CHO d) HCHO

26. Acetalsehyde reacts with:

a) Only nucleophiles
b) Both electrophiles and nucleophiles
c) Only electrophiles
d) Only free radicals

27. 

$CH_3CH{=}CH_2 + CO + H_2O \xrightarrow[675\ K]{H_3PO_4} CH_3{-}\underset{\displaystyle CH_3}{\underset{|}{C}H}{-}COOH$

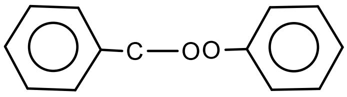
This reaction is called
a) The Stevens reaction b) The carbonylation reactionc
c) The Koch reaction d) Oxidation

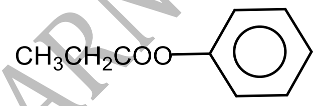
28. Which of the following statement is correct?
a) Acidity increases with increase in carbon atoms in carboxylic acids.
b) Solubility of carboxylic acid increases with increase in carbon atoms.
c) Boiling points of acids are higher than corresponding alcohols.
d) None of the above.

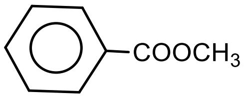
29. The best reagent to convert pent-3-en-2-ol into pent-3-en-2-one is
a) Pyridinium chloro-chromate b) Chromic anhydride in glacial acetic acid
c) Acidic dichromate d) Acidic permanganate

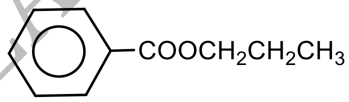
30. The catalyst used in Rosenmund reaction is
a) Zn/Hg b) Pd/$BaSO_4$ c) Raney Ni d) Na in ethanol

31. Claisen condensation is not given by

a) 

b) 

c) 

d) 

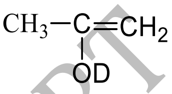
32. Which of the following is a flavouring agent called 'oil of winter green'?
a) Olive oil b) Vinegar c) Methyl acetate d) Methyl salicylate

33. The following reaction is known by the name of:

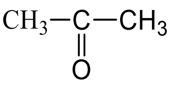
$$\underset{\text{Xylene}}{CH_3COCl} + H_2 \xrightarrow[Pb/BaSO_4]{[H]} CH_3CHO + HCl$$

a) Stephen's reduction
b) Rosenmund's reaction
c) Cannizzaro's reaction
d) None of these

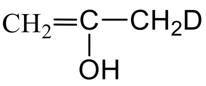
34. The enol form of acetone, after treatment with D_2O gives

a) 

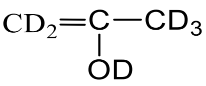
$CH_3{-}\underset{\displaystyle OD}{\underset{|}{C}}{=}CH_2$

b) 

$CH_3{-}\underset{\displaystyle O}{\underset{\|}{C}}{-}CH_3$

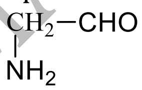
c) 

$CH_2{=}\underset{\displaystyle OH}{\underset{|}{C}}{-}CH_2D$

d) 

$CD_2{=}\underset{\displaystyle OD}{\underset{|}{C}}{-}CD_3$

35. $CH_3COOH \xrightarrow{NH_3} \xrightarrow{\Delta} ?$
The product of the reaction is isomeric with

a) 

$\underset{\displaystyle NH_2}{\underset{|}{C}H_2}{-}CHO$

b) $CH_3CH = NHO$ c) $HCONH - CH_3$ d) All of these

36. The acid formed when propyl magnesium bromide is treated with CO_2 is:
a) C_3H_7COOH b) C_2H_5COOH c) Both (a) and (b) d) None of these

37. Tamarind contains
a) (+) tartaric acid b) (−) tartaric acid c) ± tartaric acid d) None of the above

38. The splitting of an ester by an alcohol is known as:
a) Acidolysis b) Alcoholysis c) Ammonolysis d) Hydrolysis

39. The product formed when hydroxylamine condenses with a carbonyl compound is called
a) Hydrazide b) Oxime c) Hydrazine d) Hydrazone

40. ΦCHO undergoes Claisen condensation with another aldehyde to give cinnamaldehyde. The aldehyde is
a) Formaldehyde
b) Acetaldehyde
c) Crotonaldehyde
d) Propanaldehyde

41. Two mole of acetic acid are heated with P_2O_5. The product formed is:
a) 2 mole of ethyl alcohol
b) Formic anhydride
c) Acetic anhydride
d) 2 mole of methyl cyanide

42. The nitrogen content in the proteins can be quantitatively estimated by:
a) Carius method
b) Kjeldahl's method
c) Victor Meyer's method
d) Rast method

43. Correct order of reducing power of the following carbonyl compounds
a) $HCHO > CH_3COCH_3 > \phi CHO$
b) $CH_3COCH_3 > \phi CHO > HCHO$
c) $HCHO > \phi CHO > CH_3COCH_3$
d) $CH_3COCH_3 > HCHO > \phi CHO$

44. Cyanohydrin of which of the following forms lactic acid?
a) HCHO
b) CH_3COCH_3
c) CH_3CHO
d) CH_3CH_2CHO

45. Ethyl acetate on reaction with a Grignard reagent gives,
a) Alcohol
b) Aldehyde
c) Acid
d) Ketone

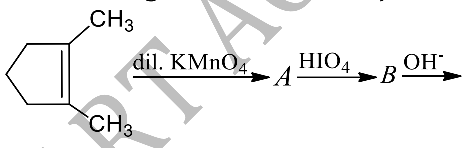
46. Acetaldehyde reacts with HCN followed by hydrolysis forms a compound which shows:
a) Optical isomerism
b) Geometrical isomerism
c) Metamerism
d) Tautomerism

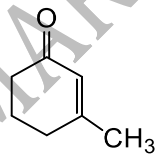
47. Carboxylic acids dissolve in aq. NaOH because the acids undergo:
a) Protonation
b) Deprotonation
c) Carboxylation
d) Decarboxylation

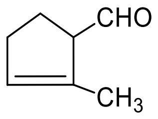
48. Which of the acids cannot be prepared by Grignard reagent?
a) Acetic acid
b) Succinic acid
c) Formic acid
d) All of these

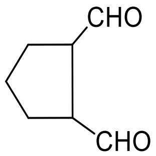
49. Compound A when treated with ethyl magnesim iodide in dry ether forms an addition compound which on hydrolysis form compound B. The compound B on oxidation form 3-pentanone. Hence, the compound A and B are
a) Propanol, 3-pentanol
b) Pentanol, 3-pentanol
c) Ethanal, pentanal
d) Acetone, 3-pentanol

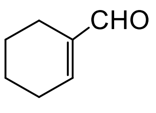
50. Suggest appropriate structures for the missing final compound. (The number of carbon atom remains the same throughout the reaction.)



a) 

b) 

c) 

d) 

51. Lactic acid on heating with conc. H_2SO_4 gives
a) Acetic acid
b) Formic acid
c) Acrylic acid
d) Propionic acid

52. Urea can be detected by
a) Benedict test
b) Molisch test
c) Ninhydrine test
d) Biurate test

53. Which of the following does not give brick red precipitate with Fehling's solution?
a) Acetaldehyde
b) Formalin
c) D-glucose
d) Acetone

54. Which of the following statements is wrong?
a) Formic acid is stronger than acetic acid

b) *o*-bromobenzoic acid is weaker than *o*-chlorobenzoic acid
c) Lactic acid does not answer the silver mirror test
d) Benzaldehyde does not reduce Fehling's solution

55. Pick out the reaction in which formic and acetic acid differs from each other:
a) Sodium replaces hydrogen from the compound
b) Forms esters with alcohols
c) Reduces solution of ammoniacal silver nitrate or Fehling's solution of dil. acid $KMnO_4$
d) Turns red litmus blue

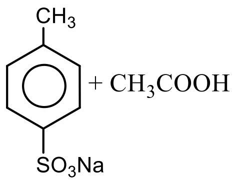
56. An organic substance from its aqueous solution can be separated by:
a) Solvent extraction b) Steam distillation c) Distillation d) Fractional distillation

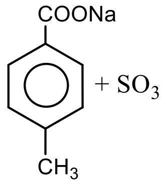
57. The strongest acid amongst the following compounds is
a) CH_3COOH b) $HCOOH$ c) $CH_3CH_2CH(Cl)CO_2H$ d) $ClCH_2CH_2CH_2COOH$

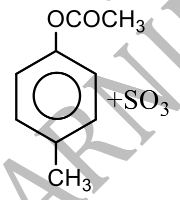
58. What is obtained what acetyl chloride is heated with benzene in presence of anhydrous $AlCl_3$
a) Acetyl benzoic acid b) Anisol c) Acetonephenone d) Chlolorobenzene

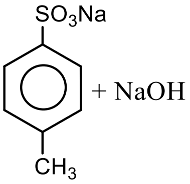
59. Reaction of formaldehyde and ammonia gives
a) Hexamethylene tetramine b) Bakelite
c) Urea d) Triethylene tetramine

60. 4-methyl benzene sulphonic acid reacts with sodium acetate to give

a) 

b) 

c) 

d) 

61. An acyl halide is formed when PCl_5 reacts with an:
a) Acid b) Alcohol c) Amine d) Ester

62. Generally it is more difficult to purify organic compounds than inorganic compounds because:
a) They are very unstable
b) Their m. p. and b. p. are low
c) Organic compounds have low solubility
d) Physical constants of organic compounds and the impurities associated with them are very close to each other

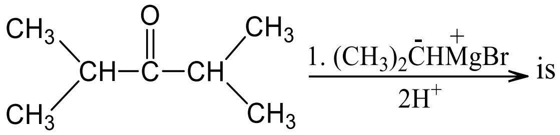
63. The acetophenone can be converted to ethylbenzene by reaction with
a) $LiAlH_4$ b) H_2NOH c) $Pd/BaSO_4 - H_2$ d) $Zn - Hg/HCl$

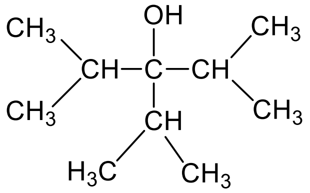
64. When propionic acid is treated with aqueous sodium bicarbonate, CO_2 is liberated. The C from CO_2 comes from
a) Methyl group b) Carboxylic acid group
c) Methylene group d) Bicarbonate

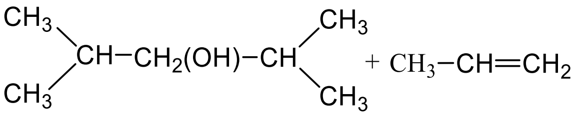
65. Boiling points of carboxylic acid are:
a) Lower than corresponding alcohols
b) Higher than corresponding alcohols
c) Equal to that of corresponding alcohols
d) None of the above

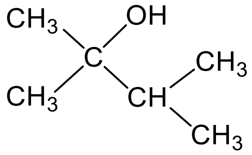
66. The —COOH group in a carboxylic acid can be replaced by 'H' by heating the acid with:
a) Zn with HCl
b) H_2 in presence of nickel
c) Sodalime
d) Bromine and concentrated aqueous alkali

67. The product obtained in the reaction



a) 

b) 

c) 

d) There is no reaction

68. Which of the following would produce secondary alcohol?

a) $C_6H_5COCH_3 \xrightarrow[2.\ H^+]{1.\ CH_3MgBr}$

b) $C_6H_5COCH_3 \xrightarrow[2.\ H^+]{1.\ LiAlH_4}$

c) $C_6H_5CHO \xrightarrow[2.\ H^+]{1.\ CH_3MgBr}$

d) $CH_3CHO \xrightarrow[2.\ H^+]{1.\ LiAlH_4}$

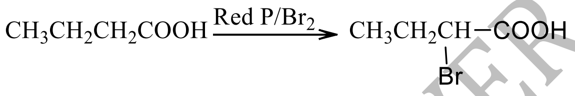
69. Which factor/s will increase the reactivity of >C=O group?

I. Presence of a group with positive inductive effect.

II. Presence of a group with negative inductive effect.

III. Presence of large alkyl group.

a) Only (i) b) Only (ii) c) (i)and(iii) d) (ii)and (iii)

70. 

$CH_3CH_2CH_2COOH \xrightarrow{Red\ P/Br_2} CH_3CH_2\underset{Br}{\underset{|}{C}H}-COOH$

This reaction is called the

a) Cannizaro reaction b) Schrodinger reaction

c) Hell-Volhard-Zelinsky reaction d) Reimer-Tiemann reaction

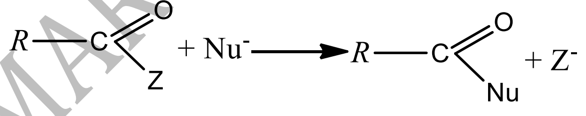
71. $(CH_3)_2C=CHCOCH_3$ can be oxidised to $(CH_3)_2C=CHCOOH$ by:

a) Cu at 300°C b) $KMnO_4$ c) Chromic acid d) NaOI

72. The correct order of decreasing boiling points of CH_3CONH_2 (A), CH_3COCl (B), CH_3COOH (C) and $(CH_3CO)_2O$ (D) is:

a) $A > D > C > B$ b) $A > B > C > D$ c) $D > C > B > A$ d) None of these

73. Rate of reaction,



is fastest when Z is

a) Cl b) NH_2 c) OC_2H_5 d) $OCOCH_3$

74. Which is useful for separating benzoic acid from a mixture of benzoic acid and methyl benzoate?

a) $NaHCO_3(aq.)$ b) Dil. HCl c) Dil. H_2SO_4 d) Dil. HNO_3

75. The compound X, in the reaction is

$X \xrightarrow{CH_3CHO} Y \xrightarrow{\text{Hydrolysis}} Mg(OH)I + CH_3COOH$

a) CH_3CHO b) CO_2 c) $(CH_3)_2CO$ d) HCHO

76. Which of the following does not undergo polymerization?

a) CH_3CHO b) HCHO c) CH_3COCH_3 d) None of these

77. The reaction ,

$RCOOAg + Br_2 \xrightarrow{CCl_4} RBr + AgBr + CO_2$ is called:

a) HVZ reaction b) Hunsdiecker reaction c) Hofmann's reaction d) Carbylamine reaction

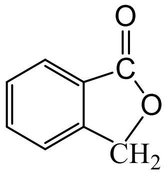
78. Methyl ketones are characterised through:

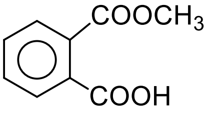
a) The Tollen's reagent
b) The iodoform test
c) The Schiff's test
d) The Benedict's reagent

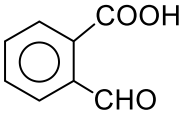
79. An organic compound X contains Y and Z impurities. Their solubility differs slightly. They may be separated by:

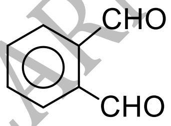
a) Simple crystallization
b) Fractional crystallization
c) Sublimation
d) Fractional distillation

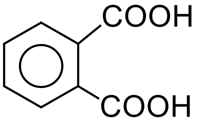
80. Which of the following reactants on reaction with conc. NaOH followed by acidification gives following lactone as the product



a) 

b) 

c) 

d) 

81. An ester (A) with molecular formula $C_9H_{10}O_2$ was treated with excess of CH_3MgBr and the complex so formed was treated with H_2SO_4 to give an olefin (B). Ozonolysis of (B) gave a ketone with molecular formulC_8H_8O which shows positive iodoform test. The structure of (A) is

a) $C_6H_5COOC_2H_5$ b) $C_6H_5COOC_6H_5$
c) $C_6H_5COOCH_3$ d) $p\text{-}H_3CO - C_6H_4 - COCH_3$

82. Acetone reacts with Grignard reagent to form

a) 3° alcohol b) 2° alcohol c) Ether d) No reaction

83. When petroleum is heated gradually, first batch of vapours evolved will be rich in:

a) Kerosene b) Petroleum ether c) Diesel d) Lubrication oil

84. Decarboxylation of malonic acid gives

a) CH_4 b) CH_3COOH c) Both (a) and (b) d) None of these

85. What is the product in the reaction

$CH_3CONH_2 \xrightarrow{NaOH_2/HCl} X$?

a) CH_3COOH b) $\overset{+}{CH_3CONH_3}Cl^-$ c) CH_3NH_2 d) CH_3CHO

86. Which of the following substances cannot be used for the replacement of —OH group in organic compounds by Cl?

a) S_2Cl_2 b) $SOCl_2$ c) PCl_3 d) PCl_5

87. Acetyl nitrate is formed when acetic anhydride reacts with

a) Nitrogen pentoxide b) Nitric acid c) Nitrous acid d) Potassium nitrate

88. Which one is not prepared from tartaric acid?

a) Tartar emetic b) Fenton's reagent c) Fehling's solution d) Rochelle salt

89. The reagent used in Clemmensen's reduction is

a) Conc. H_2SO_4 b) Zn−Hg /conc.HCl c) aq. KOH d) alc.KOH

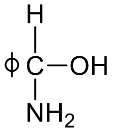
90. In the reaction, $C_6H_5COOH + CH_3\overset{*}{O}H \xrightarrow{H^+}$ Ester + water

a) Isotopically labeled oxygen (O^{18}) is present in water
b) O^{18} is present with ester
c) O^{18} shifts from acid to alcohol
d) No reaction takes place

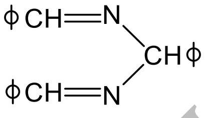
91. The technique of gas chromatography is suitable for compounds which are:
a) Liquids
b) Highly volatile
c) Soluble in water
d) Vaporise without decomposition

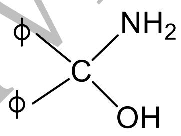
92. There are several criteria of purity of organic compounds. Which is considered to be the best?
a) Melting point
b) Mixed melting point
c) Colour
d) Microscopic examination

93. $\phi CHO + NH_3 \rightarrow ?$ Product is

a) 

b) $\phi\ CH = NH$

c) 

d) 

94. The ease of hydrolysis with an alkali in the compounds

CH_3COCl (I) $CH_3CO - O - COCH_3$ (II)

$CH_3COOC_2H_5$ (III) CH_3CONH_2 (IV)

Is of the order

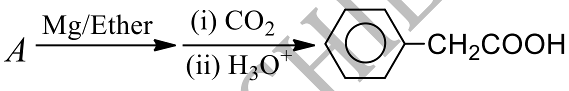
a) I>II>III>IV
b) IV>III>II>I
c) I>II>IV>III
d) II>I>IV>III

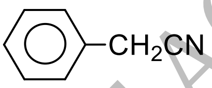
95. What is the formula of adipic acid?
a) $COOH(CH_2)_4COOH$
b) $CH_2(COOH)CH_2COOH$
c) $COOH(CH_2)_3COOH$
d) None of the above

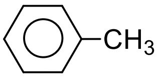
96. CH_3CHO and $C_6H_5CH_2CHO$ can be distinguished chemically by:
a) Tollen's reagent test
b) Fehling solution test
c) Benedict test
d) Iodoform test

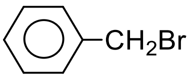
97. Acrolein on complete reduction gives:
a) Allyl alcohol
b) Propanol
c) Propanal
d) None of these

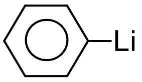
98. Identify the starting material of the following reaction



a) 

b) 

c) 

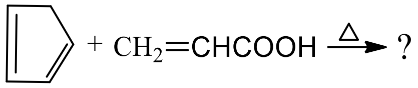
d) 

99. Which one of the following is not a fatty acid?
a) Stearic acid
b) Palmitic acid
c) Oleic acid
d) Phenyl acetic acid

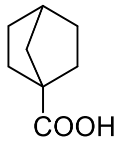
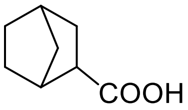
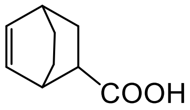
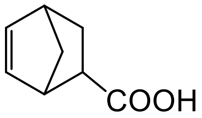
100. $CH_3CN \xrightarrow{H_2O} A \xrightarrow{\text{diazomethane}} B$

A and B are
a) Acetamide, N-methyl acetamide
b) Acetic acid, ethyl ethanoate
c) Acetic acid, methyl acetate
d) Acetamide, acetone

101. Tartronic acid is obtained from tartaric acid by:
a) HBr
b) HI
c) Tollen's reagent
d) PCl_5

102. 

Product is

a)  b)  c)  d) 

103. A compound, containing only carbon, hydrogen and oxygen, has a molecular weight of 44. On complete oxidation it is converted into a compound of molecular weight 60. The original compound is
a) An aldehyde b) An acid c) An alcohol d) An ether

104. Which of the following reagents is useful for separating aniline from a mixture of aniline and nitrobenzene?
a) $NaOH(aq.)$ b) H_2O c) $NaHCO_3(aq.)$ d) $HCl(aq.)$

105. How will you separate a miscible mixture of $C_6H_6 + CHCl_3$?
a) Sublimation b) Filtration c) Distillation d) Crystallization

106. An organic compound has C and H percentage in the ratio 6 : 1 and C and O percentage in the ration 3 : 4. The compound is:
a) HCHO b) CH_3OH c) CH_3CH_2OH d) $(COOH)_2$

107. Potassium cyanate is heated with ammonium sulphate. The product formed is
a) Urea b) Ammonia c) Potassium sulphate d) Ammonium cyanide

108. 2-pentanone and 3-petanone can be distinguished by
a) Cannizaro's reaction b) Aldol condensation
c) Iodoform reaction d) Clemmensen's reduction

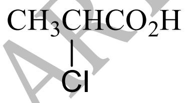
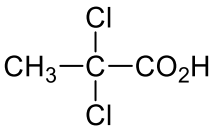
109. Acetyl bromide reacts with excess of CH_3MgI followed by treatment with a saturated solution of NH_4Cl gives
a) Acetone b) Acetamide c) 2-methyl-2-propanol d) Acetyl iodide

110. Formalin is
a) Solution of fructose b) 40% aq. sol. Of HCHO
c) 40% HCHO + 60% CH_3CHO d) None of the above

111. Aldol condensation is given by
a) Trimethylacetaldehyde b) Acetaldehyde
c) Benzaldehyde d) Formaldehyde

112. Which reaction is used for detecting the presence of carbonyl group?
a) Reaction with hydrazine
b) Reaction with phenyl hydrazine
c) Reaction wit hydroxylamine
d) All of the above

113. The product obtained in the reaction
$CH_3CH_2CO_2H \xrightarrow{Cl_2/P}$ is

a)  $CH_3\underset{|}{\underset{Cl}{C}}HCO_2H$ b) $ClCH_2CH_2CO_2H$ c)  $CH_3-\overset{Cl}{\underset{Cl}{C}}-CO_2H$ d) $Cl_2CHCH_2CO_2H$

114. An organic compound contains carbon, hydrogen and oxygen. Its elemental analysis gave, C, 38.71% and H, 9.67%. The empirical formula of the compound would be:
a) CH_2O b) CHO c) CH_4O d) CH_3O

115. $CH_3COCl \xrightarrow[{[H_2]}]{Pd/BaSO_4} A$
The isomers of CH_3COCl and A will be respectively
a) CH_2ClCHO, oxirane b) Chloral, vinyl alcohol
c) α-chloro ethyl alcohol, epoxy ethane d) None of the above

116. Acid chlorides react with Grignard's reagents to give:
a) Esters b) Ethers c) Carbonyl compounds d) None of these

117. Which of the following give an explosive RDX, on nitration?

a) Toluene	b) Benzene	c) Guanidine	d) Urotropine

118. The conversion of —COOH group to —NH_2 group can be made by:

a) Wurtz reaction	b) Claisen condensation	c) Stephen's reduction	d) Schmidt reaction

119. In question 178 step (2) can be thought of an/a:
   a) Neutralization
   b) Electrophilic attack at the carbonyl carbon
   c) Nucleophilic attack of N-lone pair at the carbonyl carbon leading to substitution
   d) Nucleophilic addition reaction

120. Acetaldehyde forms a white crystalline precipitate on mixing with a .....solution of ....

a) Acidic,Zn − Hg	b) Alcoholic, Na_2SO_3
c) Saturated aqueous, $NaHSO_3$	d) Aqueous, NaCl

121. Fehling's solution is:
   a) Acidified copper sulphate solution
   b) Ammoniacal cuprous chloride solution
   c) Copper sulphate, Rochelle salt + NaOH
   d) None of the above

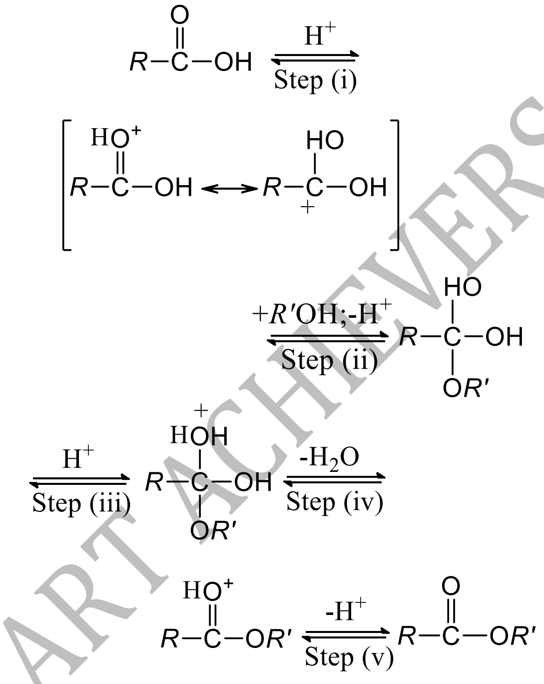
122. Stephen's reduction is used to prepare aldehyde from

a) Alcohol	b) Alkyl cyanides	c) Alkanones	d) Acid chlorides

123. Benzyl alcohol can be prepared from benzaldehyde by

a) Friedel-Craft's reaction	b) Cannizaro's reaction
c) Kolbe's reaction	d) Reimer-Tiemann reaction

124. The mechanism of ester formation in acidic medium is as follows



   The slowest step in the above mechanism is

a) Step (i)	b) Stem (ii)	c) Step (iii)	d) Step (iv)

125. Ammonolysis of an ester gives:

a) Amine	b) Amide	c) Uride	d) None of these

126. Acetic anhydride can easily be prepared by:
   a) Distilling a mixture of anhydrous sodium acetate and acetyl chloride
   b) Heating acetic acid
   c) Partial hydrolysis of acetyl chloride
   d) Oxidation of ethanol

127. When one of the following hydrocarbons is burnt in excess of oxygen, the volume of CO_2 evolved is just

double to that of hydrocarbon taken. The hydrocarbon is:

a) CH_4 b) C_2H_6 c) C_3H_8 d) C_3H_6

128. Identify the compound Z. In this reaction sequence

$CH_3CH_2COOH \xrightarrow{NH_3} X \xrightarrow{Br_2+KOH} Y \xrightarrow{HNO_2} Z;$

a) CH_3OH b) $CH_3CH_2NH_2$ c) CH_3CH_2OH d) $CH_3CH_2CH_2OH$

129. Arrange the following carboxylic acids in order of decreasing acidity

Oxalic acid	**Malonic acid**	**Succinic acid**
I	II	III

a) I > II > III b) III > II > I c) I > III > II d) II > III > I

130. Oppenauer oxidation is the reverse process of:

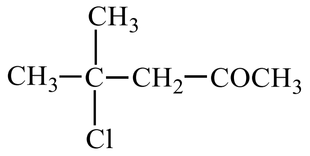
a) Wolff-Kishner's reduction

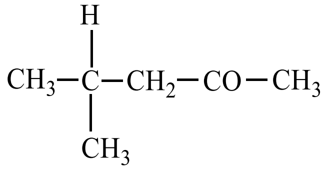
b) Rosenmund's reduction

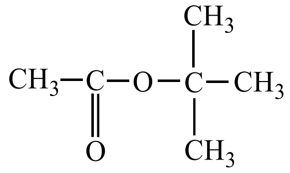
c) Clemmensen's reduction

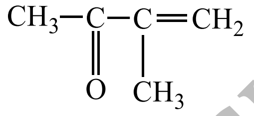
d) Meerwein-Ponndorf Verley reduction

131. Indicate the organic structure for product expected when 2-methyl propene is heated with acetyl chloride in presence of anhydrous $ZnCl_2$:

a) 
$CH_3-\overset{CH_3}{\underset{Cl}{C}}-CH_2-COCH_3$

b) 
$CH_3-\overset{H}{\underset{CH_3}{C}}-CH_2-CO-CH_3$

c) 
$CH_3-\underset{\overset{\|}{O}}{C}-O-\overset{CH_3}{\underset{CH_3}{C}}-CH_3$

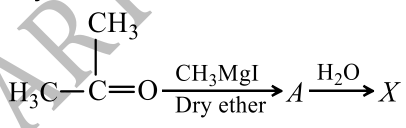
d) 
$CH_3-\underset{\overset{\|}{O}}{C}-\underset{CH_3}{C}=CH_2$

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

a) Benzyl alcohol and sodium formate b) Sodium benzoate and methyl alcohol

c) Sodium benzoate and sodium formate d) Benzyl alcohol and methyl alcohol

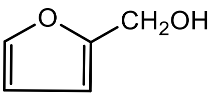
133. Identify X;

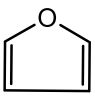

$H_3C-\overset{CH_3}{C}=O \xrightarrow[\text{Dry ether}]{CH_3MgI} A \xrightarrow{H_2O} X$

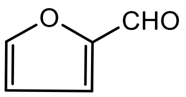
a) CH_3OH b) CH_3CH_2OH c) $CH_3CHOHCH_3$ d) $CH_3C(OH)(CH_3)_2$

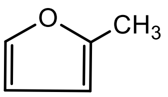
134. $X \xrightarrow{\text{Conc.NaOH}}$ Furoic acid + Furyl alcohol.

Compound X is

a) 

b) 

c) 

d) 

135. Decarboxylation of which will yield 1,1,2,2-tetra bromoethane:

a) CH_3COOH b) CH_2BrCBr_2COOH c) $HCBr_2CBr_2COOH$ d) $CH_2BrCHBrCOOH$

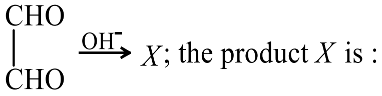
136. Fehling's solution is used in the detection of:

a) Ketonic group b) Alcoholic group c) Aldehydic group d) Carboxylic group

137. $R\text{COOH} + \text{N}_3\text{H} \xrightarrow[\text{conc.}]{\text{H}_2\text{SO}_4} R\text{NH}_2 + \text{CO}_2 + \text{N}_2$

The above reaction is called:
a) HVZ reaction
b) Hunsdiecker reaction
c) Schmidt reaction
d) Decarboxylation reaction

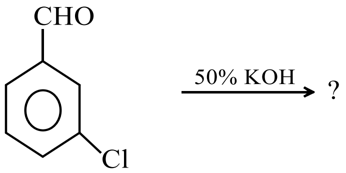
138. Butanol on reaction with one of the following will produce banana odour:
a) PCl_5 b) CH_3COCl c) CH_3OCH_3 d) NH_3

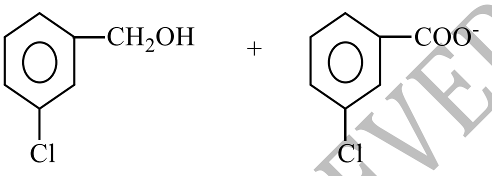
139. 
$\begin{matrix}\text{CHO}\\ |\\ \text{CHO}\end{matrix} \xrightarrow{\text{OH}^-} X$; the product X is :
a) $\text{CH}_3\text{OH} + \text{CH}_3\text{OH}$ b) $\text{CH}_2\text{OH—COO}^-$ c) $\text{CH}_3\text{OH} + \text{HCOOH}$ d) OOC—COO^-

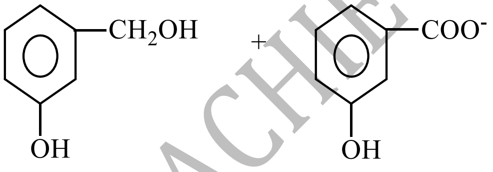
140. Some organic compounds are purified by distillation at low pressure because the compounds are:
a) Low boiling liquids
b) High boiling liquids
c) Highly volatile
d) Dissociated before reaching their boiling points

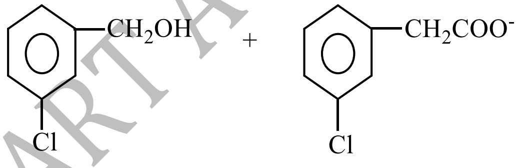
141. A compound `A' has a molecular formula $\text{C}_2\text{Cl}_3\text{OH}$. A reduces Fehling solution and on oxidation produces a monocarboxylic acid B. A can also be obtained by the action of Cl_2 on ethanol. A is
a) Chloral b) CHCl_3 c) CH_3Cl d) Chloroacetic acid

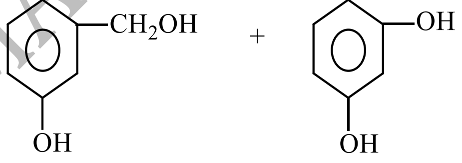
142. Predict the products in the given reaction.



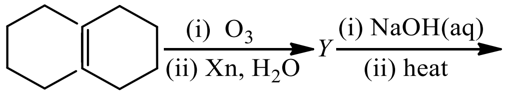
a) 

b) 

c) 

d) 

143. In the scheme given below, the total number of intramolecular aldol condensation products formed from $''Y''$ is



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

144. Calcium propanoate on refluxing yields:

a) Propanol-2 b) Propanone-2 c) Pentanone-3 d) Pentanone-2

145. When a mixture of one mole of benzoic acid and one mole of phenol in water is treated with one mole of $NaHCO_3$, the product formed will consist of

a) ϕCOOH + ϕONa b) ϕCOONa + ϕONa c) ϕCOONa + ϕOH d) ϕCOOϕ + ϕCOOCOϕ

146. Aldehyde not showing Cannizaro's reaction is

a) Paraldehyde b) Chloral c) Formaldehyde d) Acetaldehyde

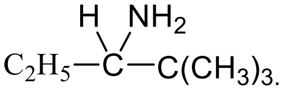
147. Compound (A) (molecular formula C_3H_8O) is treated with acidified potassium dichromate to form a product B (molecular formula C_3H_6O).'B'forms a shining silver mirror on warming with ammonical silver nitrate. 'B'when treated with an aqueous solution of $H_2NCONHNH_2$. HCl and sodium acetate gives a product 'C'. Identify the structure of 'C'.

a) $CH_3CH_2CH = NNHCONH_2$
b) $(CH_3)_2C = NNHCONH_2$
c) $(CH_3)_2C = NCONHNH_2$
d) $CH_3CH_2CH = NCONHNH_2$

148. Methyl cyanide can be converted into acetic acid by:

a) Reduction b) Hydrolysis c) Electrolysis d) Decarboxylation

149. A product obtained by the reaction of X with hydroxylamine and on further reduction gives



$C_2H_5-\overset{H\ \ NH_2}{C}-C(CH_3)_3$. Hence, the compound X can be

a) 2,2-dimethyl-3-pentanone
b) 3,3-dimethyl-3-butanone
c) 1-methyl-3-pentanone
d) Diethyl ketone

150. The main reason for the fact than carboxylic acids can undergo ionization is:

a) Absence of α-H-atom
b) Resonance stabilization of carboxylate ion
c) High reactivity of α-H-atom
d) Hydrogen bonding

151. Acetamide reacts with maximum ease with:

a) C_2H_5OH b) $C_2H_5NH_2$ c) H_2O d) aq. NaOH

152. Formalin is the commercial name of

a) Formic acid
b) Fluroform
c) 40% aqueous solution of methanal
d) *para* formaldehyde

153. Which of the following carboxylic acids is not reduced to the corresponding 1° alcohol by$LiAlH_4$?

a) $BrCH_2CH_2CH_2COOH$
b) Cyclohexane carboxylic acid
c) $(Z) - CH_3CH = CHCH_2COOH$
d) $CH_3CH(CH_3)CH_2COOH$

154. The weakest acid amongst the following is

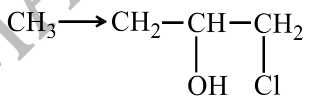
a) $ClCH_2COOH$ b) HCOOH c) FCH_2CH_2COOH d) $CH_2(I)COOH$

155. Identify (X) in the sequence,

$C_4H_7OCl \xrightarrow{NH_3} C_4H_9ON \xrightarrow{Br_2/KOH} CH_3CH_2CH_2NH_2$:

a)

b)



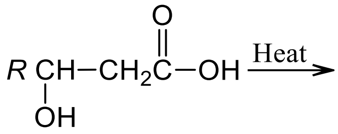
$CH_3 \longrightarrow CH_2-\underset{OH}{CH}-\underset{Cl}{CH_2}$

c) $CH_3—CH_2—CH_2—COCl$
d) $OHC—CH_2—CH_2—CH_2—Cl$

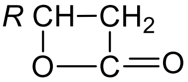
156. Which compound is oxidised to prepare ethyl methyl ketone?

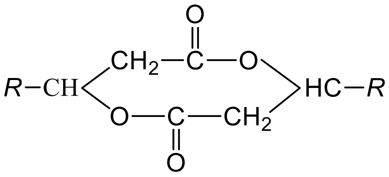
a) Propanol-2 b) Butanol-1 c) Butanol-2 d) Tert-butyl alcohol

157. The product obtained in the reaction



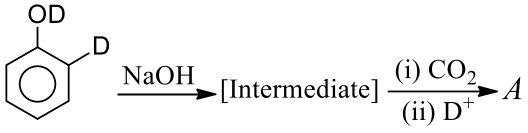
is

a) 

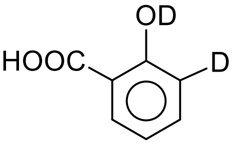
b) 

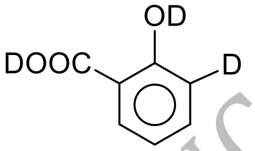
c) $RCH = CHCOOH$

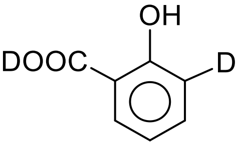
d) None of the above

158. 

Here, A is

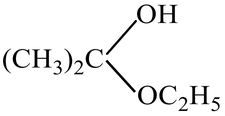
a) 

b) 

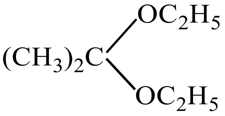
c) 

d) Reaction not possible

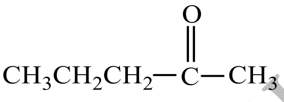
159. Acetone is treated with excess of ethanol in the presence of hydrochloric acid. The product obtained is:

a) 

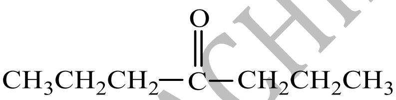
$(CH_3)_2C(OH)(OC_2H_5)$

b) 

$(CH_3)_2C(OC_2H_5)(OC_2H_5)$

c) 

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

d) 

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

160. When acetaldehyde is heated with Fehling's solution, it gives a red precipitate of:

a) Cu b) CuO c) $Cu + Cu_2O + CuO$ d) Cu_2O

161. Simple distillation can be used to separate:

a) A mixture of benzene (b. p. 80 °C) and toluene (b. p. 110°C)

b) A mixture of ether (b. p. 35°C) and toluene (b. p. 110°C)

c) A mixture of ethanol (b. p. 78°C) and water(b. p. 100°C)

d) None of the above

162. Acetyl bromide reacts with excess of CH_3MgI followed by treatment with a saturated solution of NH_4Cl gives

a) Acetone b) Acetamide c) 2-methyl-2-propanol d) Acetyl iodide

163. Aldol condensation between the following compounds followed by dehydration gives methyl vinyl ketone:

a) HCHO and CH_3COCH_3

b) HCHO and CH_3CHO

c) Two molecules of CH_3CHO

d) Two molecules of CH_3COCH_3

164. $R - \mathrm{CH_2} - \mathrm{CH_2OH}$
$R - \mathrm{CH_2} - \mathrm{CH_2} - \mathrm{H}$ can be converted into The correct sequence of reagent is,
a) $\mathrm{KCN}, \mathrm{H}^+$ b) $\mathrm{PBr_3}, \mathrm{KCN}, \mathrm{H_2}$ c) $\mathrm{HCN}, \mathrm{PBr_3}, \mathrm{H}^+$ d) $\mathrm{PBr}, \mathrm{KCN}, \mathrm{H}^+$

165. The acid which does not form an anhydride when treated with P_2O_5 is:
a) Formic acid b) Acetic acid c) Propionic acid d) Benzoic acid

166. Prior to the seventeenth century people knew the processes except:
a) Dyeing b) Preparation of wines c) Organic synthesis d) Fermentation

167. Molecular weight of acetic acid is 60. Its empirical formula is:
a) CH_2O b) $C_2H_4O_2$ c) $C_3H_6O_3$ d) $C_2H_4O_3$

168. Ketones can be obtained in one step by:
a) Hydrolysis of ester
b) Oxidation of primary alcohols
c) Reaction of acid halide with alcohols
d) Oxidation of secondary alcohol

169. The scientist who gave chromatography concept:
a) Berzelius b) Avogadro c) Tswett d) Lavoisier

170. $R\mathrm{COOH} \rightarrow R\mathrm{CH_2COOH}$. This conversion is known as reaction
a) Arndt-Eistert reaction b) Favorskii reaction
c) Mannich reaction d) Schmidt reaction

171. Nucleophilic addition reaction will be most favoured in:
a) CH_3CH_2CHO
b) CH_3CHO
c) $CH_3 \cdot CH_2 \cdot CH_2COCH_3$
d) $(CH_3)_2C{=}O$

172. 0.2 g of an organic compound containing C, H and O on combustion yielded 0.147 g CO_2 and 0.12 g water. The percentage of oxygen in it is:
a) 73.34% b) 78.45% c) 83.23% d) 89.50%

173. Aliphatic aldehydes react with Fehling's solution to give red ppt. but benzaldehyde does not produce red precipitate with Fehling's solution because:
a) Of a bulky ring, —CHO is hinderer
b) Or resonance, oxidation of benzaldehyde is difficult
c) —CHO is present in cyclic structure
d) Of all the above statements

174. The identical C—O bond lengths in carboxylate ions are due to:
a) Resonance
b) Presence of carbonyl group
c) Presence of alkyl group
d) None of the above

175. Which one of following can be oxidised to the corresponding carbonyl compound?
a) 2-hydroxypropane b) *Ortho*-nitrophenol
c) Phenol d) 2-methyl-2-hydroxypropane

176. A compound does not react with 2, 4 dinitrophenyl hydrazine, compound is
a) Acetone b) Acetaldehyde c) CH_3OH d) $CH_3CH_2COCH_3$

177. When CH_3COOH reacts with$CH_3 - MgX$
a) CH_3COX is formed b) Hydrocarbon is formed
c) Acetone is formed d) Alcohol is formed

178. 13 g of a hydrocarbon contains 1.0 g of hydrogen. Its formula is:
a) C_2H_2 b) C_2H_3 c) C_3H_4 d) C_4H_7

179. 2-pentanone and 3-pentanone can be distinguished by one of the following:
a) Tollen's reagent b) Fehling's solution c) Schiff's test d) Iodoform test

180. Ethyl acetate is obtained by acetaldehyde in one step process by

a) Condensation using $Ba(OH)_2$
b) Using aluminium ethoxide
c) Oxidation
d) Reduction

181. On reaction with hydroxylamine, aldehydes produce
a) Ketoxime
b) Hydrazone
c) Semicarbazone
d) Aldoxime

182. The solvent which can dissolve all the carboxylic acids is:
a) Water
b) Dilute HCl
c) Conc. H_2SO_4
d) Dilute NaOH

183. 0.759 g of a silver salt of a dibasic organic acid on ignition left 0.463 g metallic silver. The equivalent weight of acid is:
a) 70
b) 108
c) 60
d) 50

184. Acetone and acetaldehyde can be distinguished by
a) Molisch test
b) Tollen's test
c) Schiff's test
d) Iodoform test

185. Hydroxamic acid test is employed to detect
a) Ketones
b) Aldehydes
c) Esters
d) amides

186. When $CH_2 = CH - COOH$ is reduced with $LiAlH_4$, the compound obtained will be
a) $CH_3 - CH_2 - COOH$
b) $CH_2 = CH - CH_2OH$
c) $CH_3CH_2CH_2OH$
d) CH_3CH_2CHO

187. Conversion of benzaldehyde to 3-phenylprop-2-en-1-oic acid is
a) Perkin condensation
b) Claisen condensation
c) Oxidative addition
d) Aldol condensation

188. Dry distillation of calcium formate and subsequent treatment with conc KOH gives the mixture of
a) $CH_3OH, HCOOK$
b) $CH_3CHO, HCOOK$
c) $HCHO, HCOOK$
d) None of these

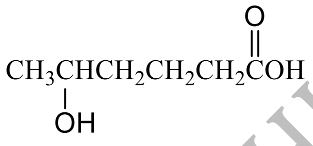
189. The main component of oil of winter green is
a) Salicylic acid
b) Methyl salicylate
c) Acetyl salicylic acid
d) salicylaldehyde

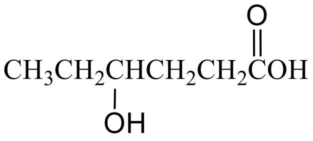
190. Acetic acid is manufactured by the fermentation of:
a) Ethanol
b) Methanol
c) Ethanal
d) Methanal

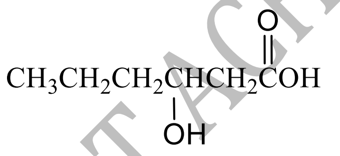
191. Which is/are hydroxy acid (s)?
a) Lactic acid
b) Tartaric acid
c) Citric acid
d) All of these

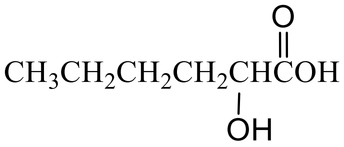
192. When cyclohexanone is treated with N_3H (hydrazoic acid)
a) Caprolactum is obtained
b) Caprolactone is obtained
c) Caproserum is obtained
d) No reaction

193. Which of the following will not give cyclic products upon being heated or being treated by an acid?

a) 
$CH_3CH(OH)CH_2CH_2CH_2C(=O)OH$

b) 
$CH_3CH_2CH(OH)CH_2CH_2C(=O)OH$

c) 
$CH_3CH_2CH_2CH(OH)CH_2C(=O)OH$

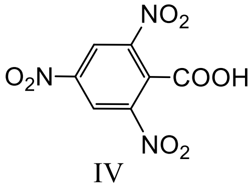
d) 
$CH_3CH_2CH_2CH_2CH(OH)C(=O)OH$

194. $CH_3CHO + CO_2(COOH)_2 \xrightarrow[\Delta]{\text{Pyridine}} X; X$ is:
a) CH_3COOH
b) C_2H_5COOH
c) $CH_3CH{=}CHCOOH$
d) $(COOH)CH{=}CH(COOH)$

195. The most suitable reagent for the conversion of primary alcohol into aldehyde with the same number of carbon is
a) Acidified $K_2Cr_2O_7$
b) Acidified $KMnO_4$
c) Alkaline $KMnO_4$
d) Pyridinium chlorochromate

196. Give the order of ease of decarboxylation of the following acids

CH_3COOH $CH_2{=}CH{-}CH_2COOH$ $CH_2(COOH)_2$
I II III



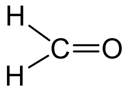
C IV

a) $I > II > III > IV$ b) $III > IV > II > I$ c) $IV > III > II > I$ d) $I > III > II > IV$

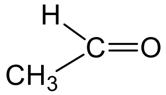
197. Which is used as a preservative for biological specimens?
a) Formalin b) Formic acid c) Liquid NH_3 d) Acetic acid

198. Carbon forms a very large number of compounds because:
a) It is a non-metal
b) It forms covalent bonds
c) It has a strong tendency of catenation
d) Compounds are combustible

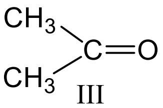
199. What will be the order of reactivity of the following carbonyl compounds with Grignard's reagent?



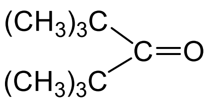
I



II



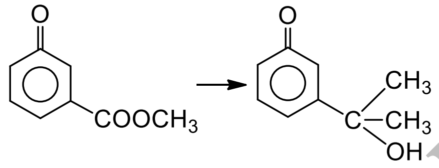
III



IV

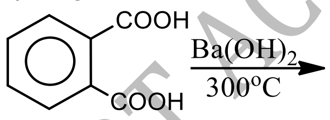
a) I > II > III > IV b) IV > III >II > I c) II > I > IV > III d) III > II > I > IV

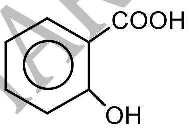
200. By which of the following reagents can the following conversion be affected?

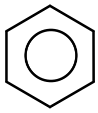


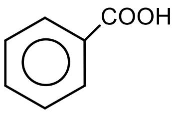
a) $2CH_3MgBr$ and H_3O^+ b) $HOCH_2 - CH_2OH, H^+, LiAlH_4$, ether, $2CH_3MgBr, H_3O^+$
c) $HOCH_2 - CH_2OH, H^+, 2CH_3MgBr, H_3O^+$ d) $HOCH_2 - CH_2OH, H^+, H_2, Pt, CH_3OH, H^+$

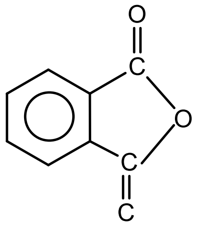
201. Which of the following does not give HVZ reaction?
a) CH_3CH_2COOH b) CH_3COOH c) $HCOOH$ d) $(CH_3)_2CHOH$

202. 

a) 

b) 

c) 

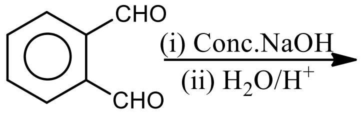
d) 

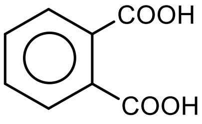
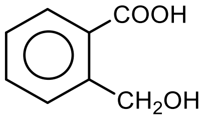
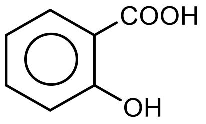
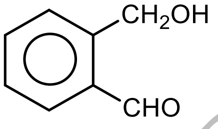
203. Which of the following on treatment with Baeyer's reagent will give *meso*-tartaric acid?
a) Fumaric acid b) Maleric acid c) Both (a) and (b) d) None of these

204. Wolff-Kishner's reaction is:
a) Reduction of carbonyl compound into hydrocarbons
b) Reduction of carbonyl compound into alcohols
c) Reduction of nitrobenzene into aniline
d) Reduction of carbohydrates to alcohols

205. Colouration of Br_2/CCl_4 will be discharged by

a) Cinnamic acid b) Benzoic acid c) *o*-phthalic acid d) acetophenone

206. 

a)  b)  c)  d) 

207. Aldehydes and ketones both give addition reaction with:

a) HCN b) $NaHSO_3$ c) Both (a) and (b) d) None of these

208. Identify the organic compound which, on heating with strong solution of NaOH, partly converted into an, acid salt and partly into alcohol.

a) Benzyl alcohol b) Acetaldehyde c) Acetone d) Benzaldehyde

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

a) CH_3CHO b) CH_3CH_2CHO c) $(CH_3)_2CHCHO$ d) None of these

210. Long chain carboxylic acids are called fatty acids because:

a) The molecule is very fatty

b) The molecules were first found in natural fat

c) They have fattering effect

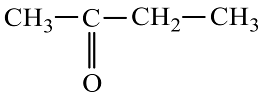
d) None of the above

211. Which of the following reagents can form a hydrazone with alkanone?

a) NH_3OHCl b) $PhNHNH_2$ c) $NH_2NHCONH_2$ d) HCN

212. Identify X in the sequence:

$$X \xrightarrow[2.\ H_2O/H^+]{1.\ CH_3MgCl} C_5H_{12}O \xrightarrow[575\ K]{Cu} C_5H_{10}:$$

a)  $CH_3-\underset{\underset{O}{\|}}{C}-CH_2-CH_3$ b) $CH_3CH_2CH_2CHO$ c) $(CH_3)_2CHCHO$ d) $CH_3CH_2CH_2CH_2OH$

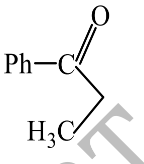
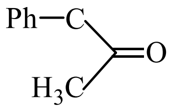
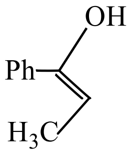
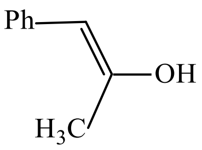
213. The reaction of HCOOH with conc. H_2SO_4 gives:

a) CO_2 b) CO c) Oxalic acid d) Acetic acid

214. Which of the following will react with water?

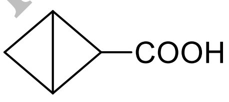
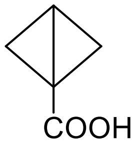
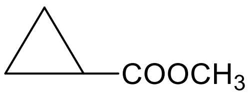
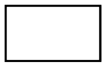
a) $CHCl_3$ b) CCl_3CHO c) CCl_4 d) $CH_2Cl \cdot CH_2Cl$

215. $Ph—C \equiv C—CH_3 \xrightarrow{Hg^{2+}/H^+} A$, A is:

a)  b)  c)  d) 

216. 

Product is

a)  b)  c)  d) 

217. Ketones are first oxidation product of:

a) Primary alcohols b) Secondary alcohols c) Dihydric alcohols d) Trihydric alcohols

218. Which does not react with Fehling's solution?

a) CH_3CHO b) C_6H_5CHO c) $C_6H_{12}O_6$ d) HCOOH

219. When sucrose is heated with conc. HNO_3,the product is:

a) Sucrose nitrate b) Formic acid c) Oxalic acid d) Citric acid

220. Amides are formed by the reaction of acid chloride with
a) NH_2NH_2 b) NH_3 c) NH_2OH d) $C_6H_5NHNH_2$

221. The product formed in aldol condensation is:
a) A β-hydroxy aldehyde or a β-hydroxy ketone
b) An α-hydroxy aldehyde or ketone
c) An α,β-unsaturated ester
d) A β-hydroxy acid

222. Tartaric acid is not used in :
a) Dyeing of clothes b) Cosmetics c) Photography d) Medicines

223. Acetaldehyde on treatment of few drops of H_2SO_4 gives:
a) Ethyl acetate b) Ethyl alcohol c) Ethyl methylamine d) Paraldehyde

224. Salt can be obtained from a concentrated seawater by:
a) Catalysis b) Decomposition c) Hydrolysis d) Crystallization

225. Liquid obtained by distillation of red ant is
a) Formaline b) Formaldehyde c) Formic acid d) Formyl chloride

226. Monocarboxylic acids show functional isomerism with :
a) Esters b) Alcohols c) Ethers d) Aldehydes

227. $CH_3CH = CHCHO \xrightarrow[+(CH_3)_2CHOH]{[(CH_3)_2CHO]_3Al} CH_3CH = CHCH_2OH$ is
a) Baeyer-Villiger reaction b) Meerwein-Ponndorff Verley reduction
c) Vilsmeier-Hack reaction d) None of the above

228. The product formed in the reaction *n*-hexanamide $+Br_2 + KOH$, is
a) Hexanamine b) Propanamine c) Butanamine d) pentanamine

229. Semicarbazide is:
a) NH_2CONH_2 b) $NH_2—NH_2$ c) $NH_2CONHNH_2$ d) None of these

230. Which statement is correct?
a) RCOOOH is stronger acid than RCOOH b) Maleic acid is stronger than fumaric acid
c) Both (a) and (b) d) None of the above

231. Which gives lactic acid on hydrolysis after reacting with HCN?
a) HCHO b) CH_3CHO c) C_6H_5CHO d) CH_3COCH_3

232. The IUPAC name of the $CH_3COCH(CH_3)_2$ is:
a) 4-methyl isopropyl ketone
b) 3-methyl-2-butanone
c) Isopropylmethyl ketone
d) 2-methyl-3-butanone

233. Which of the following will give readily a hydrocarbon?
a) $R\text{COOK} \xrightarrow{\text{Electrolysis}}$ b) $R\text{COOAg} \xrightarrow{I_2}$ c) $CH_3CH_3 \xrightarrow[hv]{Cl_2}$ d) $(CH_3)_2CCl_2 \xrightarrow{C_2H_2OH}$

234. In which of the following $\rangle C{=}O$ and $\rangle C{=}C\langle$ reactions are not similar?
a) Hydrogenation b) Elimination c) Oxidation d) None of these

235. Hydrogenation of benzoyl chloride in presence of Pd on $BaSO_4$ gives
a) Benzyl alcohol b) Benzaldehyde c) Benzonic acid d) Phenol

236. On treatment of citric acid with fuming H_2SO_4, which of the following is produced?
a) Acetone
b) Dihydroxy acetone
c) Citraconic anhydride
d) Acetone dicarboxylic acid

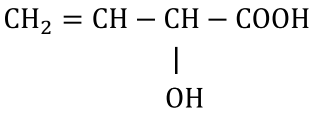
237. Base catalysed aldol condensation occurs with:
a) Propionaldehyde

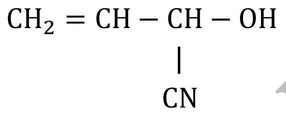
b) Benzaldehyde
c) 2,2-dimethyl propionaldehyde
d) None of the above

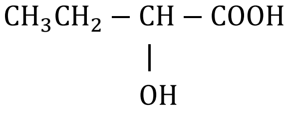
238. When HCHO is treated with C_6H_5CHO in presence of NaOH, the products are:
a) CH_3OH and HCOONa
b) $C_6H_5CH_2OH$ and C_6H_5C(
c) CH_3OH and C_6H_5COONa
d) HCOONa and $C_6H_5CH_2O$

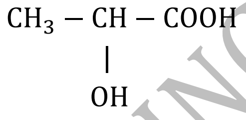
239. When formaldehyde is heated with ammonia the compound formed is:
a) Methyl amine
b) Amino formaldehyde
c) Hexamethylene tetramine
d) Formalin

240. $CH_3CHO + HCHO \xrightarrow[\text{Heat}]{\text{Dil.NaOH}} A \xrightarrow[H_3O^+]{\text{HCN}} B$.
The structure of compound B is

a) 
$CH_2=CH-\underset{\displaystyle OH}{\underset{|}{CH}}-COOH$

b) 
$CH_2=CH-\underset{\displaystyle CN}{\underset{|}{CH}}-OH$

c) 
$CH_3CH_2-\underset{\displaystyle OH}{\underset{|}{CH}}-COOH$

d) 
$CH_3-\underset{\displaystyle OH}{\underset{|}{CH}}-COOH$

241. $CH_3CH_2 \xrightarrow[\text{Fe}]{Cl_2} X \xrightarrow[\text{KOH}]{\text{Alc.}} Y$ The compound Y is:
a) CH_3CH_2OH
b) CH_3CH_2CN
c) $CH_2=CH.COOH$
d) $CH_2CHClCOOH$

242. The reaction of acetamide with water is an example of:
a) Alcoholysis
b) Hydrolysis
c) Ammonolysis
d) Saponification

243. The most acidic among the following is:
a) CH_3CH_2OH
b) C_6H_5OH
c) CH_3COOH
d) $CH_3CH_2CH_2OH$

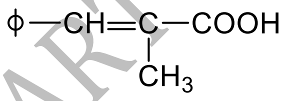
244. $A \xrightarrow{\text{HCl}} (CH_3)_2C=CHCOCH_3, A$ is
a) Acetone
b) Acetaldehyde
c) Propionaldehyde
d) Formaldehyde

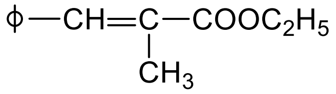
245. When citric acid is heated at 150°C, the main product formed is:
a) Acetone
b) Aconitic acid
c) Ethanal
d) None of these

246. The general formula $(RCO)_2O$ represents:
a) A ketone
b) An ether
c) An acid anhydride
d) An ester

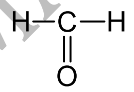
247. Formaldehyde on condensation in presence of $Ca(OH)_2$ gives:
a) Formose
b) Fructose
c) Maltose
d) Xylose

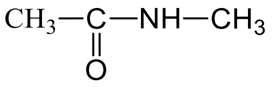
248. The correct formula of the product of reaction between ϕCHO and propanoic anhydride in presence of sodium propionate is
a) $\phi-CH=CHCH_2COOH$
b) $\phi CH=CH-CH_2COOC_2H_5$

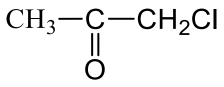
c) 
$\phi-CH=\underset{\displaystyle CH_3}{\underset{|}{C}}-COOH$

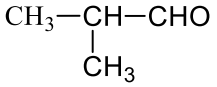
d) 
$\phi-CH=\underset{\displaystyle CH_3}{\underset{|}{C}}-COOC_2H_5$

249. Which of the following compounds neither forms semicarbazone nor oxime?

a) 
$H-\underset{\displaystyle O}{\underset{\|}{C}}-H$

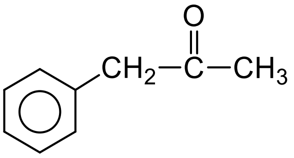
b) 
$CH_3-\underset{\displaystyle O}{\underset{\|}{C}}-NH-CH_3$

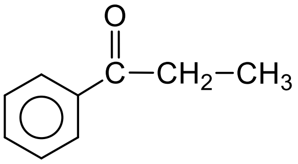
c) 
$CH_3-\underset{\displaystyle O}{\underset{\|}{C}}-CH_2Cl$

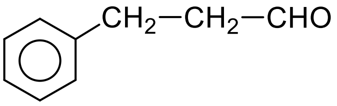
d) 
$CH_3-\underset{\displaystyle CH_3}{\underset{|}{CH}}-CHO$

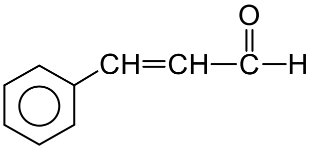
250. When a mixture of calcium benzoate and calcium acetate is dry distilled, the resulting compound is
a) Acetophenone
b) Benzaldehyde
c) Benzophenone
d) Acetaldehyde

251. An organic compound (A) with molecular formula $C_9H_{10}O$ forms an orange-red precipitate with 2,4-DNP reagent and gives yellow precipitate on heating with iodine and NaOH. It does not reduce Tollen reagent or Fehling solution nor it decolourises bromine water as Baeyer's reagent. On drastic oxidation with chromic acid, it gives a carboxylic acid having molecular formula $C_7H_6O_2$. Identify the compound (A)`

a) 

b) 

c) 

d) 

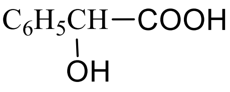
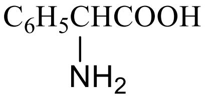
252. Ethanoic acid or CH_3COOH is a weak acid because:
   - a) It is highly ionized
   - b) It has no replaceable hydrogen
   - c) It is slightly ionized
   - d) It is insoluble in water

253. Paraldehyde is:
   - a) A trimer of formaldehyde
   - b) A trimer of acetaldehyde
   - c) A hexamer of formaldehyde
   - d) A hexamer of acetaldehyde

254. Calcium formate on distillation gives
   a) HCOOH b) CH_3COOH c) CH_3CHO d) HCHO

255. Alkaline hydrolysis of 1,1-dichloroalkane yields:
   a) Alkanal b) Alkanol c) Alkanone d) Alkyne

256. Sodium ethoxide has reacted with ethanoyl chloride. The compound that is produced in the above reaction is
   a) Diethyl ether b) 2-butanone c) Ethyl chloride d) Ethyl ethanoate

257. Which of the following carboxylic acids undergoes decarboxylation easily?
   a) $C_6H_5COCH_2COOH$ b) $C_6H_5COCOOH$ c)  $C_6H_5\underset{OH}{CH}-COOH$ d)  $C_6H_5\underset{NH_2}{CH}COOH$

258. Which of the following compound cannot formed an optically active cyanohydrins on reaction with HCN?
   a) CH_3CHO b) Benzaldehyde c) 2-pentanone d) 3-pentanone

259. The weakest acid among the following is:
   a) CH_3COOH b) CH_3CH_2COOH c) $(CH_3)_2CHCOOH$ d) $(CH_3)_3C.COOH$

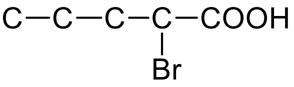
260. Reaction of acid with alcohols is also known as
   a) Esterification b) Saponification c) Alkalisation d) None of these

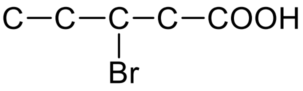
261. Cinnamic acid is formed when C_6H_5-CHO condenses with $(CH_3CO)_2O$ in presence of
   a) Concentrated H_2SO_4 b) Sodium acetate c) Sodium metal d) Anhydrous $ZnCl_2$

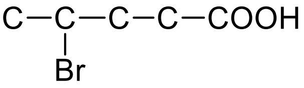
262. A mixture of water and NaCl can be separated by:
   a) Sublimation b) Evaporation c) Filtration d) Decantation

263. 500 mL of a hydrocarbon gas burnt in excess of oxygen yielded 2500 mL of CO_2 and 3.0 litre of water vapour (all volumes measured at the same temperature and pressure). The formula of the hydrocarbon is:
   a) C_3H_6 b) C_2H_4 c) C_5H_{12} d) CH_4

264. Which halo acid gives cyclic ester on treatment with aq.NaOH?

a)  $C-C-C-\underset{Br}{C}-COOH$

b)  $C-C-\underset{Br}{C}-C-COOH$

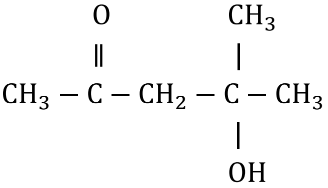
c)  $C-\underset{Br}{C}-C-C-COOH$

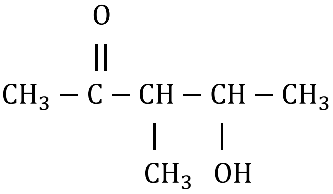
d) All of these

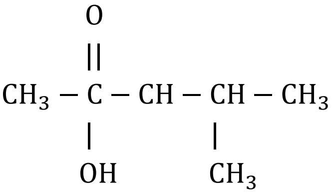
265. Which reduces carboxylic acid directly to primary alcohols?

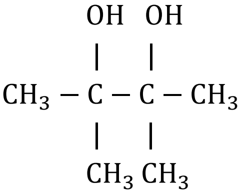
a) $LiAlH_4$ b) $Na + C_2H_5OH$ c) $NaBH_4$ d) All of these

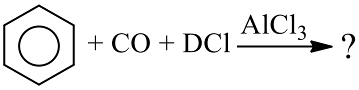
266. Which of the product is formed when acetone is reacted with barium hydroxide solution?

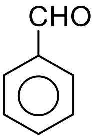
a) 
$CH_3-\overset{\overset{O}{\|}}{C}-CH_2-\underset{\underset{OH}{|}}{\overset{\overset{CH_3}{|}}{C}}-CH_3$

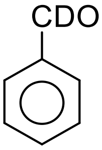
b) 
$CH_3-\overset{\overset{O}{\|}}{C}-\underset{\underset{CH_3}{|}}{CH}-\underset{\underset{OH}{|}}{CH}-CH_3$

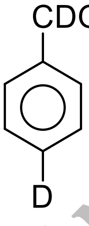
c) 
$CH_3-\underset{\underset{OH}{|}}{\overset{\overset{O}{\|}}{C}}-CH-\underset{\underset{CH_3}{|}}{CH}-CH_3$

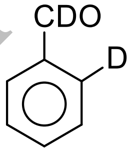
d) 
$CH_3-\underset{\underset{CH_3}{|}}{\overset{\overset{OH}{|}}{C}}-\underset{\underset{CH_3}{|}}{\overset{\overset{OH}{|}}{C}}-CH_3$

267. In Gattermann Koch reaction  the product formed is

a) 

b) 

c) 

d) 

268. A colourless water soluble organic liquid decomposes sodium carbonate and liberates CO_2. It produces black precipitate with Tollen's reagent. The liquid is:

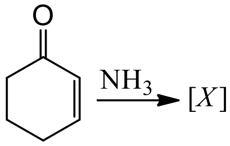
a) CH_3CHO b) CH_3COOH c) HCHO d) HCOOH

269. The formation of cyanohydrin from a ketones is an example of:

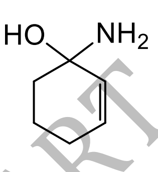
a) Electrophilic addition
b) Nucleophilic addition
c) Nucleophilic substitution
d) Electrophilic substitution

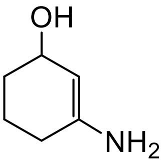
270. Aldehyde are the first oxidation product of

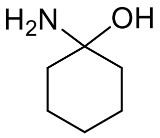
a) Primary alcohol b) Secondary alcohol c) Tertiary alcohol d) Dihydric alcohols

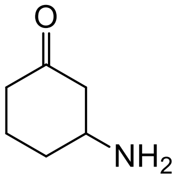
271. 

. Product is

a) 

b) 

c) 

d) 

272. Urea is preferred to ammonium sulphate as a nitrogenous fertilizer because

a) It is more soluble in water b) It is cheaper than ammonium sulphate
c) It is quite stable d) It does not cause acidity in the soil

273. Boiling point of acetone is:

a) $100\,^{\circ}C$ b) $60\,^{\circ}C$ c) $56^{\circ}C$ d) $90^{\circ}C$

274. Which of the following is correct?

a) All aldehydes undergo Cannizzaro's reaction
b) Aldehydes are less susceptible to oxidation than ketones
c) Aldehydes are more susceptible to oxidation than ketones
d) Formaldehyde forms $CH_2(OH)NH_2$ with NH_3

275. Acetone may be produced from starch by the action of:

a) Acid b) Certain bacteria c) Oxidising agents d) None of these

276. Benzaldehyde condense with acetaldehyde to produce
a) Cinnamic acid
b) Benzoic acid
c) Cinnamaldehyde
d) Acetic anhydride

277. Formic acid cannot be halogenated with chlorine in presence of red P, but acetic acid can be halogenated in the same way, because:
a) Formic acid is weaker than acetic acid
b) Formic acid has no α-H-atom in its molecule
c) Both (a) and (b)
d) None of the above

278. Treatment of acetaldehyde with ethyl magnesium bromide and subsequent hydrolysis gives:
a) l-butanol
b) 2-butanol
c) l-propanol
d) *tert*.-butanol

279. C_2H_5CHO and CH_3COCH_3 can be distinguished by testing with:
a) Phenyl hydrazine
b) Hydroxylamine
c) Fehling's solution
d) Sodium bisulphate

280. Kjeldahl's method cannot be used for the estimation of nitrogen in:
a) Pyridine
b) Nitrocompounds
c) Azo compounds
d) All of these

281. Acetic anhydride reacts with diethyl ether in the presence of anhydrous $AlCl_3$ to give:
a) Ethyl acetate
b) Methyl propionate
c) Methyl acetate
d) Propionic acid

282. Formaldehyde is not used in:
a) Adhesives
b) Bakelite
c) Tooth powders
d) Explosives

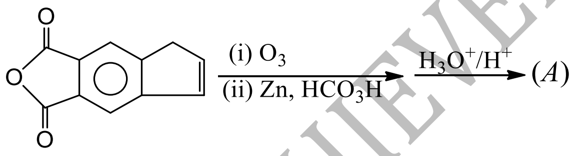
283. Acetic acid will be obtained on oxidation of
a) Ethanol
b) Propanal
c) Methanal
d) Glyoxal

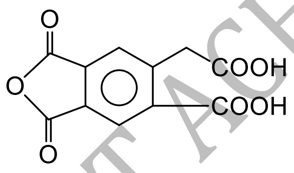
284. Acetamide is
a) Highly acidic
b) Highly basic
c) Neutral
d) Amphoteric

285. Which reagent can convert acetic acid into ethanol?
a) Na + alcohol
b) $LiAlH_4$ + ether
c) H_2 + Pt
d) Sn + HCl

286. Which reaction, intermediate is formed during the condensation reaction between acetaldehyde and formaldehyde?
a) $:\bar{C}H_2CHO$
b) $\overset{+}{C}H_2CHO$
c) $\overset{+}{C}H_2OH$
d) $:\bar{C}HCHO$

287. Write the product of the following reaction



a)


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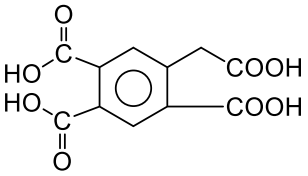

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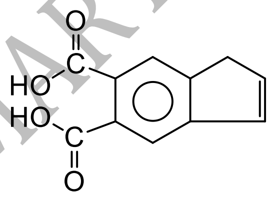
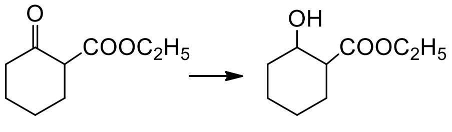


d) None of the above

288. Which of the following regent can effectively carried out the following conversion?



a) $LiAlH_4$
b) $NaBH_4$
c) $H_2/Pd-C$
d) H_2/Raney Ni

289. Which of the following on heating with aqueous KOH, produces acetaldehyde?
a) CH_3CH_2Cl
b) CH_2ClCH_2Cl
c) CH_3CHCl_2
d) CH_3COCl

290. Which carbonyl compound does not undergo aldol condensation?

a) HCHO b) CH_3CHO c) CH_3CH_2CHO d) CH_3COCH_3

291. Which of the following reagents reacts in same manner with HCHO, CH_3CHO, CH_3COCH_3?

a) HCN b) NH_2OH c) $C_6H_5NHNH_2$ d) All of these

292. Which of the following has most acidic proton?

a) CH_3COCH_3
b) $(CH_3)_2C{=}CH_2$
c) $CH_3COCH_2COCH_3$
d) $(CH_3.CO)_3CH$

293. What are the organic products formed in the following reaction?

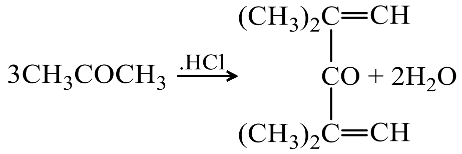
$$C_6H_5-COO-CH_3 \xrightarrow[2.\ H_3O^+]{1.\ LiAlH_4} \ldots\ldots$$

a) $C_6H_5-CH_2-OH$ and CH_3-OH
b) C_6H_5-OH and CH_3-OH
c) $C_6H_5-CH_3$ and CH_3-OH
d) $C_6H_5-CH_2-OH$ and CH_4

294. Which on oxidation will not give a carboxylic acid with the replacement of carbon atoms?

a) CH_3COCH_3 b) CCl_3CH_2CHO c) $CH_3CH_2CH_2OH$ d) CH_3CH_2CHO

295.



$$3CH_3COCH_3 \xrightarrow{.HCl} \begin{matrix} (CH_3)_2C{=}CH \\ | \\ CO \\ | \\ (CH_3)_2C{=}CH \end{matrix} + 2H_2O$$

This polymer is obtained when acetone is saturated with hydrogen chloride gas. Polymer is:

a) Phorone b) Formose c) Diacetonyl alcohol d) Mesityl oxide

296. Which of the following does not react with $NaHSO_3$?

a) CH_3COCH_3 b) CH_3CHO c) HCHO d) None of these

297. Which one is a polyprotic acid?

a) Acetic acid b) Oxalic acid c) Benzoic acid d) Salicylic acid

298. Halogens can be estimated by:

a) Duma's method b) Carius method c) Liebig's method d) None of these

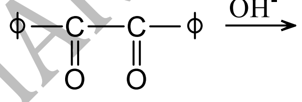
299. Ethyl isocyanide on acidic hydrolysis generates

a) Ethylamine salt and methanoic acid b) Propanoic acid and ammonium salt
c) ethanoic acid and ammonium salt d) Methyl amine salt and ethanoic acid

300. 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:

a) Diethyl ketone b) Formaldehyde c) Acetaldehyde d) Acetone

301. Which would undergo aldol condensation?

a) $\phi CHO + CH_3COCH_3 \xrightarrow{OH^-}$
b) $CCl_3CHO + HCHO \xrightarrow{OH^-}$
c)


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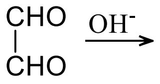

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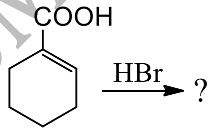
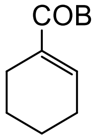


Product is

a)


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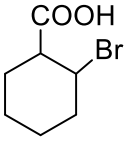

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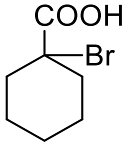

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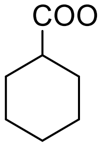
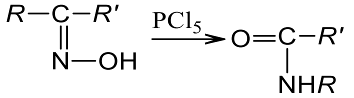


303. Aldehydes can be oxidised by
a) Tollen’s reagent b) Fehling solution c) Benedict solution d) All of these

304. Which can be oxidised to the corresponding carbonyl compound?
a) Propan-2-ol b) Ortho-nitro-phenol c) Phenol d) 2-methylpropan-2-ol

305. When ethanal reacts with CH_3MgBr and C_2H_5OH /dry HCl, the product formed are
a) Ethyl alcohol and 2-propanol
b) Ethane and hemiacetal
c) 2-propanol and acetal
d) Propane and methyl acetate

306. In the context of the rearrangement of an oxime of a ketone to an amide (represented below)



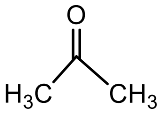
Which of the following statement is/are correct?
a) It is the *cis* hydrocarbon radical (R) with respect to the OH group that migrates
b) The group that migrates never gets completely detached from the remainder of the molecule during the transformation
c) The rearrangement is intermolecular
d) None of the above

307. In presence of dry HCl gas, CH_3CHO condenses with C_2H_5OH to give:
a) Aldol b) Paraldehyde c) Ethyl acetate d) Acetal

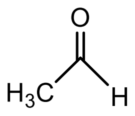
308. Which of the following acids combines the properties of acid and aldehyde?
a) Acetic acid b) Formic acid c) Benzoic acid d) Oxalic acid

309. Stephen’s reaction is reduction of:
a) Alkyl cyanide with $LiAlH_4$
b) Alkyl cyanide with $SnCl_2$and HCl
c) Alkyl isocyanide with Na and alcohol
d) Acyl halide in the presence of $Pd/BaSO_4$

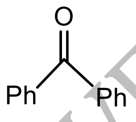
310. The order or reactivity of phenyl magnesium bromide with the following compound is



(I)



(II)

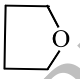


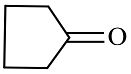
(III)

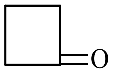
a) (II)>(III)>(I)
b) (I)>(III)>(II)
c) (II)>(I)>(III)
d) All react with the same rate

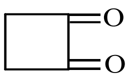
311. Alkaline hydrolysis of $R_2C.Cl_2$ forms:
a) Propanone b) Propane c) Alkanone d) Alkanal

312. Dry distillation of barium salt of Hexane-1,2-dicarboxylic acid gives:

a) 

b) 

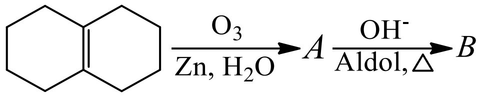
c) 

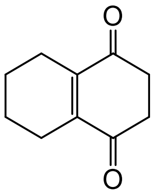
d) 

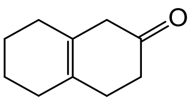
313. Which is liquid at room temperature?
a) Acetamide b) Formamide c) Methane thiol d) CH_3Cl

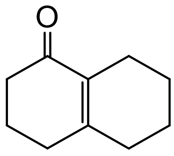
314. The key step in Cannizaro’s reaction is the intermolecular shift of
a) Proton b) Hydride ion c) Hydronium ion d) Hydrogen band

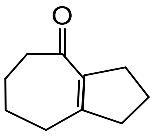
315. Identify the final product of the reaction



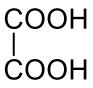
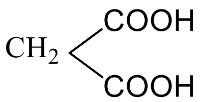
a) 

b) 

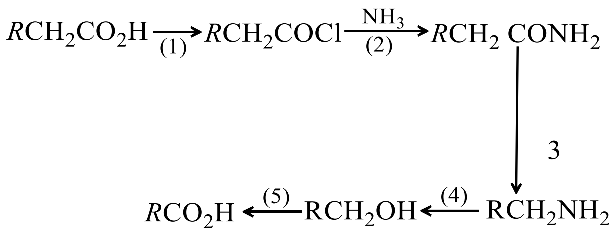
c) 

d) 

316. Which acid on heating gives CO and CO_2 both?

a) HCOOH b) CH_3COOH c) 
$$\begin{array}{c}COOH\\ |\\ COOH\end{array}$$
d) 
$$CH_2\begin{array}{l}\diagup COOH\\ \diagdown COOH\end{array}$$

317. A sequential reaction may be performed as represented below,



The appropriate reagent for step (3) is:

a) Bromine alone b) Bromine and alkali c) HBr d) P_2O_5

318. Osazone formation is used to characterise:

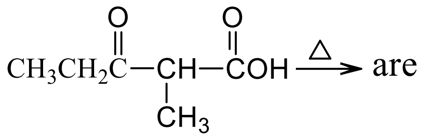
a) Polymers b) Sugars c) Carboxylic acid d) Alcohol

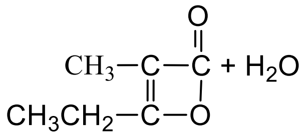
319. $C_8H_6O_4 \overset{\Delta}{\rightarrow} X \overset{NH_3}{\longrightarrow} Y$

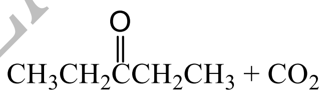
The compound X is

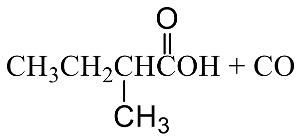
a) o-xylene b) Phthalic acid c) Phthalic anhydride d) Salicylic acid

320. The products obtained in the reaction


$$CH_3CH_2\overset{O}{\overset{\|}{C}}-\underset{CH_3}{\underset{|}{CH}}-\overset{O}{\overset{\|}{C}}OH \xrightarrow{\Delta} \text{are}$$

a) 

b) 
$$CH_3CH_2\overset{O}{\overset{\|}{C}}CH_2CH_3 + CO_2$$

c) 
$$CH_3CH_2\underset{CH_3}{\underset{|}{CH}}\overset{O}{\overset{\|}{C}}OH + CO$$

d) None of the above

321. Acetic acid vapours when passed over aluminium phosphate forms:

a) CH_3CHO b) Ketene c) C_2H_6 d) C_2H_4

322. A mixture contains four solid organic compounds *A,B,C,D*. On heating only C changes from solid to vapour state. C can be separated from others present in a mixture by:

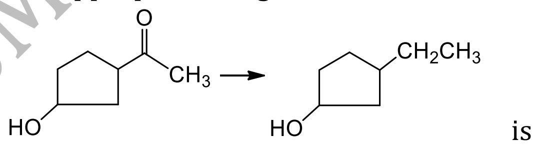
a) Distillation b) Crystallization c) Sublimation d) Fractional distillation

323. What is the end product in the following sequences of operations;

Acetamide $\overset{P_2O_5}{\longrightarrow} A \overset{4H}{\rightarrow} B$?

a) CH_3NH_2 b) $C_2H_5NH_2$ c) CH_3CN d) CH_3COONH_4

324. The appropriate reagent for the transformation



is

a) Zn(Hg), HCl b) $NH_2\ NH_2, OH^-$ c) H_2/Ni d) $NaBH_4$

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

a) C_6H_5CHO b) $CH_2{=}CH{-}CHO$ c) CH_3CH_2CHO d) None of these

326. Which of the following would undergo Hofmann reaction to give a primary amine?

a) $RCOCl$ b) $RCONHCH_3$ c) $RCONH_2$ d) $RCOOR'$

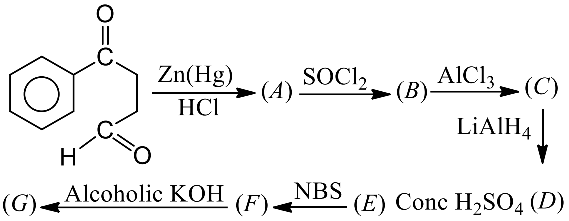
327. In kjeldahl's method, nitrogen present is estimated as:

a) N_2 b) NH_3 c) NO_2 d) None of these

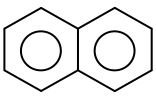
328. Correct order of reactivity of acid derivatives towards a nucleophile is
    a) $R\text{COCl} > (R\text{CO})_2\text{O} > R\text{COO}R > R\text{CONH}_2$
    b) $R\text{COO}R > R\text{COCl} > R\text{CONH}_2 > (R\text{CO})_2\text{O}$
    c) $R\text{CONH}_2 > (R\text{CO})_2\text{O} > R\text{COO}R > R\text{COCl}$
    d) $(R\text{CO})_2\text{O} > R\text{COCl} > R\text{COO}R > R\text{CONH}_2$

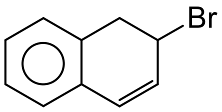
329. Methylethyl ketone can be reduced to n-butane by
    a) The Meerwein-Ponndroff reduction
    b) The Wolf-Kishner reduction
    c) $\text{Mg}-\text{Hg}, \text{H}_2\text{O}$
    d) All of the above

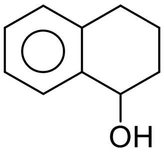
330.

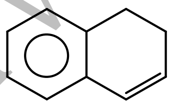


Show the final product of the reaction

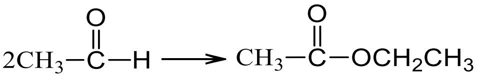
a) 

b) 

c) 

d) 

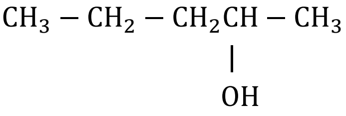
331.



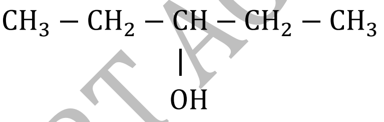
$$2\text{CH}_3-\overset{\text{O}}{\overset{\|}{\text{C}}}-\text{H} \longrightarrow \text{CH}_3-\overset{\text{O}}{\overset{\|}{\text{C}}}-\text{OCH}_2\text{CH}_3$$

The name of the reaction and reagent used for it is
    a) Cannizaro reaction, NaOH
    b) Aldon condensation, OH^-
    c) Tischenko reaction, $\text{Al(OC}_2\text{H}_5)_3$
    d) Perkin reaction, $(\text{CH}_3\text{CO})_2\text{O}$

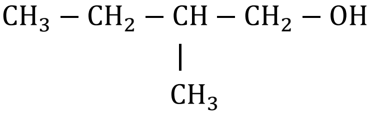
332. Which statement is incorrect in the case of acetaldehyde and acetone?
    a) Both react with hydroxylamine to form oximes
    b) Both react with sodium bisulphite to form addition product
    c) Both reduce ammoniacal silver nitrate to silver
    d) Both react with hydrazine to form hydrazones

333. A compound ‘A’ having the molecular formula $\text{C}_5\text{H}_{12}\text{O}$, on oxidation gives a compound ‘B’ with molecular formula $\text{C}_5\text{H}_{12}\text{O}$. Compound ‘$B$ gave a 2, 4-dinitrophenylhydrazine derivative but did not answer haloform test or silver mirror test. The structure of compound ‘A’
    a) $\text{CH}_3-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{OH}$
    b) 

$$\text{CH}_3-\text{CH}_2-\text{CH}_2\underset{\text{OH}}{\underset{|}{\text{CH}}}-\text{CH}_3$$

    c) 

$$\text{CH}_3-\text{CH}_2-\underset{\text{OH}}{\underset{|}{\text{CH}}}-\text{CH}_2-\text{CH}_3$$

    d) 

$$\text{CH}_3-\text{CH}_2-\underset{\text{CH}_3}{\underset{|}{\text{CH}}}-\text{CH}_2-\text{OH}$$

334. Acetone is used:
    a) As a solvent
    b) In nail polishes
    c) For storing acetylene under pressure
    d) All are correct

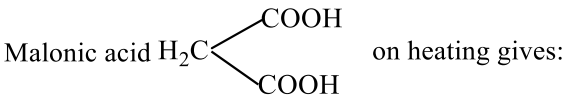
335. Which of the following will form two isomers with semi carbazide?
    a) Benzaldehyde b) Acetone c) Benzoquinone d) Benzophenone

336. 15 mL of a gaseous hydrocarbon required 45mL of oxygen for complete combustion. 30 mL of CO_2 is formed. The formula of the hydrocarbon is:
    a) C_2H_6 b) C_2H_4 c) C_3H_6 d) C_2H_2

337. First Noble Prize winner in chemistry is:
    a) Van’t Hoff b) Rutherford c) Pasteur d) Madam Curie

338. Which cannot be used as acylating agent?

a) $RCOBr$ b) $(RCO)_2O$ c) RCH_2COCl d) $RCONH_2$

339.


a) Formic acid b) Acetic acid $+CO_2$ c) Oxalic acid d) Acetaldehyde

340. With hot conc. KOH brown black resinous product is given by:

a) CH_3CHO b) C_2H_5OH c) HCHO d) CH_3COCH_3

341. Acetamide and ethyl amine are distinguished by reacting with

a) Br_2 water b) Acidic $KMnO_4$ c) aq. NaOH and heat d) aq. HCl and heat

342. General formula of saturated carboxylic acid is:

a) $C_nH_{2n+1}COOH$ b) $C_nH_{2n}O_2$ c) Both (a) and (b) d) None of these

343. The reagent which can be used to distinguish acetophenone from benzophenone is :

a) 2,4-dinitrophenyl hydrazine

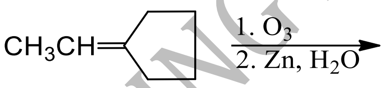
b) Aqueous $NaHSO_3$

c) Benedict's solution

d) I_2 and Na_2CO_3

344. Acetaldehyde is not obtained in the reactions

a) $CH_2=CH-CH_2 \xrightarrow[2.Zn,H_2O]{1.O_3}$

b)


c) $HC\equiv CH+H_2O \xrightarrow[H_2SO_4]{HgSO_4}$

d) $CH_3COCl+H_2 \xrightarrow{Pd-BaSO_4}$

345. The acid present in tomatoes is:

a) Lactic acid b) Oxalic acid c) Citric acid d) Tartaric acid

346. Identify A and B in the following reaction

$CH_3-CH_3 \xleftarrow{B} CH_3COOH \xrightarrow{A} CH_3CH_2OH$

A B

a) HI + red P $LiAlH_4$ b) Ni/Δ $LiAlH_4$

c) $LiAlH_4$ HI + red P d) $Pd-BaSO_4$ Zn + HCl

347. A ketone reacted with C_2H_5MgBr reagent followed by hydrolysis gave a product which on dehydration gives an alkene. The alkene on ozonolysis gave diethyl ketone and acetaldehyde. The ketone is:

a) Dimethyl ketone b) Ethyl methyl ketone c) Diethyl ketone d) Ethyl propyl ketone

348. Cross aldol condensation occurs between

a) Two same aldehydes b) Two same ketones

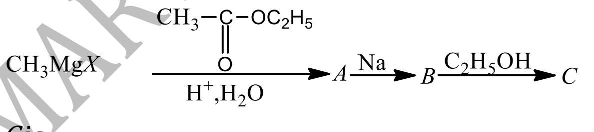
c) Two different aldehydes and ketones d) None of the above

349. The increasing order of the rate of HCN addition to compounds A-D is:

(A) HCHO (B) CH_3COCH_3

(C) $PhCOCH_3$ (D) PhCOPh

a) $A<B<C<D$ b) $D<B<C<A$ c) $D<C<B<A$ d) $C<D<B<A$

350.


C is

a) $CH_3-\overset{\overset{\displaystyle O}{||}}{C}-CH_3$ b) $(CH_3)_3C-O-C_2H_5$ c) $C_2H_5OC_2H_5$ d) $\underset{\underset{\displaystyle O}{||}}{CH_3-C-OC_2H_5}$

351. Which method cannot be used for purification of liquids?

a) Chromatographic b) Steam distillation c) Sublimation d) Distillation

352. $CH_3COOC_2H_5$ with excess of C_2H_5MgBr and hydrolysis gives

a) $\underset{\underset{\displaystyle C_2H_5}{|}}{CH_3-C=O}$ b) $CH_3-\overset{\overset{\displaystyle C_2H_5}{|}}{C}-OH$ c) $\underset{\underset{\displaystyle CH_3}{|}}{CH_3-C=O}$ d) $\overset{\overset{\displaystyle C_2H_5}{|}}{CH_3-C=O}$

| |
C_2H_5 CH_3

353. Aniline is purified by:
   a) Steam distillation
   b) Simple distillation
   c) Vacuum distillation
   d) Extraction with a solvent

354. Percentage of Se(at. mass = 78.4) in peroxidase anhydrase enzyme is 0.5% by weight, then minimum molecular mass of peroxidase anhydrase enzyme is:
   a) 1.576×10^4 b) 1.576×10^3 c) 15.76 d) 2.136×10^4

355. Which reagent is most suitable for the following for the synthesis of $HOCH_2CH_2CH_2COOH$ from$HOCH_2CH_2CH_2Br$?
   a) Grignard reagent b) KCN/H_3O^+ c) $HgSO_4/H_2SO_4$ d) PCl_5

356. The IUPAC name of acrolein is:
   a) Propanal b) Prop-2-en-l-al c) Propan-2-ol d) Prop-l-en-2-al

357. An organic compound contains hydrogen, oxygen, a single carbon atom and responds positively to Tollen's reagent. The compound is:
   a) HCHO b) CH_3OH c) CH_3CHO d) CH_3COOH

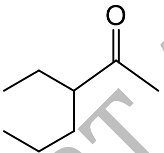
358. The reagent with which both acetaldehyde and acetophenone react easily are
   a) Fehling's solution b) Schiff's reagent
   c) Tollen's reagent d) 2, 4-dinitrophenylhydrazine

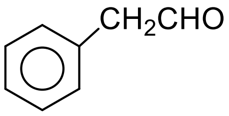
359. $CH_3COOH \xrightarrow{LiAlH_4} A + CH_3COOH \xrightarrow{H_3O^+} B + H_2O$
   In the above reactions '*A*' and '*B*'respectively are
   a) $CH_3COOC_2H_5, C_2H_5OH$ b) CH_3CHO, C_2H_5OH c) C_2H_5OH, CH_3CHO d) $C_2H_5OH, CH_3COOC_2H_5$

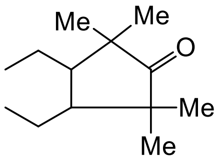
360. Formaldehyde gives an additive product with methyl magnesium iodide which on aqueous hydrolysis gives:
   a) Isopropyl alcohol
   b) Ethyl alcohol
   c) Methyl alcohol
   d) Propyl alcohol

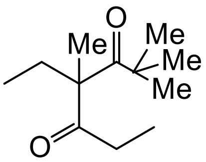
361. In Kjeldahl's method of estimation of nitrogen, K_2SO_4 acts as:
   a) Oxidizing agent b) Catalytic agent c) Hydrolysing agent d) Boiling point elevator

362. The compound that doesn't undergo aldol condensation

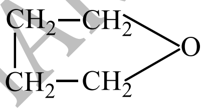
a)


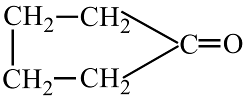
b)


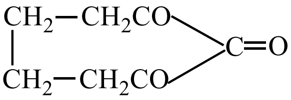
c)


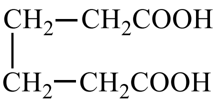
d)


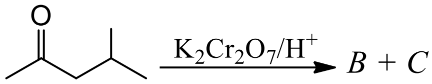
363. Which of the following products is formed when adipic acid is heated?

a)

$\begin{matrix} CH_2-CH_2 \\ | \\ CH_2-CH_2 \end{matrix} \!\!>\! O$

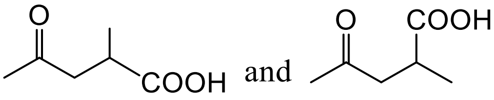
b)

$\begin{matrix} CH_2-CH_2 \\ | \\ CH_2-CH_2 \end{matrix} \!\!>\! C=O$

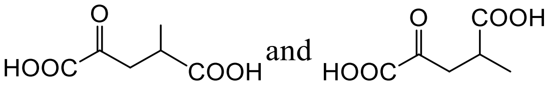
c)

$\begin{matrix} CH_2-CH_2CO \\ | \\ CH_2-CH_2CO \end{matrix} \!\!>\! C=O$

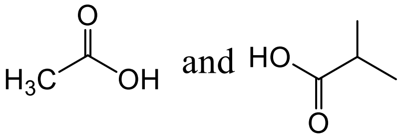
d)

$\begin{matrix} CH_2-CH_2COOH \\ | \\ CH_2-CH_2COOH \end{matrix}$

364. 

Here B and C are

a) 

b) 

c) 

d) None of the above

365. A silver salt of fatty acid on heating with an alkyl halide gives:

a) Ether b) Alcohol c) Aldehyde d) Ester

366. For hydrolysis of the following functional groups, the decreasing order of reactivity is:

a) $RCOOR > RCOCl > RCONH_2$

b) $RCOCl > RCOOR > RCONH_2$

c) $RCOCl > RCONH_2 > RCOOR$

d) $RCOOR > RCONH_2 > RCOCl$

367. The organic compounds A and B react with sodium metal and release H_2 gas. A and B react with each other to give ethyl acetate. A and B are:

a) CH_3COOH and C_2H_5OH

b) $HCOOH$ and C_2H_5OH

c) CH_3COOH and CH_3OH

d) CH_3COOH and $HCOOH$

368. $A \xrightarrow{\text{Dil.NaOH}} (CH_3)_2C = CHCOCH = C(CH_3)_2$

a) Acetaldehyde b) Formaldehyde c) Acetone d) Propionaldehyde

369. The hydrolysis product of $CH_3COCH_3 + CH_3MgBr$ is

a) n −butyl alcohol

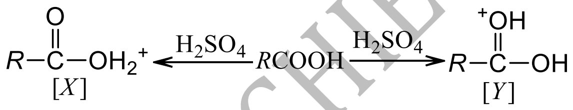
b) Tertiary butyl alcohol

c) Secondary butyl alcohol

d) Isopropyl alcohol

370. Aldehyde used in the manufacture of perfumes is:

a) $HCHO$ b) CH_3CHO c) C_6H_5CHO d) CCl_3CHO

371. 

$$\underset{[X]}{R-\overset{\overset{O}{\|}}{C}-OH_2^+} \xleftarrow{H_2SO_4} RCOOH \xrightarrow{H_2SO_4} \underset{[Y]}{R-\overset{\overset{^+OH}{\|}}{C}-OH}$$

Which is more stable?

a) X

b) Y

c) Both are equally stable

d) Can't be predicted

372. When sodium formate is heated it gives:

a) Hydrogen b) Water c) Sodium hydroxide d) Carbon dioxide

373. In esterification, the reactivity of alcohols is:

a) $3^\circ > 2^\circ > 1^\circ$ b) $1^\circ > 2^\circ > 3^\circ$ c) Same in all cases. d) None of these

374. Separation of organic compounds by column chromatography is due to:

a) Selective adsorption

b) Selective absorption

c) Solubilities

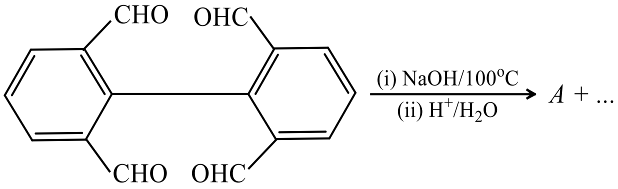
d) Selective adsorption and selective absorption

375. To determine the weight of halogen in the organic compound, the compound is heated with fuming HNO_3 in presence of:

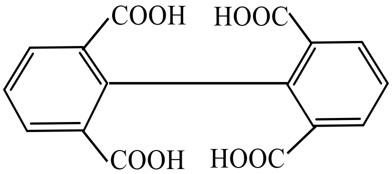
a) Ag b) $AgNO_3$ c) $AlCl_3$ d) Ag_2SO_4

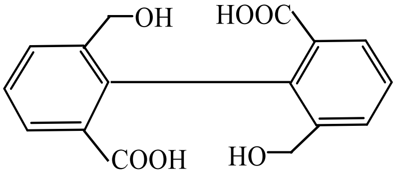
376. Cannizzaro's reaction involves:

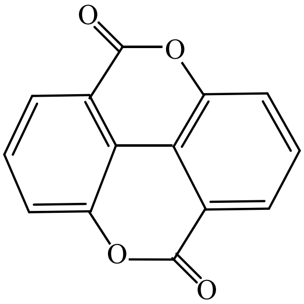
a) Conversion of aldehyde into acid only
b) Conversion of aldehyde into alcohol only
c) Redox system reaction
d) Aromatic transformation

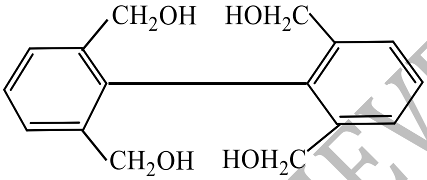
377. 

The major product A is:

a) 

b) 

c) 

d) 

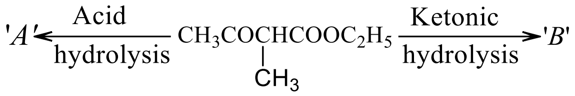
378. Which one of the following compounds on treatment with $LiAlH_4$ will give a product that will give a positive iodoform test?
a) CH_3CH_2CHO b) $CH_3CH_2COOCH_3$ c) $CH_3CH_2OCH_2CH_3$ d) CH_3COCH_3

379. An aldehyde can be distinguished from a ketone by the use of the reagent:
a) Grignard reagent b) Schiff's reagent c) Hydroxylamine d) Hydrazine

380. A compound A has molecular formula C_2Cl_3OH. It reduces Fehling's solution and on oxidation gives a monocarboxylic acid B. A is obtained by action of Cl_2 on ethyl alcohol. A is:
a) Chloral b) $CHCl_3$ c) CH_3Cl d) Chloro acetic acid

381. Halogenation of silver salt of carboxylic acid using CCl_4 as solvent to form alkyl halide is an example of:
a) Free radical halogenation
b) Nuclear halogenation
c) Hunsdiecker reaction
d) HVZ reaction

382. Anhydrous $CaCl_2$ is used as drying agent because it:
a) Adsorbs water molecules
b) Absorbs water molecules
c) Adsorbs and absorbs water molecules
d) none of the above

383. 

$'A' \xleftarrow[\text{hydrolysis}]{\text{Acid}} \underset{\substack{|\\ CH_3}}{CH_3COCHCOOC_2H_5} \xrightarrow[\text{hydrolysis}]{\text{Ketonic}} 'B'$

$''A''$ and $''B''$ are

a) $CH_3CH_2COOH, CH_3COCH_2CH_3$
b) CH_3CH_2COOH, CH_3COOH
c) CH_3COOH, CH_3COCH_3
d) $CH_3COOH, C_2H_5COC_2H_5$

384. Aldol condensation between the following compounds followed by dehydration gives methyl vinyl ketone:

a) Methanal and ethanal
b) Two mole of formaldehyde
c) Methanal and propanone
d) Two mole of ethanol

385. In a reaction RCHO is reduced to RCH_3 using amalgamated zinc and concentrated HCI and warming the solution. The reaction is known as

a) Meerwein-Ponndorf reaction
b) Clemmensen's reduction
c) Wolff-Kishner reduction
d) Schiff's reaction

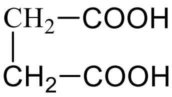
386. The Lassaigne's extract is boiled with conc. HNO_3 while testing for halogens. By doing so it:

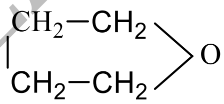
a) Increases the concentration of NO_3^- ions
b) Decomposes Na_2S and NaCN, if formed
c) Helps in the precipitation of AgCl
d) Increases the solubility product of AgCl

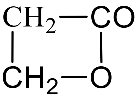
387. $CH \equiv CH \xrightarrow{CH_3MgBr} A \xrightarrow[\text{(ii)}H_3O^+]{\text{(i)}CO_2} B \xrightarrow{HgSO_4/H_2SO_4} D \xleftarrow[\text{(ii)}H^+]{\text{(i) }[Ag(NH_3)_2]^+, OH^-} C$

In the given reaction, product D is,

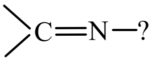
a) c

b) 

c) 

d) 

388. Among the following compounds which will react with acetone to give a product containing

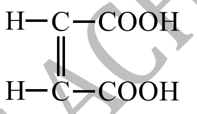


$>C{=}N-$?

a) $C_6H_5NH_2$
b) $C_6H_5NHNH_2$
c) $(CH_3)_3N$
d) $C_6H_5NHC_6H_5$

389. Which can be used to distinguish aldehydes and ketones?

a) Fehling's solution
b) H_2SO_4 solution
c) $NaHSO_3$
d) NH_3

390. The name of  is :

$\begin{array}{c} H-C-COOH \\ \| \\ H-C-COOH \end{array}$

a) Maleic acid
b) Fumaric acid
c) Malonic acid
d) Succinic acid

391. The important step in Cannizzaro's reaction is the intermolecular shift of:

a) Proton
b) H-atom
c) Hydride ion
d) Hydronium ion

392. Given below are some statements concerning formic acid, which of them is true?

a) It is weaker acid than acetic acid
b) It is reducing agent
c) When its calcium salt is heated, it forms a ketone
d) It is an oxidising agent

393. When Lemery for the first time proposed his classification of substances in 1675 the substance not known among the following was:

a) Cane sugar
b) Wine
c) Iron
d) Penicillin

394. Formalin is:

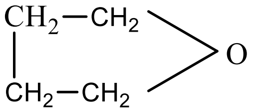
a) Formaldehyde
b) Formaldehyde + methanol
c) Formaldehyde + methanol + water

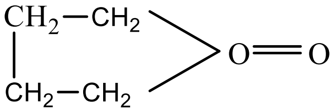
d) Formaldehyde + water

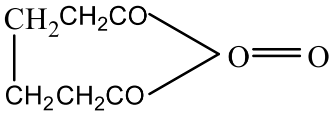
395. Chloral belongs to the class of:

a) Alcohols b) Aldehydes c) Amides d) Ketones

396. Which one of the following product is formed when calcium salt of adipic acid is heated?

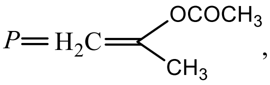
a) 

b) 

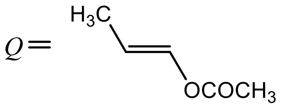
c) 

d) CH_2CH_2COOH
|
CH_2CH_2COOH

397. The product of acid hydrolysis of P and Q can be distinguish by



,



a) Lucas reagent b) 2, 4-DNP c) Fehling's solution d) $NaHSO_3$

398. Which gives positive haloform test and positive Fehling's solution test?

a) Acetone b) Acetaldehyde c) Ethanol d) Formaldehyde

399. Acetone when saturated with dry acid gives:

a) Diacetone alcohol b) Mesityl oxide c) Mesitylene d) Propane

400. $-COOH$ group of a compound does not react with $NaHSO_3$ even though it has $>C=O$ group because of:

a) Acid character

b) Resonance

c) Cyclic structure

d) The attached organic group

401. Aceto acetic ester behaves as:

a) An unsaturated hydroxyl compound

b) A keto compound

c) Both of these ways

d) None of the above

402. When benzoic acid is treated with PCl_5 at 100^0C, it gives

a) Benzoyl chloride b) *o*-chlorobenzoic acid c) *p*-chlorobenzoic acid d) Benzyl chloride

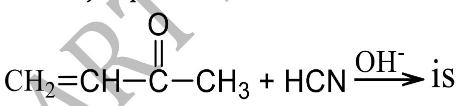
403. $CH_3\ COOCH_3 + \text{excess PhMgBr} \longrightarrow \text{Product} \xrightarrow{H^+} X$

Th product X is

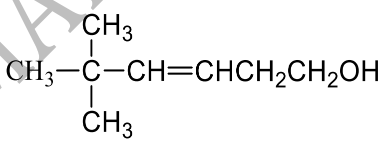
a) 1, 1-diphenylethanol b) 1, 1-diphenylethanol

c) Methyl phenylethanol d) Methyl phenylketone

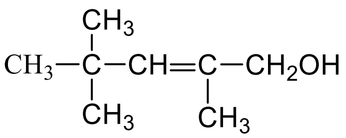
404. The major product obtained in the reaction,



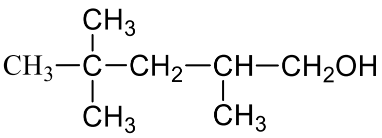
$$CH_2=CH-\overset{O}{\overset{\|}{C}}-CH_3 + HCN \xrightarrow{OH^-} \text{is}$$

a) 

$$CH_3-\underset{CH_3}{\overset{CH_3}{C}}-CH=CHCH_2CH_2OH$$

b) 

$$CH_3-\underset{CH_3}{\overset{CH_3}{C}}-CH=\underset{CH_3}{C}-CH_2OH$$

c) 

$$CH_3-\underset{CH_3}{\overset{CH_3}{C}}-CH_2-\underset{CH_3}{CH}-CH_2OH$$

d) None of the above

405. The end product B in the sequence of reactions,

$R-X \xrightarrow{CN^-} A \xrightarrow{NaOH} B$ is:

a) An alkane

b) A carboxylic acid

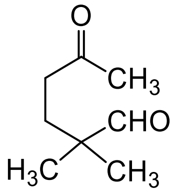
c) Sodium salt of carboxylic acid
d) A ketone

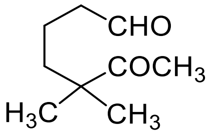
406. The correct order of acidic strengths of the carboxylic acids is
a) Formic acid < benzoic acid < acetic acid
b) Formic acid < acetic acid < benzoic acid
c) Acetic acid < formic acid < benzoic acid
d) Acetic acid < benzoic acid < formic acid

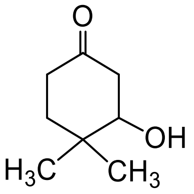
407. When formic acid reacts with PCl_3, it forms:
a) Formyl chloride
b) Acetyl chloride
c) Methyl chloride
d) Propionyl chloride

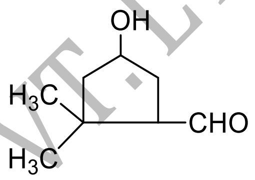
408. Carboxylic acids react with diazomethane to yield:
a) Amines
b) Alcohols
c) Esters
d) Amides

409. $Me_2CHCHO + CH_2 = CHCOCH_3 \xrightarrow[\text{(ii)}OH^-]{\text{(i)Michael addition}} [X]$ product is

a) 

b) 

c) 

d) 

410. Tamarind contains:
a) (+) tartaric acid
b) (-) tartaric acid
c) Citric acid
d) Lactic acid

411. Which of the following, compounds is the reactant in Rosenmund's reduction?
a) CH_3CO_2H
b) CH_3CHO
c) CH_3CH_2Cl
d) CH_3COCl

412. Aldol condensation will not take place in
a) HCHO
b) CH_3CH_2CHO
c) CH_3CHO
d) CH_3COCH_3

413. Benzaldehyde reacts with methyl amine to give
a) $C_6H_5NH_2$
b) $C_6H_5CH_2NH_2$
c) $C_6H_5CH = NCH_3$
d) $C_6H_5CONH_2$

414. The reagent with which both acetaldehyde and acetone react easily is:
a) Fehling's solution
b) Grignard reagent
c) Schiff's reagent
d) Tollen's reagent

415. 0.20 g of a hydrocarbon on combustion gave 0.66 g CO_2.The percentage of hydrogen in the hydrocarbon is about :
a) 33
b) 45
c) 10
d) 90

416. Which of the following is hydroxy acid?
a) Malic acid
b) Lactic acid
c) Tartaric acid
d) All of these

417. Which one of the following undergoes reaction with 50% sodium hydroxide solution to give the corresponding alcohol and acid?
a) Phenol
b) Benzaldehyde
c) Butanal
d) Benzoic acid

418. Amides may be converted into amines by reaction named after:
a) Perkin
b) Claisen
c) Hofmann
d) Kekule

419. The correct order of decreasing acid strength of trichloroacetic acid, (A), trifluoroacetic (B), acetic acid $(C)$and formic acid (D) is:
a) $A > B > C > D$
b) $A > C > B > D$
c) $B > A > D > C$
d) $B > D > C > A$

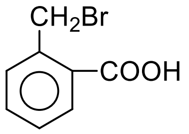
420. Which of the following is the strongest acid?
a) HCOOH (pK_a 3.77)
b) C_6H_5COOH (pK_a 4.22)
c) CH_3COOH (pK_a 4.71)
d) CH_3CH_2COOH (pK_a 4.88)

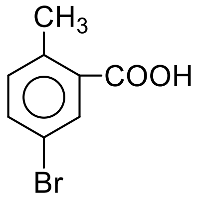
421. In Lassaigne's test sodium metal is used because:
a) It is a very reactive
b) Its melting point is low
c) Its compounds are soluble in water
d) all of the above

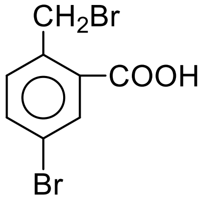
422. A process that involves the union of two or more molecules to form a new molecular aggregate without losing any simple molecule is known as:

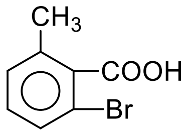
a) Polarisation b) Polymerisation c) Photosensitization d) None of these

423. *o*-toluic acid on reaction with $Br_2 + Fe$ gives

a) 

b) 

c) 

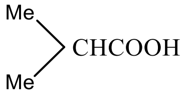
d) 

424. The correct order of increasing acid strength of the compounds

(A) CH_3COOH

(B) $MeOCH_2COOH$

(C) CF_3COOH

(D) 

is

a) B < D < A < C b) D < A < C < B c) D < A < B < C d) A < D < C < B

425. Acetic acid and P_2O_5 reacts to produce which of the following?

a) Acetic anhydride b) Acetaldehyde c) Phosphoric acid d) Acetone

426. Which of the following is an example of aldol condensation?

a) $2CH_3CHO \xrightarrow{\text{Dil. NaOH}} CH_3CHOHCH_2CHO$

b) $HCHO \xrightarrow{\text{Dil. NaOH}} CH_3OH$

c) $C_6H_5CHO + HCHO \xrightarrow{\text{Dil. NaOH}} C_6H_5CH_2OH$

d) $2CH_3COCH_3 \xrightarrow{\text{Conc. NaOH}} CH_3C(OH)(CH_3)CH_2COCH_3$

427. Aldehydes behave as:

a) Oxidising agent

b) Reducing agent

c) Dehydrating agent

d) Oxidizing as well as reducing agent

428. Acetone is prepared by:

a) Pyrolysis of acetic acid

b) Oxidation of acetic acid

c) Pyrolysis of calcium acetate

d) Oxidation of *n*-propyl alcohol

429. Benzaldehyde gives a positive test with

a) Tollen's reagent b) Fehling's solution c) Benedict's solution d) All of these

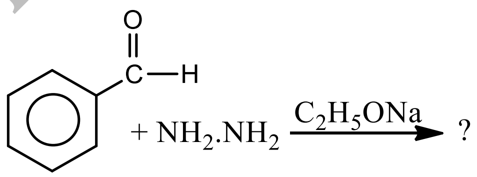
430. Isopropyl alcohol on passing over heated copper at 300°C gives:

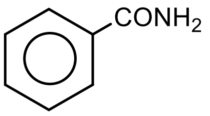
a) Propylene b) Acetaldehyde c) Acetone d) None of these

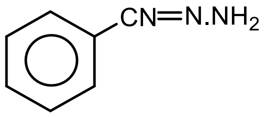
431. Vinegar contains:

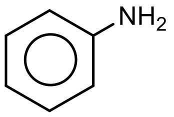
a) 10 to 20% acetic acid b) 10% acetic acid c) 6 to 10% acetic acid d) 100% acetic acid

432. What product is formed in the reaction



a) 

b) 

c) 

d) None of these

433. Acetaldehyde is the rearrangement product of:

a) Ethyl alcohol b) Vinyl alcohol c) Allyl alcohol d) Methyl alcohol

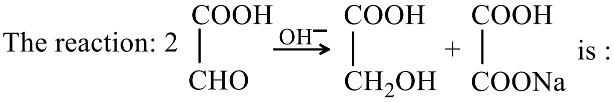
434. When sodium extract is prepared, generally the substance ignites:

a) Na b) H_2 c) Organic compound d) O_2

435. The compound which forms acetaldehyde when heated with dilute NaOH, is

a) 1, 1-dicholoroethane b) 1, 1, 1-trichloroethane

c) 1-chloroethane d) 1, 2-dichloroethane

436. 

$$\text{The reaction: } 2\begin{array}{c}COOH\\ |\\ CHO\end{array} \xrightarrow{OH^-} \begin{array}{c}COOH\\ |\\ CH_2OH\end{array} + \begin{array}{c}COOH\\ |\\ COONa\end{array} \text{ is :}$$

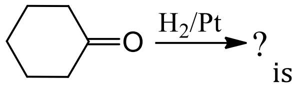
a) Crossed Cannizzaro reaction

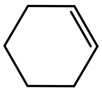
b) Intermolecular Cannizzaro reaction

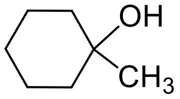
c) Intramolecular Cannizzaro reaction

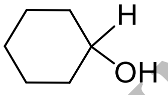
d) Either of the above

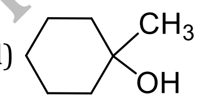
437. The product of following reaction



a) 

b) 

c) 

d) 

438. Tollen's reagent is:

a) Ammoniacal cuprous chloride

b) Ammoniacal cuprous oxide

c) Ammoniacal silver nitrate

d) Ammoniacal silver nitrite

439. Which structural unit is possessed by aldehyde and not ketone?

a) α-H-atom

b) H-atom and carbonyl group

c) OH and carbonyl group

d) None of the above

440. CH_3CH_2CHO is produced when the following is hydrolysed:

a) $CH_3CH_2CH_2Cl$ b) $CH_3CHClCH_2Cl$ c) $CH_3CH_2CHCl_2$ d) $CH_3C \cdot Cl_2 \cdot CH_3$

441. Acetaldehyde undergoes self condensation in presence of aluminium ethoxide to give ethyl acetate. This reaction is called:

a) Perkin reaction b) Tischenko's reaction c) Cannizzaro's reaction d) Aldol condensation

442. Formaldehyde polymerises from 6 to 100 molecules to form:

a) Formalin b) Metaldehyde c) Para formaldehyde d) None of these

443. Magenta is:

a) Alkaline phenolphthalein

b) Red litmus

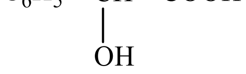
c) *p*-rosaniline hydrochloride

d) Methyl red

444. Aldehyde which is formed during photosynthesis of plants is

a) Methanal b) Acetaldehyde c) Propanal d) Phenylmethanal

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

a) $C_6H_5—CO—CH_2COOH$ b) $C_6H_5—CO—COOH$ c) 

$$C_6H_5-\underset{\substack{|\\ OH}}{CH}-COOH$$

d) 

$$C_6H_5-\underset{\substack{|\\ NH_2}}{CH}-COOH$$

446. The salicylic acid reacts with both the neutral $FeCl_3$ solution and in esterification reaction because it contains:

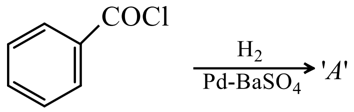
a) Both an acid group and an alcoholic group

b) Both an acid group and an aldehydic group

c) Both an acid group and a phenolic group

d) Both an acid and ester group

447. Consider the following reaction:



The product 'A' is:

a) C_6H_5CHO b) C_6H_5OH c) $C_6H_5COCH_3$ d) C_6H_5Cl

448. Ink stains can be removed from clothes by treating them with:

a) Formic acid b) Acetic acid c) Benzoic acid d) Oxalic acid

449. Identify 'acetaldoxime'

a) $CH_3CH=N-NH_2$ b) $CH_3CH=N-OH$ c) $(CH_3)_2C=N-OH$ d) $CH_2=N-OH$

450. Benzaldehyde and acetaldehyde can be distinguished by:

a) Iodoform test

b) 2 : 4 DNP test

c) NH_3 reaction

d) Wolff-Kishner's reduction

451. Ethyl benzoate reacts with PCl_5 to give

a) $C_2H_5Cl + C_6H_5COCl + POCl_3 + HCl$ b) $C_2H_5Cl + C_6H_5COCl + POCl_3$

c) $CH_3COCl + C_6H_5COCl + POCl_3$ d) $C_2H_5Cl + C_6H_5COOH + POCl_3$

452. Lactic acid extracted from muscles is:

a) *laevo*-rotatory

b) *dextro*-rotatory

c) Similar with synthetic lactic acid

d) None of the above

453. Phenol is soluble in:

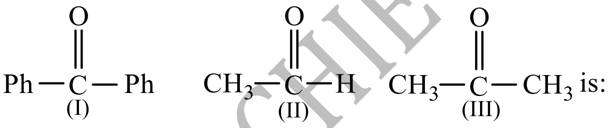
a) Dilute HCl

b) Both NaOH solution and dilute HCl

c) $NaHCO_3$ solution

d) NaOH solution

454. The correct order of reactivity of PhMgBr with,



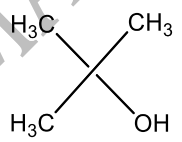
$Ph-\overset{\overset{O}{\|}}{C}-Ph$ (I) $CH_3-\overset{\overset{O}{\|}}{C}-H$ (II) $CH_3-\overset{\overset{O}{\|}}{C}-CH_3$ (III) is:

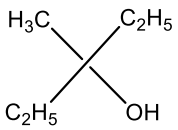
a) I > II > III b) III > II > I c) II > III > I d) II > I > III

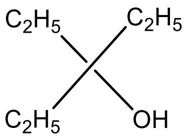
455. Reactions between organic compounds are generally slow because they are:

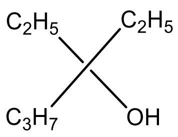
a) Ionic b) Covalent c) Metallic d) None of these

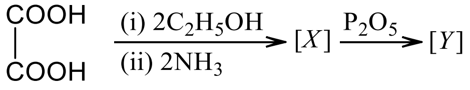
456. Ethyl ester $\xrightarrow[\text{(excess)}]{CH_3MgBr}$ P, the product 'P' will be

a) 

b) 

c) 

d) 

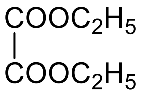
457. 

$\begin{matrix}COOH\\|\\COOH\end{matrix}\xrightarrow[\text{(ii) }2NH_3]{\text{(i) }2C_2H_5OH}[X]\xrightarrow{P_2O_5}[Y]$

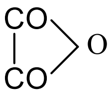
What is "Y" ?

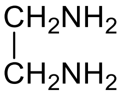
a) 

$\begin{matrix}CN\\|\\CN\end{matrix}$

b) 

$\begin{matrix}COOC_2H_5\\|\\COOC_2H_5\end{matrix}$

c) 

d) 

$\begin{matrix}CH_2NH_2\\|\\CH_2NH_2\end{matrix}$

458. Lemon gives sour taste because of

a) Citric acid b) Tartaric acid c) Oxalic acid d) Acetic acid

459. On warming formic acid with ammoniacal silver nitrate, the product formed is:

a) Silver oxide b) Metallic silver c) Silver formate d) Formaldehyde

460. Simple distillation is used to separate liquids which differ in their boiling point by:

a) 5°C b) 10°C c) $30^\circ - 80$°C d) Less than 20°C

461. Maximum percentage of chlorine is in:

a) Pyrene b) PVC c) Chloral d) Ethylidene chloride

462. Which of the following aldehydes give red precipitated with Fehling solution?

a) Benzaldehyde b) Salicylaldehyde c) Acetaldehyde d) None of these

463. Pinacole is:

a) 2,3-dimethyl-2,3-butandiol
b) 3,3-dimethyl-2-propanone
c) 3-methyl butan-2-ol
d) None of the above

464. $CH_3CHO \xrightarrow{HCN} A \xrightarrow{HOH} B$. The product B is

a) Malonic acid b) Glycolic acid c) Lactic acid d) Malic acid

465. A mixture of calcium acetate and calcium formate on heating gives:

a) CH_3COCH_3 b) CH_3CHO c) HCHO d) All of these

466. Which of the following can be used to differentiate between aldehyde and ketone?

a) Ammoniacal $AgNO_3$
b) Ammoniacal $AgNO_3$ in presence of tartarate ion
c) I_2 in the presence of base
d) Ammoniacal $AgNO_3$ in the presence of citrate ion

467. If the compound contains C, H and halogen. When C and H are to be estimated the combustion tube at the exit should contain a:

a) Copper spiral b) Silver spiral c) Lead spiral d) Iron spiral

468. A ketone on reduction gives:

a) Primary alcohol
b) Secondary alcohol
c) A dihydric alcohol
d) A mixture of above all three

469. Which is least soluble in water?

a) Phenol b) Ethanol c) Benzene d) Benzoic acid

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

$$CH_3CH_2COOH \xrightarrow{SOCl_2} B \xrightarrow{NH_3} C \xrightarrow[Br_2]{KOH} D$$

The structure of D would be:

a) $CH_3CH_2NHCH_3$ b) $CH_3CH_2NH_2$ c) $CH_3CH_2CH_2NH_2$ d) $CH_3CH_2CONH_2$

471. Acetals are:

a) Aldehyde b) Diethers c) Ketones d) Hydroxy aldehydes

472. Hexamethylene tetramine is used as an:

a) Analgesic b) Antipyretic c) Urinary antiseptic d) All of these

473. Which of the following gives an aldehyde on dry distillation?

a) Calcium formate + calcium acetate b) Calcium acetate + calcium benzoate
c) Calcium acetate d) Calcium benzoate

474. Which aldehyde cannot be obtained by Rosenmund's reaction?

a) CH_3CHO b) HCHO c) CH_3CH_2CHO d) All of these

475. Which is tribasic acid?

a) Malonic acid b) Citric acid c) Valeric acid d) Tartaric acid

476. Which of the following on heating with aqueous KOH, produces acetaldehyde?
a) CH_3COCl b) CH_3CH_2Cl c) CH_2ClCH_2Cl d) CH_3CHCl_2

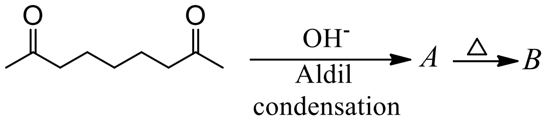
477. Fruits are preserved by using:
a) Aldehydes b) Sodium benzoate c) Formic acid d) Salicylic acid

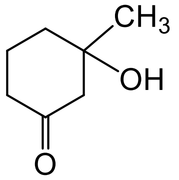
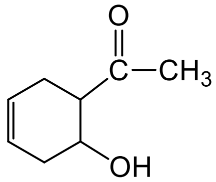
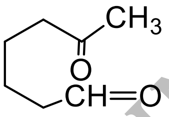
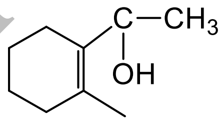
478. End product of the following reaction is

$CH_3CH_2COOH \xrightarrow[\text{red P}]{Cl_2} X \xrightarrow{\text{Alc.KOH}}$

a) $\begin{array}{c}CH_3CH_2COOH\\ \quad|\\ \quad OH\end{array}$ b) $\begin{array}{l}CH_2CH_2COOH\\ |\\ OH\end{array}$ c) $CH_2 = CHCOOH$ d) $\begin{array}{l}CH_2CHCOOH\\ |\quad\ \ |\\ Cl\ \ OH\end{array}$

479. Predict the product for the following



a) 
b) 
c) 
d) 

480. Ketones can be prepared by:
a) Rosenmund's reduction
b) Stephen's reduction
c) Both (a) and (b)
d) None of the above

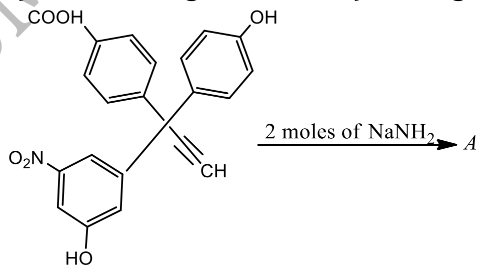
481. The percentage of nitrogen in urea is about:
a) 64.6 b) 46.7 c) 35.8 d) 28

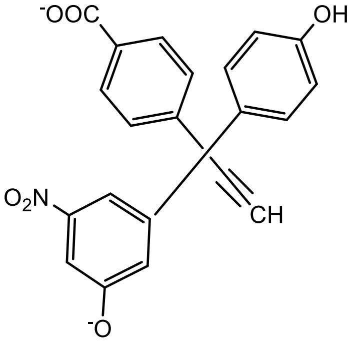
482. Collin's reagent is used to convert
a) $>C=O \longrightarrow >CHOH$ b) $-CH_2OH \rightarrow CHO$
c) $-CHO \longrightarrow -COOH$ d) $-CHO \longrightarrow -CH_2OH$

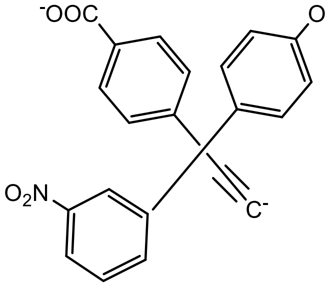
483. Which of the following reactant give Tollen's reagent and Fehling's solution test?
a) CH_3CHO b) CH_3COOH c) $\begin{array}{c}CH_3-C-CH_3\\ ||\\ O\end{array}$ d) CH_3-CH_2COOH

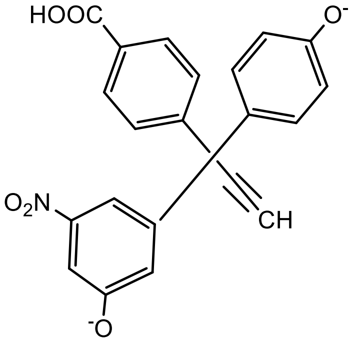
484. Reduction of aldehydes and ketones into hydrocarbons using Zn – Hg HCl conc. is called?
a) Cope reaction
b) Dow reaction
c) Wolff-Kishner reaction
d) Clemmensen reduction

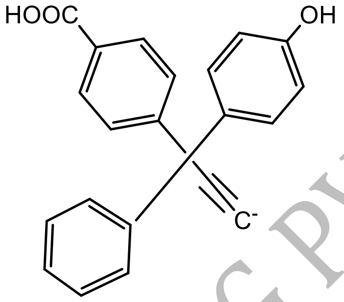
485. How will you convert butan-2-one to propanoic acid?
a) Tollen's reagent b) Fehling solution c) $NaOH/I_2/H^+$ d) $NaOH/NaI/H^+$

486.


a) 

b) 

c) 

d) 

487. When vapours of acetic acid are passed over …. 300°C we get acetone.
a) Al_2O_3 b) CuO c) MoO d) Cu

488. Which product is obtained on reduction of methanal in the presence of concentrated NaOH?
a) Formic acid and methyl alcohol b) $CO + H_2$
c) Methyl alcohol d) Formic acid

489. Which of the following doesn't give Fehling solution test?
a) Acetone b) Propanal c) Ethanal d) Butanal

490. Which gives smell of burnt sugar on charring?
a) Tartaric acid b) Formic acid c) Oxalic acid d) Acetic acid

491. Hydrated oxalic acid contains:
a) 5 water molecules b) 1 water molecule c) 2 water molecules d) 4 water molecules

492. Cacodyl test is used for identification of:
a) HCOOH b) CH_3COOH c) Oxalic acid d) Tartaric acid

493. During hydrogenation of oils vegetable ghee is formed. In this process:
a) Hydrogen is dissolved in the oil
b) Hydrogen combines with O_2 of the oil
c) Esters of unsaturated fatty acids are reduced to those of saturated acids
d) Hydrogen drives off impurities from the oil

494. Hydrogenation of $C_6H_5CHOH-COOH$ over $Rh-Al_2O_3$ catalyst in methanol gives
a) $C_6H_5CH_2COOH$ b) $C_6H_{11}CH_2COOH$ c) $C_6H_5CHOH.CH_2OH$ d) $C_6H_{11}CHOH-COOH$

495. Formaldehyde can be distinguished from acetaldehyde by the use of:
a) Schiff's reagent b) Tollen's reagent c) Fehling's solution d) NaOH and iodine

496. Which of the following carbonyl compounds on condensation gives an aromatic compound?
a) CH_3CHO b) HCHO c) $(CH_3)_2CO$ d) CH_3CH_2CHO

497. Mild oxidation of carboxylic acids occurs at…….position.
a) α b) γ c) β d) δ

498. The compound obtained by the reduction of propionaldehyde by Zn/Hg and conc. HCl is:
a) Propanol b) Propane c) Propene d) None of these

499. Almost all amides exist in:
a) Solid state
b) Liquid state
c) Gaseous state
d) Liquid and gaseous state

500. In public urinals, we observe some nascent smell. This smell is due to:
a) Hydrolysis of urea of urine by urease of atmosphere into NH_3 and CO_2
b) Formation of sulphamic acid by urea of urine
c) Reaction of CO_2 of atmosphere with urea mononitrate in urine
d) Hydrogen present in air reacts with nitrogen forming NH_3

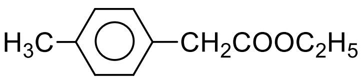
501. Trichloroacetaldehyde was subjected to Cannizaro's reaction by using $NaOH$.The mixture of the products contains sodium trichloroacetate ion and another compound. The other compound is
a) 2, 2, 2-trichlorethanol b) Trichloromethanol
c) 2, 2, 2-trichloropropanol d) Chloroform

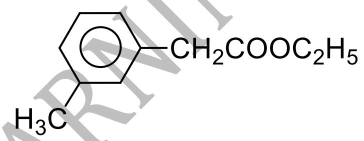
502. The end products in the Cannizaro reaction of benzaldehyde is
a) $PhCO_2H, PhCH_2OH$ b) $PhCO_2H, PhCH_2CO_2H$ c) $PhCH_2OH, PhCOCH_3$ d) $PhCO_2H, PhCOCH_3$

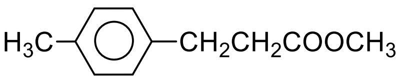
503. Turpentine oil can be purified by:
a) Vacuum distillation b) Fractional distillation c) Steam distillation d) Simple distillation

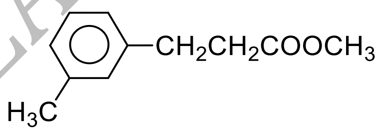
504. CH_3NH_2 is heated with sodium and extracted with water and then $AgNO_3$ is added. The white ppt. obtained is of:
a) AgCN b) Ag_2SO_4 c) AgCl d) $Cl \cdot CH_2COOAg$

505. An ester $(A)C_{11}H_{14}O_2$ was treated with $LiAlH_4$ to give compound $(B)C_9H_{12}O$ and $(C)C_2H_6O$. B on slight heating with an acid forms$(D)C_9H_{10}$. Compound D on vigorous oxidation with $KMnO_4$ gives terephthalic acid. The compound (A), is

a) 

b) 

c) 

d) 

506. Elements found in explosive are:
a) S b) N c) Both S and N d) C

507. Which acid forms Zwitter ions?
a) CH_3COOH b) Salicylic acid c) Phthalic acid d) Sulphanilic acid

508. Acetaldehyde cannot show
a) Iodoform test b) Lucas test c) Benedict's test d) Tollen's test

509. In Lassaigne's test for N, S and halogens, the organic compound is:
a) Fused with sodium
b) Dissolved with sodamide
c) Extracted with sodamide
d) Fused with calcium

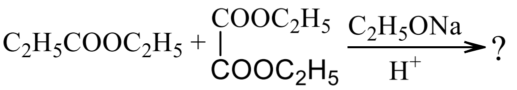
510. The number of aldehydes of molecular formula $C_5H_{10}O$ is:
a) 2 b) 3 c) 4 d) 5

511. Which of the following compound a would have the smallest value of pK_a?
a) $CHF_2CH_2CH_2COOH$ b) $CH_3CH_2CF_2COOH$ c) $CH_2FCHFCH_2COOH$ d) $CH_3CF_2CH_2COOH$

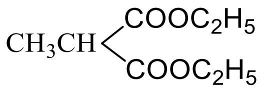
512. Hydrolysis of an ester gives acid A and alcohol B. The acid reduces Fehling's solution. Oxidation of alcohol B gives acid A. The ester is:
a) Methyl formate b) Ethyl formate c) Methyl acetate d) Ethyl acetate

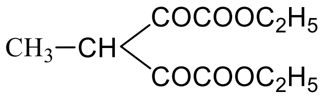
513. Weakest acid among the following is:
a) CH_3COOH b) $CH_2ClCOOH$ c) $(CH_3)_2CHCOOH$ d) CCl_3COOH

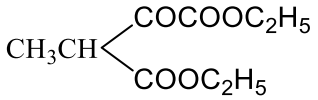
514. What is the product in following cross Claisen condensation?

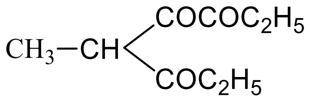


$$C_2H_5COOC_2H_5 + \begin{array}{l} COOC_2H_5 \\ | \\ COOC_2H_5 \end{array} \xrightarrow[H^+]{C_2H_5ONa} ?$$

a) 

b) 

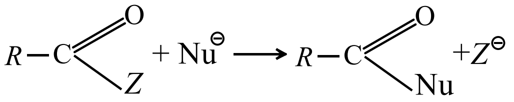
c) 

d) 

515. 0.22 g of organic compound C_xH_yO which occupied 112 mL at NTP and on combustion gave 0.44 g CO_2. The ratio of X to Y in the compound is:

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

516. Rate of the reaction:



a) $OCOCH_3$ b) NH_2 c) OC_2H_5 d) Cl

517. Among the following acids which has the lowest pK_a value?

a) CH_3CH_2COOH b) $(CH_3)_2CH-COOH$ c) HCOOH d) CH_3COOH

518. The reaction of an organic compound with ammonia followed by nitration of the product gives a powerful explosive, called RDX. The organic compound is

a) Phenol b) Toluene c) Glycerine d) Formaldehyde

519. The decreasing order of solubility of methanal (A), propanaldehyde (B), benzaldehyde (C) and acetophenone (D):

a) $A > B > C > D$ b) $D > C > B > A$ c) $D > A > B > C$ d) $B > A > C > D$

520. Why —OH group in ethyl alcohol is neutral, while it is acidic in acetic acid?

a) In acetic acid —OH group is attached with electronegative carbonyl group

b) Ethyl alcohol molecules get associated

c) Acetic acid has much stronger hydrogen bonding

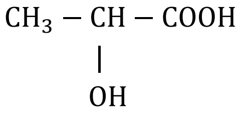
d) All of the above

521. The class of compounds that are reduced to primary alcohols and also respond to Fehling's solution are known as:

a) Aliphatic aldehydes b) Aliphatic ketones c) Aromatic amines d) Aromatic ketones

522. $CH_3-CHO+HCN \rightarrow$ A.Compound A on hydrolysis gives

a) CH_3-CH_2-COOH b) $CH_3-CH_2-CH_2-NH_2$

c) $CH_3-CO-COOH$ d) 

$CH_3-\underset{\displaystyle OH}{\underset{|}{CH}}-COOH$

523. Which of the following aldehydes on chlorination will give a product, which can be used for the synthesis of DDT?

a) HCHO b) CH_3CHO c) CH_3CH_2CHO d) C_6H_5CHO

524. The relation of the isoelectric point for an amino acid to solubility is:

a) The two are not related

b) An amino acid is the least soluble at the isoelectric point

c) An amino acid has the maximum solubility at the isoelectric point

d) Solubilities of only some amino acids depend on it

525. The discovery that shocked the vital force theory was:

a) Stereoisomerism

b) Synthesis of indigo

c) Wöhler's synthesis of urea from NH_4CNO

d) Fermentation of sugars

526. α-chloropropionic acid on treatment with alcoholic KOH followed by acidification gives:

a) $CH_3—CH(OH)—COOH$

b) $CH_2=CH—COOH$
c) $HO—CH_2—CH_2—COOH$
d) None of the above

527. A mixture of camphor and NaCl can be separated by:
a) Sublimation b) Evaporation c) Filtration d) Decantation

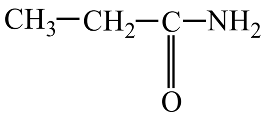
528. When $CH_2=CH—COOH$ is reduced by $LiAlH_4$, the compound obtained is:
a) CH_3CH_2COOH b) $CH_2=CHCH_2OH$ c) $CH_3CH_2CH_2OH$ d) CH_3CH_2CHO

529. Among the given compounds, the most susceptible to nucleophile attack at the carbonyl group is:
a) MeCOCl b) MeCHO c) MeCOOMe d) MeCOOCOMe

530. In Tischenko's reaction an aldehyde is heated with catalyst:
a) NaOH
b) $Al(OC_2H_5)_3$
c) Al_2O_3
d) Mg/Hg

531. Identify Z in the sequence,

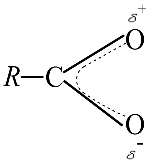
$$CH_3CO\bar{O}NH_4^+ \xrightarrow[2.\ P_2O_5]{1.\ Heat} Y \xrightarrow{H_2O(H^+)} Z:$$

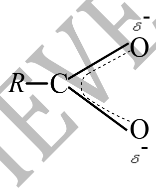
a) 
$CH_3-CH_2-\underset{\underset{O}{\|}}{C}-NH_2$
b) CH_3CN c) CH_3COOH d) $(CH_3CO)_2O$

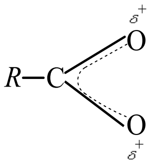
532. In the α-halogenation of aliphatic acids (HVZ reaction) the catalyst used is:
a) Zn b) P c) $FeCl_3$ d) $AlCl_3$

533. Distillation under reduced pressure in principle resembles with:
a) Steam distillation
b) Fractional distillation
c) Azeotropic distillation
d) All of these

534. Which of the following does the best represent the structure of the carboxylate ion?

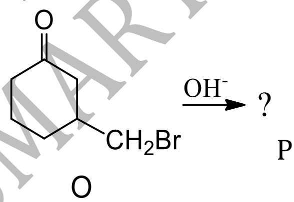
a) 

b) 

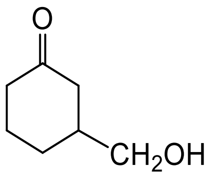
c) 

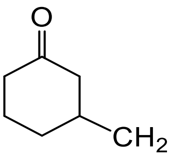
d) None of these

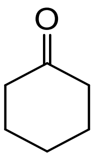
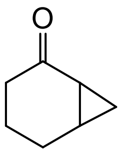
535. Acetic acid is obtained when:
a) Glycerol is heated with sulphuric acid
b) Methyl alcohol is oxidized with potassium permanganate
c) Acetaldehyde is oxidized with potassium dichromate and sulphuric acid
d) Calcium acetate is distilled in presence of calcium formate

536. 

Product is

a) 

b) 

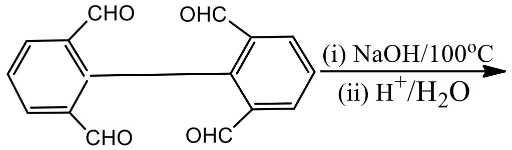
c) 
d) 

537. Acetophenone is used in:
a) Toilet soaps
b) Preparation of hypnotic drug
c) Perfumery

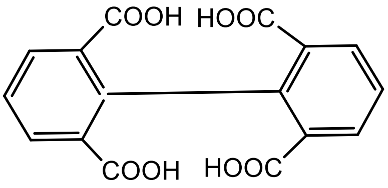
d) Phenacyl chlorine preparation used in tear gas shells

538. In organic compounds sulphur is estimated as:

a) H_2SO_4 b) $BaSO_4$ c) SO_2 d) $BaCl_2$

539.


Major product is

a)


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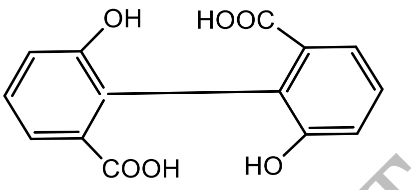

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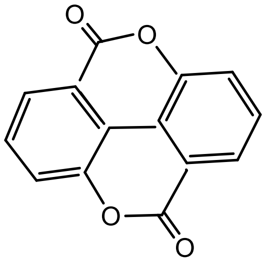

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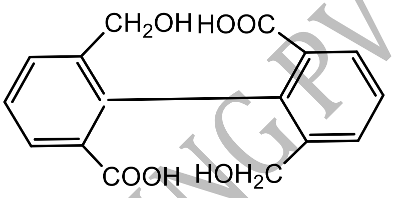


540. Malonic acid and succinic acid are distinguished by:

a) Heating b) $NaHCO_3$ c) Both (a) and (b) d) None of these

541. Pleasant odours of common fruits is due to:

a) Alcohol b) Fats c) Sugars d) Esters

542. Which one of the following pairs gives effervescence with aq. $NaHCO_3$?

CH_3COCl (I)
CH_3COCH_3 (II)
CH_3COOCH_3 (III)
$CH_3COOCOCH_3$ (IV)

a) I and II b) I and IV c) II and III d) I and III

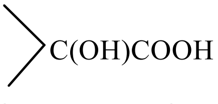
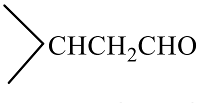
543. The reduction of aldehydes and ketones to the corresponding alkanes in presence of alkaline hydrazine solution is called:

a) MPV reaction
b) Stephen reduction
c) Wolff-Kishner's reduction
d) Cannizzaro's reaction

544. The acid showing salt like structure in aqueous solution is:

a) Acetic acid b) Benzoic acid c) Formic acid d) α-aminoacetic acid

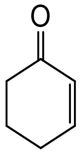
545. Cannizaro reaction is given by

a) HCHO b)

$>C(OH)COOH$
c)

$>CHCH_2CHO$
d) CH_3CH_2OH

546. Acetone on addition to methyl magnesium bromide forms a complex, which on decomposition with acid gives $X$and Mg(OH)Br. Which one of the following is X?

a) CH_3OH b) $(CH_3)_3COH$ c) $(CH_3)_2CHOH$ d) CH_3CH_2OH

547. $OHC(CH_2)_3COCH_3 \xrightarrow[\Delta]{OH^-}$? Major product is

a)


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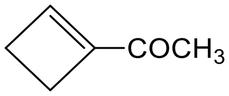

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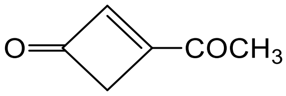

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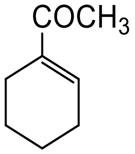


548. $CH_3CH_2OH \xrightarrow[\text{I}]{\text{Cu,573 K}} X \xrightarrow[\text{II}]{[O]} Y \xrightarrow[\text{III}]{Br_2,P} BrCH_2COOH$
Reaction I, II and III respectively are
a) Reduction, oxidation and substitution
b) Dehydration, oxidation and substitution
c) Dehydrogenation, oxidation and substitution
d) Dehydration, oxidation and elimination

549. Chromatographic techniques of purification can be used for:
a) Coloured compounds
b) Liquids
c) Solids
d) All of these

550. Decarboxylation of malonic acid gives:
a) HCHO
b) COOH—COOH
c) CH_3COOH
d) CH_4

551. Which of following reactions convert acetone into hydrocarbon having same number of carbon atoms?
a) Wolff-Kishner reaction
b) Hofmann reaction
c) Grignard reaction
d) Reduction with $LiAlH_4$

552. A compound $C_5H_{10}O$ gives a positive test of carbonyl group, gives a negative test with Fehling solution but gives positive haloform test and on reduction it gives normal pentane. Identify the compound
a) 3-pentanone
b) 2-pentanone
c) 1,5-pentanediol
d) None of these

553. Fruity smell is given by
a) Esters
b) Alcohols
c) Chloroform
d) Acid anhydrides

554. The reaction of a carboxylic acid gives effervescences of CO_2 with $NaHCO_3$. The CO_2 comes from:
a) R —COOH
b) $NaHCO_3$
c) Both (a) and (b)
d) None of these

555. Hydrolysis of HCN gives:
a) Acetic acid
b) Formaldehyde
c) Acetaldehyde
d) Formic acid

556. Which of the following is an example of aldol condensation?
a) $2CH_3COCH_3 \xrightarrow{\text{Dil.NaOH}} CH_3COHCH_3CH_2COCH_3$
b) $2HCHO \xrightarrow{\text{Dil.NaOH}} CH_3OH$
c) $C_6H_5CHO + HCHO \xrightarrow{\text{Dil.NaOH}} C_6H_5CH_2OH$
d) None of the above

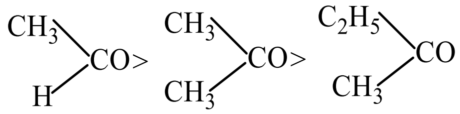
557. Benedict's solution provides:
a) Ag^+
b) Cu^{2+}
c) Ba^{2+}
d) Li^+

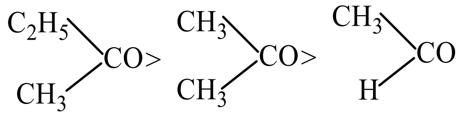
558. Which of the following product is formed in the reaction
$CH_3MgBr \xrightarrow[\text{(ii)}H_2O]{\text{(i)}CO_2}$?
a) Acetic acid
b) Methanoic acid
c) Methanol
d) Ethanal

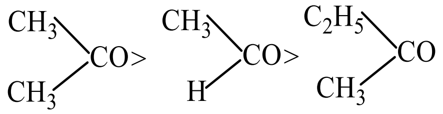
559. The Cannizaro reaction is not given by
a) Trimethyl acetaldehyde
b) Acetaldehyde
c) Benzaldehyde
d) Formaldehyde

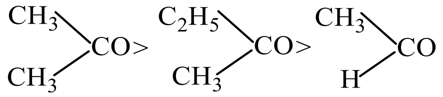
560. Carboxylic acids readily dissolve in aqueous sodium bicarbonate, liberating carbon dioxide. Which one of the following is correct?
a) Free carboxylic acid and its conjugate base are of comparable stability.
b) The free carboxylic acid is more stable than its conjugate base.
c) The conjugate base of the carboxylic acid is more stable than the free carboxylic acid.
d) The conjugate acid of the carboxylic acid is more stable than the free carboxylic acid.

561. $ClCH_2COOH$ is heated with fuming HNO_3in the presence of $AgNO_3$ in Carius tube. After filtration and washing the precipitate obtained is:
a) $AgNO_3$
b) AgCl
c) Ag_2SO_4
d) $ClCH_2COOA_g$

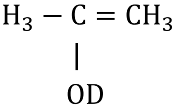
562. The correct order of reactivity of $>$CO group
in given compounds is :
a)


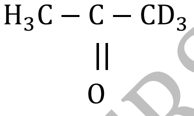
b) 

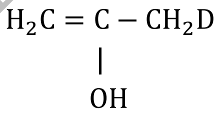
c) 

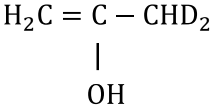
d) 

563. Doctors detect diabetes disease by testing the presence of glucose in urine with :
    a) Nessler's reagent b) Fehling's solution c) Fenton's reagent d) Silver nitrate solution
564. Which reaction is used for the preparation of acetophenone?
    a) Reimer-Tiemann reaction b) Wurtz-Fittig reaction
    c) Friedel-Craft's reaction d) Cannizaro's reaction
565. Carbonyl group undergoes:
    a) Electrophilic addition reactions
    b) Nucleophilic addition reactions
    c) Both (a) and (b)
    d) None of the above
566. Carbon shows maximum capacity of catenation because:
    a) Carbon shows variable valency
    b) In carbon there is one extra empty d-orbital
    c) C—C bond strength is very low
    d) C—C bond strength is very high
567. The enol form of acetone after treatment with D_2O, give

a) 
$H_3-\underset{\mathrm{OD}}{\underset{|}{C}}=CH_3$

b) 
$H_3C-\underset{\mathrm{O}}{\underset{||}{C}}-CD_3$

c) 
$H_2C=\underset{\mathrm{OH}}{\underset{|}{C}}-CH_2D$

d) 
$H_2C=\underset{\mathrm{OH}}{\underset{|}{C}}-CHD_2$

568. An important reaction of acetone is autocondensation in presence of concentrated sulphuric acid to give the aromatic compound
    a) Mesitylene b) Mesityl oxide c) Trioxan d) Phorone
569. Acetals are
    a) Ketones b) Diethers c) Aldehyde d) Hydroxy aldehydes
570. Azeotropes are:
    a) Liquid mixture, which distil unchanged in composition
    b) Liquids mixed in equal proportion
    c) Sodium which form solutions of definite composition
    d) Gaseous mixture, which cannot be separated
571. The name glacial acid is given to pure acetic acid:
    a) Below 16.6°C it is white liquid
    b) It forms ice like solid below 16.6°C
    c) It is mixed with methanol
    d) Pure acetic acid above 16.6°C
572. The conversion of CH_3OH to CH_3COOH can be brought in by:
    a) $K_2Cr_2O_7/H^+$ b) $CO + Rh$ c) $KMnO_4$ d) H_3PO_4
573. The IUPAC name of tartaric acid is:
    a) 2,3-dihydroxy butane-1-4-dicarboxylic acid
    b) 1,4-dihydroxy butane-2-3-dioic acid
    c) Butane-1-4-dicarboxylic acid
    d) None of the above
574. The IUPAC name of caproic acid is:

a) Pentanoic acid b) Hexanoic acid c) Heptanoic acid d) Octanoic acid

575. An azeotropic mixture of ethanol and water is first treated with …… before subjecting for fractional distillation to separate them.

a) Anhydrous lime b) C_6H_6 c) Both (a) and (b) d) None of these

576. Acetaldehyde on oxidation with SeO_2 gives:

a) CH_3COOH b) C_2H_5OH c) CHO·CHO d) None of these

577. Acetaldehyde is used:

a) In the preparation of dyes
b) In the preparation of chloral
c) In the preparation of paraldehyde
d) All are correct

578. Consider the following reactions,

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

Compound B is:

a) An ether b) An alcohol c) An aldehyde d) A ketone

579. Ethanal reacts with alkali to give 3-hydroxybutanal. This reaction is:

a) Polymerisation
b) Claisen condensation
c) Reimer-Tiemann reaction
d) Aldol condensation

580. When acetic acid is dissolved in benzene its molecular mass:

a) Decreases
b) Increases
c) Either decreases or increases
d) Suffers no change

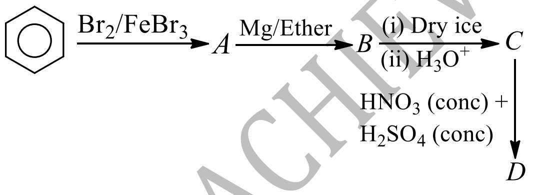
581. Chloral is prepared industrially by the chlorination of:

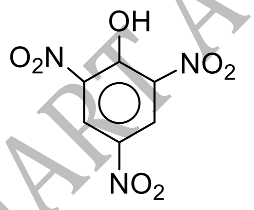
a) Propanone b) Formaldehyde c) Ethanol d) Chloroform

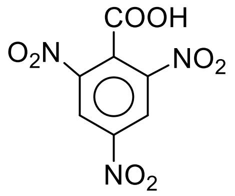
582. Paraldehyde is used as a:

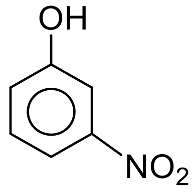
a) Soporific b) Poison c) Polymer d) Dye

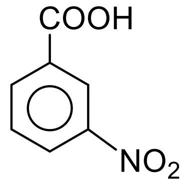
583. Identify the final product (D) of the reaction



a) 

b) 

c) 

d) 

584. Ketones are prepare by:

a) Clemmensen's reduction
b) Rosenmund's reduction
c) Oppenauer's oxidation
d) Cannizzaro's reaction

585. The correct sequence of decreasing order of reactivity of hydrolysis of acid chlorides is

a) $PhCOCl > p-O_2NC_6H_4COCl > p-CH_3OC_6H_4COCl$

b) $PhCOCl > p-CH_3OC_6H_4COCl > p-O_2NC_6H_4COCl$

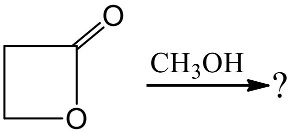
c) $p-O_2NC_6H_4COCl > PhCOCl > p-CH_3OC_6H_4COCl$

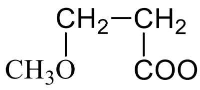
d) $p-O_2NC_6H_4COCl > p-CH_3OC_6H_4COCl > PhCOCl$

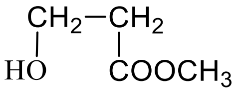
586. When acetamide is treated with $Br_2$and caustic soda, the product formed is

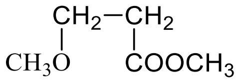
a) N-bromamide b) Bromoacetic acid c) Methanamine d) Ethanamine

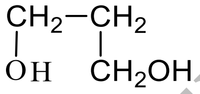
587. The product (A) of the following reaction



a) 
$\underset{CH_3O}{CH_2}-\underset{COOH}{CH_2}$

b) 
$\underset{HO}{CH_2}-\underset{COOCH_3}{CH_2}$

c) 
$\underset{CH_3O}{CH_2}-\underset{COOCH_3}{CH_2}$

d) 
$\underset{OH}{CH_2}-\underset{CH_2OH}{CH_2}$

588. Nitration of salicylic acid will give:

a) 2,4,6-trinitophenol
b) 2,4,6-trinitrobenzoic acid
c) 2,4,6-trinitrobenzene
d) None of the above

589. In Dumas' method of estimation of nitrogen 0.35 g of an organic compound gave 55mL of nitrogen collected at 300 K temperature and 715 mm pressure. The percentage composition of nitrogen in the compound would be:

(Aqueous tension at 300 K = 15 mm)

a) 14.45 b) 15.45 c) 16.45 d) 17.45

590. A powerful sedative made from acetaldehyde is:

a) Acetic anhydride b) Paraldehyde c) Acetic acid d) Acetamide

591. An organic compound of molecular formula C_3H_6O did not give a silver mirror with Tollen's reagent, but gave an oxime with hydroxylamine, it may be

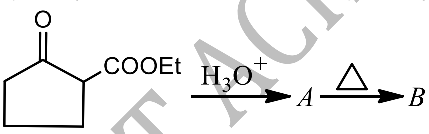
a) $CH_3-CO-CH_3$ b) C_2H_5CHO
c) $CH_2=CH-CH_2-OH$ d) $CH_3-O-CH=CH_2$

592. Trichloroacetaldehyde was subjected to Cannizzaro's reaction by using NaOH. The mixture of the products conatains sodium trichloroacetate ion and another compound. The other compound is:

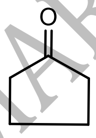
a) 2,2,2-Trichloroethanol
b) Trichloromethanol
c) 2,2,2-Trichloropropanol
d) Chloroform

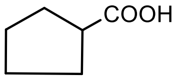
593. Acetic anhydride is prepared in the laboratory by heating sodium acetate with

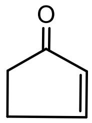
a) Ethyl chloride b) Acetyl chloride c) Conc. H_2SO_4 d) Zinc dust

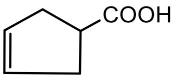
594. 

The compound B is

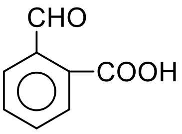
a) 

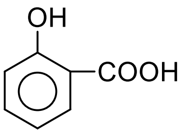
b) 

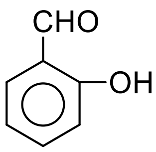
c) 

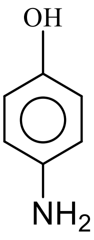
d) 

595. Which one of the following compound gives aspirin on reacting with acetic anhydride in presence of H_2SO_4 ?

a) 

b) 

c) 

d) 

596. The acid which contains the aldehyde group is
a) Acetic acid b) Formic acid c) Benzoic acid d) Propionic acid

597. When acetyl chloride reacts with any amine, the reaction is known as:
a) Saponification b) Esterification c) Acetylation d) Condensation

598. Fehling solution is
a) $CuSO_4$+lime b) $CuSO_4 +$ NaOH(aq) c) $CuSO_4 + Na_2CO_3$ d) None of these

599. In the Rosenmund's reaction
$RCOCl + H_2 \xrightarrow{Pd/BaSO_4} RCHO + HCl$ $BaSO_4$ here
a) Promotes catalytic activity of Pd
b) Removes the HCl formed in the reaction
c) Deactivates palladium
d) Activates palladium

600. Formaldehyde can be manufactured from:
a) Natural gas b) Water gas c) Both (a) and (b) d) None of these

601. Which of the following methods is not employed to prepare methyl benzoate $C_6H_5COOCH_3$?
a) $C_6H_5COOH, (CH_3)_2SO_4,$ b) C_6H_5COCl, C_2H_5OH c) $C_6H_5COOH, CH_2N_2, \Delta$ d) $C_6H_5COOC_2H_5, CH_3OH,$

602. The boiling and melting points of carboxylic acids depend on:
a) Hydrogen bonding b) Polarization c) Resonance d) All of these

603. Complete the following reaction $RCOOH \xrightarrow[\Delta]{P_2O_5} ?$
a) Acid anhydride b) Ketone c) Aldehyde d) Ester

604. Which of the following does not undergo Cannizaro's reaction?
a) Benzaldehyde
b) 2-methylpropanal
c) p-methoxybenzaldehyde
d) 2,2-dimethylpropanal

605. The strongest acid amongst the following compound is:
a) CH_3COOH b) HCOOH c) $CH_3CH_2CH(Cl)COOH$ d) $ClCH_2CH_2CH_2COOH$

606. Phthalic acid
$\Delta\downarrow$
$A \xrightarrow{NH_3} B \xrightarrow[H_2O]{NaOH} C \xrightarrow{Br_2/KOH} D \xrightarrow{HCl} E$

In this reaction, the product E is
a) o-nitrobenzoic acid b) Salicylic acid c) Anthranilic acid d) Crotonic acid

607. In the Lassaigne's test the Sulphur present in the organic compound first changes into:
a) Na_2SO_3 b) CS_2 c) Na_2SO_4 d) Na_2S

608. Which of the following statements is correct about a carbonyl group?
a) The carbonyl carbon is sp-hybridised
b) The carbonyl carbon is sp^3-hybridised
c) The three groups attached to the carbonyl carbon lie in the same plane
d) The three groups attached to the carbonyl carbon lie in different planes

609. Formaldehyde and formic acid can be distinguished by:
a) Tollen's reagent b) Fehling's solution c) Ferric chloride d) $NaHCO_3$

610. Oxidation of which compound is not possible?
a) $CH_3 - COOH$ b) $CH_3 - CO - CH_3$ c) $CH_3 - CHO$ d) $CH_3 - CH_2 - OH$

611. Which type of isomerism is not common in carboxylic acid?
a) Chain b) Functional c) Metamer d) Optical

612. The acidity of the compounds $RCOOH, H_2CO_3, C_6H_5OH, ROH$ decreases in the order
a) $RCOOH > H_2CO_3 > C_6H_5OH > ROH$
b) $C_6H_5OH > RCOOH > H_2CO_3 > ROH$
c) $ROH > C_6H_5OH > RCOOH > H_2CO_3$
d) $H_2CO_3 > RCOOH > C_6H_5OH > ROH$

613. Which one of the following will undergo *meta*-sustitution on monochlorination?
a) Ethoxybenzene b) Chlorobenzene c) Ethyl benzoate d) Phenol

614. When acetamide is hydrolysed by boiling with acid, the product obtained is

a) Acetic acid b) Ethyl amine c) Ethanol d) acetamide

615. $CH_3COOH \xrightarrow{Br_2/P} Y \xrightarrow[(ii)H_3O^+]{(i)KCN} X$ Here, X is

a) Glycollic acid
b) α −hydroxy propionic acid
c) Succinic acid
d) Malonic acid

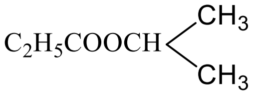
616. Lemon is sour due to:
a) Citric acid b) Tartaric acid c) Oxalic acid d) Acetic acid

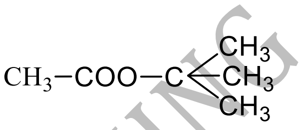
617. Both acetaldehyde and ketone react with:
a) Ammoniacal $AgNO_3$
b) Rochelle salt
c) 2,4-dinitro phenylhydrazine
d) All of the above

618. Self condensation of two moles of ethyl acetate in presence of sodium ethoxide yields:
a) Methyl acetoacetate b) Ethyl propionate c) Ethyl butyrate d) Acetoacetic ester

619. $Me_2CHCOC_2H_5 \xrightarrow[Villiger]{Baeyer}$? Productc

a) $Me_2CHCOOC_2H_5$

b)


c)


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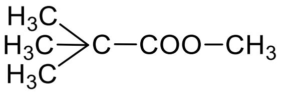
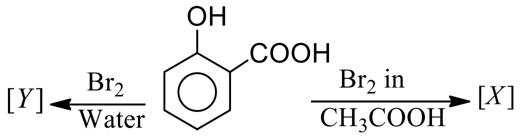
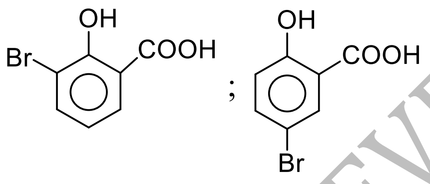
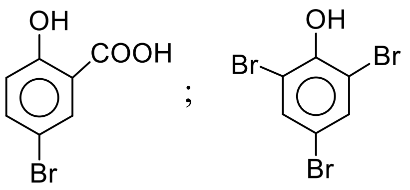


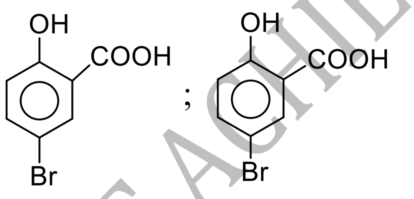
620. Salicylic acid is treated with bromine under two different conditions.

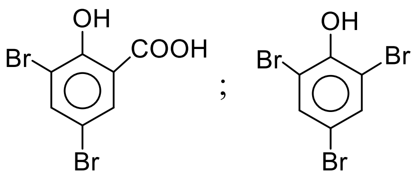


Predict the nature of $[X]$ and $[Y]$ in the above reactions,

a)


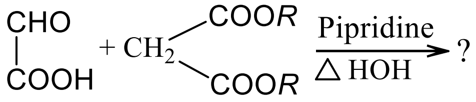
b)


c)


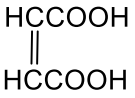
d)


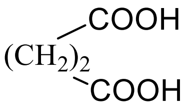
621. Acetic acid on warming with hydrazoic acid in presence of conc. H_2SO_4 gives:
a) CH_3CONH_2 b) CH_3NH_2 c) CH_3COONH_4 d) $CH_3CH_2NH_2$

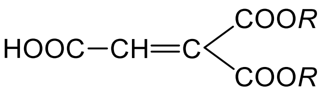
622. Electrolytic reduction with lead cathode of oxalic acid yields:
a) Glycollic acid
b) Glyoxalic acid
c) Glycollic acid + glyoxalic acid
d) CH_3COOH

623.


Final product and the name of the reaction is

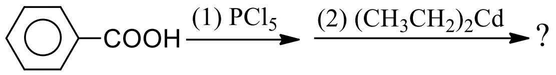
a) 
$\begin{matrix}HCCOOH\\ \|\\ HCCOOH\end{matrix}$ Knoevengel

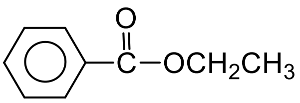
b) 
$(CH_2)_2(COOH)_2$ Claisen condensation

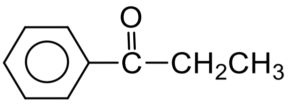
c) 
$HOOC-CH=C(COOR)_2$, Mannich

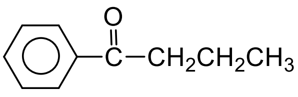
d) None of the above

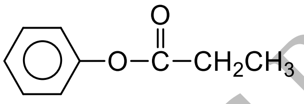
624. Complete the following reaction,



a) 

b) 

c) 

d) 

625. In the following reaction

$RCH_2COOH \xrightarrow{Br_2/P} X \xrightarrow{\text{Excess } NH_3} Y$

The major amounts of X and Y are

a) $RCHBrCONH_2; RCH(NH_2)COOH$
b) $RCHBrCOOH; RCH(NH_2)COOH$
c) $RCH_2COBr; RCH_2COONH_4$
d) $RCHBrCOOH; RCH_2CONH_2$

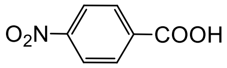
626. Benzaldehyde and acetone can be best distinguished using

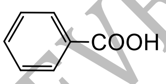
a) Fehling's solution
b) Sodium hydroxide solution
c) 2, 4-DNP
d) Tollen's reagent

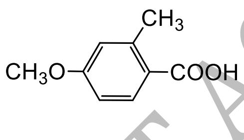
627. $CH_3COOH \xrightarrow{LiAlH_4} X \xrightarrow[300^0C]{Cu} Y \xrightarrow[NaOH]{Dilute} Z$. In the above reaction Z is

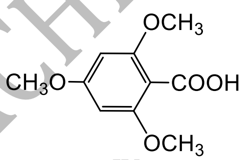
a) Butanol
b) Aldol
c) Ketol
d) Acetal

628. Give the order of ease of the esterification of the following acids


I


II


III


IV

a) I > $II > III > IV$
b) IV > $III > II > I$
c) II > $I > IV > III$
d) I > $II > III > IV$

629. Which of the following statements is/are correct?

a) Magnesium citrate is used as antacid
b) Tartar emetic is used to produce nausea and vomiting in the treatment of poisoning
c) Cream of tarter (pot. Hydrogen tartrate) is used in baking powder
d) All of the above

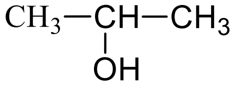
630. Which of the following reaction is a condensation reaction?

a) HCHO ⟶Para-formaldehyde
b) $CH_3CHO \longrightarrow$ Paraldehyde
c) $CH_3COCH_3 \longrightarrow$ Mesityl oxide
d) $CH_2=CH_2 \longrightarrow$ Polyethylene

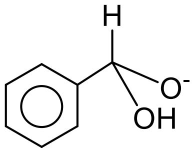
631. In Duma's method for determining the nitrogen content of an organic compound, the nitrogen content is determined in the form of:

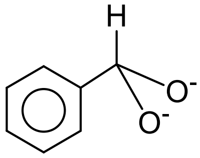
a) Gaseous NH_3 b) NaCN c) Gaseous N_2 d) $(NH_4)_2SO_4$

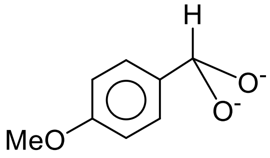
632. An organic compound containing C, H and O gives red colouration with sodium nitroprusside solution but does not reduce Tollen's reagent and yields chloroform on treating with NaOH and Cl_2. The compound is

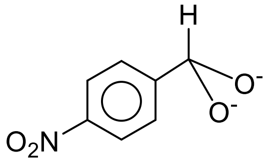
a) CH_3CH_2OH b) 
$CH_3-\underset{OH}{\underset{|}{CH}}-CH_3$ c) CH_3COCH_3 d) $(CH_3)_2CH-CHO$

633. In a Cannizaro reaction, the intermediate that will be best hydride donor is

a) 

b) 

c) 

d) 

634. 0.58 g of hydrocarbon on combustion gave 0.9 g water. The percentage of carbon is about :

a) 75.8 b) 82.7 c) 27.85 d) 68.8

635. $C_6H_5CHO + HCN \longrightarrow C_6H_5CH(CN)OH$; the product is:

a) Optically active
b) A meso compound
c) Racemate
d) Mixture of distereoisomers

636. Which is the most reactive of the following?

a) Ethyl acetate b) Acetic anhydride c) Acetamide d) Acetyl chloride

637. When acetamide is hydrolysed by boiling with acid, the product formed is:

a) Acetic acid b) Ethyl amine c) C_2H_5OH d) Acetamide

638. The most reactive compound towards formation of cyanohydrin on treatment with HCN followed by acidification is

a) Benzaldehyde b) *p*-nitrobenzaldehyde
c) Phenylacetaldehyde d) *p*-hydroxybenzaldehyde

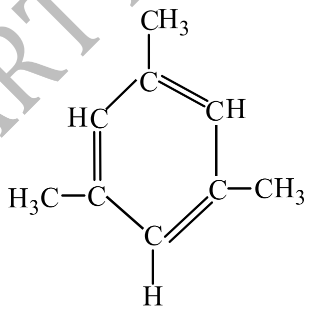
639. Which one of the following aldehydes will not form an aldol when treated with dil. NaOH?

a) CH_3CHO b) CH_3CH_2CHO c) $(CH_3)_3CCHO$ d) $C_6H_5CH_2CHO$

640. Wacker method is used to convert alkene into corresponding………using $PbCl_2$

a) Alcohol b) Ketone c) Aldehyde d) Acid

641. The figure given below describes a condensation polymer which can be obtained in two ways. Either treating 3 molecules of acetone (CH_3COCH_3) with conc. H_2SO_4or passing propyne ($CH_3C≡CH$) through a red hot tube. The polymer is:



a) Phorone b) Mesityl oxide c) Diacetonyl alcohol d) Mesitylene

642. 0.5 g of an organic compound containing nitrogen on Kjeldahlising required 29 mL of $N/5$ H_2SO_4 for complete neutralization of ammonia. The percentage of nitrogen in the compound is:

a) 34.3 b) 16.2 c) 21.6 d) 14.8

643. A nitrogen containing organic compound gave an oily liquid on heating with bromine and potassium hydroxide solution. On shaking the product with acetic anhydride, an antipyretic drug was obtained. The

reactions indicate that the starting compound is

a) Aniline b) benzamide c) acetamide d) nitrobenzene

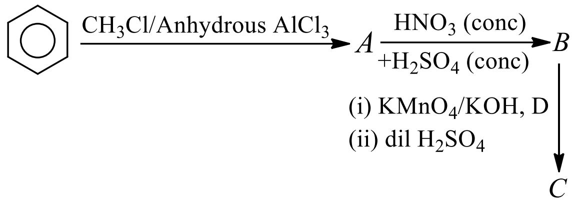
644. Acid hydrolysis of *X* yields two different organic compounds. Which one of the following is *X*?

a) CH_3COOH b) CH_3CONH_2 c) $CH_3COOC_2H_5$ d) $(CH_3CO)_2O$

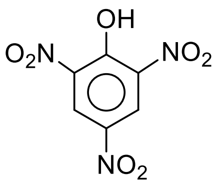
645. An alcohol, on oxidation, produces a ketone with the same number of carbon atoms. When the ketone is oxidized, it yields an acid with a lesser number of carbon atoms. The alcohol could be a

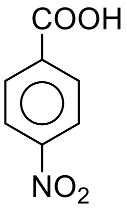
a) Primary alcohol b) Secondary alcohol c) Tertiary alcohol d) None of these

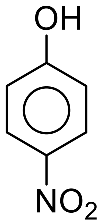
646.

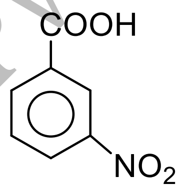


In this reaction, C is

a) 

b) 

c) 

d) 

647. At room temperature formaldehyde is :

a) Gas b) Liquid c) Solid d) None of these

648. Positive Beilstein test shows that:

a) Halogens are surely present
b) Halogens are absent
c) Halogens may be present
d) None of the above

649. Among the following, the most acidic is

a) CH_3COOH b) $ClCH_2COOH$ c) $Cl_2CHCOOH$ d) Cl_2CHCH_2COOH

650. In question 178 step (4) cab be carried out with $NaNO_2$ + dil. HCl. The other products of the step are:

a) NO_2 b) NH_3 c) $N_2 + H_2O$ d) RCH_2NO_2

651. In question 178 an intermediate involved in step (3) is:

a) $R—CH_2CO_2H$ b) $R—CH_2COONH_4$ c) $R—CH_2CN$ d) $R—CH_2—N=C=O$

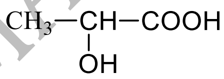
652. Acetyl chloride is reduced to acetaldehyde by:

a) $Na—C_2H_5OH$ b) $LiAlH_4$ c) $H_2/Pd—BaSO_4$ d) H_2/Ni

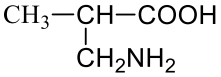
653. The compound having least solubility in water is:

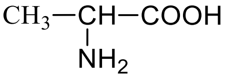
a) Methanol b) Acetaldehyde c) Acetone d) Acetophenone

654. 2-bromopropanoic acid when heated with alcoholic KCN gives an organic compound which on further acid hydrolysis gives the compound A. Hence, A will be:

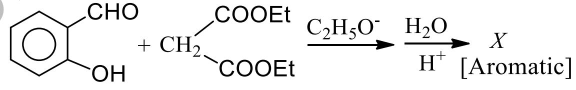
a) 
$CH_3-\underset{\underset{OH}{|}}{CH}-COOH$

b) $CH_3CH(COOH)_2$

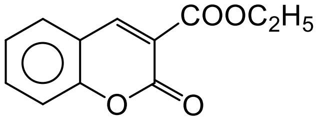
c) 
$CH_3-\underset{\underset{CH_2NH_2}{|}}{CH}-COOH$

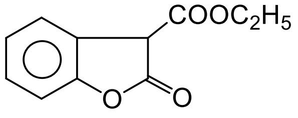
d) 
$CH_3-\underset{\underset{NH_2}{|}}{CH}-COOH$

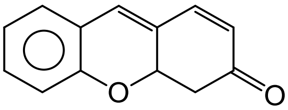
655.

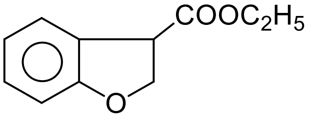


Identify the final product X

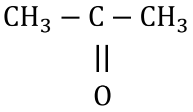
a) 

b) 

c) 

d) 

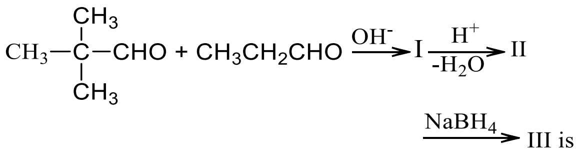
656. $RCOOH \longrightarrow RCH_2OH$. This mode of reduction of an acid to alcohol can be affected only by:
   a) Zn/HCl
   b) Na-alcohol
   c) Aluminium isopropoxide and isopropyl alcohol
   d) $LiAlH_4$

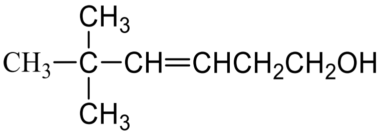
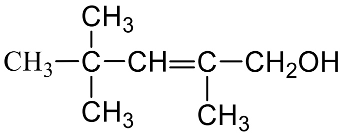
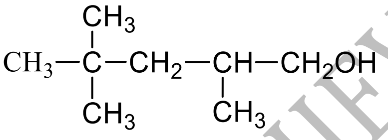
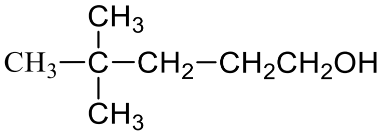
657. An organic compound X is oxidised by using acidified $K_2Cr_2O_7$. The product obtained reacts with phenyl hydrazine but does not answer silver mirror test. The possible structure of X is
   a) CH_3CH_2OH
   b) 
   $CH_3-\underset{\underset{O}{||}}{C}-CH_3$
   c) $(CH_3)_2CHOH$
   d) CH_3CHO

658. Formic acid reduces ammoniacal $AgNO_3$ solution and Fehling's solution because:
   a) All organic acids do so
   b) Formic acid has aldehyde like structure
   c) Formic acid is an aliphatic acid
   d) None of the above statement is correct

659. Vapour density of a volatile substance is $4(CH_4 = 1)$. Its molecular weight would be:
   a) 8
   b) 2
   c) 64
   d) 128

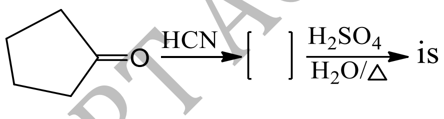
660. The final product (III) obtained in the reaction

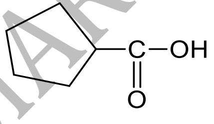
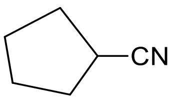
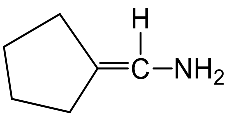
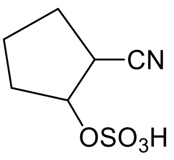


   a) 
   b) 
   c) 
   d) 

661. Which one of the following compounds, each with two carbons will have the highest boiling point?
   a) C_2H_5OH
   b) $CH_3—O—CH_3$
   c) CH_3COOH
   d) CH_3CHO

662. The major product obtained in the reaction



   a) 
   b) 
   c) 
   d) 

663. In organic chemistry the element which is estimated by difference:
   a) N
   b) O
   c) S
   d) H

664. In estimation of carbon and hydrogen, the saphnolite resin absorbs:
   a) N_2
   b) H_2O_2
   c) CO_2
   d) CO_2 and H_2O_2

665. $(CH_2CO)_2O + RMgX \xrightarrow{H_2O} ?$
   a) $ROOC(CH_2)COOR$
   b) $RCOCH_2CH_2COOH$
   c) $RCOOR$
   d) $RCOOH$

666. Which reaction is suitable for the preparation of α −chloroacetic acid?
   a) Hell-Volhard-Zelinsky reaction
   b) Nef reaction

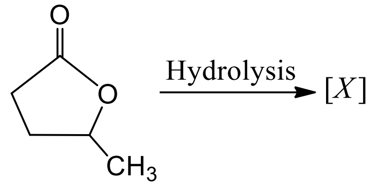
c) Stephen's reaction
d) Perkin condensation

667. A fractionating column is used in:
a) Sublimation
b) Distillation
c) Fractional distillation
d) Chromatography

668. Ni formate is best used as catalyst in:
a) Preservation of fruits
b) Esterification
c) Dyeing wool and cotton fabric
d) Hydrogenation of oil

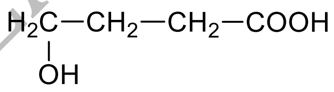
669. The term carboxylic is a contraction of two terms:
a) Carbonyl and amine
b) Carbonyl and hydroxyl
c) Hydroxyl and carboxyl
d) Carboxyl and hydroxyl

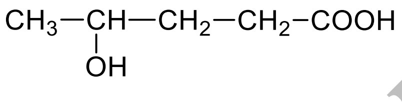
670. Boiling point of a compound does not depend on:
a) Hydrogen bonding in the compound
b) Solubility of the compound in water
c) Size of the molecule
d) Polarity of the molecule

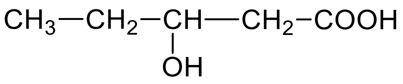
671.


What is $''X''$?

a) $CH_3 - CH_2 - CH_2 - CH_2 - COOH$

b)

$H_2C-CH_2-CH_2-COOH$ with OH below H_2C

c)

$CH_3-CH(OH)-CH_2-CH_2-COOH$

d)

$CH_3-CH_2-CH(OH)-CH_2-COOH$

672. In the following reaction,

$CH_3COCl \xrightarrow[Pd/H_2]{BaSO_4} X$

Identify X out of the following
a) Acetaldehyde
b) Propionaldehyde
c) Acetone
d) Acetic anhydride

673. Which acid is an optically active?
a) Propionic acid
b) 2-chloropropionic acid
c) 3-chloropropionic acid
d) Acetic acid

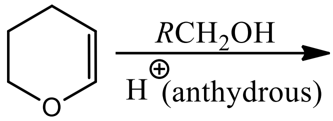
674. Two substances when separated out on the basis of their extent of adsorption by one material, the phenomenon is:
a) Chromatography
b) Paper chromatography
c) Sublimation
d) Steam distillation

675. Which of the following statement is correct?
a) o-nitrophenol can be separated from p-nitrophenol because of intermolecular hydrogen bonding in o-nitrophenol
b) m-nitrophenol vcan be separated from p-nitrophenol because of intermolecular hydrogen bonding in o-nitrophenol

c) *o*-hydroxybenzoic acid can be separated from *p*-hydrobenzoic acid because of intramolecular hydrogen bonding in *o*-hydroxybenzoic acid

d) *o*-hydroxybenzoic acid can be separated from *p*-hydrobenzoic acid because of intermolecular hydrogen bonding in *o*-hydroxybenzoic acid

676. The major product of the following reaction is



a) A hemiacetal b) An acetal c) An ether d) An ester

677. The molecular formula of chlorinated acetone produced in the distillation with bleaching powder is:

a) CH_3COCl b) CCl_3COCl_3 c) $CH_2ClCOOH$ d) CCl_3COCH_3

678. Which one of the following contains acetic acid?

a) Vinegar b) Molasses c) Coal-tar d) Butter

679. The compound which on reduction with $LiAlH_4$ gives two alcohols:

a) CH_3COOCH_3 b) $CH_3COOC_2H_5$ c) CH_3COCH_3 d) CH_3CHO

680. Salicylic acid gives a compound known as oil of winter green when treated with

a) CH_3COCl b) ϕOH c) CH_3OH d) PCl_5

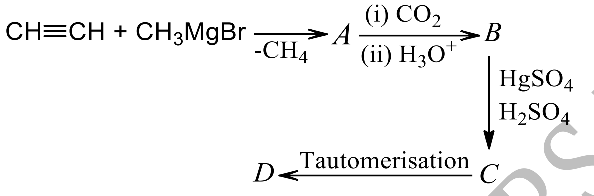
681. The compound easily soluble in water is:

a) Stearic acid b) Benzene c) Aniline d) Ethanol

682. Carbon atom of carbonyl gp. in aldehyde is of:

a) 1° b) 2° c) 3° d) None of these

683. Identify *D* in the following reaction



a) $HOOC-CH_2-COOH$ b) $OHC-CH_2-COOH$

c) $OHC-CH_2-CHO$ d) $HO-CH=CH-COOH$

684. Which reagent is useful in separating benzoic acid from phenol?

a) Dilute HCl b) Dilute H_2SO_4 c) 5% NaOH d) 5% $NaHCO_3$

685. Acetone and acetophenone can be identified by:

a) Burning the compound on spatula

b) Adding a saturated solution of $NaHSO_3$

c) HCN

d) All are correct

686. Which of the following will produce only one product on reduction with $LiAlH_4$?

a) $CH_3OCOCH_2CH_3$ b) $CH_3CH_2OCOCH_2CH_3$

c) $CH_3CH_2OCOCH_3$ d) $CH_3CH_2OCOCH_2CH_2CH_3$

687. Main product of the reaction ,

$CH_3CONH_2 + HNO_2 \longrightarrow$ ……. is :

a) CH_3COOH b) $CH_3CH_2NH_2$ c) CH_3NH_2 d) CH_3COONH_4

688. In presence of sodium ethoxide two molecules of ethyl acetate interact to form acetoacetic ester, this process is known as:

a) Aldol condensation b) Claisen condensation c) Polymerization d) None of these

689. When calcium acetate is distilled, it will produce which of the following compound?

a) CH_3COOH b) CH_3CHO c) CH_3COCH_3 d) All of these

690. The main source of organic compounds is:

a) Coal-tar b) Petroleum c) Both (a) and (b) d) None of these

691. The strongest acid is:

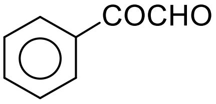
a) CH_2FCOOH b) $CH_2ClCOOH$ c) $CHCl_2COOH$ d) CHF_2COOH

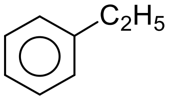
692. Which one of the following is the mechanism of hydrolysis of ethyl benzoate by refluxing with dil. Aq. NaOH solution?

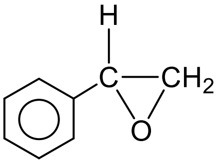
a) Acyl oxygen bond cleavage, unimolecular b) Acyl oxygen bond cleavage, bimolecular

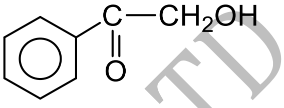
c) Alkyl oxygen bond cleavage, unimolecular d) Alkyl oxygen bond cleavage, bimolecular

693. $\phi COCH_3 \xrightarrow[\text{(ii)LAH}]{\text{(i)}Br_2\text{1 eq.}} [X] \xrightarrow{OH^-} [Y]$. Here Y is

a) 

b) 

c) 

d) 

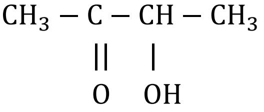
694. Formaldehyde can be distinguished from acetaldehyde by:

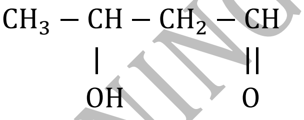
a) Fehling's solution b) Schiff's reagent c) Ammonia d) Ammoniacal $AgNO_3$

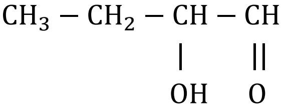
695. 20 mL of CH_4 is burnt with 60 mL of O_2. If all measurements are made at the same P and T, what is the volume of unreacted oxygen?

a) 10 mL b) 20 mL c) 30 mL d) 40 mL

696. The aldol condensation of CH_3-CHO results in the formation of

a) 
$CH_3-\underset{\underset{O}{\|}}{C}-\underset{\underset{OH}{|}}{CH}-CH_3$

b) 
$CH_3-\underset{\underset{OH}{|}}{CH}-CH_2-\underset{\underset{O}{\|}}{CH}$

c) 
$CH_3-CH_2-\underset{\underset{OH}{|}}{CH}-\underset{\underset{O}{\|}}{CH}$

d) $CH_3-CH_2OH+CH_3OH$

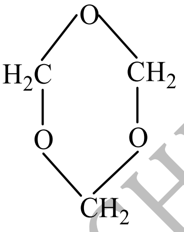
697. Oxalic acid may be distinguished from tartaric acid by:

a) $NaHCO_3$

b) Ammoniacal silver nitrate

c) Litmus paper

d) Phenolphthalein

698. The polymer  is obtained

When HCHO is allowed to stand. It is a white solid. The polymer is:

a) Trioxane b) Formose c) Para formaldehyde d) Metaldehyde

699. Aldehydes are produced in atmosphere by:

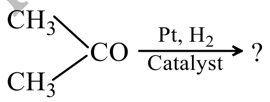
a) Oxidation of secondary alcohols

b) Reduction of alkenes

c) Reaction of oxygen atoms with hydrocarbons

d) Reaction of oxygen atoms with O_3

700. Main product of the reaction is,


$(CH_3)_2CO \xrightarrow[\text{Catalyst}]{Pt,\ H_2} ?$

a) $CH_3COOH+H_2$ b) CH_3CH_2COOH c) $CH_3CH(OH)CH_3$ d) CH_3CH_2OH

701. Which is not an organic compound?

a) Hexane b) Urea c) Spirit d) Ammonium cyanate

702. In organic compound phosphorus is estimated as:

a) Magnesium pyrophosphate $Mg_2P_2O_7$

b) H_3PO_4

c) $Mg_3(PO_4)_2$
d) P_2O_5

703. Wolff-Kishner reduction, reduces
a) $-COOH$ group b) $-C \equiv C-$ group c) $-CHO$ group d) $-O-$ group

704. $RMgX$ on reaction with O_2 followed by hydrolysis gives:
a) RH b) $RCOOH$ c) ROR d) ROH

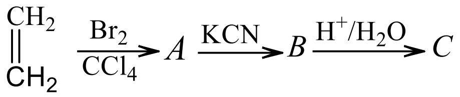
705. Aldehyde with $NH_2.NH_2$ forms
a) Hydrazones b) Aniline c) Nitrobenzene d) None of these

706. Steam distillation is a better method of purification for…..compounds.
a) Liquids b) Steam volatile c) Non-volatile d) Miscible with water

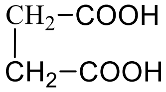
707. On mixing ethyl acetate with aqueous sodium chloride, the composition of the resultant solution is
a) $CH_3COOC_2H_5 + NaCl$
b) $CH_3COONa + C_2H_5OH$
c) $CH_3COCl + C_2H_5OH + NaOH$
d) $CH_3Cl + C_2H_5COONa$

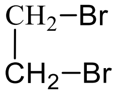
708. Liquid benzene burns in oxygen according to $2C_6H_6 + 15O_2 \longrightarrow 12CO_2\ (g) + 6H_2O\ (g)$. How many litre of O_2 at STP are needed to complete the combustion of 39 g of liquid benzene?
a) 11.2 litre b) 22.4 litre c) 84 litre d) 74 litre

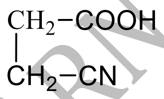
709. The final product of the following sequence of reaction is

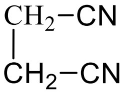


$$CH_2{=}CH_2 \xrightarrow[CCl_4]{Br_2} A \xrightarrow{KCN} B \xrightarrow{H^+/H_2O} C$$

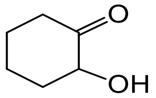
a) 
CH_2-COOH | CH_2-COOH

b) 
CH_2-Br | CH_2-Br

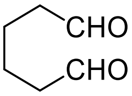
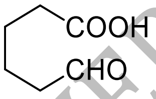
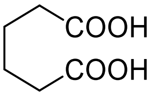
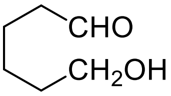
c) 
CH_2-COOH | CH_2-CN

d) 
CH_2-CN | CH_2-CN

710. The product obtained when



is oxidized with HIO_4

a) 
b) 
c) 
d) 

711. Identify Z in the series,

$$CH_3CHO \xrightarrow[Dil.H_2SO_4]{MnO_4^-} X \xrightarrow{SOCl_2} Y \xrightarrow[Heat]{CH_3COONa} Z:$$

a) $CH_3 \cdot CO \cdot CH_2COONa$
b) $(CH_3CO)_2O$
c) $CH_2Cl \cdot CO \cdot O \cdot COCH_3$
d) $CHCl_2CO \cdot O \cdot COCH_3$

712. When an acyl chloride is heated with Na salt of a carboxylic acid, the product is an
a) ester b) Anhydride c) Alkene d) Aldehyde

713. Which produces NH_3 on reaction with caustic soda?
a) Ethyl amine b) Dimethyl amine c) Acetamide d) Aniline

714. The IUPAC name of crotonaldehyde is:
a) Propenal b) But-2-en-l-al c) Butan-2-en-l-al d) None of these

715. The elimination of CO_2 from a carboxylic acid is known as:
a) Hydration b) Dehydration c) Decarboxylation d) Carboxylation

716. Oxidation product of 'X' (molecular formula C_3H_6O) is 'y'(molecular formula $C_3H_6O_2$). The compound 'y' is :
a) Acetic acid b) Formic acid c) Propionic acid d) Butyric acid

717. HVZ reaction leads to the formation of:
a) Acetic acid
b) Formic acid

c) Chlorosubstituted acids
d) Oxalic acid

718. Which of the following acids acts as reducing agent?
a) COOH—COOH b) Tartaric acid c) Formic acid d) All of these

719. Which part of —COOH group is involved in the reaction of acid with metals?
a) Only H-atom b) Only —OH part c) Both (a) and (b) d) None of these

720. HCHO and HCOOH are distinguished by treating with:
a) Tollen's reagent b) $NaHCO_3$ c) Fehling's solution d) Benedict solution

721. Formula of diacetone alcohol is:
a) $(CH_3)_2C(OH)CH_2COCH_3$
b) $CH_3CHOHCH_2COCH_3$
c) $(CH_3)_2CHOHCH_2COCH_3$
d) None of the above

722. Mercuric chloride is reduced to mercurous chloride by:
a) Acetic acid b) Carbon tetrachloride c) Formic acid d) Ammonia

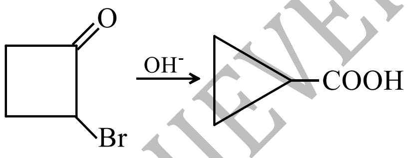
723. An organic compound containing C,H and N have the percentage 40, 13.33 and 46.67 respectively. Its empirical formula may be:
a) C_2H_7N b) $C_2H_7N_2$ c) CH_4N d) CH_5N

724. Pick up the correct statement from the following:
a) Secondary alcohols are oxidized to ketones in which the number of carbon atoms remains unchanged
b) TEL is a good anti-knock compound
c) Both aldehydes and ketones use sp^2-hybrid carbon atoms for their formation
d) All of the above

725. Name the end product in the following series of reactions,
$CH_3COOH \xrightarrow{NH_3} A \xrightarrow{\Delta} B \xrightarrow{P_2O_5} C$:
a) CH_4 b) CH_3OH c) Acetonitrile d) Ammonium acetate

726. Certain unripe fruits like green apples and plums contain:
a) H_2SO_4 b) HCl c) CH_3COOH d) Malic acid

727. The reaction



is an example of:
a) Wolf rearrangement
b) Favorskii rearrangement
c) Steven's rearrangement
d) Wagner-Meerwin rearrangement

728. Which of the following is least acidic?
a) C_2H_5OH b) CH_3COOH c) C_6H_5OH d) $ClCH_2COOH$

729. For a compound to be purified by steam distillation:
a) Impurities must be non-volatile
b) The liquid must be completely immiscible with water
c) The vapour pressure of the liquid must be sufficiently high
d) All of the above are correct

730. Acetone + mercaptan $\xrightarrow{HCl} X \xrightarrow{4[O]} Y$; Identify `$Y$' in the above sequence
a) Sulphonal b) Trional c) Tetronal d) None of these

731. Amides are:
a) Amphoteric b) Acidic c) Basic d) Neutral

732. Silica gel is used for keeping away the moisture because it:
a) Absorbs H_2O b) Adsorbs H_2O c) Reacts with H_2O d) None of these

733. Consider the acidity of the carboxylic acids

(i) PhCOOH (ii) o $-$ $NO_2C_6H_4COOH$

(iii)$p - NO_2C_6H_4COOH$ (iv)$m - NO_2C_6H_4COOH$

Which of the following order is correct?

a) I > II > III > IV b) II > IV > III > I c) II > IV > IN >III d) II > III > IV > I

734. Benzaldehyde on refluxing with aqueous alcoholic KCN produce

a) Cyanobenzene b) Cyanohydrin c) Benzoyl cyanide d) Benzoin

735. A bottle containing two immiscible liquids is given to you. These may be separated by:

a) Fractionating column b) Separating funnel c) Fractional distillation d) Steam distillation

736. Which of the following is obtained by the oxidation of propionaldehyde?

a) Acetic acid
b) Formic and acetic acid
c) Propionic acid
d) n-propyl alcohol

737. Acetaldehyde and acetone differ in their reaction with:

a) $NaHSO_3$ b) NH_3 c) PCl_5 d) Phenyl hydrazine

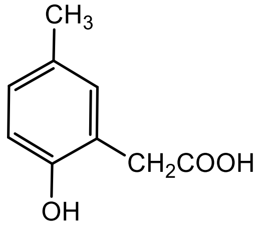
738. Which of the following reactions can be used to change benzaldehyde to cinnamic acid?

a) Perkin's reaction b) Knoevenagel reaction
c) Reformatsky reaction and ketones d) Benzoin condensation

739. In the estimation of nitrogen by Duma's method 1.18 g of an organic compound gave 224 mL of N_2 at NTP. The percentage of nitrogen in the compound is about:

a) 20.0 b) 11.8 c) 47.5 d) 23.7

740. p-cresol reacts with chloroform in alkaline medium to give the compound A which adds hydrogen cyanide to form the compound B. The latter on acidic hydrolysis gives chiral carboxylic acid. The structure of the carboxylic acid is

a)


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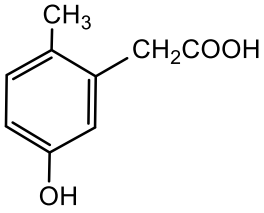

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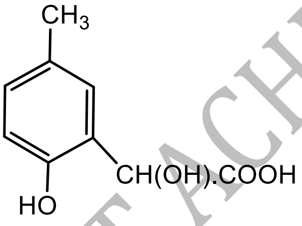

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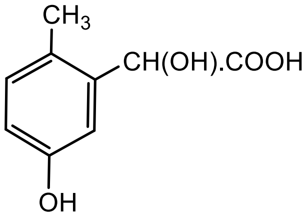


741. Butan-2-one can be converted to propanoic acid by:

a) Tollen's reagent b) Fehling's solution c) $NaOH/I_2/H^+$ d) $NaOH/NaI/H^+$

742. By passing water gas ($CO + H_2$) through an electric discharge at low pressure, we get:

a) HCHO b) HCOOH c) CH_3CHO d) CO_2 and H_2O

743. An organic compound $C_5H_{10}O$ forms phenyl hydrazone, gives positive iodoform test and undergoes Wolff Kishner reaction to give isopentane. It is:

a) Pentanol b) Pentan-2-one c) Pentan-3-one d) 3-methylbutan-2-one

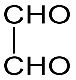
744. Consider the reaction:

$RCHO + NH_2NH_2 \longrightarrow RCH = N—NH_2$

What sort of reaction is it?

a) Electrophilic addition – elimination reaction
b) Free radical addition – elimination reaction
c) Electrophilic substitution – elimination reaction
d) Nucleophilic addition – elimination reaction

745. Lindlar's catalyst is:
a) $Ni + BaSO_4$ b) $Pd—CaCO_3 + BaSO_4$ c) $Hg + BaSO_4$ d) $Ni + ZnSO_4$

746. In a Cannizaro's reaction, the combination not possible is
a) $HCHO + HCHO$ b) $C_6H_5CHO + HCHO$ c) $CH_3CHO + HCHO$ d)

$\begin{array}{c} CHO \\ | \\ CHO \end{array}$

747. When propanone reacts with chlorine, it forms:
a) Trichloro propanone
b) Hexachloro propanone
c) Trichloro ethanol
d) Trichloro propanal

748. Benzyl alcohol and sodium benzoate is obtained by the action of sodium hydroxide on benzaldehyde. This reaction is known as
a) Perkin's reaction b) Cannizaro's reaction
c) Sandmeyer's reaction d) Claisen condensation

749. The structural formula of the compound isomeric with acetone is:
a) CH_3CH_2CHO b) CH_3CHO c) CH_3CH_2OH d) None of these

750. An organic compound contains, C, H and S. When C and H are to be estimated the combustion tube at the exit should contain a:
a) Copper spiral b) Silver spiral c) Potassium chloride d) Lead chromate

751. In the preparation of an ester the commonly used dehydrating agent is:
a) Phosphorus pentoxide
b) Anhydrous calcium chloride
c) Anhydrous aluminium chloride
d) Concentrated sulphuric acid

752. A compound A has a molecular formula C_2Cl_3OH. It reduces Fehling's solution and on oxidation, gives a monocarboxylic acid B. A can be obtained by the action of chlorine on ethyl alcohol. A is
a) Chloroform b) Chloral
c) Methyl chloride d) Monochloroacetic acid

753. In glycine the basic group is:
a) $—NH_2$ b) $—NH_3^{\oplus}$ c) $—COOH$ d) $—COO^{\ominus}$

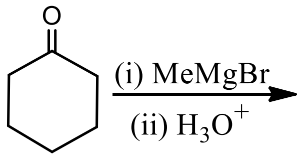
754. 3-hydroxybutanal is formed when (X) reacts with (Y) in dilute (Z) solution. What are X, Y and Z?

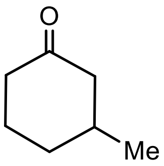
	X	Y	Z
a)	CH_3CHO,	$(CH_3)_2CO$,	NaOH
b)	CH_3CHO,	CH_3CHO,	NaCl
c)	$(CH_3)_2CO$,	$(CH_3)_2CO$,	HCl
d)	CH_3CHO,	CH_3CHO,	NaOH

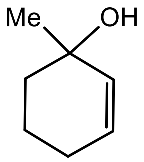
755. Which of the following have high melting points?
a) Acids containing even number of carbon atoms
b) Acids containing odd number of carbon atoms
c) Both (a) and (b)
d) None of the above

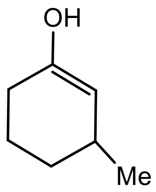
756. $A \xrightarrow{HCN} B \xrightarrow{H_3O^+}$ lactic acid. Identify A
a) HCHO b) CH_3CHO c) C_6H_5CHO d) CH_3COCH_3

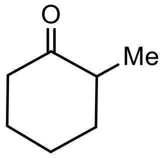
757. Predict the product,



a) 

b) 

c) 

d) 

758. The reverse of esterification is known as:

a) Acidolysis b) *trans*-esterification c) Hydrolysis d) Neutralization

759. Identify the reaction which is used to obtain β-hydroxy ketone.

a) Condensation reaction b) Aldol condensation
c) Cross aldol condensation d) Cannizaro reaction

760. 0.14 g of an acid required 12.5 mL of 0.1 N NaOH for complete neutralization. The equivalent weight of the acid is:

a) 45 b) 56 c) 63 d) 112

761. Which of the following contains pungent odour?

a) Esters b) Higher aldehydes c) Lower aldehydes d) None of these

762. Which of the following cannot reduce Fehling solution?

a) HCOOH b) H_3CCOOH c) HCHO d) H_3CCHO

763. Which of the following on treatment with 50% *aq*. NaOH gives alcohol and acid?

a) C_6H_5CHO b) $CH_3CH_2CH_2CHO$ c) CH_3COCH_3 d) $C_6H_5CH_2CHO$

764. The reaction $C_6H_5CHO + CH_3CHO \longrightarrow C_6H_5CH{=}CHCHO + H_2O$ is called:

a) Benzoin condensation
b) Claisen condensation
c) Aldol condensation
d) Condensation

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

a) Benzene carbaldehyde b) *p*-toluene carbaldehyde
c) Phenylethanal d) 4-methoxyhbenzaldehyde

766. When acetaldehyde is heated with Fehling solution, a red precipitate is formed. Which of the following is that?

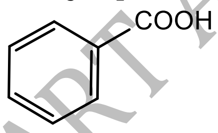
a) Cu_2O b) Cu c) CuO d) $CuSO_4$

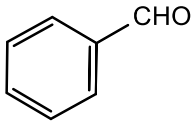
767. Benzaldehyde reacts with ammonia to form

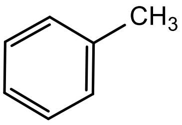
a) Benzaldehyde ammonia b) Urotropine
c) Hydrobenzamide d) Ammonium chloride

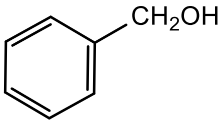
768. The reactant (X) in the reaction,

$(X)\xrightarrow[(CH_3CO)_2O]{CH_3COONa}$ Cinnamic acid is

a) 

b) 

c) 

d) 

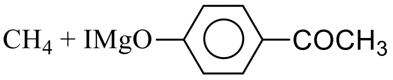
769. Ketones are less reactive than aldehydes because:

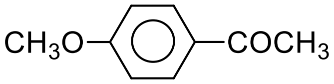
a) C=O group is less polar in ketones
b) Of electromeric effect
c) Of steric hindrance to the attacking reagent
d) None of the above

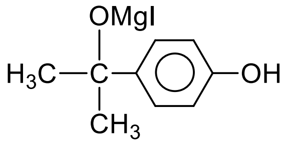
770. Dialkyl cadmium reacts with a compound to form a ketone. The compound is:

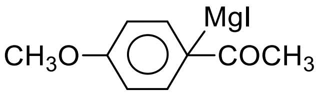
a) Acid b) Acid chloride c) Ester d) CO

771. The reaction of 1 mole each of *p*-hydroxyacetophenone and methyl magnesium iodide will give

a) 

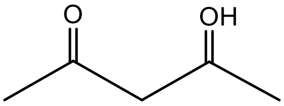
b) 

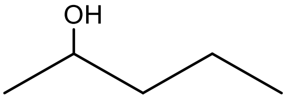
c) 

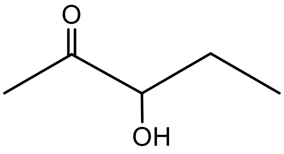
d) 

772. Which of the following has the most acidic hydrogen?
a) 3-hexanone
b) 2,4-hexanedione
c) 2,5-hexanedione
d) 2,3-hexanedione

773. Which of the following will be most readily dehydrated under acidic conditions?

a) 

b) 

c) 

d) 

774. Sodium salt of formic acid on strong heating followed by acid hydrolysis yields:
a) HCHO
b) HCOOH
c) COOH—COOH
d) CH_3CHO

775. $RCOOH \xleftarrow{H_2O^+} X \xrightarrow{[H]} RCH_2NH_2$
Identify the X in the above sequence
a) Alkane nitrile
b) Alkyl isonitrile
c) Aldoxime
d) Alkyl nitrile

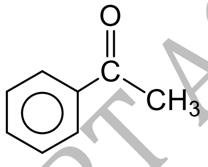
776. Which of the following acids has the smallest dissociation constant?
a) $CH_3CHFCOOH$
b) $FCH_2\ CH_2\ COOH$
c) $BrCH_2CH_2COOH$
d) $CH_3CHBrCOOH$

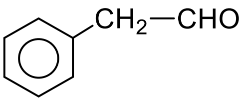
777. Salol (phenyl salicylate) is used as an:
a) Insecticide
b) Analgesic
c) Ointment
d) Intestinal antiseptic

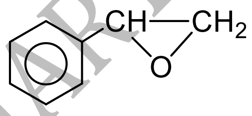
778. Aldehydes and ketones will not form crystalline derivatives with:
a) $NaHSO_3$
b) Phenyl hydrazine
c) Semicarbazide hydrochloride
d) Dihydrogen sodium phosphate

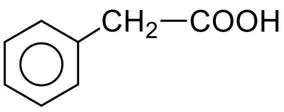
779. Pyruvic acid is obtained by
a) Oxidation of acetaldehyde cyanohydrin
b) Oxidation of formaldehyde cyanohydrin
c) Oxidation of acetone cyanohydrin
d) None of the above

780. A compound (A) (molecular formula – C_8H_8O) on treatment with $NH_2OH \cdot HCl$ gives B and C rearrange to give D and E respective on treatment with acid. B, C, D and E are all isomers of molecular formula (C_8H_9NO). When D is boiled with the alcoholic KOH, an oil F (C_6H_7N) separates out. F reacts rapidly with CH_3COCl to give back D. On the other hand, E on boiling with alkali followed by acidification gives a white solid $G(C_7H_6O_2)$. Identify A

a) 

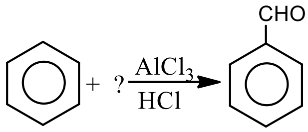
b) 

c) 

d) 

781. On mixing ethyl acetate with aqueous sodium chloride, the composition of the resultant solution is
a) $CH_3COOC_2H_5 + NaCl$
b) $C_3COONa + C_2H_5OH$
c) $CH_3COCl + C_2H_5OH + NaOH$
d) $CH_3Cl + C_2H_5COONa$

782.



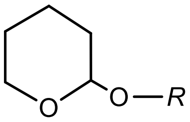
Identify the reactant.
a) H_2O
b) HCHO
c) CO
d) CH_3CHO

783. Carbon atom of carbonyl gp. in ketone is of:
a) 1° b) 2° c) 3° d) None of these

784. Formic acid is not a representative member of the carboxylic acids because:
a) It is the first member of the series
b) It does not contain alkyl group
c) It is a gas
d) It contains an aldehydic group while the other acids do not have the aldehydic group

785. $CH_3CHO + H_2NOH \longrightarrow CH_3—CH=N—OH$ The above reaction occurs at:
a) pH = 1 b) pH = 4.5 c) Any value of pH d) pH = 12

786. β-hydroxy butyraldehyde is an example of:
a) Aldol b) Diol c) Hemiacetal d) Acetal

787.


is

a) An ester b) An anhydride c) Acetal d) Hemiacetal

788. Hydrogenation of $C_6H_5CHOHCOOH$ over Rh — Al_2O_3 catalyst in methanol gives:
a) $C_6H_5CH_2COOH$ b) $C_6H_{11}CHOHCOOH$ c) $C_6H_5CHOHCH_2OH$ d) $C_6H_{11}CH_2COOH$

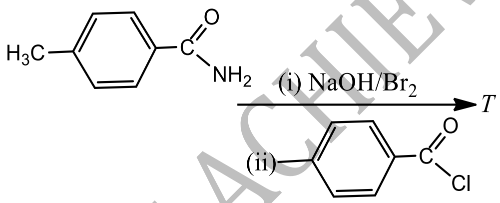
789. CH_3COCH_3 and CH_3CH_2CHO can be distinguished by
a) $FeCl_3$ b) Tollen's reagent c) $NaHSO_3$ d) 2, 4 − DNP

790. The molecular formula of methanoic acid and propanoic acid differs by:
a) C_2H_4 b) CH_3 c) CH_2 d) $CH_2CH_2CH_3$

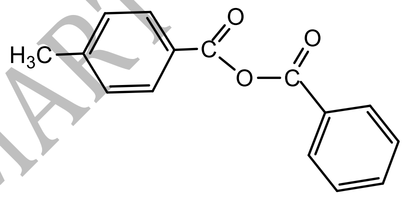
791. The most suitable method of separation of 1 : 1 mixture of *ortho* and *para* nitrophenols is:
a) Distillation b) Crystallization c) Sublimation d) Chromatography

792. Identify the product *Z* in the series,
$CH_3CN \xrightarrow{Na/C_2H_5OH} X \xrightarrow{HNO_2} Y \xrightarrow{[O]} Z$:
a) CH_3CHO b) $CH_3CH_2CONH_2$ c) CH_3COOH d) CH_3CH_2NHOH

793. Which of the following is not true about the urea?
a) It can be stored easily
b) It should be applied at sowing time
c) It cannot be used for all types of crops and soils
d) The cost of production of urea is cheap

794. In the reaction


The structure of the product *T* is

a)


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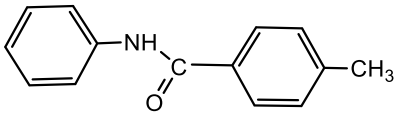

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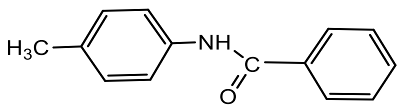

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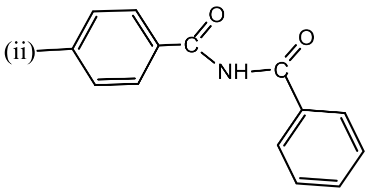


795. The term hypnone is used for:
a) Benzophenone b) Acetophenone c) Acetaldehyde d) None of these

796. The end product of $CH_3COOH \xrightarrow{CaCO_3} A \xrightarrow{Heat} B \xrightarrow{NH_2OH} C$

a) Acetaldehyde b) Acetoxime c) Formaldehydeoxime d) Methyl cyanide

797. The boiling points of aldehydes and ketones lie in between alkanes and alcohols of comparable masses because:

a) Alkanes are polar

b) Aldehydes and ketones are non-polar

c) Alkanes are non-polar and aldehydes and ketones contain polar $\rangle C=O$ group and lower alcohols have H-bonding.

d) Alkanes are held together by weak van der Waals' forces (being non-polar), aldehydes and ketones contain polar $\rangle C=O$ group and held together by strong dipole-dipole attraction and lower alcohols have H-bonding, which is stronger than dipole-dipole attraction

798. A compound (60 g) on analysis gave C=24g, H =4 g and O = 32 g. Its empirical formula is:

a) $C_2H_4O_2$ b) C_2H_2O c) CH_2O_2 d) CH_2O

799. Alkaline hydrolysis of esters is………than acid hydrolysis.

a) Faster b) Slower c) Equal d) None

800. Main product obtained from the reaction of ammonia and formaldehyde is

a) Formic acid b) Methylamine c) Methanol d) Urotropine

801. The gas evolved on heating alkali formate with soda-lime is

a) CO b) CO_2 c) Hydrogen d) Water vapour

802. 2, 4-dichlorophenoxy acetic acid is used as

a) Fungicide b) Insecticide c) Herbicide d) Moth repellant

803. Benzaldehyde undergoes Claisen's condensation with another aldehyde to give cinnamaldehyde. The aldehyde is:

a) Formaldehyde b) Acetaldehyde c) Crotonaldehyde d) Propanaldehyde

804. An organic compound *X* gives a red precipitate on heating with Fehling's solution. Which one of the following reactions yields *X* as a major product?

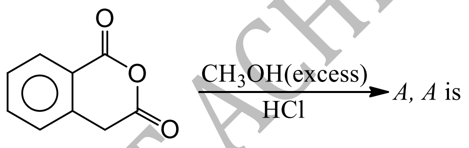
a) $HCHO \xrightarrow[\text{(ii)}H_2O]{\text{(i)}CH_3MgI}$

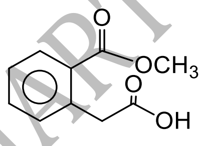
b) $C_2H_5Br + AgOH \xrightarrow{\Delta}$

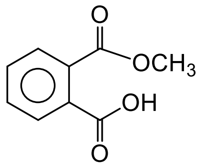
c) $2C_2H_5Br + Ag_2O \xrightarrow{\Delta}$

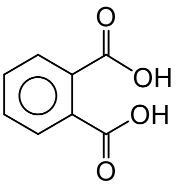
d) $C_2H_2 + H_2O \xrightarrow[1\%\ HgSO_4,\ 60^0C]{40\%\ H_2SO_4}$

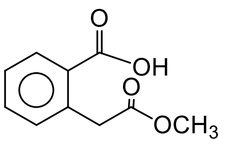
805.



a) 

b) 

c) 

d) 

806. The Cannizzaro's reaction is not given by:

a) Trimethylacetaldehyde

b) Acetaldehyde

c) Benzaldehyde

d) Formaldehyde

807. Which of the following represents the correct order of the activity in the given compounds?

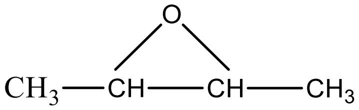
a) $CH_3COOH > BrCH_2COOH > ClCH_2COOH > FCH_2COOH$

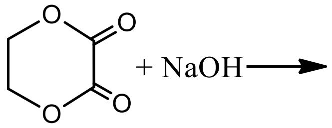
b) $FCH_2COOH > CH_3COOH > BrCH_2COOH > ClCH_2COOH$

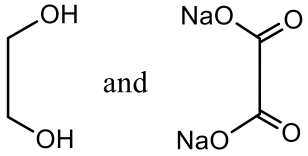
c) $BrCH_2COOH > ClCH_2COOH > FCH_2COOH > CH_3COOH$ d) $FCH_2COOH > ClCH_2COOH > BrCH_2COOH > CH_3COOH$

808. Ellution is the process for:
a) Crystallization of compound
b) Separation of compound
c) Extraction of compound
d) Distillation of compound

809. Pyroligneous acid contains:
a) 2% acetic acid b) 50% acetic acid c) 10% acetic acid d) 20% acetic acid

810.

is the anhydride in
a) 1, 2-butane diol b) 2, 2-butane diol c) 2, 3-butane diol d) 1, 1-butane diol

811.


a)


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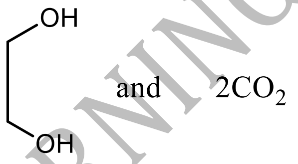

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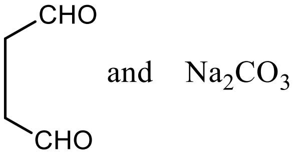

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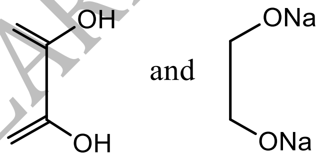
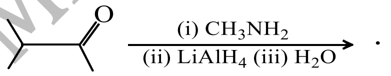


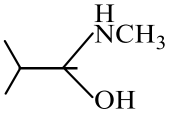
812. Consider the following reaction;
$CH_3Br + Mg \xrightarrow{Ether} A \xrightarrow{HCHO} B \xrightarrow{HOH} C$
compound C is :
a) Acetic acid b) Acetaldehyde c) Ethyl alcohol d) Formic acid

813. In the reaction sequence,
$A \xrightarrow{CH_3CH_2MgBr} B \xrightarrow{H_3O^{\oplus}} C_5H_{12}O$
Compound 'A' is
a) 1-propanol b) Propanal c) Ethanol d) 2-propanol

814. Identify Z in the sequence
$CH_3COONH_4 \xrightarrow{\Delta} X \xrightarrow[\Delta]{P_2O_5} Y \xrightarrow{H_2O/H^+} Z$

a) $CH_3CH_2CONH_2$ b) CH_3CN c) CH_3COOH d) $(CH_3CO)_2O$

815. The major organic product formed in the following reaction is:


a)

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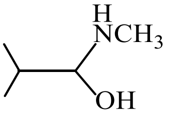
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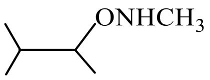
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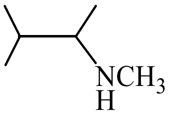
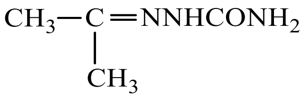
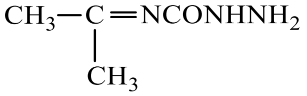


816. Compound 'A' (molecular formula C_3H_8O) is treated with acidified potassium dichromate to form a product 'B' (molecular formula C_3H_6O). 'B' forms a shining silver mirror on warming with ammoniacal silver nitrate. 'B' when treated with an aqueous solution of $H_2NCONHNH_2$. HCl and sodium acetate gives a product 'C'. Identify the structure of 'C'.
a) $CH_3CH_2CH{=}NNHCONH_2$



b) $CH_3-\underset{\displaystyle CH_3}{\underset{|}{C}}=NNHCONH_2$

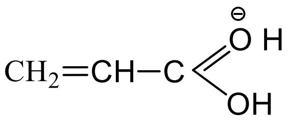


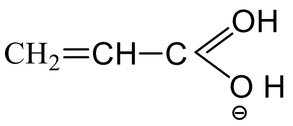
c) $CH_3-\underset{\displaystyle CH_3}{\underset{|}{C}}=NCONHNH_2$

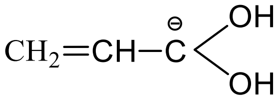
d) $CH_3CH_2CH=NCONHNH_2$

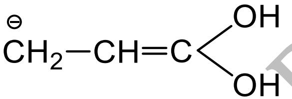
817. Which of the following intermediate species is not formed in the reaction of acrylic acid with HBr to give β-bromopropionic acid?

$(CH_2 = CH - COOH \xrightarrow{HBr} BrCH_2CH_2COOH)$?

a) 

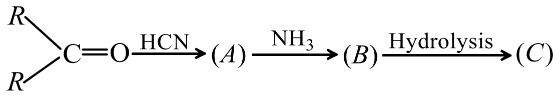
b) 

c) 

d) 

818. The oxidation of benzyl chloride with lead nitrate gives

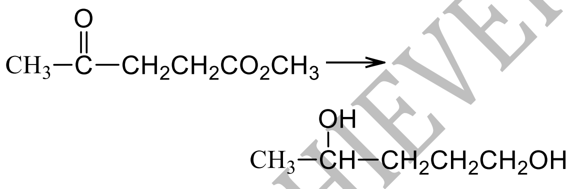
a) Benzaldehyde
b) Benzyl alcohol
c) *p*-chloro benzaldehyde
d) Benzoic acid

819. 

Compound (C) in above reaction is:

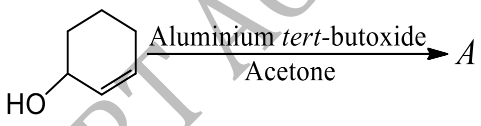
a) α-hydroxy acid
b) α-amino acid
c) α-amino alkanol
d) α-amino β-hydroxy acid

820. The conversion

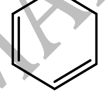


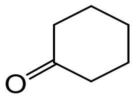
Can be effected using

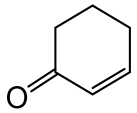
a) $LiAlH_4$ and then H^+
b) $NaBH_4$ and then H^+
c) $H_2/Pt - C$
d) None of these

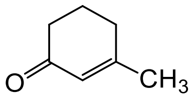
821. 

In the above reaction, A is

a) 

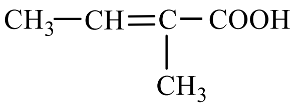
b) 

c) 

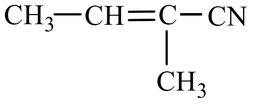
d) 

822. The major product H of the given reaction sequence is:

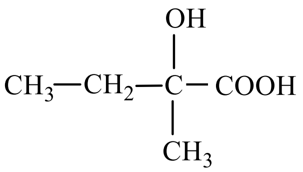
$$CH_3-CH_2-CO-CH_3 \xrightarrow{^{\ominus}CN} G \xrightarrow[\text{Heat}]{95\%H_2SO_4} H$$



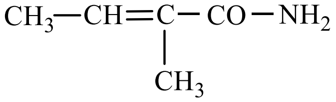
a) $CH_3-CH=\underset{\displaystyle CH_3}{\underset{|}{C}}-COOH$



b) $CH_3-CH=\underset{\displaystyle CH_3}{\underset{|}{C}}-CN$

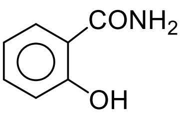
c) 

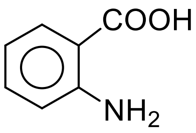
$CH_3-CH_2-C(OH)(CH_3)-COOH$

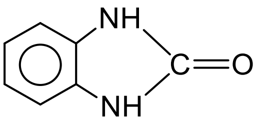
d) 

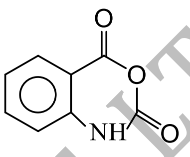
$CH_3-CH=C(CH_3)-CO-NH_2$

823. Which of the following compounds is not obtained when phthalic anhydride is treated withN_3H ?

a) 

b) 

c) 

d) 

824. Chlorine does not react with:

a) Methanal b) CH_3CHO c) Propanone d) C_6H_5CHO

825. An organic acid when heated strongly with P_2O_5, gave rise to a colourless gas which burns with a pale blue flame. The acid is:

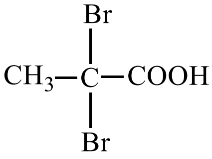
a) Acetic acid b) Formic acid c) Formalin d) Benzoic acid

826. Bakelite polymer is formed by the polymerization of

a) Methanal and salicyaldehyde b) Methanal and hydroxy benzene

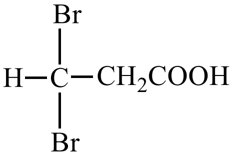
c) Ethanal and hydroxy benzene d) Ethanal and cinnamic acid

827. Propionic acid with $Br_2 | P$ yields a dibromo product. Its structure would be:

a) 

$CH_3-C(Br)_2-COOH$

b) $CH_2Br-CHBr-COOH$

c) 

$H-C(Br)_2-CH_2COOH$

d) CH_2Br-CH_2-COBr

828. The difference between aldol condensation and Cannizzaro's reaction is that:

a) The former takes place in the presence of α-H-atom

b) The former takes place in the absence of α-H-atom

c) The former takes place in the presence of β-H-atom

d) None of the above

829. Collin's reagent causes the conversion:

a) $\rangle CO \longrightarrow \rangle CHOH$ b) $\rangle CHO \longrightarrow -COOH$ c) $\rangle CHOH \longrightarrow \rangle CO$ d) $\rangle CHOH \longrightarrow -COOH$

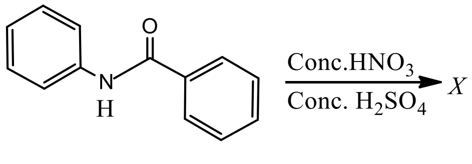
830. Cyanohydrin of which compound gives lactic acid on hydrolysis?

a) Acetone b) Acetaldehyde c) Propanal d) HCHO

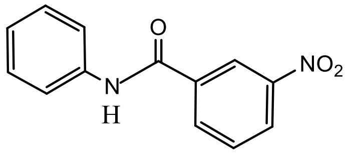
831. Arrange phenol (I), cyclohexanol (II), 2, 4, 6-trinitrophenol (III) and acetic acid (IV) in order of acidity

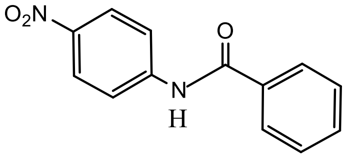
a) III>IV>I>II b) I>II>III>IV c) III>I>II>IV d) II>I>IV>III

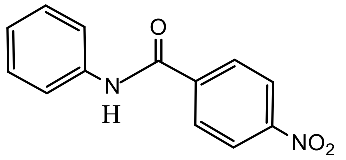
832. In the following reaction,

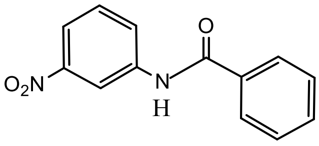


The structure of the major product *X* is

a) 

b) 

c) 

d) 

833. Preparation of β-hydroxy ester is favoured by:
- a) Cannizzaro's reaction
- b) Reformatsky reaction
- c) Claisen condensation
- d) Wittig reaction

834. The enolic form of acetone contains:
- a) 9 σ-bonds, 1π-bond and 2 lone pairs
- b) 8 σ-bonds, 2π-bond and 2 lone pairs
- c) 10 σ-bonds, 1π-bond and 1 lone pair
- d) 9 σ-bonds, 2π-bond and 1 lone pairs

835. Monocarboxylic acids (saturated) are regarded as……….oxidation products of paraffins.
a) First b) Second c) Third d) Fourth

836. Which of the following forces explain the boiling point of aldehydes and ketones?
- a) Hydrogen bonding
- b) van der Waals' forces
- c) Dipole-dipole attraction
- d) None of the above

837. Which can reduce$R\text{COOH} \rightarrow R\text{CH}_2\text{OH}$?
a) NaBH_4 b) $\text{Na/C}_2\text{H}_5\text{OH}$ c) $\text{BH}_3\text{/THF /H}_3\text{O}^+$ d) H_2/ catalyst

838. Ethanol vapours are passed over heated copper at 300°C and product is treated with aqueous NaOH. The final product is:
- a) Aldol
- b) β-hydroxy butyraldehyde
- c) Both (a) and (b)
- d) None of the above

839. The refluxing of $(\text{CH}_3)_2\text{NCOCH}_3$ with acid gives
- a) $(\text{CH}_3)_2\text{NH} + \text{CH}_3\text{COOH}$
- b) $(\text{CH}_3)_2\text{NCOOH} + \text{CH}_4$
- c) $2\text{CH}_3\text{OH} + \text{CH}_3\text{CONH}_2$
- d) $2\text{CH}_3\text{NH}_2 + \text{CH}_3\text{COOH}$

840. $\text{OCH} - \text{CHO} \xrightarrow{\text{OH}^-} \text{HOH}_2\text{C} - \text{COOH}$. The reaction given is
a) Aldol condensation b) Knovengel reaction c) Cannizaro reaction d) None of these

841. A distinctive and characteristic functional group in fat is:
a) Keto group b) Ester group c) Basic group d) None of these

842. Sodium acetamide smells like:
a) Garlic b) Rotten egg c) Pleasant d) Reminiscents of mice

843. On mixing ethyl acetate with aqueous sodium chloride, the composition of the resultant solution is:
- a) $\text{CH}_3\text{Cl} + \text{C}_2\text{H}_5\text{COONa}$
- b) $\text{CH}_3\text{COONa} + \text{C}_2\text{H}_5\text{OH}$
- c) $\text{CH}_3\text{COCl} + \text{C}_2\text{H}_5\text{OH} + \text{NaOH}$
- d) $\text{CH}_3\text{COOC}_2\text{H}_5 + \text{NaCl}$

844. The final product formed when acetaldehyde is reduced with sodium and alcohol is:

a) Ethylene b) Ethyl alcohol c) Ethene d) All of these

845. Oxalic acid when reduced with zinc and H_2SO_4 gives
a) Glyoxalic acid b) Glyoxal c) Glycolic acid d) glycol

846. Which of the following functional groups, cannot be reduced to alcohol using $NaBH_4$ in ethanolic solution?
a) $R-O-R$ b) RCOCl c) $R-COOH$ d) $R-CHO$

847. A carboxylic acid is converted into its anhydride using
a) Thionyl chloride b) Sulphur chloride
c) Sulphuric acid d) Phosphorus pentoxide

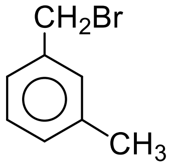
848. Ammonium formate on heating yields:
a) Ammonia
b) Formamide
c) Formic acid
d) Ammonium carbonate

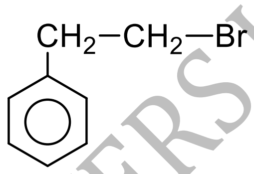
849. By combining the two calcium salts of carboxylic acids we are preparing 2-butanone. Find the correct pair of the following
a) Calcium formate + calcium propanoate b) Calcium acetate + calcium propanoate
c) Calcium acetate + calcium acetate d) Calcium formate + calcium acetate

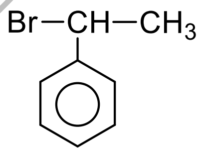
850. Aldehydes and ketones form addition products with:
a) Phenyl hydrazine b) Hydrazine c) Semicarbazide d) Hydrogen cyanide

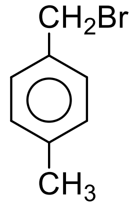
851. Lactic acid on oxidation with Fenton's reagent gives main product:
a) CH_3COOH b) $H_2C_2O_4$ c) $CH_3COCOOH$ d) None of these

852. An aromatic compound (A), C_8H_9Br reacts with $CH_2(COOC_2H_5)_2$ in then presence of C_2H_5ONa to give (B) which on refluxing with oil H_2SO_4 gives(C), a monobasic acid. (C)On vigorous oxidation gives benzoic acid. What is the structure of(A)?

a) 

b) 

c) 

d) 

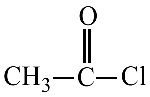
853. Urotropine has the composition:
a) $(CH_2)_4N_6$ b) $(CH_2)_5N_5$ c) $(CH_2)_6N_4$ d) $(CH_3)_6N_5$

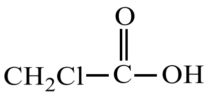
854. 0.75 g platinic chloride of a mono-acid base on ignition gave 0.245 g platinum. The molecular weight of the base is :
a) 75.0 b) 93.5 c) 100 d) 80.0

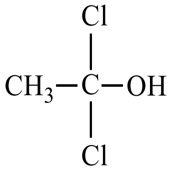
855. An aliphatic hydroxy acid is:
a) Maleic acid b) Mandelic acid c) Malonic acid d) Malic acid

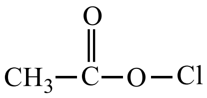
856. Carbonyl compounds when treated with sodium bisulphite solution generally a crystalline sodium bisulphite addition product is formed but which of the following carbonyl compound not forms crystalline addition product?
a) HCHO b) CH_3CHO c) CH_3COCH_3 d) $C_2H_5COC_2H_5$

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

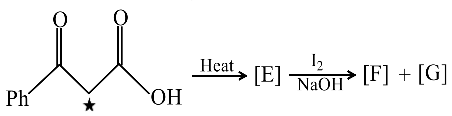
a) 
$CH_3-\overset{\overset{\displaystyle O}{\|}}{C}-Cl$

b) 
$CH_2Cl-\overset{\overset{\displaystyle O}{\|}}{C}-OH$

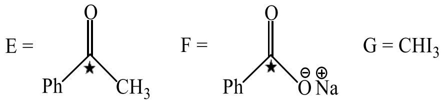
c) 
$CH_3-\underset{\underset{\displaystyle Cl}{|}}{\overset{\overset{\displaystyle Cl}{|}}{C}}-OH$

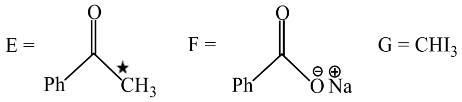
d) 
$CH_3-\overset{\overset{\displaystyle O}{\|}}{C}-O-Cl$

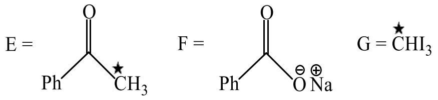
858. In the following reaction sequence, the correct structures of E, F and G are:

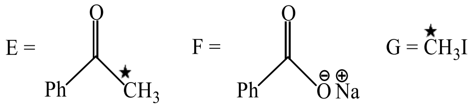


(*implies ^{13}C labelled carbon)

a) 

b) 

c) 

d) 

859. Compound having molecular formula C_3H_6O may be:
   a) Cyclic ether
   b) Carbonyl compound
   c) Unsaturated ether or unsaturated alcohol
   d) All of the above

860. In the estimation of nitrogen by Duma's method 0.59 g of an organic compound gave 112 mL nitrogen at NTP. The percentage of nitrogen in the compound is about:
   a) 23.7 b) 11.8 c) 20 d) 47.5

861. Propanone does not undergo:
   a) Oxime formation
   b) Hydrazone formation with hydrazine
   c) Cyanohydrin formation with HCN
   d) Reduction of Fehling's solution

862. $2DCDO \xrightarrow{OH^-} [X]$ and $[Y]$are
   a) $DCOO^-, D_2CHOH$ b) $HCOO^-, CH_3OH$ c) $HCOO^-, CD_3OH$ d) $DCOO^-, CD_3OH$

863. A typical compound undergoes Cannizzaro's reaction and aldol condensation. It is :
   a) $(CH_3)_2CHCHO$ b) HCHO c) C_6H_5CHO d) CH_3CHO

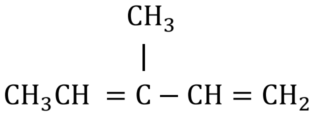
864. Formaldehyde when reacted with methyl magnesium bromide gives
   a) C_2H_5OH b) CH_3COOH c) HCHO d) CH_3CHO

865. Among the following which has lowest pK_a values:
   a) CH_3COOH b) HCOOH c) $(CH_3)_2CHCOOH$ d) CH_3CH_2COOH

866. Ethane can be obtained from ethanal in one step by:
   a) Na-Hg + water
   b) Zn-Hg + conc. HCl
   c) Aluminium isopropoxide and isopropyl alcohol
   d) $LiAlH_4$ + ether

867. The end product 'C' in the following sequence of chemical reactions is
   $CH_3COOH \xrightarrow{CaCo_3} A \xrightarrow{Heat} B \xrightarrow{NH_2OH} C$
   a) Acetaldehyde oxime b) Formaldehyde oxime c) Methyl nitrate d) Acetoxime

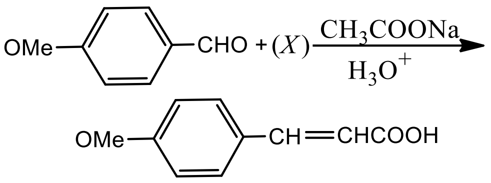
868. Which set of products is expected on reductive ozonolysis of the following diolefin?



$$CH_3CH = \overset{\overset{CH_3}{|}}{C} - CH = CH_2$$

   a) $CH_3CHO; CH_3COCH = CH_2$ b) $CH_3CH = C(CH_3)CHO; CH_2O$
   c) $CH_3CHO; CH_3COCHO; CH_2O$ d) $CH_3CHO; CH_3COCH_3; CH_2O$

869.



The compound (X) is

a) CH_3-COOH b) $BrCH_2-COOH$ c) $(CH_3CO)_2O$ d) $CHO-COOH$

870. In the sequence, $A \xrightarrow{NH_2OH} CH_3CH=NOH \xrightarrow{\text{Reduction}} B$

A and B are

a) $CH_3CH_2OH, CH_3CH_2NH_2$ b) CH_3CHO, CH_3NH-CH_3

c) $CH_3CHO, CH_3CH_2NH_2$ d) CH_3CH_2OH, CH_3NHCH_3

871. Partial oxidation of methane gives:

a) HCHO b) HCOOH c) H_2O and CO_2 d) CO and H_2O

872. Ethyl acetate is obtained when methyl magnesium bromide reacts with

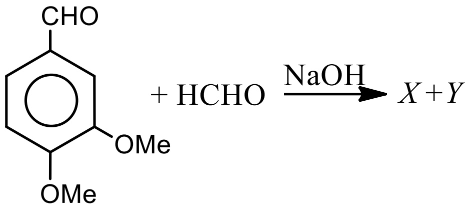
a) Ethyl formate b) Ethyl chloroformate c) Acetyl chloride d) Carbon dioxide

873. Collin's reagent is used to convert

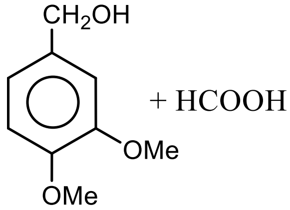
a) $>C=O \longrightarrow >CHOH$ b) $-CH_2OH \rightarrow -CHO$

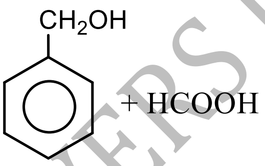
c) $-CHO \rightarrow -COOH$ d) $-CHO \rightarrow -CH_2OH$

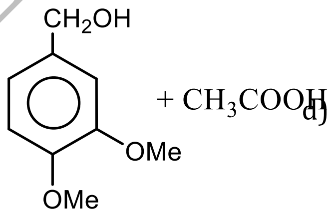
874.

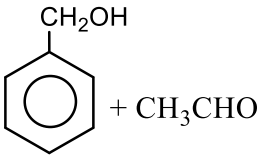


identify X and Y

a) 

b) 

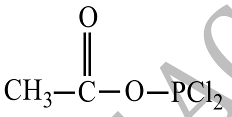
c) 

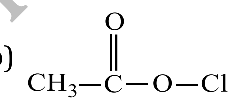
d) 

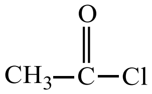
875. Which can be reduced to corresponding hydrocarbon by Zn/HCl?

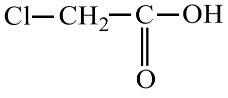
a) Butan-2-one b) Acetic acid c) Acetamide d) Ethyl acetate

876. The product obtained when acetic acid is treated with phosphorus trichloride is:

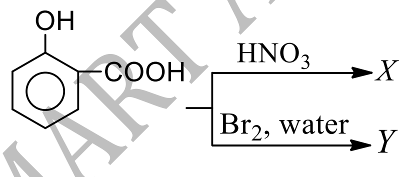
a) 
$CH_3-C(=O)-O-PCl_2$

b) 
$CH_3-C(=O)-O-Cl$

c) 
$CH_3-C(=O)-Cl$

d) 
$Cl-CH_2-C(=O)-OH$

877.



X and Y respectively are

a) Picric acid, 2, 4, 6-tribromophenol b) 5-nitrosalicylic acid, 5-bromosalicylic acid

c) *o*-nitrophenol, *o*-bromophenol d) 3, 5-dinitrosalicylic acid, 3, 5-dibromosalicylic acid

878. The final products of oxidation of isopropyl alcohol are:

a) $CH_3COCH_3 + HCOOH$

b) $CH_3CH_2COOH + HCOOH$

c) $CH_3COOH + HCOOH$

d) $CH_3COOH + CH_3CH_2COOH$

879. The main product obtained in the reaction of acetamide and HNO_2 is

a) CH_3CN b) CH_3NC c) CH_3NH_2 d) CH_3COOH

880. Which gives a ketone with a Grignard reagent?

a) Formaldehyde b) Ethyl alcohol c) Methyl cyanide d) Methyl iodide

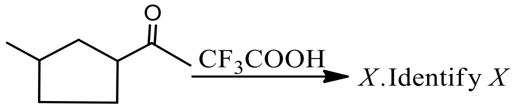
881. Self condensation of acetaldehyde, in the presence of dilute alkalies gives

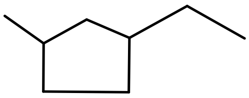
a) An acetal b) An aldol c) Mesitylene d) Propionaldehyde

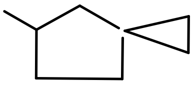
882. Hybridization of carbon in carbonylic group is:

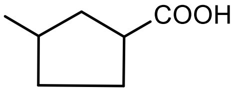
a) sp b) sp^2 c) sp^3 d) None of these

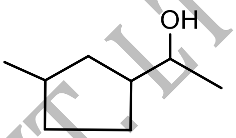
883.



a) 

b) 

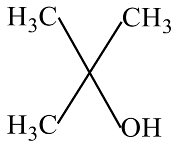
c) 

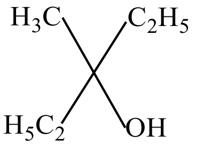
d) 

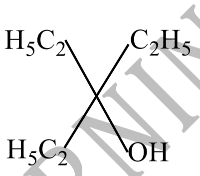
884. $CH_3CH_2CONH_2 \xrightarrow{X} CH_3CH_2CH_2NH_2, X$ is

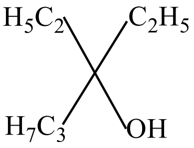
a) Pt/H_2 b) Ni/H_2 c) $LiAlH_4$ d) Zn

885. Ethyl ester $\xrightarrow[\text{Excess}]{CH_3MgBr}$ P. The product P will be:

a) 

b) 

c) 

d) 

886. When benzaldehyde reacts with acetophenone in presence of sodium hydroxide, then product is

a) $C_6H_5CH = CHCOC_6H_5$ b) $C_6H_5COCH_2C_6H_5$

c) $C_6H_5CH = CHC_6H_5$ d) $C_6H_5CH(OH)COC_6H_5$

887. Acetaldehyde cannot exhibit:

a) Lodoform test b) Benedict's test c) Tollen's test d) Lucas test

888. Cannizaro reaction is performed by

a) Formaldehyde b) Formaldehyde and acetaldehyde

c) Benzaldehyde d) Formaldehyde and benzaldehyde

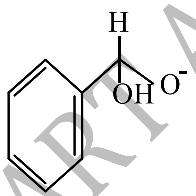
889. The reaction,

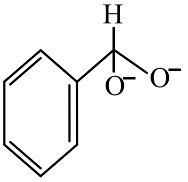
$CH_3COOH + Cl_2 \xrightarrow{p} ClCH_2COOH + HCl$ is called

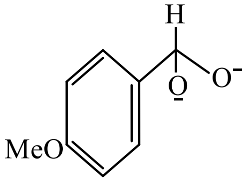
a) Hell-Volhard-Zelinsky reaction b) Wurtz reaction

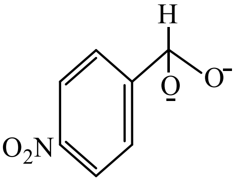
c) Rosenmund reaction d) Hunsdiecker reaction

890. In a Cannizzaro's reaction, the intermediate that will be best hydride donor is:

a) 

b) 

c) 

d) 

891. Aldehydes can be conveniently separated from alcohols by treating with:

a) Na_2SO_4 b) NaCN c) $NaHSO_3$ d) Schiff's reagent

892. One having high vapour pressure at temperature below its m. p. :

a) Benzoic acid b) Salicylic acid c) Citric acid d) All of these

893. Which of the following compounds would be the main product of an aldol condensation of acetaldehyde and acetone?

a) $CH_3CH = CH.CHO$ b) $CH_3CH = CHCOCH_3$ c) $(CH_3)_2C = CH.CHO$ d) $(CH_3)_2C = CHCOCH_3$

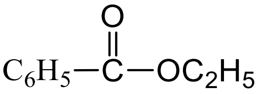
894. Reaction between $(C_2H_5)_2Cd$ and CH_3COCl leads to the formation of

a) Diethyl ketone b) Ethyl methyl ketone c) Dimethyl ketone d) Acetaldehyde

895. Which of these does not contain –COOH group?

a) Aspirin b) Benzoic acid c) Picric acid d) Salicylic acid

896. The ease of reduction of C_6H_5COCl (i), C_6H_5CHO (II), $C_6H_5COCH_3$ (III) and



$C_6H_5-\overset{O}{\overset{\|}{C}}-OC_2H_5$ (IV) by hydrogen over a palladium catalyst follows the order

a) $I > II > III > IV$ b) $IV > III > II > I$ c) $II > III > I > IV$ d) $III > II > I > IV$

897. Schiffs and Piria method is used for the estimation of:

a) Nitrogen b) Sulphur c) Halogens d) Oxygen

898. Select the strongest acid:

a) CF_3COOH b) CCl_3COOH c) CH_3COOH d) CBr_3COOH

899. The most acidic of the following is

a) $ClCH_2COOH$ b) C_6H_5COOH c) CD_3COOH d) CH_3CH_2COOH

900. The formula of a compound which gives simple whole number atomic ratio in one molecule of a compound is called:

a) Structure formula b) Molecular formula c) Empirical formula d) Projection formula

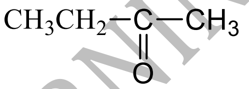
901. Which of the following is a better reducing agent for the following reduction?

$RCOOH \rightarrow RCH_2OH$

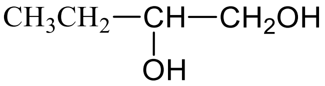
a) $SnCl_2/HCl$ b) $NaBH_4$/ether c) H_2/Pd d) B_2H_6/H_3O^+

902. Alkaline hydrolysis of $C_4H_8Cl_2$ gives a compound which on heating with NaOH and I_2 produces a yellow precipitate of CHI_3. The compound should be

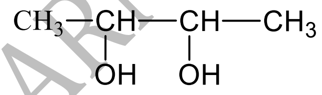
a) $CH_3CH_2CH_2CHO$

b)


$CH_3CH_2-\underset{\underset{O}{\|}}{C}-CH_3$

c)


$CH_3CH_2-\underset{\underset{OH}{|}}{CH}-CH_2OH$

d)


$CH_3-\underset{\underset{OH}{|}}{CH}-\underset{\underset{OH}{|}}{CH}-CH_3$

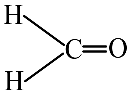
903. The most appropriate reagent to distinguish between acetaldehyde and formaldehyde is

a) Fehling's solution b) Tollen's reagent

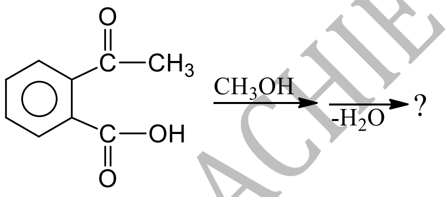
c) Schiff's reagent d) Iodine in presence of base

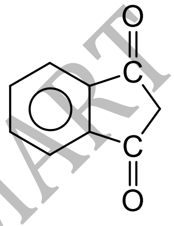
904. Which will form two oximes with NH_2OH?

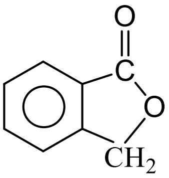
a) CH_3COCH_3 b) $CH_3CH_2COCH_3$ c) $CH_3CH_2COCH_2CH_3$ d)



905. What is the final product of the following reaction?



a)


b)


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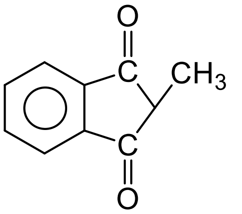

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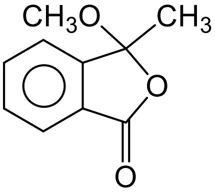


906. The reaction of acetaldehyde with Tollen's reagent gives

a) Silver acetate b) Methyl alcohol c) Formaldehyde d) Acetic acid

907. Aldol condensation is given by:

a) Aldehydes only having α-hydrogen atom

b) Aldehydes and ketones having α-hydrogen atom

c) Ketones only having α-hydrogen atom

d) Aldehydes having α-hydrogen atom

908. Isoelectric point is the pH at which :

a) An amino acid becomes acidic

b) An amino acid becomes basic
c) Zwitter ion has positive charge
d) Zwitter ion has zero charge

909. Ascorbic acid is a/an:
a) Vitamin C b) Enzyme c) Protein d) None of these

910. Lacrymator or tear gas is:
a) C_6H_5COCl b) $C_6H_5OC_6H_5$ c) $C_6H_5COCH_2Cl$ d) $C_6H_5COCH_3$

911. Which acid derivatives on hydrolysis will give brown precipitate with Nessler's reagent?
a) Acid chloride b) Acid anhydride c) Acid amide d) All of these

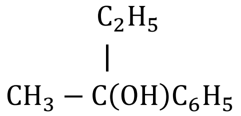
912. In a set of the given reactions, acetic acid yielded a product *C.*

$$CH_3COOH + PCl_5 \rightarrow A$$

$$A \xrightarrow[\text{arth.AlCl}_3]{C_6H_5} B \xrightarrow[\text{ether}]{C_2H_5MgBr} C$$

Product C would be

a) $CH_3CH(OH)C_6H_5$

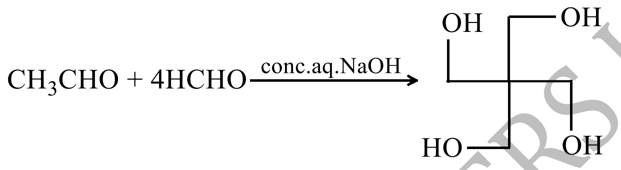
b) 
$CH_3-\overset{C_2H_5}{\overset{|}{C}}(OH)C_6H_5$

c) $CH_3CH(OH)C_2H_5$

d) $CH_3COC_6H_5$

913. Formic acid:
a) Is immiscible with water
b) Reduces ammoniacal silver nitrate
c) Is a weak acid nearly three and a half times weaker than acetic acid
d) Is prepared by heating potassium hydroxide

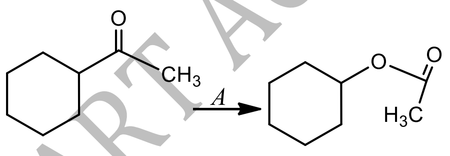
914. The number of aldol reaction(s) that occurs in the given transformation is:



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

915. Reactivity of acids in esterification follows the order:
a) $HCOOH > CH_3COOH > RCH_2COOH > R_2CHCOOH > R_3CCOOH$
b) $CH_3COOH > HCOOH > R_3CCOOH > R_2CHCOOH > RCH_2COOH$
c) $R_3CCOOH > R_2CHCOOH > RCH_2COOH > CH_3COOH > HCOOH$
d) None of the above

916. The most suitable reagent *A*, for the reaction



is/are
a) O_3 b) H_2O_2
c) $NaOH - H_2O_2$ d) *m*-chloroperbenzoic acid

917. Three of the following four reactions are due to one similar feature of carbonyl compounds, while the fourth one is different. Which one is fourth?
a) Aldol condensation b) Knoevenagel reaction
c) Witting reaction d) Haloform reaction

918. The relative reactivities of acyl compounds towards nucleophilic substitution are in the order of:
a) Ester > Acyl chloride > Amide > Acid anhydride
b) Acid anhydride > Amide > Ester > Acyl chloride
c) Acyl chloride > Ester > Acid anhydride > Amide
d) Acyl chloride > Acid anhydride > Ester > Amide

919. With the help of following Grignard synthesis which carboxylic acid is formed?

$$CH_2 = CHCH_2Br \xrightarrow{\text{Mg/Ether}} \xrightarrow[\text{(ii) } H_3O^+]{\text{(i) } CO_2} ?$$

a) $CH_2 = CHCH_2COOH$ b) $CH_3CH_2CH_2COOH$ c) $CH_2 = CHCOOH$ d) $CH_3CH = CH - COOH$

920. Oxalic acid on treatment with conc. H_2SO_4 gives:

a) $CO + H_2O_2$ b) $H_2O + CO + CO_2$ c) $HCOOH + CO_2$ d) $HCOOH + CO_2 + O_2$

921. The reaction product of the compound 'A' with excess of methyl magnesium iodide followed by acidification yields t-butanol. The compound A is:

a) Methanal b) Ethanal c) Propanal d) Methyl ethanoate

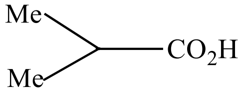
922. The correct order of increasing acid strength of the compounds:

$(A) CH_3CO_2H$

$(B) MeOCH_2CO_2H$

$(C) CH_3CO_2H$

(D)



is:

a) $B < D < A < C$ b) $D < A < C < B$ c) $D < A < B < C$ d) $A < D < C < B$

923. Which is obtained by the oxidation of propionaldehyde?

a) Acetic acid

b) Formic acid and acetic acid

c) Propanoic acid

d) n-Propyl alcohol

924. Acetone and acetaldehyde can be identified by treatment with:

a) $NaHSO_3$ b) NaCN c) $NaOH + I_2$ d) $Ag(NH_3)_2^+$

925. The presence of carbon in an organic compound can be shown by

a) Heating with copper which goes black

b) Burning it to produce green edge flame

c) Heating it with copper oxide to convert it into CO_2

d) None of the above

926. Choose the incorrect statement

a) Carboxylic acids have higher boiling points than those of alcohols of similar molecular weight

b) Carboxylic acids have lower boiling points than those of alcohols of similar molecular weight

c) Carboxylic acids (C_1 to C_4) are soluble in water

d) The melting points of carboxylic acids increase or decrease in an irregular manner

927. The increasing order of the rate of HCN addition to compounds $A - D$ is

IV. HCHO

V. CH_3COCH_3

VI. $PhCOCH_3$

VII. PhCOPh

a) A < B < C < D b) D < B < C < A c) D < C < B < A d) C < D < B < A

928. Benzoin is

a) Compound containing an aldehyde and a ketonic group b) α, β-unsaturated acid

c) α −hydroxy aldehyde d) α −hydroxy ketone

929. Highest pH value among the following is that of:

a) Gastric juice b) Lemon juice c) Human blood d) Pepsi cola

930. Molecular weight of phorone is equal to

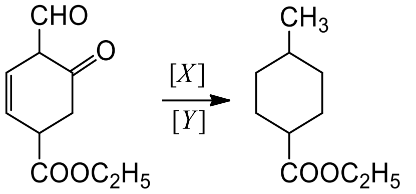
a) 2 × molecular weight of acetone − molecular weight of water

b) 3 × molecular weight of accetone − 2 × molecular weight of water

c) 3 × molecular weight of acetone − molecular weight of water

d) 2 × molecular weight of acetone − 2 × molecualr weight of water

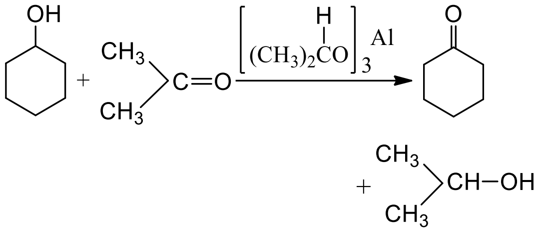
931.



here

a) H_2/Ni and NaOH
b) H_2/Ni and hydrazine
c) H_2/Ni, LAH
d) None of theses

932.



The reaction is known as

a) MPV reaction
b) Oppanauer oxidation
c) Tischenko reaction
d) Gattermann Koch reaction

933. Raw juice in sugar factories is generally concentrated by:

a) Vacuum distillation
b) Steam distillation
c) Sublimation
d) Crystallization

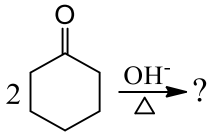
934. Which of the following converts carbonyl compounds into hydrocarbons?

a) H_2 / Pt
b) $LiAlH_4$
c) $K_2Cr_2O_7/H_2SO_4$
d) Zn − Hg /HCl

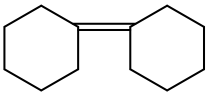
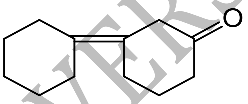
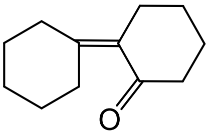
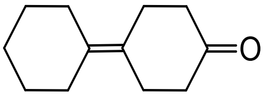
935. Two molecules of an aldehyde react with a concentrated solution of caustic soda and produces one molecule of an alcohol and acid each, which one is the aldehyde?

a) Acetaldehyde
b) Formaldehyde
c) Propionaldehyde
d) Butyraldehyde

936.



product is

a) 
b) 
c) 
d) 

937. Schiff's reagent is:

a) Magenta solution decolourised with sulphurous acid
b) Magenta solution decolourised with chlorine
c) Ammoniacal cobalt chloride solution
d) Ammoniacal manganese sulphate solution

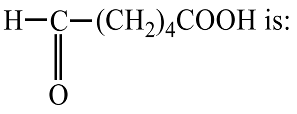
938. The compound which is not formed during the dry distillation of a mixture of calcium formate and calcium acetate is

a) Methanal
b) Propanal
c) Propanone
d) Ethanal

939. The reaction

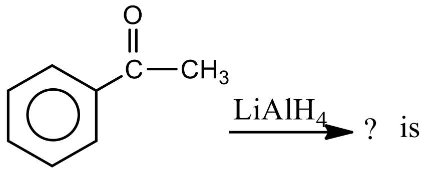
$RCOOH + N_3H \xrightarrow{\text{Conc.}H_2SO_4} RNH_2 + CO_2 + N_2$ is called

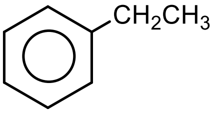
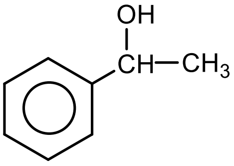
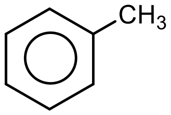
a) Lossen reaction
b) Schmidt reaction
c) Curtius reaction
d) Ullmann reaction

940. The IUPAC name of  $H-\underset{\underset{O}{\|}}{C}-(CH_2)_4COOH$ is:

a) 6-oxohexanoic acid
b) Hexan-1-al-6-oic acid
c) 1-aldo-hexanoic acid
d) 6-aldo-hexan-1-oic acid

941. The product formed in the reaction

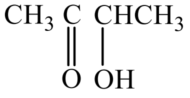


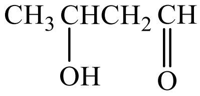
a) 
b) 
c) 
d) None of these

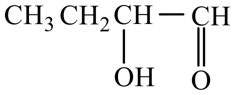
942. Fuels from crude oil are separated from one another by:
a) Fractional distillation b) Crystallization c) Steam distillation d) Selective adsorption

943. Propanoic acid on warming with Cl_2 in presence of red P gives:
a) CH_3CH_2COCl b) CH_3CH_2Cl c) $CH_3CHClCOOH$ d) CH_2ClCH_2COOH

944. The aldol condensation of acetaldehyde results in the formation of:

a) 
$CH_3\underset{\overset{\|}{O}}{C}\,\underset{\overset{|}{OH}}{CH}CH_3$

b) 
$CH_3\underset{\overset{|}{OH}}{CH}CH_2\underset{\overset{\|}{O}}{CH}$

c) 
$CH_3CH_2\underset{\overset{|}{OH}}{CH}-\underset{\overset{\|}{O}}{CH}$

d) $CH_3CH_2OH + CH_3COOH$

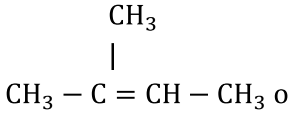
945. Which one of the following can produce hydrogen when treated with metallic sodium?
a) $(CH_3)_2NH$ b) CH_3NH_2 c) $C_6H_5NH_2$ d) CH_3CONH_2

946. Identify the correct order of boiling points of the following compounds,
$CH_3(CH_2)_2CH_2OH$; $CH_3(CH_2)_2CHO$;
1 2
$CH_3(CH_2)_2COOH$:
3
a) 1 > 2 > 3 b) 3 > 1 > 2 c) 1 > 3 > 2 d) 3 > 2 >1

947. Organic compounds are studied separately from inorganic compounds because:
a) They occur in plants and animals
b) These are combustible and have complex structures
c) These are the compounds of carbon
d) The number of organic compounds is very large

948. Give IUPAC name of the product, when acetamide is heated with anhydrous phosphorus pentoxide.
a) Ethyl amine b) Propane nitrile c) Cyano methane d) Ethane nitrile

949. Acetamide is treated with the following reagents separately. Which one of these would yield methyl amine.
a) $NaOH + Br_2$ b) Sodalime c) Hot conc. H_2SO_4 d) PCl_5

950. 
The compounds $CH_3-\overset{\overset{CH_3}{|}}{C}=CH-CH_3$ on reaction with $NaIO_4$ in the presence of $KMnO_4$ gives
a) CH_3COCH_3 b) $CH_3COCH_3 + CH_3COOH$
c) $CH_3COCH_3 + CH_3CHO$ d) $CH_3CHO + CO_2$

951. When a ketone is condensed into an aldol, the reagent used is:
a) Alkali b) $NaHCO_3$ c) Br_2 water d) Cl_2

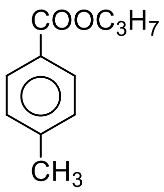
952. Amides contain $>C=O$ group, yet they do not give characteristic reactions of $>C=O$ group because
a) They dimerise b) Of resonance
c) They posses cyclic structure d) Of attached alkyl group

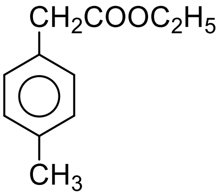
953. Which of the following acids (1 mol) does not give cyclic anhydride on heating

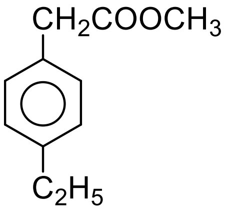
a) Adipic acid b) Terephthalic acid c) Succinic acid d) Phthalic acid

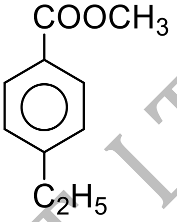
954. Which of the aldehyde is most reactive?
a) C_6H_5CHO
b) CH_3CHO
c) HCHO
d) All are equally reactive

955. An ester (X) molecular formula $C_{11}H_{14}O_2$ was treated with LAH when it forms two compounds (A) and (B) with molecular formula $C_9H_{12}O$ and C_2H_6O respectivity (A) on heating with an acid forms $C_9H_{10}(C)$. (C) on oxidation with $KMnO_4$ forms terephthalic acid. Compound (X) is

a) 

b) 

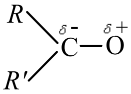
c) 

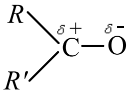
d) 

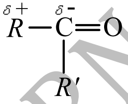
956. Which of the following is present in tea as well as in bark of a tree?
a) Tannic acid b) Oxalic acid c) Cellulose d) Caffeine

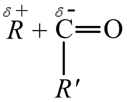
957. Waxes are long chain compounds belonging to the class:
a) Acids b) Alcohols c) Esters d) Ethers

958. Which of the following is correct for carbonyl compounds?

a) 

b) 

c) 
$\overset{\delta+}{R}-\underset{R'}{\overset{\delta-}{C}}=O$

d) 
$\overset{\delta+}{R}+\underset{R'}{\overset{\delta-}{C}}=O$

959. Which of the following has most acidic hydrogen?
a) 3-hexanone b) 2,4-hexanedione c) 2,5-hexanedione d) 2,3-hexanedione

960. Which acid gives wine red colour with neutral $FeCl_3$?
a) Propanoic acid b) Acetic acid c) Formic acid d) None of these

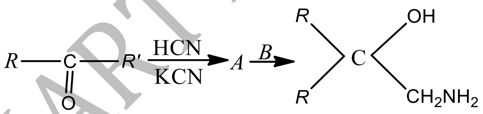
961. An organic compound is fused with fusion mixture and extracted with HNO_3. The extract gives yellow precipitate with ammonium molybdate. It show the presence of which element?
a) P
b) As
c) Both P and As
d) May be P or As or both

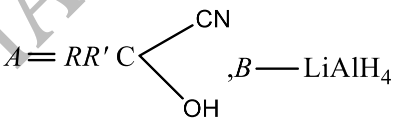
962. Which acid is produced in the following reaction?

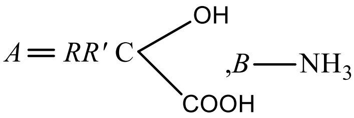

$CH_3-\overset{\overset{O}{\|}}{C}-H + HCN \longrightarrow A \xrightarrow{H_3O^+} B$

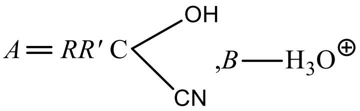
a) Maleic acid b) Lactic acid c) Tartaric acid d) Oxalic acid

963. A and B in the following reaction are



a) 

b) 

c) 

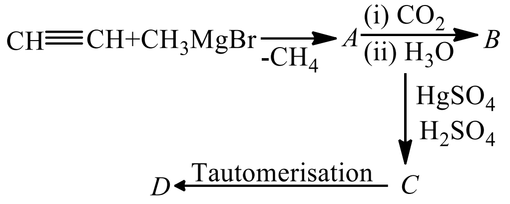
d) $A + RR'CH_2CN, B = NaOH$

964. Amino acid usually exists in the form of Zwitter ions, which consists of:
a) The basic group $—NH_2$ and the acidic group —COOH
b) The basic group $—NH_3^+$ and the acidic group $—CO_2^-$
c) The basic group $—CO_2^-$ and the acidic group $—NH_3^+$
d) No basic or acidic groups as such

965. Which of the following do not form addition compounds with ammonia?

a) HCHO b) CH_3COCH_3 c) CH_3CHO d) None of these

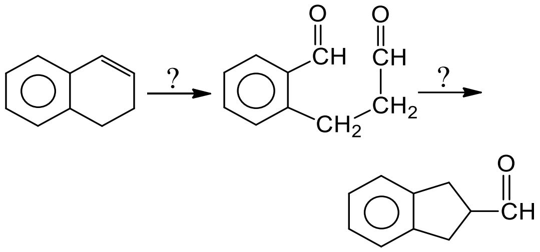
966. Identify D in the following reaction



a) $HOOC-CH_2-COOH$ b) $OHC-CH_2-COOH$

c) $OHC-CH_2-CHO$ d) $HO-CH=CH-COOH$

967. What reagent would be needed to bring about each step of following synthesis?



a) Hg^{2+}, H_2SO_4, OH^- b) $KMnO_4/H_2SO_4, OH^-$ c) $H_2Cr_2O_7$, dry HCl d) O_3, Zn, H_2O, OH^-

968. Etard's reaction involves the preparation of benzaldehyde from

a) Toluene b) Ethyl benzene c) Benzoyl chloride d) Sodium benzoate

969. The Hell-Volhard-Zelinsky reaction is used for preparing

a) β –halo acid b) γ –halo acid c) α-halo acid d) Acid halide

970. It acetyl chloride is reduced in presence of $BaSO_4 + Pd$, the product formed is:

a) CH_3CHO b) CH_3CH_2OH c) CH_3COOH d) CH_3COCH_3

971. The end product of the reaction,

$CH_3OH \xrightarrow[300^oC]{Cu} A \xrightarrow{NaOH} B$ is:

a) Alkane

b) Carboxylic acid

c) Ketone

d) Sodium slat of carboxylic acid

972. Aldehydes on reaction with hydroxylamine gives :

a) Aldoxime b) Hydrazone c) Aminohydroxide d) Semicarbazone

973. In which of the below reaction do we find α, β- unsaturated carbonyl compounds undergoing a ring closure reaction with conjugated dienes?

a) Perkin reaction b) Diels-Alder reaction

c) Claisen rearrangement d) Hofmann reaction

974. When an aldehyde was heated with alkali, a part of it was converted into alcohol and a part of it into an acid. The aldehyde is:

a) An aliphatic aldehyde other than HCHO

b) An aliphatic aldehyde or salicylaldehyde

c) An aromatic aldehyde other than salicylaldehyde

d) An aromatic aldehyde or HCHO

975. In the reaction,

$C_2H_5OC_2H_5 + CO \xrightarrow[150^0,C,500 \text{ atm pressure}]{BF_3} X$

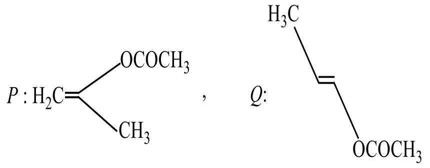
What is X?

a) Diethyl carbonate b) Ethyl carbonate c) Diethyl peroxide d) Ethyl propionate

976. The correct order of decreasing acid strength of trichloroacetic acid (A), trifluoroacetic acid (B), acetic

acid (C) and formic acid (D) is:
a) $A > B > C > D$
b) $A > C > B > D$
c) $B > A > D > C$
d) $B > D > C > A$

977. The product of acid hydrolysis of P and Q can be distinguished by:



a) Lucas reagent b) 2,4-DNP c) Fehling's solution d) $NaHSO_3$

978. Acetone is used in:
a) Face creams
b) Vanilla
c) Nail polishes
d) Sweet smelling erasers

979. A colourless water soluble organic liquid decomposes sodium carbonate and liberatesCO_2. It produces black precipitate with Tollen's reagent. The liquid is
a) Acetaldehyde b) Acetamide c) Formic acid d) Acetone

980. The conversion of benzaldehyde into benzyl alcohol takes place by
a) Fittig reaction b) Wurtz Fitting reaction
c) Wurtz reaction d) Cannizaro's reaction

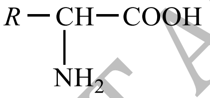
981. What is the oxidation number of carbonyl carbon in acetophenone?
a) +3 b) +1 c) +2 d) Zero

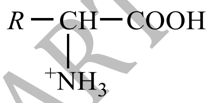
982. Acetic acid on heating with urea gives:
a) Acetamide, carbon dioxide and ammonia
b) Ammonium carbonate and carbon
c) Ammonium acetate, acetamide and carbon dioxide
d) None of the above

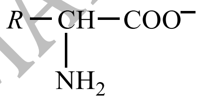
983. C_6H_5CHO on reacting with Cl_2 gives:
a) $C_6H_5CHCl_2$ b) C_6H_5COOH c) $C_6H_5CH_2OH$ d) C_6H_5COCl

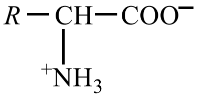
984. In sodium extract test of organic compounds, the nitrogen of an organic compound is converted into:
a) Sodamide b) Sodium cyanide c) Sodium nitrite d) Sodium nitrate

985. At the isoelectric point for amino acid the species present are:

a)

$R-\underset{\underset{NH_2}{|}}{CH}-COOH$

b)

$R-\underset{\underset{{}^+NH_3}{|}}{CH}-COOH$

c)

$R-\underset{\underset{NH_2}{|}}{CH}-COO^-$

d)

$R-\underset{\underset{{}^+NH_3}{|}}{CH}-COO^-$

986. CH_3COCl reacts with:
a) C_6H_5OH b) $C_6H_5NH_2$ c) Salicylic acid d) All of these

987. Stinges of bees, red ant and wasps contain:
a) Formaline b) Formic acid c) Acetic acid d) Formaldehyde

988. A colourless organic compound gives brisk effervescences with a mixture of sodium nitrite and dil. HCl. It could be

a) Oxalic acid b) Acetic acid c) Urea d) Glucose

989. Which of the following on oxidation gives an acid containing two carbon atoms?

a) Ethanol b) Ethane nitrile c) Ethanamide d) Ethanamine

990. Which of the following has highest b.p.?

a) C_2H_5OH b) CH_3COOH c) CH_3COCH_3 d) $HCOOCH_3$

991. $C_6H_5CHO \xrightarrow{NH_3} ?$

a) $(C_6H_5CHN)_2CH.C_6H_5$ b) $C_6H_5NHCH_3$ c) $C_6H_5CH_2NH_2$ d) $C_6H_5NHC_6H_5$

992. Cyclohexanone is subjected to reduction by $NaBH_4$. The product formed is:

a) Cyclohexane b) Cyclohexanal c) Cyclohexadiene d) Cyclohexanol

993. Alkaline hydrolysis of an ester is called:

a) Neutralization b) Esterification c) Polymerization d) Saponification

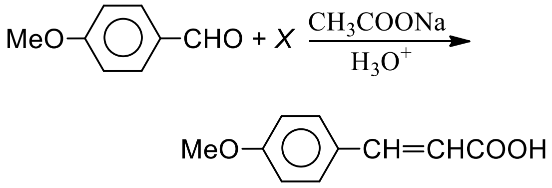
994. The reagent used in Gattermann Koch aldehyde synthesis is

a) $Pb/BaSO_4$ b) Alkaline $KMnO_4$ c) Acidic $KMnO_4$ d) CO + HCl

995. Which is false in case of carboxylic acids?

a) They are polar molecules
b) They form H-bonds
c) They are stronger than mineral acids
d) They have higher b.p. than corresponding alcohols

996.



The compound *X* is

a) $CH_3 - COOH$ b) $BrCH_2 - COOH$ c) $(CH_3CO)_2O$ d) $CHO - COOH$

997. Acetyl chloride cannot be obtained by treating acetic acid with:

a) $CHCl_3$ b) $SOCl_2$ c) PCl_3 d) PCl_5

998. Carbonyl compounds react with phenyl hydrazine to form:

a) Oxime b) Phenyl hydrazone c) Hydrazone d) Semicarbazone

999. Formic acid is obtained when:

a) Calcium acetate is heated with conc. H_2SO_4
b) Calcium formate is heated with calcium acetate
c) Glycerol is heated with oxalic acid
d) Acetaldehyde is oxidized with $K_2Cr_2O_7$ and H_2SO_4

1000. Benedict's solution is not reduced by

a) Formaldehyde b) Acetaldehyde c) Glucose d) Acetic anhydride

1001. Vinegar is

a) HCHO b) HCOOH
c) CH_3CHO d) CH_3COOH

1002. Which will not give acetamide (no heating) on reaction with ammonia?

a) Acetic acid b) Acetyl chloride c) Acetic anhydride d) Methyl acetate

1003. Jone's reagent is:

a) Acidified $KMnO_4$
b) $K_2Cr_2O_7 + H_2SO_4$ or chromic acid + H_2SO_4
c) Alkaline $K_2Cr_2O_7$
d) None of the above

100 Acetaldehyde reacts with PCl_5, to give:
4.

a) Ethyl chloride
b) Ethylene chloride
c) Ethylidene dichloride
d) Trichloroacetaldehyde

100 *Trans* esterification is the process of
5.

a) Conversion of an aliphatic acid to ester
b) Conversion of an aromatic acid to ester
c) Conversion of one ester to another ester
d) Conversion of an ester into its components namely acid and alcohol

100 The formation of aldehyde from alkyl cyanide is related with the name
6.

a) Stephen b) Rosenmund c) Wurtz d) HVZ reaction

100 Which of the following substances will not react with PCl_5?
7.

a) Methyl alcohol b) Acetic acid c) Acetaldehyde d) Ethane

100 Treatment of propionaldehyde with dil. NaOH gives:
8.

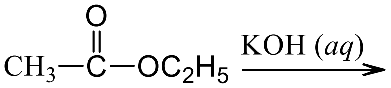
a) $CH_3CH_2COOCH_2CH_2CH_3$ b) $CH_3CH_2CHOHCH_2CH_2C$ c) $CH_3CH_2CHOHCH(CH_3)C$ d) $CH_3CH_2COCH_2CHO$

100 Fehling's solution consists of two separate alkaline solution. If one is $CuSO_4$, the other is:
9.

a) $NaHCO_3$ b) Na_2SO_4 c) $NaKC_4H_6O_8$ d) $NaKC_2O_4$

101 α, β- unsaturated aldehyde is formed in the sequence
0.

a) $HCHO \xrightarrow{KOH\ (aq)}$ b) $CH_3CHO \xrightarrow{Dil.KOH} A \xrightarrow{\Delta} B$

c) $CCl_3\ CHO \xrightarrow{KOH\ (aq)}$ d)

$CH_3-\overset{O}{\overset{\|}{C}}-OC_2H_5 \xrightarrow{KOH\ (aq)}$

101 Which of the following organic compounds answers to both iodoform test and Fehling's test?
1.

a) Ethanol b) Methanal c) Ethanal d) Propanone

101 In steam distillation, the vapour pressure of the volatile organic compound is:
2.

a) Equal to atmospheric pressure
b) Less than atmospheric pressure
c) More than atmospheric pressure
d) None of the above

101 The correct order of acid strength is:
3.

a) $CH_3COOH > CH_2ClCOOH > CHCl_2COOH$
b) $CHCl_2COOH > CH_2ClCOOH > CH_3COOH$
c) $CHCl_2COOH > CH_3COOH > CH_2ClCOOH$
d) $CH_2ClCOOH > CH_3COOH > CHCl_2COOH$

101 The ration of carbon, hydrogen and oxygen in 2-methyl benzoic acid is:
4.

a) 4 : 4 : 2 b) 4 : 4 : 1 c) 4 : 2 : 2 d) 2 : 4 : 1

101 Oxalic acid, malonic acid and succinic acid can be distinguished by:
5.

a) Heat

b) Acidified $KMnO_4$
c) Br_2 water
d) NH_3

1016. Ketones on reaction with $NH_2CONHNH_2$ form well defined crystalline compounds, called:

a) Hydrazones b) Schiff's base c) Oximes d) Semicarbazones

1017. In Kjeldahl's method nitrogen present is quantitatively converted to:

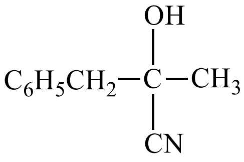
a) N_2 b) $(NH_4)_2SO_4$ c) NO_2 d) None of these

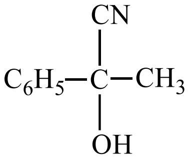
1018. Propionic acid and KOH reacts to produce which one of the following?

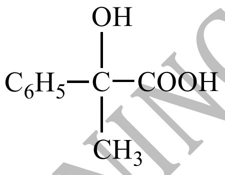
a) Potassium propionate b) Propyl alcohol
c) Propionaldehyde d) Does not react

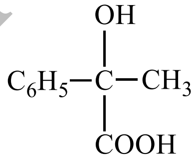
1019. In a set of reaction acetic acid yields a product [D]. The structure of [D] would be:

$$CH_3COOH \xrightarrow{SOCl_2} A \xrightarrow[\text{Anhy. } AlCl_3]{C_6H_6} B \xrightarrow{HCN} C \xrightarrow{HOH} D$$

a) 
$C_6H_5CH_2-\overset{OH}{\underset{CN}{C}}-CH_3$

b) 
$C_6H_5-\overset{CN}{\underset{OH}{C}}-CH_3$

c) 
$C_6H_5-\overset{OH}{\underset{CH_3}{C}}-COOH$

d) 
$C_6H_5-\overset{OH}{\underset{COOH}{C}}-CH_3$

1020. Benzamide on treatment with $POCl_3$ gives

a) Aniline b) Benzonitrile c) Chlorobenzene d) Benzyl amine

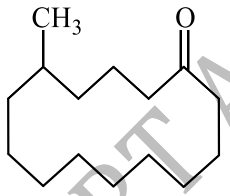
1021. Anhydrous formic acid cannot be obtained from aqueous solution by fractional distillation because:

a) It is soluble in water
b) It forms a constant boiling mixture with water
c) Its boiling point is very close to water
d) There is much difference in their boiling points

1022. In lassaigne's test when both N and S are present, blood red colour obtained is due to the formation of:

a) Ferric ferrocyanide b) Ferric sulphocyanide c) Ferric cyanide d) None of the above

1023. Muscone (an explosive perfume secreted by musk deer) has the structure



. Its IUPAC name is:

a) 3-methyl cyclopentadecanone
b) Methyl cyclopentadecan-3-one
c) 3-methyl cyclotetradecanone
d) 3-methyl cyclohexadecan-3-one

1024. An organic compound X with the molecular formula $C_5H_{10}O$ yields phenyl hydrazone and gives a negative response to the iodoform test and Tollen's test. It prouduces n-pentane on reduction. The compound could be

a) Pentanal b) Pentanone-2 c) Pentanone-3 d) Amyl alcohol

1025. Which compounds will not reduce Fehling's solution?

a) Methanal b) Ethanal c) Trichloroethanal d) Benzaldehyde

1026. Which of the following compounds is oxidized to prepare methyl ethyl ketone?

6.
a) 2-propanol b) 1-butanol c) 2-butaonol d) Tert-butyl alcohol

1027. An organic compound is boiled with alcoholic potash. The product is cooled and acidified with HCl. A white solid separates out. The starting compound may be
a) Ethyl benzoate b) Ethyl formate c) Ethyl acetate d) Methyl acetate

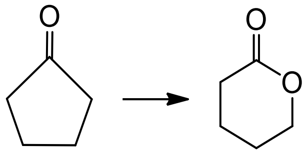
1028. The substance used as an adsorbent in the column chromatography is:
a) Na_2O b) Na_2SO_4 c) Al_2O_3 d) Alum

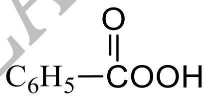
1029. Saturated fatty acids are represented by which of the formula?
a) $C_nH_nO_2$ b) $C_nH_{3n}O_2$ c) C_nH_{2n+1} d) $C_nH_{2n}O_2$

1030. Clemmensen reduction of a ketone is carried out in the presence of which of the following?
a) H_2 and Pt as catalyst b) Glycol with KOH c) Zn-Hg with HCl d) $LiAlH_4$

1031. Which of the following diacid readily gives anhydride on heating?
a) Fumaric b) Maleic acid c) Malic acid d) Terephthalic acid

1032. The conversion



Can be effected by using the reagent
a) H_2O, H_2SO_4 b) O_2 c)  $C_6H_5-\overset{O}{\overset{\|}{C}}OOH$ d) CrO_3, H_2SO_4

1033. For detection of sulphur in an organic compound, sodium nitroprusside is added to the sodium extract. A violet colour is obtained due to the formation of:
a) $Fe(CN)_2$ b) K_3 $Fe(CN)_5$ NS c) $Na_4[Fe(CN)_5NOS]$ d) $Na_4Fe(CN)_6$

1034. Which of the following acids has the smallest dissociation constant?
a) $CH_3CHFCOOH$ b) FCH_2CH_2COOH c) $BrCH_2CH_2COOH$ d) $CH_3CHBrCOOH$

1035. In the conversion of Grignard reagent into an aldehyde, the other component used in
a) Ethyl formate b) Ethyl acetate c) Ethyl cyanide d) Hydrogen cyanide

1036. Compound (A) $C_5H_{10}O$ forms a phenyl hydrazone and gives negative Toolen's and iodoform tests. Compound (A) on reduction gives n-pentane. Compound (A) is:
a) A primary alcohol b) An aldehyde c) A ketone d) A secondary alcohol

1037. Which of the following statements regarding amides is not correct?
a) Amides do not form salts when treated with aqueous acids
b) The aqueous solutions of amides are alkaline
c) Amides are very poor nucleophiles
d) Amides are considerably less reactive than acid chlorides

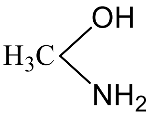
1038. Maleic and fumaric acids:
a) Have identical m.p.
b) Have identical solubility in water
c) Form the same anhydride on heating
d) None of the above

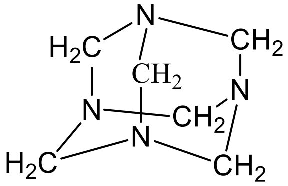
103 Sodium extract prepared by using thio urea contains which ion in the solution, mainly responsible for a

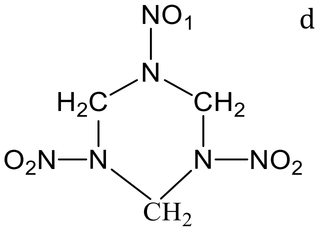
9. characteristic test?

a) NaCN b) Na_2S c) NaCNS d) Na_2SO_4

1040. The final product obtained in the reaction $CH_2O + NH_3 \longrightarrow [\quad] \xrightarrow[Ac_2O]{HNO_3}$ is

a) 

b) 

c) 

d) None of the above

1041. Both HCHO and CH_3CHO gives similar reactions with all the reagents except

a) Schiff reagent b) Fehling solution c) Ammoniacal $AgNO_3$ d) Ammonia

1042. In the reaction,

$R - X \xrightarrow{\text{Alcoholic KCN}} A \xrightarrow{\text{Dilute HCl}} B$

The product B is

a) Alkyl chloride b) Aldehyde c) Carboxylic acid d) Ketone

1043. The property which distinguishes formic acid from acetic acid is

a) Only ammonium salt of formic acid on heating gives amide

b) When heated with alcohol /H_2SO_4 only acetic acid forms ester

c) Only acetic acid forms salts with alkali

d) Only formic acid reduces Fehling's solution

1044. Absolute alcohol is prepared from rectified spirit by:

a) Fractional distillation

b) Steam distillation

c) Azeotropic distillation

d) Vacuum distillation

1045. Which of the following gives oxalic acid?

a) Heating of acetic acid b) Action of nitric acid glucose

c) Acidic hydrolysis of cyanogen d) Strong heating of sodium formate

1046. Urea on slow heating gives

a) $NH_2CONHNO_2$ b) $NH_2CONHCONH_2$

c) HCNO d) $NH_2CONH_2.HNO_3$

1047. The conversion of acetophenone to acetanilide is best accomplished by using

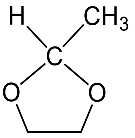
a) Backmann rearrangement b) Curtius rearrangement

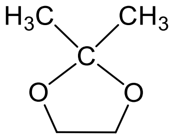
c) Lossen rearrangement d) Hofmann rearrangement

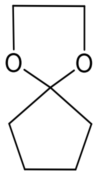
1048. 

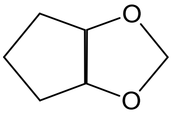
$\begin{array}{l} CH_2OH \\ | \\ CH_2OH \end{array} + \text{cyclopentanone} \longrightarrow [X].$

Product is

a) 

b) 

c) 

d) 

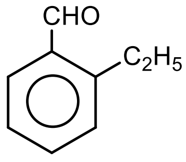
1049. An aldehyde which undergoes Cannizzaro's reaction and reduces Schiff's reagent but does not reduce Fehling's solution is:

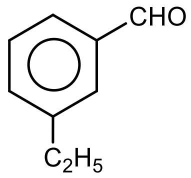
a) CH_3CHO b) HCHO c) C_6H_5CHO d) Salicyladehyde

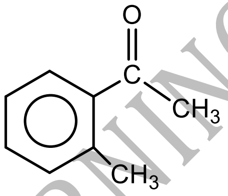
105 Which acid is used in baking powder?
0.
a) Oxalic acid b) Citric acid c) Lactic acid d) Tartaric acid

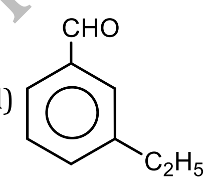
105 Which of the following statements are correct for benzoic acid?
1.
a) Nitration gives o and p-nitrobenzoic acid
b) Bromination gives o-bromobenzoic acid
c) The Friedel-Craft's reaction with $CH_3COCl/AlCl_3$ give m-carboxyaceto-phenone
d) The reaction with concentrated sulphonic acid gives 3-carboxybenzene sulphonic acid

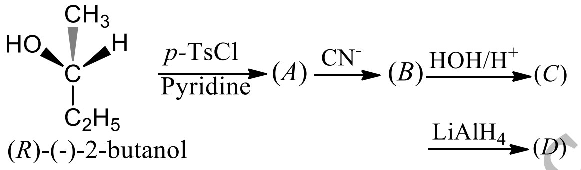
105 An aromatic compound 'X' with molecular formula $C_9H_{10}O$ gives the following chemical tests
2.
VIII. Forms 2, 4-DNP derivative,
IX. Reduces Tollen's reagent,
X. Undergoes Cannizaro reaction and,
XI. On vigorous oxidation 1, 2-benzenedicarboxylic acid is obtained.
X is

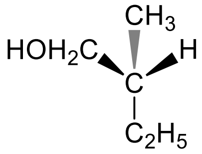
a) 

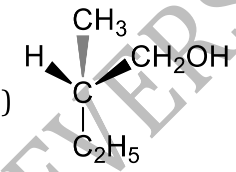
b) 

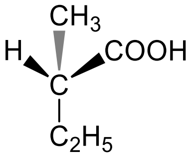
c) 

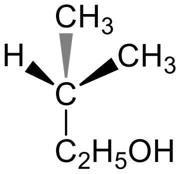
d) 

105 Give stereochemical formula for compound (D)
3.


a) 

b) 

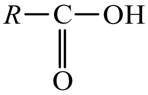
c) 

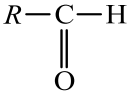
d) 

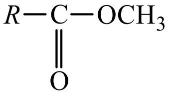
105 General formula of carbonyl compound is:
4.
a) $C_nH_{2n}O$ b) $C_nH_{2n+2}O$ c) $C_nH_{2n+1}O$ d) $C_nH_{2n+2}O_2$

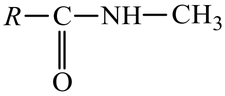
105 The product C of the reaction,
5.
$CH_3CN \xrightarrow{H_2O} A \xrightarrow{NH_3} B \xrightarrow{\Delta} C$ is:
a) Methyl amine b) Ammonium acetate c) Ethyl amine d) Acetamide

105 Formic acid and acetic acid are distinguished by
6.
a) $NaHCO_3$ b) $FeCl_3$ c) Victor Meyer test d) Tollen's reagent

105 Which of the following types of carbonyl groups will produce oxime on reaction with?
7.
a) 
$R-\underset{\underset{O}{\|}}{C}-OH$

b) 
$R-\underset{\underset{O}{\|}}{C}-H$

c) 
$R-\underset{\underset{O}{\|}}{C}-OCH_3$

d) 
$R-\underset{\underset{O}{\|}}{C}-NH-CH_3$

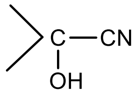
105 Aldehydes and ketones can be reduced to hydrocarbon by using
8.
a) $LiAlH_4$ b) $H_2/Pd - BaSO_4$ c) Na-Hg /HCl d) $NH_2 - NH_2/C_2H_5ONa$

105 Industrial preparation of formic acid involves:
9.

a) Reaction of CO with aqueous NaOH under pressure
b) Reaction of CO_2 with aqueous NaOH under pressure
c) Passing a mixture of CO and H_2 overheated copper at 473 K
d) Reaction of CO with methanol at 473 K

1060. CH_3COCH_3 can be obtained by:

a) Heating acetaldehyde with methanol
b) Oxidation of propyl alcohol
c) Oxidation of isopropyl alcohol
d) Reduction of propionic acid

1061. 

group is called

a) Hydroxy nitrile
b) Hydroxy cyanide
c) Cyanohydrin
d) Hydroxy isocyanide

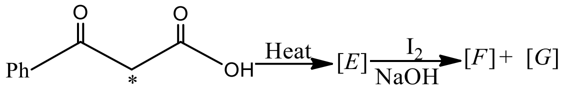
1062. Vinegar is a solution of acetic acid which is

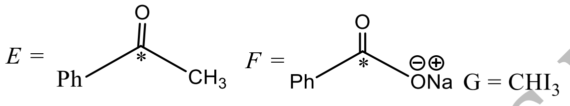
a) 15-20 %
b) 20-25 %
c) 6-8 %
d) 2-4 %

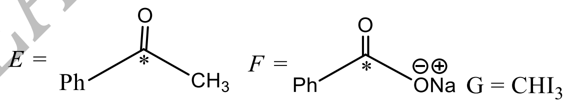
1063. Which of the following is the strongest acid?

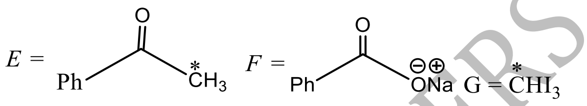
a) CH_3COOH
b) HCOOH
c) $ClCH_2COOH$
d) $Cl_2CHCOOH$

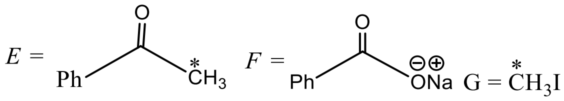
1064. In the following reaction sequence, the correct structures of E, F and G are



a) 

b) 

c) 

d) 

1065. Which of the following has high vapour pressure at temperature below its melting point?

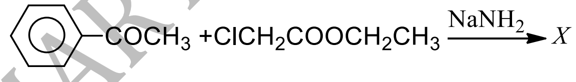
a) Citric acid
b) Benzoic acid
c) Salicylic acid
d) All of these

1066. Tollen's reagent is

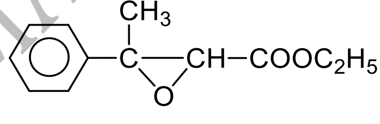
a) $[Ag(NH_3)_2]NO_3$
b) $[Ag(NH_3)_2]Br$
c) Both (a) and (b)
d) None of these

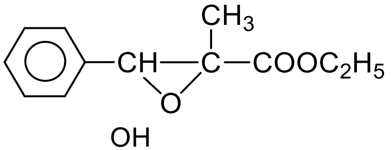
1067. The Sulphur present in an organic compound is oxidized by fuming nitric acid into:

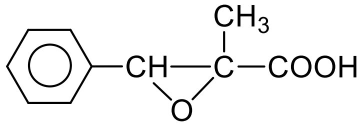
a) SO_2
b) H_2SO_4
c) H_2S
d) S

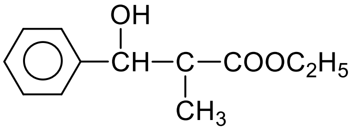
1068. 

Identify X in the following reaction

a) 

b) 

c) 

d) 

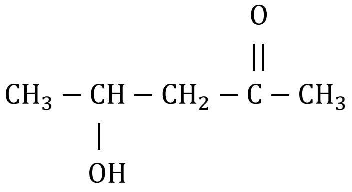
1069. $CH \equiv CH \xrightarrow[\text{dil.}H_2SO_4]{HgSO_4} A \xrightarrow[NaOH]{\text{Dilute}} B$

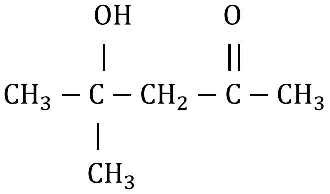
The compound B is

a) $CH_3 - CH - CH_2 - CHO$
b) $CH_3 - CH - CH_2 - COONa$

$|$
OH

$|$
OH

c) 
$CH_3-\underset{\underset{OH}{|}}{CH}-CH_2-\overset{\overset{O}{||}}{C}-CH_3$

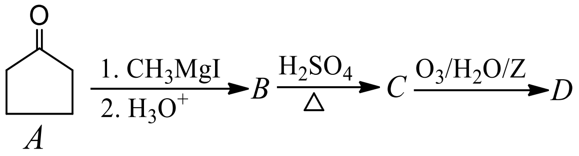
d) 
$CH_3-\overset{\overset{OH}{|}}{\underset{\underset{CH_3}{|}}{C}}-CH_2-\overset{\overset{O}{||}}{C}-CH_3$

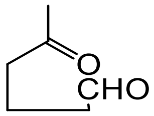
1070. Aldol condensation of aldehydes and ketones takes place through the formation of:
- a) Carbene
- b) Nucleophile
- c) Electrophile
- d) Free radical

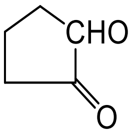
1071. Acetic anhydride reacts with ammonia to give:

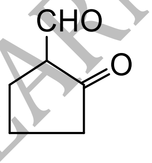
a) Acetamide b) Formamide c) Ethyl amine d) Methyl amine

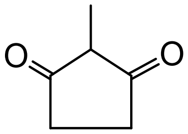
1072. Identify the final product in the following reaction sequence



a) 

b) 

c) 

d) 

1073. Petroleum refining involves:
- a) Vacuum distillation
- b) Steam distillation
- c) Fractional distillation
- d) Passing over activated charcoal

1074. Acetyl bromide reacts with excess of CH_3MgI followed by treatment with a saturated solution of NH_4Cl gives:

a) Acetyl iodide b) Acetamide c) 2-methyl propan-2-ol d) Acetone

1075. Which of the following will not undergo Hell Volhard Zelinsky reaction?
- a) CH_3COOH
- b) CH_3CH_2COOH
- c) 2,2-dimethyl propionic acid
- d) 2-methyl propionic acid

1076. Which of the following will not undergo aldol condensation?
- a) Acetaldehyde
- b) Propanaldehyde
- c) Benzaldehyde
- d) Trideuteroacetaldehyde

1077. In a compound C, H and N are present in 9 : 1 : 3.5 by weight. If molecular weight of the compound is 108, the molecular formula of compound is:

a) $C_2H_6N_2$ b) C_3H_4N c) $C_6H_8N_2$ d) $C_9H_{12}N_3$

1078. Which method is not used in the preparation of ketone?

a) Dehydrogenation of 2° alcohol
b) Heating Ca salt of an acid
c) Acid hydrolysis of alkyl cyanide
d) Reaction of acid chloride with Grignard reagents

1079. In the Cannizzaro's reaction given below,
$2\text{Ph—CHO} \xrightarrow{\text{OH}^-} \text{Ph—CH}_2\text{OH} + \text{PhCOO}^-$
the slowest step is:
a) The attack of OH^- at the carbonyl group
b) The transfer of hydride to the carbonyl group
c) The abstraction of proton from the carboxylic acid
d) The deprotonation of $\text{Ph—CH}_2\text{OH}$

1080. Which one is correct for acidic nature of the following?
(i) PhCOOH (ii) o-$NO_2C_6H_4COOH$
(iii) p-$NO_2C_6H_4COOH$ (iv) m-$NO_2C_6H_4COOH$
a) (ii) > (iii) > (iv) > (i) b) (ii) > (iv) >(iii) > (i) c) (ii) > (iv) > (i) >(iii) d) (i) >(ii) > (iii) > (iv)

1081. The reagent which does not give acid chloride on treating with a carboxylic acid is
a) PCl_5 b) Cl_2 c) $SOCl_2$ d) PCl_3

1082. Separation of petroleum into its components is mostly done by:
a) Chromatography
b) Sublimation
c) Distillation under reduced pressure
d) Fractional distillation

1083. The product formed in the aldol condensation of acetaldehyde is
a) $CH_3CH_2CH(OH)CHO$ b) $CH_3CH(OH)CH_2CHO$ c) $CH_3CH(OH)COCH_3$ d) $CH_3CH_2CH_2CHO$

1084. A compound X undergoes reduction with $LiAlH_4$ to yield Y. When vapours of Y are passed over freshly reduced copper at 300⁰C, X is formed. What is Y?
a) CH_3COCH_3 b) CH_3CHO c) CH_3CH_2OH d) CH_3OCH_3

1085. Formaldehyde when treated with KOH gives methanol and potassium formate. The reaction is known as:
a) Perkin's reaction
b) Claisen's reaction
c) Cannizzaro's reaction
d) Knoevenagel's reaction

1086. The reagent with which both acetaldehyde and acetone react is
a) Fehling's solution b) $I_2/NaOH$ c) Tollen's reagent d) Carbonic acid

1087. The compound obtained when acetaldehyde reacts with dilute aqueous sodium hydroxide exhibits
a) Geometrical isomerism b) Optical isomerism
c) Neither optical nor geometrical isomerism d) Both optical and geometrical isomerism

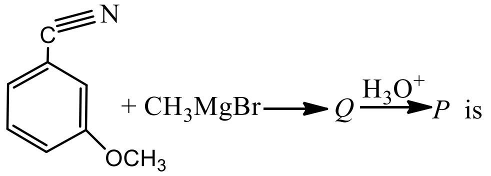
1088. Consider the acidity of the carboxylic acids
(i) PhCOOH
(ii) $o-NO_2C_6H_4COOH$
(iii) $p-NO_2C_6H_4COOH$
(iv) $m-NO_2C_6H_4COOH$
Which of the following order is correct?
a) (i) > (ii) > (iii) > (iv) b) (ii) > (iv) > (iii) > (i)

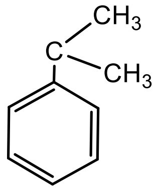
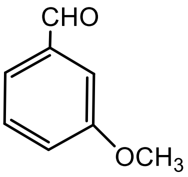
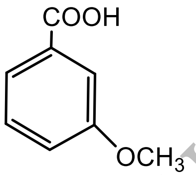
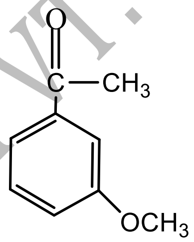
c) (ii) > (iv) > (i) > (iii) d) (ii) > (iii) > (iv) > (i)

1089. Which of the following orders is wrong with respect to property indicated?

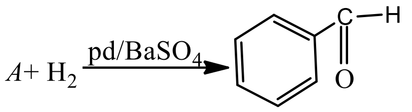
a) Formic acid > Acetic acid > Propionic acid (Acid strength)
b) Fluoro acetic acid > Chloro acetic acid > Bromo acetic acid (Acid strength)
c) Benzoic acid > Phenol > Cyclohexanol (Acid strength)
d) Aniline > Cyclohexylamine > Benzamide (Base strength)

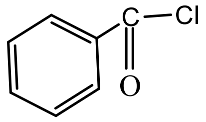
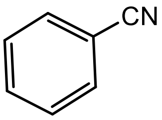
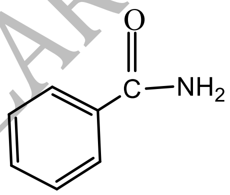
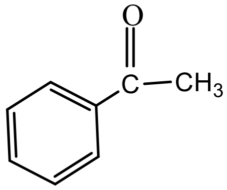
1090. The product P in the reaction,



a) 
b) 
c) 
d) 

1091.



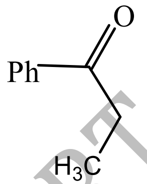
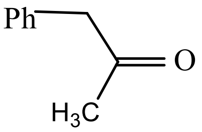
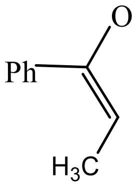
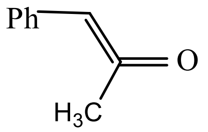
a) 
b) 
c) 
d) 

1092. What is the product in the reaction

$CH_3MgBr \xrightarrow[(ii)H_2O]{(i)CO_2} X?$

a) Acetaldehyde b) Acetic acid c) Formic acid d) Formaldehyde

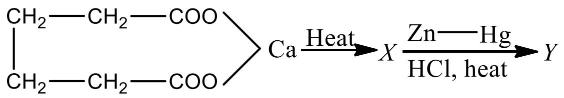
1093. $Ph - C \equiv C - CH_3 \xrightarrow{Hg^{2+}/H^+} A, A$ is

a) 
b) 
c) 
d) 

1094. Organic compounds are studied separately from others, because:

a) Organic compounds do not confirm to the laws of chemical combination
b) Organic compounds are all covalent, while inorganic compounds are electrovalent
c) Special characteristics if carbon compounds like catenation, formation of compounds both with electropositive and electronegative elements and their tendency to show isomerism
d) It appears a convenient way of study

1095. Identify the product Y in the following reaction sequence



a) Pentane b) Cyclobutane c) Cyclopentane d) Cyclopentanone

1096. A liquid was mixed with ethanol and a drop of concentrated H_2SO_4 was added. A compound with a fruity

6. smell was formed. The liquid was

a) CH_3OH b) $HCHO$ c) CH_3COCH_3 d) CH_3COOH

109 Aldehydes are first oxidation product of:
7.

a) Primary alcohols b) Secondary alcohols c) Tertiary alcohols d) Dihydric alcohols

ALDEHYDES, KETONES AND CARBOXYLIC ACIDS

CHEMISTRY

: ANSWER KEY :

1)	b	2)	b	3)	c	4)	d	177)	b	178)	a	179)	d	180)	b
5)	d	6)	c	7)	c	8)	b	181)	d	182)	d	183)	a	184)	b
9)	d	10)	b	11)	a	12)	b	185)	c	186)	b	187)	a	188)	a
13)	c	14)	c	15)	d	16)	c	189)	b	190)	a	191)	d	192)	a
17)	a	18)	b	19)	a	20)	c	193)	c	194)	c	195)	d	196)	c
21)	d	22)	d	23)	b	24)	c	197)	a	198)	c	199)	a	200)	c
25)	c	26)	b	27)	c	28)	c	201)	c	202)	c	203)	b	204)	a
29)	b	30)	b	31)	a	32)	d	205)	a	206)	b	207)	c	208)	d
33)	b	34)	a	35)	d	36)	a	209)	c	210)	b	211)	b	212)	a
37)	a	38)	b	39)	b	40)	b	213)	b	214)	b	215)	a	216)	c
41)	c	42)	b	43)	c	44)	c	217)	b	218)	b	219)	c	220)	b
45)	d	46)	a	47)	b	48)	c	221)	a	222)	b	223)	d	224)	d
49)	a	50)	a	51)	c	52)	d	225)	c	226)	a	227)	b	228)	d
53)	d	54)	c	55)	c	56)	a	229)	c	230)	b	231)	b	232)	b
57)	c	58)	c	59)	a	60)	a	233)	a	234)	b	235)	b	236)	d
61)	a	62)	d	63)	d	64)	d	237)	a	238)	d	239)	c	240)	a
65)	b	66)	c	67)	b	68)	b	241)	c	242)	b	243)	c	244)	a
69)	b	70)	c	71)	d	72)	a	245)	b	246)	c	247)	a	248)	c
73)	a	74)	a	75)	b	76)	c	249)	b	250)	a	251)	a	252)	c
77)	b	78)	b	79)	b	80)	c	253)	b	254)	d	255)	a	256)	d
81)	a	82)	b	83)	b	84)	b	257)	a	258)	d	259)	d	260)	a
85)	a	86)	a	87)	a	88)	b	261)	b	262)	b	263)	c	264)	c
89)	b	90)	b	91)	d	92)	b	265)	d	266)	a	267)	b	268)	d
93)	c	94)	a	95)	a	96)	d	269)	b	270)	a	271)	d	272)	d
97)	b	98)	c	99)	d	100)	c	273)	c	274)	c	275)	b	276)	c
101)	c	102)	d	103)	a	104)	d	277)	b	278)	b	279)	c	280)	d
105)	c	106)	a	107)	a	108)	c	281)	a	282)	d	283)	a	284)	d
109)	c	110)	b	111)	b	112)	d	285)	b	286)	a	287)	b	288)	b
113)	a	114)	d	115)	a	116)	c	289)	c	290)	a	291)	d	292)	c
117)	d	118)	d	119)	c	120)	c	293)	a	294)	a	295)	a	296)	d
121)	c	122)	b	123)	b	124)	b	297)	b	298)	b	299)	a	300)	c
125)	b	126)	a	127)	b	128)	c	301)	a	302)	b	303)	d	304)	a
129)	a	130)	d	131)	a	132)	a	305)	c	306)	b	307)	d	308)	b
133)	d	134)	c	135)	c	136)	c	309)	b	310)	c	311)	c	312)	b
137)	c	138)	b	139)	b	140)	d	313)	b	314)	b	315)	d	316)	c
141)	a	142)	a	143)	a	144)	c	317)	b	318)	b	319)	c	320)	b
145)	c	146)	d	147)	a	148)	b	321)	b	322)	c	323)	b	324)	b
149)	a	150)	b	151)	d	152)	c	325)	c	326)	c	327)	b	328)	a
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353)	a	354)	a	355)	b	356)	b	557)	b	558)	a	559)	b	560)	c
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785)	b	786)	a	787)	d	788)	b
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817)	b	818)	a	819)	b	820)	a
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825)	b	826)	b	827)	a	828)	a
829)	c	830)	b	831)	a	832)	b
833)	b	834)	a	835)	c	836)	c
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905)	d	906)	d	907)	b	908)	d
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925)	c	926)	b	927)	c	928)	d
929)	c	930)	b	931)	b	932)	a

933)	a	934)	d	935)	b	936)	c
937)	a	938)	b	939)	b	940)	d
941)	b	942)	a	943)	c	944)	b
945)	d	946)	b	947)	d	948)	d
949)	a	950)	b	951)	a	952)	b
953)	b	954)	c	955)	b	956)	d
957)	c	958)	b	959)	b	960)	b
961)	d	962)	b	963)	a	964)	c
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973)	b	974)	d	975)	d	976)	c
977)	c	978)	c	979)	c	980)	d
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985)	d	986)	d	987)	b	988)	c
989)	a	990)	b	991)	a	992)	d
993)	d	994)	d	995)	c	996)	c
997)	a	998)	b	999)	c	1000)	d
1001)	d	1002)	a	1003)	b	1004)	c
1005)	c	1006)	a	1007)	d	1008)	c
1009)	c	1010)	b	1011)	c	1012)	b
1013)	b	1014)	b	1015)	a	1016)	d
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1021)	c	1022)	b	1023)	a	1024)	c
1025)	d	1026)	c	1027)	a	1028)	c
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1033)	c	1034)	c	1035)	d	1036)	c
1037)	c	1038)	c	1039)	c	1040)	c
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1045)	c	1046)	b	1047)	a	1048)	c
1049)	c	1050)	d	1051)	d	1052)	a
1053)	b	1054)	a	1055)	d	1056)	d
1057)	b	1058)	d	1059)	a	1060)	c
1061)	c	1062)	c	1063)	d	1064)	c
1065)	b	1066)	a	1067)	b	1068)	a
1069)	a	1070)	b	1071)	a	1072)	a
1073)	c	1074)	c	1075)	c	1076)	c
1077)	c	1078)	c	1079)	b	1080)	a
1081)	b	1082)	d	1083)	b	1084)	c
1085)	c	1086)	b	1087)	b	1088)	d
1089)	d	1090)	d	1091)	a	1092)	b
1093)	a	1094)	c	1095)	c	1096)	d
1097)	a						

ALDEHYDES, KETONES AND CARBOXYLIC ACIDS

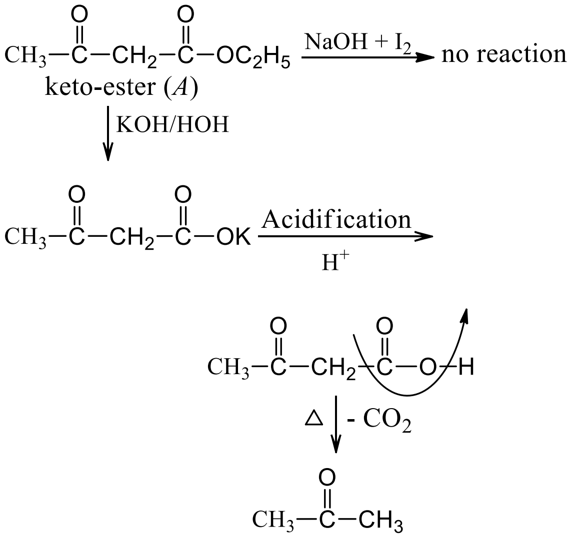
CHEMISTRY

: HINTS AND SOLUTIONS :

1 **(b)**

$CHCl_3 \xrightarrow{HOH} CH(OH)_3 \longrightarrow HCOOH$

2 **(b)**



The keto-ester (A) does not give haloform reaction inspite of the presence of CH_3CO- group in it. The reason is the presence of active methylene group ($ie, -CH_2-$), which prevents the conversion of CH_3CO- to CX_3CO-

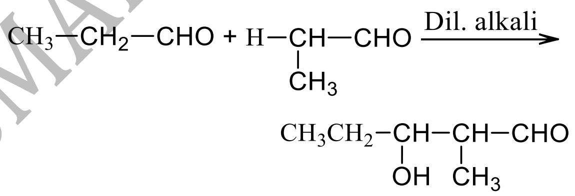
3 **(c)**

Formaldehyde reacts with NH_3 to form urotropine which is used as medicine to cure urinary infections.

$6HCHO$	+	$4NH_3 \rightarrow$	$(CH_2)_6N_4$
Formaldehyde		ammonia	hexamethylene tetramine urotropine

4 **(d)**

Aldehydes and ketones having α-hydorgen atom undergo aldol condensation in presence of dilute base



$$CH_3-CH_2-CHO + H-\underset{CH_3}{\underset{|}{CH}}-CHO \xrightarrow{\text{Dil. alkali}} CH_3CH_2-\underset{OH}{\underset{|}{CH}}-\underset{CH_3}{\underset{|}{CH}}-CHO$$

5 **(d)**

$CH_3CHO \xrightarrow{[O]} CH_3COOH$

6 **(c)**

Acetic acid reacts with PCl_5 to form acetyl chloride.

$CH_3COOH + PCl_5 \longrightarrow CH_3COCl + POCl_3 + HCl$

acetic acid acetyl chloride

9 **(d)**

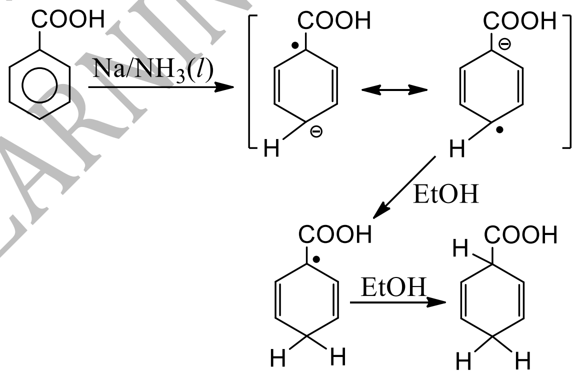
C_6H_5COOH is solid, less soluble in water and burn with smoky flame.

11 **(a)**

$CH_2Cl_2 \xrightarrow{HOH} HCHO$

12 **(b)**

When aromatic carboxylic acids are subjected to Birch reduction (ie, Na or K in NH_3 and an alcohol), 1, 4-additional of hydrogen takes place and 1, 4-cyclohexadiene carboxylic acids are produced



13 **(c)**

Picric acid is 2,4,6-trinitrophenol.

14 **(c)**

Herbicides are the substances that kills plants or inhibit their growth. Selective herbicides affect only particular plant types, making it possible to attack weeds growing among cultivated plants.

15 **(d)**

Carbonyl compounds are reduced to corresponding alkanes with (Zn+ conc.HCl). It is called Clemmensen reduction.

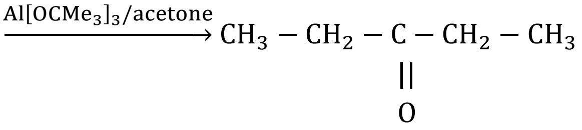
$$CH_3CH_2.\overset{\overset{O}{||}}{C}-CH_3 \xrightarrow{Zn(Hg)+HCl} CH_3CH_2CH_2CH_3$$

16 **(c)**

Aluminium tertiary butoxide is an oxidising agent used for the oxidation of secondary alcohols into ketones.

$$CH_3-CH_2-\underset{OH}{\underset{|}{CH}}-CH_2-CH_3$$

3-pentanol



$$\xrightarrow{Al[OCMe_3]_3/acetone} CH_3-CH_2-\underset{\underset{O}{\|}}{C}-CH_2-CH_3$$

3-pentanone

18 **(b)**

The silver salt of fatty acid on refluxing with an alkyl halide, give an ester.

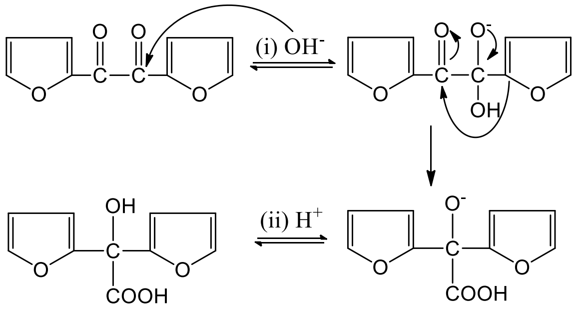
$$RCOOAg + R'Cl \xrightarrow{\Delta} \underset{\text{ester}}{RCOOR'} + AgCl$$

19 **(a)**

$$CH_3COCH_3 \xrightarrow{SeO_2} CH_3CO\cdot CHO + Se + H_2O$$

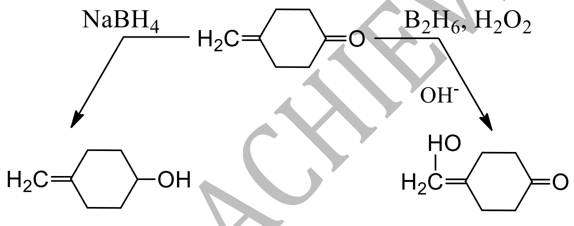
20 **(c)**

1, 2 diketone undergoes rearrangement to α-hydroxy carboxylic acid in presence of base. This reaction is known as benzilic acid rearrangement



23 **(b)**

In the given compound, carbonyl group is reduced to – OH group by $NaBH_4$ and it does not affect double bond. The another is hydroboration-oxidation reaction, in which one water molecule is added to double bond



26 **(b)**

$$CH_3CHO \xrightarrow{Na/C_2H_5OH} CH_3CH_2OH$$

28 **(c)**

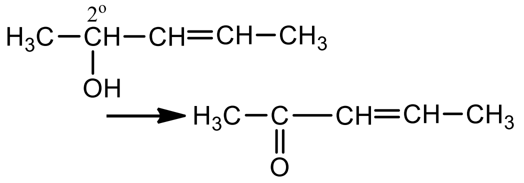
1. Acidity decreases with increase in number of carbon atoms in carboxylic acid.

2. Solubility of carboxylic acid decrease with increase in number of carbon atoms. Higher acids are insoluble in H_2O.

3. Boiling points of acids are higher than corresponding alcohols due to greater extent of hydrogen bonding.

∴ (c) is correct answer.

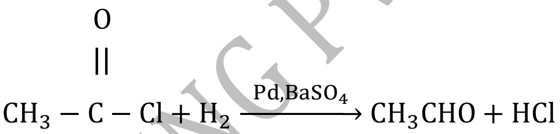
29 **(b)**



Only suitable reagent is chromic anhydride in glacial acetic acid. Other will also effect (C=C) bond.

30 **(b)**

In the Rosenmund's reaction the acid chlorides are converted to corresponding aldehydes by catalytic reaction. This reaction is carried in the presence of palladium deposited over barium, sulphate.

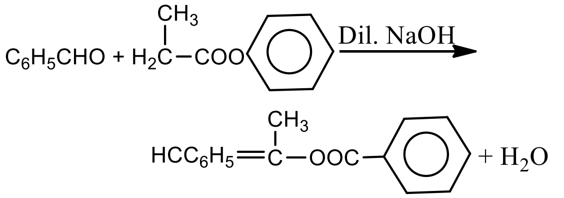


$$CH_3-\overset{\overset{O}{\|}}{C}-Cl + H_2 \xrightarrow{Pd,BaSO_4} CH_3CHO + HCl$$

Acetyl chloride acetaldehyde

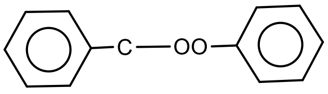
31 **(a)**

In Claisen condensation aromatic aldehydes having no α −hydrogen atom react with aldehyde, ketones or esters having α −hydrogen atom in presence of dilute alkali to form α,β −unsaturated carbonyl compound. *e.g.*,



a,β -unsaturated carbonyl compound

Claisen condensation is not given by



As it does not containα −hydrogen atom.

32 **(d)**

Methyl salicylate an ester has smell of oil of winter green and used as medicine in iodex; the pain reliever of strains in muscles.

33 **(b)**

Rosenmund's reaction involves reduction of acid chlorides to aldehydes by the action of H_2 in presence of $Pd/BaSO_4$. $BaSO_4$ acts as poison for Pd and prevents further reduction of aldehydes to alcohol.

34 **(a)**

After treatment with D_2O, the H^+ ion of − OH group is replaced by D^+ ion, because of being more reactive than deuterium

$$CH_3-C=CH_2 \xrightarrow{D_2O} CH_3-C=CH_2$$

| |
OH   OD

35 **(d)**

$$CH_3COOH \xrightarrow{NH_3} CH_3COONH_4 \xrightarrow[-H_2O]{\Delta} CH_3CONH_2$$

acetic acid   ammonium acetate   acetamide

The isomers of CH_3CONH_2 is

4. NH_2CH_2CHO
5. $CH_3-CH=NOH$
6. $H-CONH-CH_3$

38 **(b)**

$$CH_3COOCH_3 + C_2H_5OH \longrightarrow CH_3COOC_2H_5 + CH_3OH$$

40 **(b)**

Cinnamaldehyde is prepared by the Claisen reaction between benzaldehyde and acetaldehyde

$$C_6H_5CHO + CH_3CHO \xrightarrow{NaOH} C_6H_5OH = CHCHO + H_2O$$

cinnamaldehyde

41 **(c)**

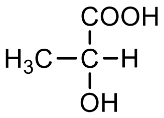
$$2CH_3COOH \xrightarrow{P_2O_5} (CH_3CO)_2O + H_2O$$

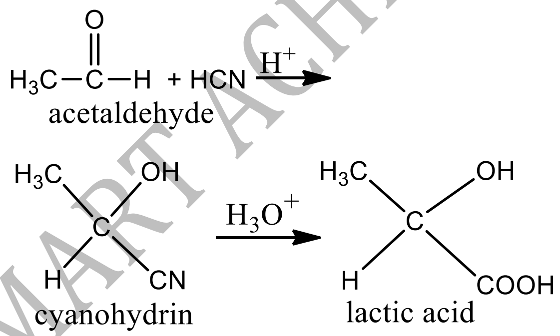
P_2O_5 acts as dehydrating agent.

44 **(c)**

Carbonyl compound + HCN →cyanohydrin$\xrightarrow{H_2O/H^+}$hydroxy acid

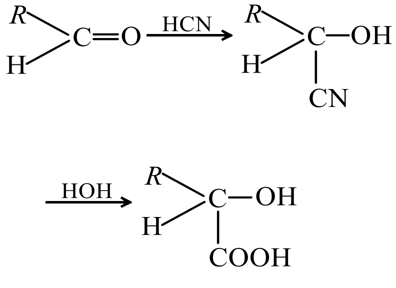
Latic acid is





∴ Cyanohydrin of acetaldehyde forms lactic acid.

46 **(a)**



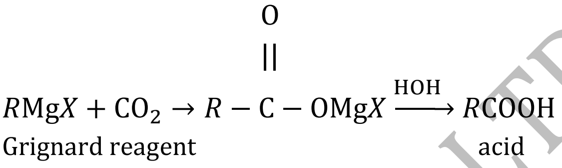
Carbon is asymmetric.

48 **(c)**

Carboxylic acids are prepared by reaction of Grignard reagent with CO_2.

∵ Formic acid (HCOOH)has only one carbon atom

∴ Formic acid cannot be prepared from Grignard reagent.

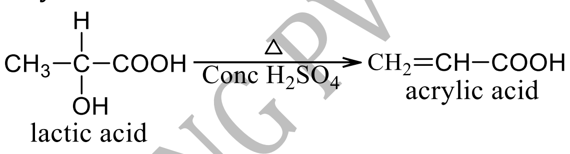


$$RMgX + CO_2 \rightarrow R-\overset{\overset{\displaystyle O}{||}}{C}-OMgX \xrightarrow{HOH} RCOOH$$

Grignard reagent   acid

51 **(c)**

Lactic acid on heatng with conc. H_2SO_4 to give acrylic acid



52 **(d)**

When urea is heated it gives the biurate which give violet colour with $CuSO_4$ and NaOH.

56 **(a)**

An immiscible solvent is added to the solution. Some of the solute passes in this solvent maintaining Nernst distribution law $K = \frac{C_1}{C_2}$, where C_1 and C_2 are concentration of solute in two phases.

57 **(c)**

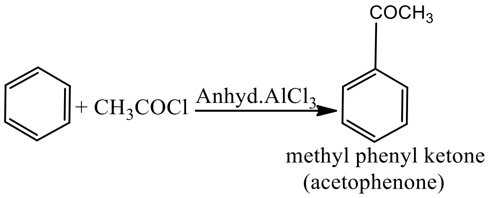
Electron withdrawing group ($-I$ effect) stabilizes the anion, and thus increases acidic nature.

Thus (c), (d)> (a), (b) acidic

Farther the electron withdrawing group from the –COOH group, its effect in increasing acid strength decreases thus (c) with Cl at α −position is stronger than (d) with Cl at γ −position.

58 **(c)**

When, benzene is heated with acetyl chloride, in presence of anhydrous $AlCl_3$, electrophilic substitution takes place and acetophenone is obtained. The reaction is known as Friedel-Craft acylation.



59 **(a)**

$$: 6HCHO + 4NH_3 \rightarrow (CH_2)_6N_4 + 6H_2O$$

hexamethylene tetramine

60 **(a)**

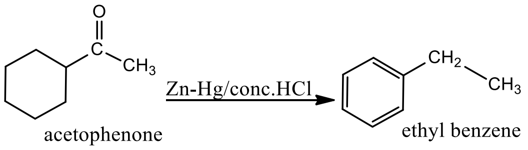
4-methyl benzene sulphonic acid is stronger than acetic acid thus, it will release acetic acid from sodium acetate.

61 **(a)**

$RCOOH \xrightarrow{PCl_5} RCOCl.$

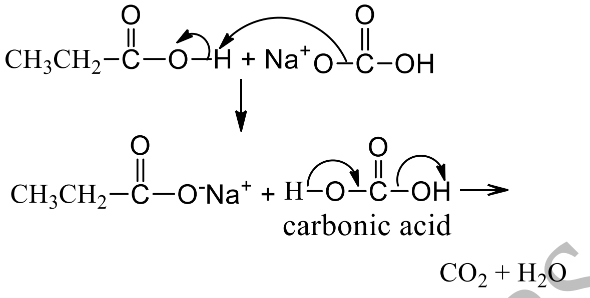
63 **(d)**

Clemmensen reduction can be used to convert acetophenone into ethyl benzene as it reduce >C=O group into > CH_2



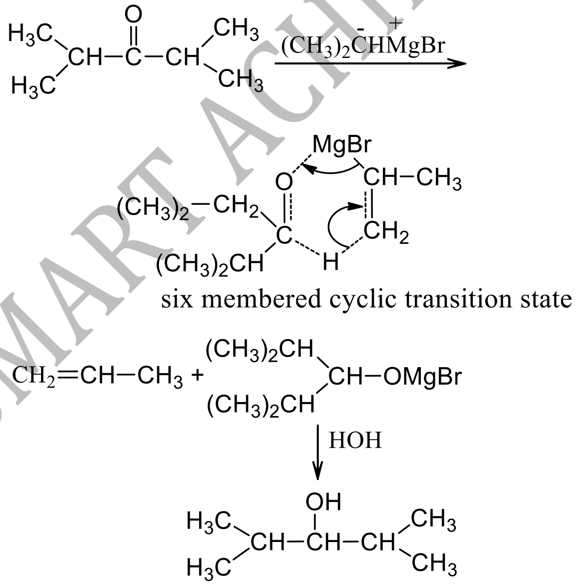
64 **(d)**

Carboxylic acids reacts with weaker bases such as bicarbonates producingCO_2. The CO_2 evolved comes from $NaHCO_3$, not from carboxylic group as shown below :



67 **(b)**

Iso-propyl magnesium bromide reduces di-*iso*-propyl ketone to secondary alcohol. However, only – H^+ ion adds to ketone in spite of bulky alkyl group due to steric hinderance



68 **(b)**

In (a) t-alcohol, in (c) initially s-alcohol converting to ether. In (d) p-alcohol.

69 **(b)**

Carbonyl carbon becomes more reactive towards nucleophilic addition depending upon the magnitude of the positive charge on the carbonyl carbon atom. The introduction of negative inductive effect showing group (-I effect) increases the reactivity while introduction of alkyl group (+I effect) decreases the reactivity. So, large alkyl group decreases the reactivity of > C=O.

71 **(d)**

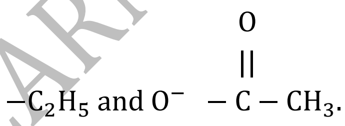
Unsaturated ketones may be converted to unsaturated acids by sodium hypohalite, *i. e.*, NaOCl, NaOI, etc.

72 **(a)**

The b.p. are $CH_3CONH_2 > (CH_3CO)_2O$
$> CH_3COOH > CH_3COCl$
222°C 139°C 116°C
52°C

73 **(a)**

Cl^- is the best leaving group being the weakest nucleophile out of NH_2^-, Cl^-, O^-



$$-C_2H_5 \text{ and } O^- \; -\overset{\overset{\displaystyle O}{||}}{C}-CH_3.$$

74 **(a)**

Former reacts with $aq.$ $NaHCO_3$.

75 **(b)**

CO_2 adds to Grignard's reagent to yield acids.

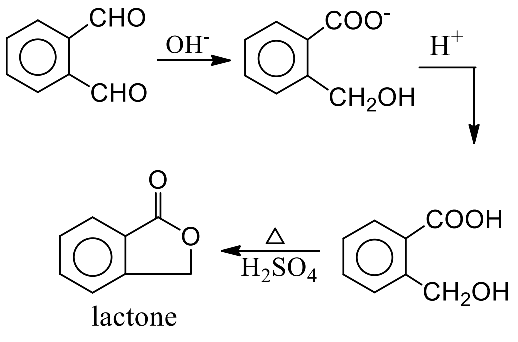
$$CO_2 \xrightarrow{CH_3MgI} CH_3COOMgI \xrightarrow{H.OH} CH_3COOH + Mg(OH)I$$

78 **(b)**

All methyl ketones give iodoform test.

80 **(c)**

This is an example of Cannizaro reaction

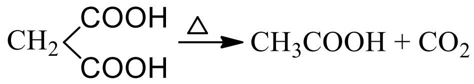


82 **(b)**

Grignard reagent =CH_3MgX
Clemmensen reduction=Zn – Hg/Conc HCl
Rosenmund reduction=$H_2/Pd - BaSO_4$
Wolff-Kishner reduction=$N_2H_4/KOH/CH_2OH$
|
CH_2OH

84 **(b)**

Decarboxylation of malonic acid give acetic acid and CO_2



$$CH_2\begin{cases}COOH\\COOH\end{cases}\xrightarrow{\Delta}CH_3COOH+CO_2$$

malonic acid

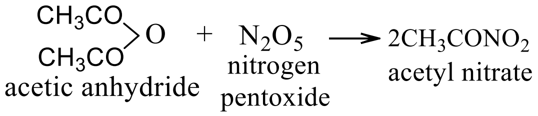
85 **(a)**

Amides, on treating with HNO_2, give acids.

$$CH_3CONH_2\xrightarrow[(HNO_2)]{NaNO_2/HCl}\underset{\text{acetic acid}}{CH_3COOH}+N_2+H_2O$$

87 **(a)**

Acetyl nitrate is formed, when acetic anhydride reacts with nitrogen pentoxide.



$$\underset{\text{acetic anhydride}}{\begin{matrix}CH_3CO\\CH_3CO\end{matrix}\!\!>O}+\underset{\substack{\text{nitrogen}\\\text{pentoxide}}}{N_2O_5}\longrightarrow\underset{\text{acetyl nitrate}}{2CH_3CONO_2}$$

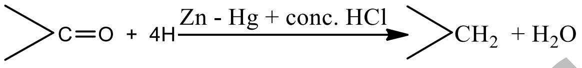
88 **(b)**

Fenton's reagent is $FeSO_4+H_2O_2$.

89 **(b)**

In Clemmensen's reduction

$Zn-Hg/conc.HCl$ is used



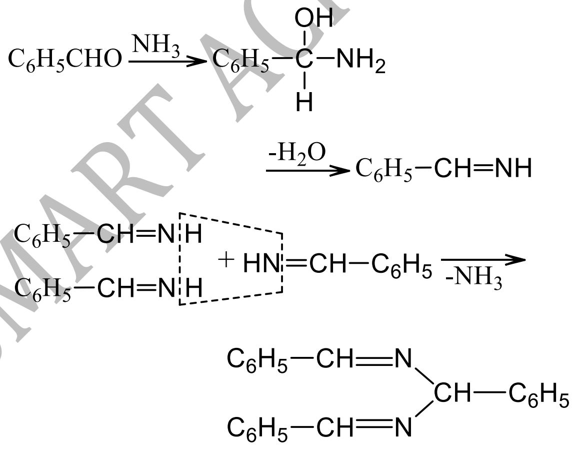
This method is used to convert carbonyl compound into alkane.

91 **(d)**

—do—

93 **(c)**

Bezaldehyde does not yield a simple addition product with ammonia, but forms a complex product, hydrobenzamide (90%)



hydrobenzamide

94 **(a)**

The order of the acidic characters of acid derivative or their ease of hydrolysis with alkali is given below :

$$CH_3COCl>CH_3CO-O-COCH_3>CH_3COOC_2H_5>CH_3CONH_2$$

95 **(a)**

It is adipic acid.

97 **(b)**

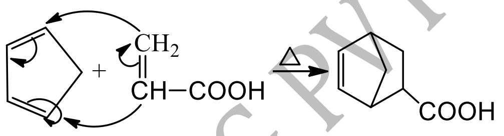
$$CH_2{=}CHCHO\xrightarrow{\text{Reduction}}CH_3CH_2CH_2OH$$

99 **(d)**

Stearic acid ($C_{17}H_{35}COOH$), palmitic acid ($C_{15}H_{31}COOH$) and oleic acid ($C_{17}H_{33}COOH$; an unsaturated acid) are fatty acids.

102 **(d)**

The given reaction is an example of Diels-Alder reaction, which is a cycloaddition



103 **(a)**

On complete oxidation the obtained compound shows increment in molecular weight of only 16. It means only one oxygen atom is added here. This condition is fulfilled by only aldehyde which on oxidation gives acid.

$$RCHO\xrightarrow{[O]}RCOOH$$

∴ Original compound must be

$$\underset{\text{mol. wt. 44}}{CH_3CHO}\xrightarrow{[O]}\underset{\text{mol.wt.60}}{CH_3COOH}$$

104 **(d)**

Former reacts with *aq*. HCl.

106 **(a)**

% ratio of C : H : : 6 : 1 and C : O : : 3 : 4

∴ % ratio of C : H : O :: 6 : 1 : 8

	%/at. wt.
∴ $\%\ C=\frac{6}{15}\times100=40$	$\frac{40}{12}=3.33$
$\%\ H=\frac{1}{15}\times100=6.66$	$\frac{6.66}{1}=6.66$
$\%\ O=\frac{8}{15}\times100=53.3$	$\frac{53.3}{16}=3.33$

∴ Simplest ratio of C : H : O : : 1 : 2 : 1, *i.e.*, CH_2O

107 **(a)**

$$2KCNO+(NH_4)_2SO_4\rightarrow2NH_4CNO+K_2SO_4$$

$$NH_4CNO\xrightarrow{\Delta}\underset{\text{urea}}{NH_2CONH_2}$$

108 **(c)**

2-pentanone and 3-pentanone can be distinguished by iodoform test. $CH_3COCH_2CH_2CH_3$(2-pentanone) gives positive iodoform test while $CH_3CH_2COCH_2CH_3$ (3-pentanone) doesn't give iodoform test.

110 **(b)**

A 40% solution of formaldehyde in water, called formalin, is used for the preservation of biological and anatomical species

111 **(b)**

Aldol condensation is given by acetaldehyde due to the presence of α-hydrogen atom.

$$CH_3CHO + H.CH_2CHO \xrightarrow{\text{Dil.NaOH}} CH_3 - CH - CH_2 - CHO$$

|
OH
aldol

112 **(d)**

These reactions lead to replacement of oxygen atom of carbonyl group to form hydrazones and oximes.

114 **(d)**

$$C = \frac{38.7}{12} = 3.22 = \frac{3.22}{3.22} = 1$$

$$H = \frac{9.67}{1} = 9.67 = \frac{9.67}{3.22} = 3$$

$$O = \frac{51.63}{16} = 3.22 = \frac{3.22}{3.22} = 1$$

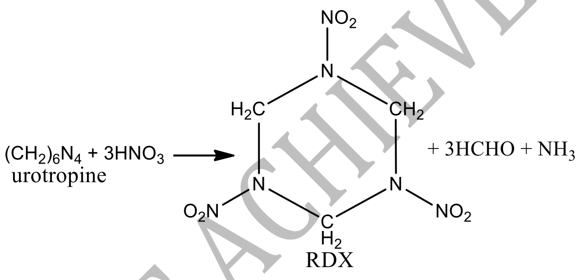
$\therefore$ Empirical formula is CH_3O

115 **(a)**

$$CH_3COCl \xrightarrow[H_2]{Pd/BaSO_4} \underset{(A)}{CH_3CHO} + HCl$$

CH_3COCl is the isomer of $CH_2ClCHO \cdot CH_3CHO$ is the isomer of oxirane *ie*

117 **(d)**



$\therefore$ Nitration of urotropine gives powerful explosive

118 **(d)**

$RCOOH + N_3H \longrightarrow RNH_2 + CO_2 + N_2$

121 **(c)**

The solution produces CuO in it.

122 **(b)**

Stephen's reduction Aldehyde can be prepared from alkyl cyanides. *e.g.*,

$$CH_3 - C \equiv N + 2[H] \xrightarrow[\text{Ether}]{SnCl_2/HCl} CH_3 - CH = NH.HCl$$

$\downarrow H_2O/H^+$

$CH_3CHO + NH_4Cl$
acetaldehyde

123 **(b)**

Aldehydes, which have no α −hydrogen atom, undergo Cannizaro reaction is presence of conc. NaOH and yield an alcohol and an acid salt. (Disproportionation).

$$\underset{\text{benzaldehyde}}{2C_6H_5CHO} \xrightarrow{NaOH} \underset{\text{benzyl alcohol}}{C_6H_5CH_2OH} + C_6H_5COONa$$

125 **(b)**

$RCOOR' + NH_3 \longrightarrow RCONH_2 + R'OH$

126 **(a)**

$CH_3COCl + NaCOOCCH_3 \longrightarrow (CH_3CO)_2O + NaCl$

127 **(b)**

$$C_2H_6 + \frac{7}{2}O_2 \longrightarrow 2CO_2 + 3H_2O$$

128 **(c)**

$$\underset{\text{Propionic acid}}{CH_3CH_2COOH} \xrightarrow{NH_3} \underset{\substack{\text{propionamide}\\(X)}}{CH_3CH_2CONH_2}$$

$$\xrightarrow{Br_2+KOH} \underset{\substack{\text{Ethyl amine}\\(Y)}}{CH_3CH_2NH_2} \xrightarrow{HNO_2} \underset{\substack{\text{ethyl alcohol}\\(Z)}}{CH_3CH_2OH}$$

129 **(a)**

The acidic strength of dicarboxylic acids decreases as the number of methyl groups increases, because of their $+I$ effect

130 **(d)**

Oppenauer oxidation;

=

Meerwein − Ponndorf − Verley reaction.

$R_2CO + [(CH_3)_2CHO]_3Al \longrightarrow CH_3COCH_3 + [R_2CHO]_3Al$

$\downarrow$ less

R_2CHOH

131 **(a)**

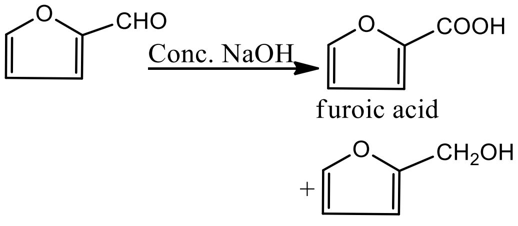
Addition according to Markownikoff's rule.

132 **(a)**

In Cannizaro reaction when formaldehyde reacts with other aldehydes lacking α-hydrogen, it is always oxidized and other aldehyde is reduced

$$HCHO + C_6H_5CHO \xrightarrow[\Delta]{NaOH} HCOO^-Na^+ + C_6H_5CH_2OH$$

134 **(c)**



It is an example of Cannizaro's reaction.

135 **(c)**

$Br_2HCCBr_2COOH \xrightarrow{\text{Sodalime}} CHBr_2CHBr_2$

136 **(c)**

All aldehydes reduce Fehling's solution to give red ppt. of Cu_2O.

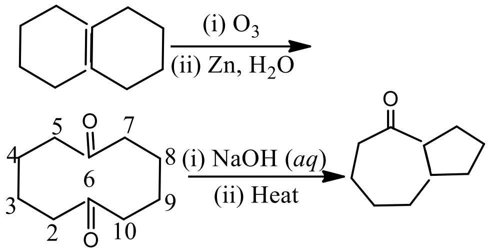
138 **(b)**

$CH_3CH_2CH_2COOCH_3$; has banana odour.

139 **(b)**

This is internal Cannizzaro's reaction.

143 **(a)**



For aldol condensation C-5 and C-7 can attack to C-1 similarly C-2 and C-10 can attack to C-6 but all give same product.

144 **(c)**

$(CH_3CH_2COO)_2Ca \longrightarrow CH_3CH_2COCH_2CH_3 + CaCO_3$

146 **(d)**

Aldehyde containing no α-H-atom on reaction with 50% NaOH or KOH, undergo disproportionation to give an alcohol and Na or K salt of an acid. This reaction is called Cannizaro reaction. Acetaldehyde does not show Cannizaro reaction due to presence of α-hydrogen atom

147 **(a)**

$CH_3CH_2CH_2OH \xrightarrow[H_2So_4]{K_2Cr_2O_7} CH_3CH_2CHO$

7. (B)

propanol propanal

$\xrightarrow{H_2NCONHNH_2} CH_3CH_2CH = NNHCONH_2$

(C)

148 **(b)**

$CH_3CN \xrightarrow{HOH} CH_3COOH$

152 **(c)**

40% aqueous solution of formaldehyde (methanal) is called as formalin.

Note Formalin used as disinfectant and preservative for biological specimens.

153 **(a)**

$LiAlH_4$ is a strong reducing agent, which reduces carboxylic acids to corresponding primary alcohols as well as alkyl halide to alkenes, but donot reduce double bond

$BrCH_2CH_2CH_2COOH \xrightarrow{LiAlH_4} CH_3CH_2CH_2CH_2OH$

154 **(d)**

The strength of carboxylic acid depends upon the nature of the electron withdrawing halogen atom. Greater the electron withdrawing influence of the halogen atom stronger will be the acid. The electron withdrawing effect of the halogen decreases as

$F > Cl > Br > I$

Hence, $CH_2(I).COOH$ is the weakest acid among these.

155 **(c)**

$C_4H_9OCl \xrightarrow{NH_3} C_4H_9ONH_2 \xrightarrow[KOH]{Br_2^+} CH_3CH_2CH_2NH_2$

Thus, C_4H_9OCl should be $CH_3CH_2CH_2COCl$.

156 **(c)**

$CH_3CH_2CHOHCH_3 \overset{[O]}{\rightarrow} CH_3CH_2COCH_3$

160 **(d)**

$R — CHO + 2CuO \longrightarrow RCOOH + Cu_2O$

167 **(a)**

Acetic acid is CH_3COOH or $C_2H_4O_2$. Thus, its empir

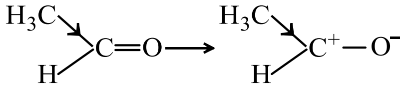
170 **(a)**

The Arndt-Eistert synthesis is used to convert carboxylic acid to the higher acid homologue

$RCOOH \xrightarrow[\text{(ii) } CH_2N_2]{\text{(i) } SOCl_2} RCH_2COOH$

171 **(b)**

Less +ve inductive effect on carbonyl group and thus more +ve charge on C^+ to give nucleophilic addition.



172 **(a)**

$\% \text{ of C} = \frac{12\times0.147}{44\times\ 0.2} \times 100 = 20$

$\% \text{ of H} = \frac{2\times0.12}{18\times0.2} \times 100 = 6.66$

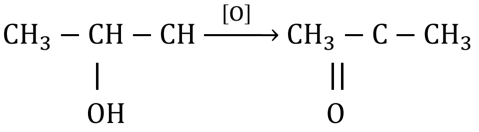
$\therefore \% \text{ of O} = 100 - 20 - 6.66 = 73.34$

174 **(a)**

Resonance in carboxylate ions give rise to identical bond lengths.

175 **(a)**

2-hydroxypropane or secondary alcohol is oxidised into propanone (corresponding carbonyl compound because in 2-hydroxypropane, secondary alcoholic group is present and it is oxidised into ketone).

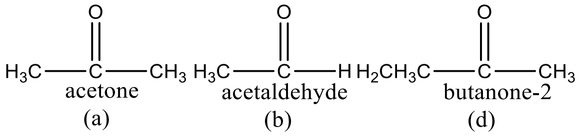


$$\underset{\text{OH}}{\mathrm{CH_3-CH-CH}}\xrightarrow{[O]}\mathrm{CH_3-\overset{\text{O}}{\overset{\|}{C}}-CH_3}$$

2-hydroxyprone (s-alcohol) propanone (ketone)

176 **(c)**

Only aldehydes and ketones react with 2, 4-dinitrophenyl hydrazine to give orange coloured ppt. This reaction is used as test for carbonyl group. Alcohols does not give this reaction.



Choice (a), (b) and (d) are carbonyl compounds and they react with 2,4-dnitreophenyl hydrazine

CH_3OH[choice(c)] doesn't have carbonyl group.

∴ CH_3OH[choice (c)] doesn't react with 2,4-dinitrophenyl hydrazine.

177 **(b)**

Carboxylic acids acids react with Grignard's reagent to give alkanes.

$$CH_3COOH + CH_3MgX \rightarrow CH_3COOMgX + \underset{\text{methane}}{CH_4}$$

179 **(d)**

2-pentanone give positive iodoform test.

180 **(b)**

Ethyl acetate is obtained by acetaldehyde by using aluminium ethoxide. It is a one step process and called Tischenko's reaction

$$\underset{\text{ethanal}}{2CH_3CHO}\xrightarrow[\text{Aluminium ethoxide}]{(C_2H_5O)_3Al}\underset{\text{ethyl acetate}}{CH_3COOC_2H_5}$$

182 **(d)**

Acids are soluble in bases.

183 **(a)**

Eq. of silver salt = Eq. of Ag

$$\frac{0.759}{E}=\frac{0.463}{108}$$

∴ Eq. wt. of ag salt = 177

∴ Eq. wt. of acid = 177 – 108 +1 = 70

184 **(b)**

Acetaldehyde on heating with Tollen's reagent give silver mirror test while acetone is not oxidised by Tollen's reagent

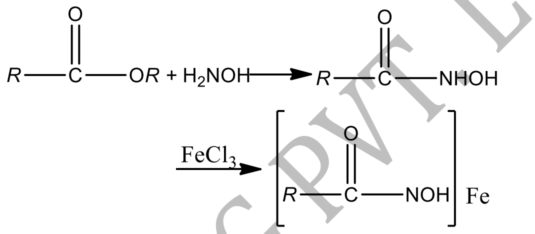
(Ketones oxidise only under drastic condition).

185 **(c)**

Hydroxamic acid test is used to detect presence of esters.

In hydroxamic acid test a few crystals or a few drops of the substance is dissolved in 1 mL of 95% ethanol+1 mL of 1 MHCl. Then, a drop of 5% $FeCl_3$ is added.

Formation of characteristic colour shows the presence of acyl or ester group.



186 **(b)**

$LiAlH_4$ reduces – COOH group to – CH_2OH group without affecting C=C bond.

187 **(a)**

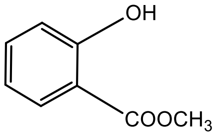
$$\text{Benzaldehyde}\xrightarrow{\text{Perkin reaction}}3-\text{phenyl prop}-2\text{ene}-1-\text{oic acid.}$$

$$C_6H_5CHO+(CH_3CO)_2O\xrightarrow{CH_3COONa}C_6H_5CH=CHCOOH+CH_3COOH$$

Cinnamic acid

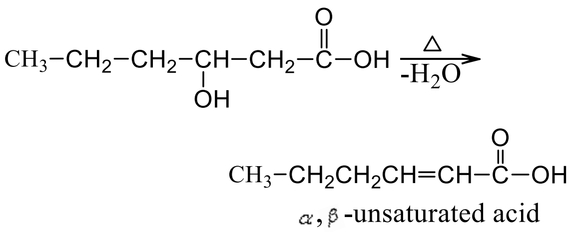
189 **(b)**

Methyl salicylate is the main component of oil of winter green. Its structure is



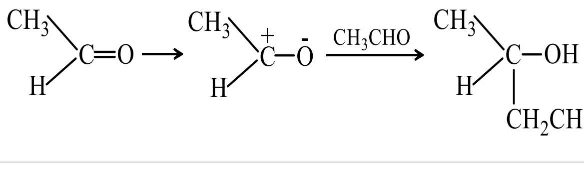
193 **(c)**

α-hydroxy acids form lactides, γ and δ-hydroxy acids form lactones, (cyclic compounds). While β-hydroxy acids form α, β-unsaturated acid on heating



194 **(c)**

This is Knovengeal reaction.



195 **(d)**

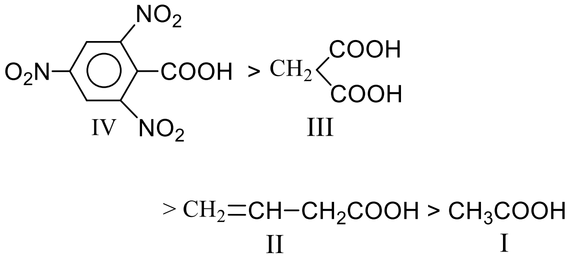
For the conversion of primary alcohol into aldehyde with the same number of carbon, the most suitable reagent is pyridinium chlorochromate (PCC).

$$RCH_2OH \xrightarrow{PCC} RCHO$$

Note PCC is the mixture of pyridine, CrO_3 and HCl in 1:1:1 ratio.

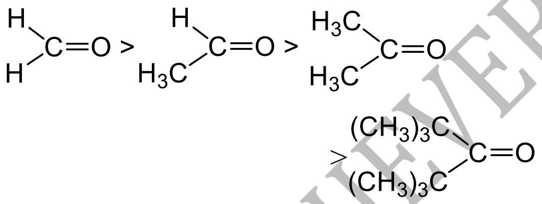
196 **(c)**

In 2, 4, 6-tri-nitrobenzoic acid, the decarboxylation takes place most easily, because of $-I$ effect of nitro group, whereas in the dicarboxylic acid with one carbon atom having two carboxylic group it is also easier to removeCO_2. Hence, the order of ease of decarboxylation



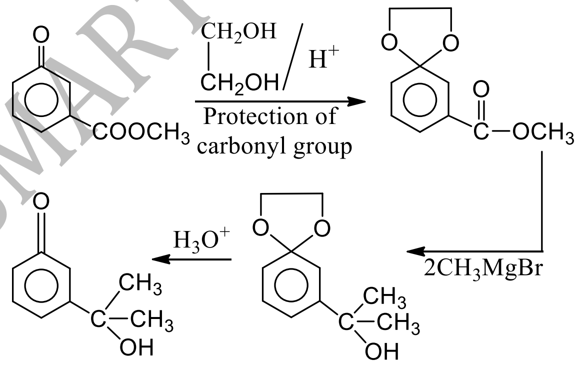
199 **(a)**

As the number and the size of the alkyl groups increases, reactivity decreases. Hence, the reactivity order is



200 **(c)**

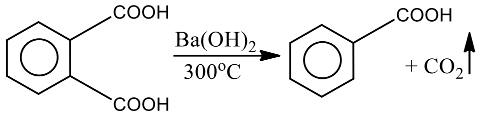
Keto group is protected by ethylene glycol being reduced and ester radical of the compound is reduced to tertiary alcohol by reaction with Grignard reagent and subsequent hydrolysis



201 **(c)**

In Hell-Volhard Zelinsky reaction, when acid reacts with Br_2 or Cl_2 in presence of red phosphorus α-hydrogen atom of the acid is replaced by halogen atom. HCOOH does not give HVZ reaction due to absence of α-hydrogen atom

202 **(c)**



Phthalic acid

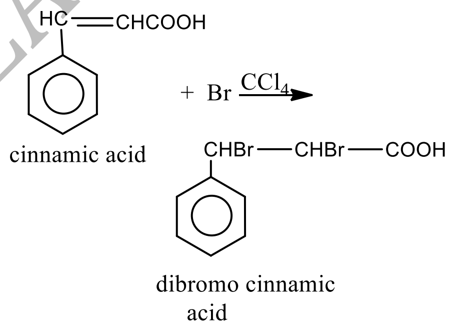
In presence of $Ba(OH)_2$ when heated phthalic acid undergoes decarboxylation.

204 **(a)**

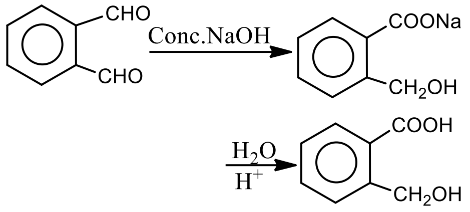
Wolff-Kishner's reaction involves reduction of carbonyl compound into alkane using alkaline hydrazine as reducing agent.

205 **(a)**

Benzoic acid, *o*-phthalic acid and acetophenone inspite of having double bonds, does not give unsaturation test (addition with Br_2/CCl_4) as they are aromatic compounds and are quite stable due to large resonance energy. Cinnamic acid, on the other hand has a double bond outside the benzene ring (in the side chain) hence it gives unsaturation test.

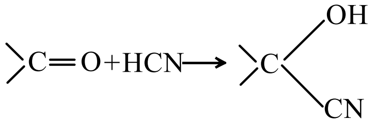


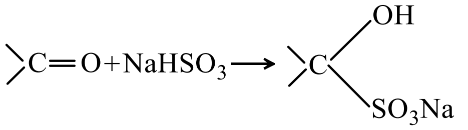
206 **(b)**



This reaction is an example of intramolecular Cannizaro's reaction.

207 **(c)**





Note : only methyl ketones react with $NaHSO_3$.

208 **(d)**

Benzaldehyde lacks α −hydrogen atom, hence undergo Cannizaro reaction in which it disproportionate into benzyl alcohol and sodium benzoate.

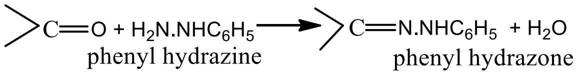
$2C_6H_5CHO \xrightarrow{\text{Conc.NaOH}} C_6H_5.CH_2OH + C_6H_5COOK$

209 **(c)**

Although it has α-H-atom but undergoes Cannizzaro's reaction; an exception.

211 **(b)**

Hydrazines react with alkanones to give an addition-elimination reaction and hydrazones are obtained.



212 **(a)**

$C_5H_{12}O$ must be a tertiary alcohol as it gives alkene on treatment with Cu. Thus C_4H_8O is a ketone.

213 **(b)**

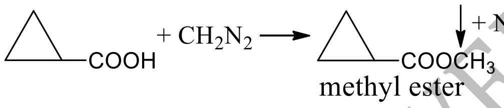
$HCOOH \xrightarrow{H_2SO_4} CO + H_2O$

214 **(b)**

$CCl_3CHO \xrightarrow{H_2O} \underset{\text{Chloral hydrate}}{CCl_3CH(OH)_2}$

216 **(c)**

In the reaction of carboxylic acid with diazomethane, methyl esters are produced with liberation of N_2



217 **(b)**

$(CH_3)_2CHOH \xrightarrow{[O]} (CH_3)_2CO$

218 **(b)**

Aromatic aldehyde *i.e.*, C_6H_5CHO are not able to reduce Fehling's solution but it gives Cannizaro's reaction with alkali.

220 **(b)**

$\underset{\text{Acid chloride}}{RCOCl} + NH_3 \rightarrow \underset{\text{amide}}{R - CONH_2}$

223 **(d)**

$3CH_3CHO \xrightarrow{H_2SO_4} \underset{\text{Paraldehyde}}{(CH_3CHO)_3}$

224 **(d)**

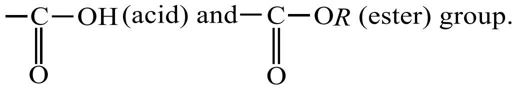
Crystallization of conc. solution separates out salts.

225 **(c)**

By distillation of red ant, formic acid is obtained.

226 **(a)**

RCOOH and HCOOR are functional isomers having



$-\underset{\underset{O}{\|}}{C}-OH$ (acid) and $-\underset{\underset{O}{\|}}{C}-OR$ (ester) group.

228 **(d)**

When amide is heated with a mixture of Br_2 in the presence of NaOH or KOH amine is formed which has one carbon atom less than original amide. This is called Hofmann's degradation reaction.

Hexanamide+$Br_2 + 4KOH \rightarrow$ Pentanamine + $K_2CO_3 + 2KBr + 2H_2O$

229 **(c)**

Semicarbazide is $NH_2NHCONH_2$.

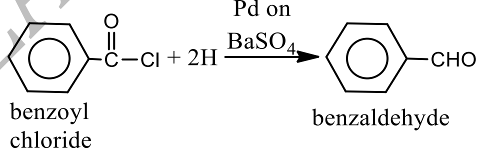
230 **(b)**

Maleic acid contains intramolecular hydrogen bonding while Fumaric acid contains iuntermolecular bonding. Thus, maleic acid forms more stable maleate ion after the removal ofH^+. Hence maleric acid is stronger acid than Fumaric acid

233 **(a)**

$RCOOK(aq.) \xrightarrow{\text{Electrolysis}} R - R + CO_2 + KOH + H_2$

235 **(b)**



This reaction is called Rosenmund's reaction.

238 **(d)**

The reaction is called crossed Cannizzaro's reaction;

$HCHO + C_6H_5CHO \xrightarrow{NaOH} HCOONa + C_6H_5CH_2OH$

239 **(c)**

$6HCHO + 4NH_3 \longrightarrow (CH_2)_6N_4 + 6H_2O$

242 **(b)**

$CH_3CONH_2 + HOH \longrightarrow CH_3COOH + NH_3$

243 **(c)**

Acidic order is: $CH_3COOH > CH_3CH_2COOH > C_6H_5OH > C_2H_5OH$.

244 **(a)**

Acetone (CH_3COCH_3) undergoes condensation reaction in presence of HCl to produce mesityl oxide.

$2CH_3COCH_3 \xrightarrow[-H_2O]{HCl} (CH_3)_2 - C = CHCOCH_3$

4-methyl pent-3en-2one

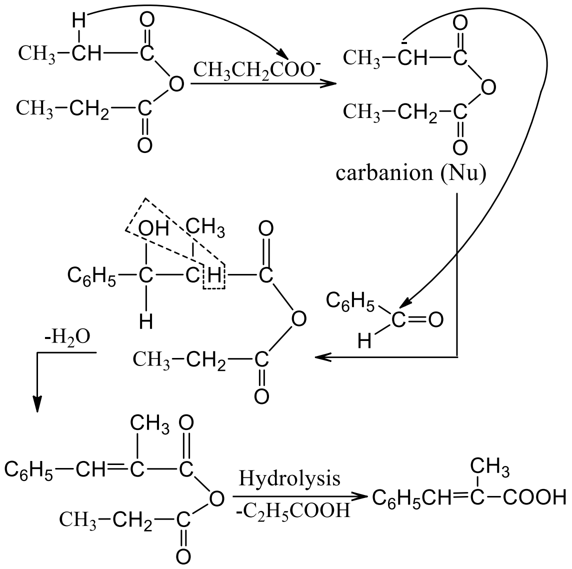
or mesityl oxide

247 **(a)**

$6HCHO \xrightarrow{Ca(OH)_2} C_6H_{12}O_6$; formose or α-acrose; an isomer of glucose and fructose.

248 **(c)**

Benzaldehyde condenses with propanoic anhydride to yield α, β- unsaturated acids in the presence of catalytic amount of sodium propionate



249 **(b)**

$CH_3CONHCH_3$ neither forms semicarbazone nor oxime because it is a substituted amide. While other compounds have carbonyl group hence, they form semicarbazone or oxime

252 **(c)**

$CH_3COOH \rightleftharpoons CH_3COO^- + H^+$

254 **(d)**

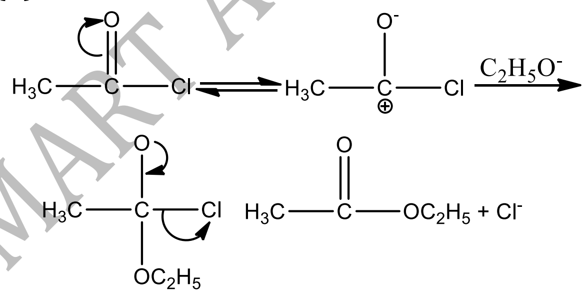
Calcium formate on distillation gives HCHO.

$(HCOO)_2Ca \xrightarrow{\text{Distillation}} HCHO + +CaCO_3$

255 **(a)**

$RCH_2HCCl_2 \xrightarrow{HOH} RCH_2CH(OH)_2 \xrightarrow{\text{Unsatble}} RCH_2CHO$

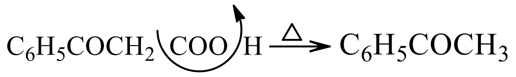
256 **(d)**



This is by S_N reaction. Cl^- is a better leaving group than $C_2H_5O^-$ and the ethyl ethanoate is formed.

257 **(a)**

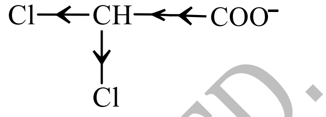
β-keto acids are the carboxylic acids that undergo decarboxylation easily



$C_6H_5COCH_2COOH \xrightarrow{\Delta} C_6H_5COCH_3$

259 **(d)**

See the influence of $-IE$ of Cl-atom. The negative charge on carboxy late ion is dispersed more in presence of two Cl-atoms.



260 **(a)**

Acids react with alcohols give ester, this process is known as esterification.

$RCOOH + R'OH \longrightarrow RCOOR'$

acid alcohol ester

261 **(b)**

When C_6H_5CHO condenses with $(CH_3CO)_2O$ in presence of sodium acetate then cinnamic acid is formed. This reaction is called Perkin reaction.

$$C_6H_5-CHO + (CH_3CO)_2O \xrightarrow[100°C]{CH_3COONa} C_6H_5CH$$
$$= CHCOOH + CH_3COOH$$

benzaldehyde acetic cinnamic acid

anhydride

263 **(c)**

$$C_xH_y + \left[x + \frac{y}{4}\right] O_2 \longrightarrow xCO_2 + \frac{y}{2}H_2O(v)$$

500 0 0

0 $500\,x$ $\frac{y}{2} \times 500$

Now, $500\,x = 2500$ $\therefore\ x = 5$

$500\frac{y}{2} = 3000$ $\therefore\ y = 12$

∴ Alkane is C_5H_{12}.

264 **(c)**

As small rings cannot be formed because of internal strain

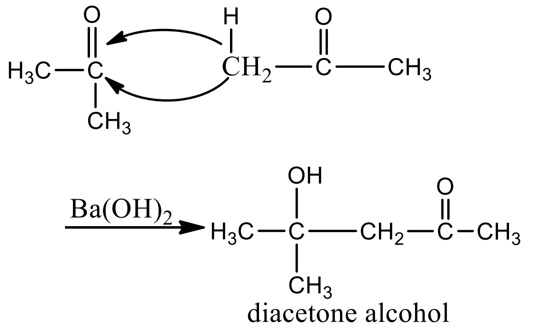
265 **(d)**

$CH_3COOH \xrightarrow{\text{Reduction}} CH_3CH_2OH$

All these do so.

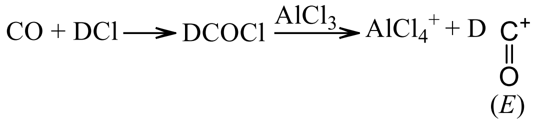
266 **(a)**

When treated with $Ba(OH)_2$,acetone undergoes aldol condensation to form diacetone alcohol.



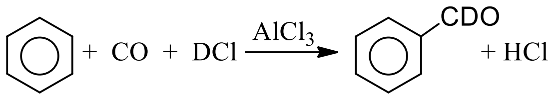
267 **(b)**

The Gattermann-Koch reaction is an example of electrophilic substitution and electrophile is generated as,

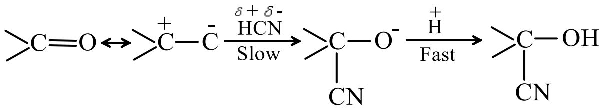


$$CO + DCl \longrightarrow DCOCl \xrightarrow{AlCl_3} AlCl_4^{+} + D\underset{(E)}{\overset{+}{C}=O}$$

The reaction takes place as,



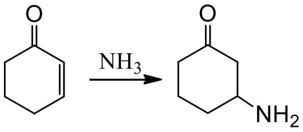
269 **(b)**



The rate determining step suggest addition of CN^-

271 **(d)**

The α, β-unsaturated ketones add on ammonia to form β-amino compounds



272 **(d)**

Urea is one of the most important fertilizer as it does not change pH of soil. Urea, after hydrolysis gives ammonia and CO_2. Ammonia is taken up by plants leaving behind CO_2.CO_2 is a very weak acidic oxide. It doesn't affect pH of soil

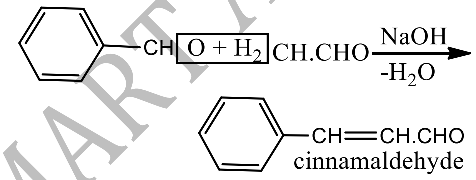
$$\underset{\text{urea}}{NH_2CONH_2} \xrightarrow{H_2O} 2NH_3 + CO_2$$

274 **(c)**

Aldehydes are easily oxidised to respective acids.

276 **(c)**

This reaction is an example of Claisen Schmidt reaction (Claisen condensation). The reaction is as fallows



280 **(d)**

Kjeldahl's method is not used for compounds having nitrogen atom in ring or having N—O and N—N bonds or to say heterocyclic ring with N-atom, azo, azoxy and nitro compounds.

281 **(a)**

$$(CH_3CO)_2O + C_2H_5OC_2H_5 \longrightarrow 2CH_3COOC_2H_5$$

282 **(d)**

In rest all HCHO is used.

283 **(a)**

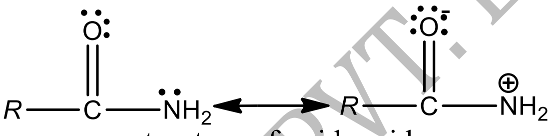
Acetic acid is obtained by the oxidation of ethanol with alkaline $KMnO_4$.

$$\underset{\text{Ethanol}}{C_2H_5OH} + [O] \xrightarrow{\text{Alkaline } KMnO_4} \underset{\text{acetic acid}}{CH_3COOH}$$

284 **(d)**

The acid amides are amphoteric in nature. In amides, the lone pair of electrons on N atom remains delocalised (in resonance) with (C=O) group.

∴ Amides are not much basic but infact they are amphoteric in nature.



structure of acid amide

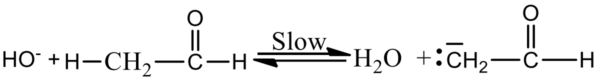
285 **(b)**

Lithium aluminium hydride is a powerful reducing agent. It reduces acetic acid into ethanol.

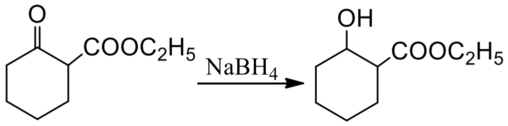
$$CH_3COOH \xrightarrow[\text{ether}]{LiAlH_4} CH_3CH_2OH$$

286 **(a)**

The α −hydrogen atoms of acetaldehyde due to –E effect of $>C=O$ group is slightly acidic in nature. In crossed aldol condensation between formaldehyde and acetaldehyde in the first step OH^-ion (from the base added) abstracts one of these acidic α −hydrogens to form carbanion or enolate ion which is stabilised by resonance.



288 **(b)**



$NaBH_4$ is a mild reducing agent and can not reduce less reactive ester group

289 **(c)**

$$CH_3CHCl_2 \xrightarrow{KOH(aq.)} \underset{\text{unstable}}{CH_3CH(OH)_2} \longrightarrow CH_3CHO$$

290 **(a)**

Aldol condensation is shown by the molecules having α-carbon atom.

293 **(a)**

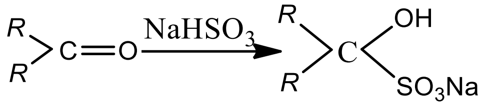
$$C_6H_5COOCH_3 \xrightarrow{\text{Red}} C_6H_5CH_2OH + CH_3OH$$

294 **(a)**

$$CH_3COCH_3 \xrightarrow{[O]} CH_3COOH + HCOOH$$

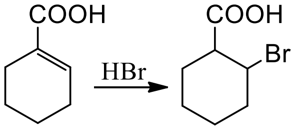
296 **(d)**

Ketones and aldehydes add to $NaHSO_3$ to give white crystalline bisulphite addition product



297 **(b)**
COOHCOOH is dibasic acid. A polyprotic acid donates more than one proton.

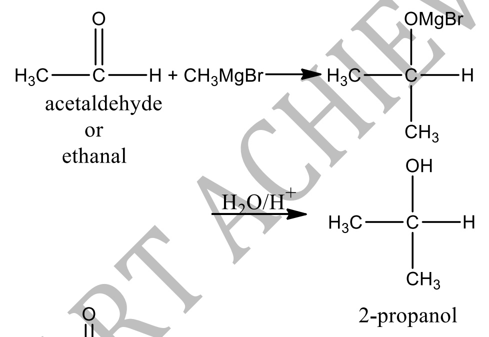
302 **(b)**
α, β-unsaturated acids add on halogen acids. The mode of addition is contrary to Markownikff's rule and may be described to the inductive effect of the carboxyl group.

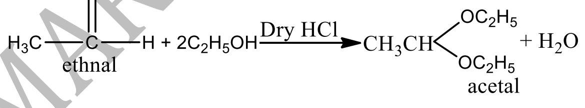


303 **(d)**
Aldehydes are strong oxidising agents. They oxidise Tollen's reagent (ammoniacal $AgNO_3$ to Ag), Fehling solution (to Cu_2O)and Benedict solution (to Cu_2O). The reactions are used to detect the presence of aldehyde group in compound.

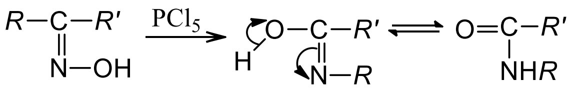
304 **(a)**
Secondary alcohols are oxidised to give ketones.

305 **(c)**
Grignard reagent (RMgX) with aldehyde) other than formaldehyde (HCHO) gives 2° alcohol. Aldehyde on reaction with C_2H_5OH/HCl gives acetal.





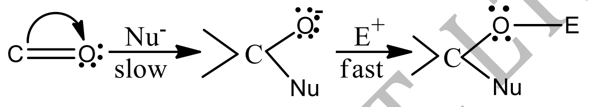
306 **(b)**
This reaction is an example of rearrangement, *ie*, migration of alkyl group from carbon to adjacent nitrogen atom and the group which is *trans* to the leaving group (—OH group) migrates leading to the formation of resonance stabilised imine



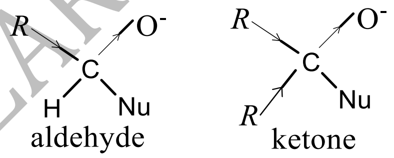
309 **(b)**

$$R\text{—CN} \xrightarrow{SnCl_2+HCl} R\text{CHO} + NH_4Cl + SnCl_4$$

310 **(c)**
In phenyl magnesium bromide $\left(\overset{\delta-}{Ph}\,\overset{\delta+}{Mg}\,Br\right)^{\delta-}$. Ph is attached with that C-atom of carbonyl group which have low electron density (higher electropositive charge)
In carbonyl compounds, aldehydes are more reactive

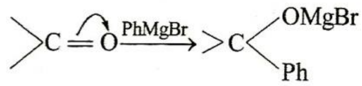


towards nucleophile in nucleophilic addition reaction because in ketones alkyl groups(due to $+I$ effect) decrease the electropositive charge of carbon of carbonyl group. Hence attraction of nucleophile decreases. Moreover in the tetrahedral intermediate aldehyde have less steric repulsion than ketones and also the aldehyde increases the negative charge on oxygen less in comparison of ketones.



Thus, on the basis of above reason the order of reactivity of acetone(I), acetaldehyde (II) and benzaldehyde (III) with PhMgBr is

II > I > III



311 **(c)**

$$R_2CCl_2 \xrightarrow{HOH} R_2C(OH)_2 \longrightarrow R_2CO$$

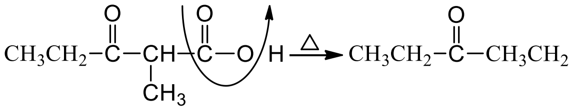
313 **(b)**
CH_3CONH_2+ is solid, CH_3Cl and CH_3SH are gas.

314 **(b)**
Cannizaro reaction,
$HCHO + NaOH \rightarrow CH_3OH + HCOONa$
This reaction takes place by those compounds which has no α —H atom.
Inter molecular shift of hydride ion is key step of Cannizaro reaction

317 **(b)**
This is carbylamine reaction carried out by Br_2 + NaOH.

320 **(b)**
p-keto acids are the only carboxylic acids that

decarboxylate under mild heat



$+ CO_2$

321 **(b)**

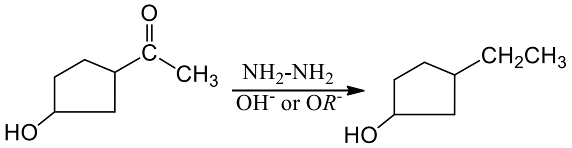
$CH_3COOH \xrightarrow{AIPO_4} CH_2{=}CO + H_2O$

323 **(b)**

$CH_3CONH_2 \xrightarrow{P_2O_5} CH_3CN \xrightarrow{4H} CH_3CH_2NH_2$

324 **(b)**

Hydrazine in the presence of strong base also reduces $>C{=}O$ group to $>CH_2$ (Wolff-Kishner reduction). If there is any base sensitive groups, such as – Br, −Cl,etc in carbonyl compound, this reagent is not advised



326 **(c)**

Hofmann reaction In this reaction acid amide group reacts with Br_2 in presence of NaOH or KOH to give primary amine group. The amine is one carbon less than the parent amide. So, the reaction is known as Hofmann degradation reaction.

$$RCONH_2 + Br_2 + 4KOH \xrightarrow{\Delta} RNH_2 + 2KBr + K_2CO_3 + 2H_2O$$

327 **(b)**

The kjeldahl's method is based on the fact that nitrogen of an organic compound is quantitatively converted to $(NH_4)_2SO_4$ on heating with H_2SO_4 (conc.). The $(NH_4)_2SO_4$ is then treated with KOH to liberate NH_3, which is absorbed in H_2SO_4 to obtain % of N.

328 **(a)**

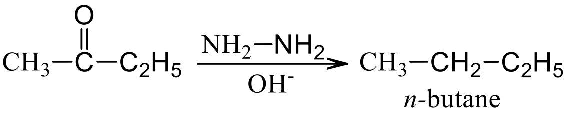
The relative reactivity of the acid derivatives towards nucleophilic acyl substitution reaction follow the order :

$RCOCl > (RCO)_2O > RCOOR > RCONH_2$

The ease with which these leaving groups depart decreases in the order: $Cl^- > RCOO^- > RCO^- > NH_2^-$. Consequently the relative reactivities of all these acid derivatives decreases in the order : acid chloride > anhydride > ester > amide

329 **(b)**

Hydrazine in the presence of a strong base reduces $>C{=}O$ group to $>CH_2$ group



$$CH_3-\overset{\overset{O}{\|}}{C}-C_2H_5 \xrightarrow[OH^-]{NH_2-NH_2} \underset{n\text{-butane}}{CH_3-CH_2-C_2H_5}$$

This reaction is called Wolff-Kishner reduction

331 **(c)**

$$2CH_3-\overset{\overset{O}{\|}}{C}-H \xrightarrow[\text{Tischenko reaction}]{Al(OC_2H_5)_3} CH_3-\overset{\overset{O}{\|}}{C}-OCH_2CH_3$$

332 **(c)**

Only aldehydes reduce Tollen's reagent.

333 **(c)**

Since, the compound 'B' gave a 2,4-dinitrophenylhydrazine derivative but did not answer halogen test or silver mirror test, it must contains a >C=O group, but it is neither a methyl ketone nor an aldehyde.

Moreover, compound 'B'is obtained by the oxidation of compound 'A' having molecular formula$C_5H_{12}O$, so the compound must be a secondary alcohol.

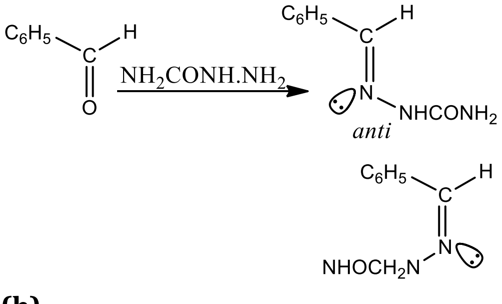
$$\underset{\substack{2^0\text{ alcohol}\\(\text{Compound }'A')}}{CH_3-\underset{\underset{OH}{|}}{CH_2CH}-CH_2-CH_3} \xrightarrow[-H_2O]{[O]} \underset{\substack{\text{Ketone}\\(\text{Compound }'B')}}{CH_3-\underset{\underset{O}{\|}}{CH_2C}-CH_2-CH_3}$$

334 **(d)**

All are facts about CH_3COCH_3.

335 **(a)**

Benzaldehyde forms two isomeric semicarbazone with semicarbazide.



336 **(b)**

$$C_xH_y + \left[x + \frac{y}{4}\right]O_2 = xCO_2 + \frac{y}{2}H_2O$$

15	45	0	0
0	0	$15x$	$\frac{15y}{2}$

Given, $15x = 30$ $\quad \therefore x = 2$

Also, $15\left[x+\frac{y}{4}\right]=45 \quad \therefore y=4$

338 **(d)**

Acid halides and acid anhydrides are acylating agent.

342 **(c)**

A carboxylic acid contains —COOH gp. and an alkyl group.

343 **(d)**

$CH_3COC_6H_5$ will show iodoform test.

346 **(c)**

Acetic acid on reduction with lithium aluminiumhydride ($LiAlH_4$) gives ethyl alcohol while on reduction with HI and red P gives ethane.

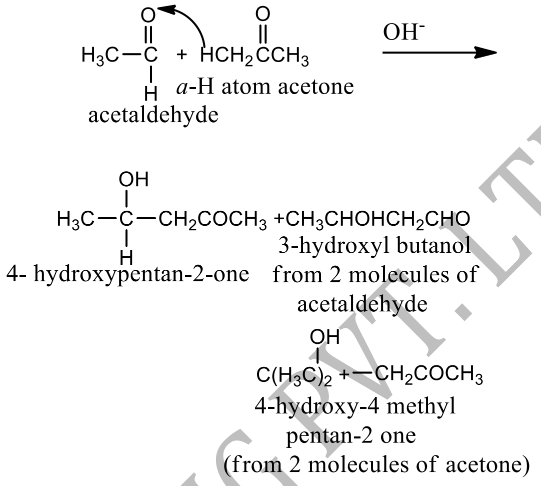
$$CH_3COOH \xrightarrow{LiAlH_4} \underset{\text{ethyl alcohol}}{CH_3CH_2OH}$$

$$CH_3COOH \xrightarrow{\text{Red P +HI}} \underset{\text{Ethane}}{CH_3-CH_3}$$

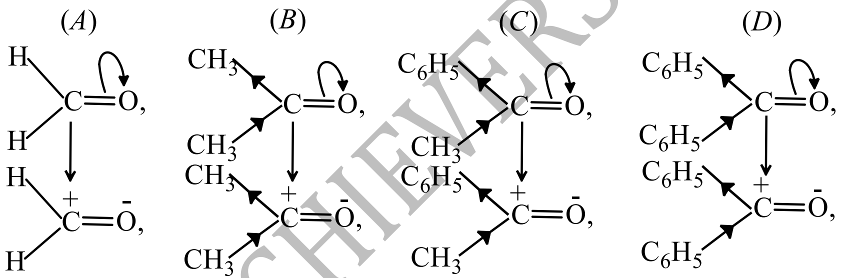
Hence, reagent A and B are respectively $LiAlH_4$ and HI/red P.

348 **(c)**

Aldol condensation is given by those aldehydes and ketones which have at least one α −H atom. When this reaction takes place between two different aldehydes and ketones, it is called across aldol condensation, *e.g.*,



349 **(c)**



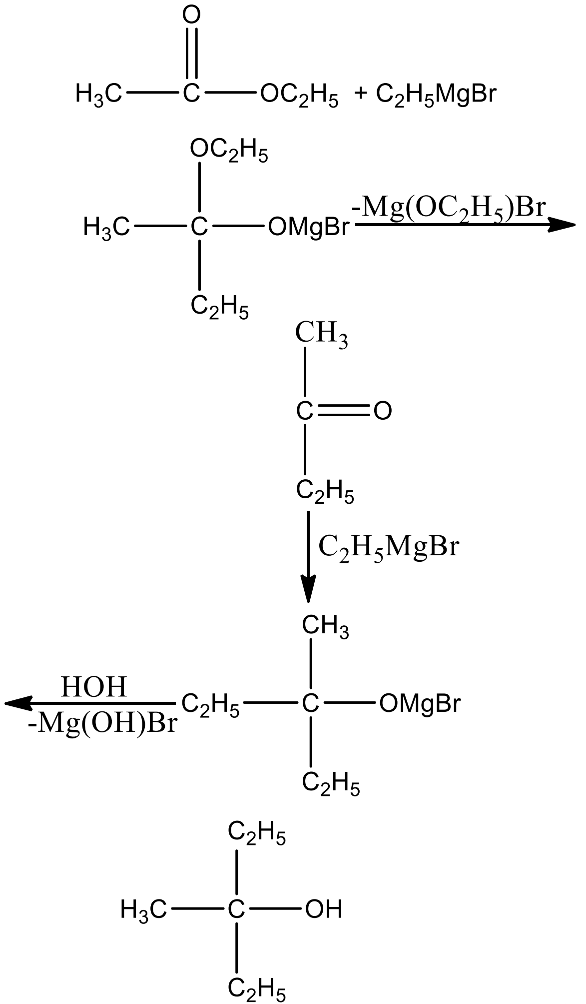
+ve charge is less intensified

+ve charge is max. intensified

More intensified is +ve charge on C-atom, more is tendency to attack by nucleophile but due to steric hindrance, this tendency decreases.

352 **(b)**

Esters on reaction with excess of Grignard reagent produce 3° alcohol.



(3^o alcohol)

354 **(a)**

The enzyme must contain at least one atom of Se.

$\because$ 0.5 g enzyme, mol. weight = 100

$\therefore$ 78.4 g enzyme, mol. weight $= \frac{100 \times 78.4}{0.5}$

$= 1.576 \times 10^4$

356 **(b)**

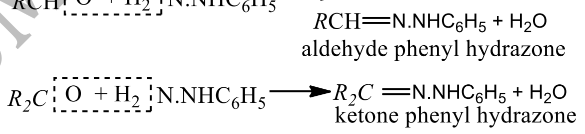
$CH_2{=}CH—CHO$ is acrolein.

357 **(a)**

HCHO has one carbon and reduces Tollen's reagent.

358 **(d)**

Aldehydes and ketones both can react with 2, 4-dinitrophenyl hydrazine as



359 **(d)**

$CH_3COOH + 4H \xrightarrow{LiAlH_4} CH_3CH_2OH + H_2O$

(*A*)

$CH_3CH_2OH + CH_3COOH \xrightarrow{H_3O^+} CH_3COOC_2H_5 + H_2O$

(*B*)

361 **(d)**

Addition of K_2SO_4 increases the b. p. of H_2SO_4.

365 **(d)**

$RCOOAg + R'X \longrightarrow RCOOR'$ (ester); this is called Hunsdiecker reaction.

366 **(b)**

The reactivity order of acid derivatives is based on nature of leaving gp.,resonance and inductive effect.

367 **(a)**

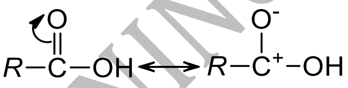
$CH_3COOH + HOC_2H_5 \longrightarrow CH_3COOC_2H_5$

370 **(c)**

Due to bitter almonds odour.

371 **(b)**

In carboxylic acid the oxygen attached to carboxyl carbon is more electronegative and withdraws the electrons of bond



Hence, protonation occurs at the carboxyl oxygen

373 **(b)**

$RCO\boxed{OH + H}OR' \longrightarrow RCOOR'$

Alcohol loses H-atom and thus, reactivity order: $3^\circ < 2^\circ < 1^\circ$.

375 **(b)**

$AgNO_3$ gives precipitation of silver halides.

376 **(c)**

One molecule is oxidised and one is reduced on the cost of other.

377 **(b)**

This is Cannizzaro's reaction.

378 **(d)**

$CH_3COCH_3 \xrightarrow{LiAlH_4} CH_3CHOHCH_3$;

This will give iodoform test.

379 **(b)**

Aldehydes restore pink colour of Schiff's reagent.

380 **(a)**

$CH_3CH_2OH \overset{Cl_2}{\rightarrow} CH_3CHO \overset{Cl_2}{\rightarrow} CCl_3CHO$

381 **(c)**

$RCOAg + X_2 \longrightarrow RX + AgX + CO_2$

(CCl_4)

385 **(b)**

In Clemmensen's reduction, aldehyde ($RCHO$) and ketones ($R - CO - R'$) are reduced into hydrocarbons ($R - R'$).

$RCHO + 6[H] \xrightarrow[\text{Conc.HCl}]{\text{Zn amalgamated}} RCH_3 + 2H_2O$

386 **(b)**

Na_2S and NaCN are decomposed on heating with

HNO_3 to form H_2S and HCN in gaseous phase otherwise they will give precipitate with $AgNO_3$

$$NaCN + HNO_3 \longrightarrow NaNO_3 + HCN\uparrow$$
$$Na_2S + 2HNO_3 \longrightarrow 2NaNO_3 + H_2S$$

390 **(a)**

The *cis* form is maleic acid; *trans* form is fumaric acid.

391 **(c)**

Follow mechanism of Cannizzaro's reaction.

392 **(b)**

Formic acid also act as a reducing agent as it can reduce Tollen's reagent, Fehling solution, mercuric chloride and $KMnO_4$ etc.

393 **(d)**

Penicillin, an antibiotic is discovery of 20th century.

394 **(c)**

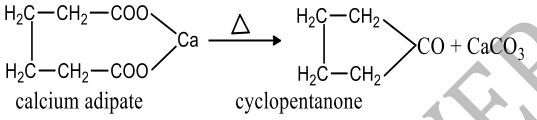
HCHO is gas at room temperature. Its aqueous solution called formalin (42% HCHO + 8% CH_3OH) is used as preservative for biological specimens.

395 **(b)**

Chloral is CCl_3CHO, i.e., 2,2,2 − trichloroethanal.

396 **(b)**

Calcium adipate on dry distillation gives cyclopentanone.

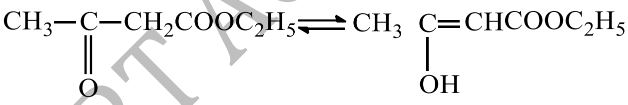


398 **(b)**

Acetaldehyde is the only aldehyde which gives +ve iodoform test. Also, only aldehydes reduce Fehling's solution.

401 **(c)**

Due to tautomerism,



$$CH_3-\underset{\underset{O}{\|}}{C}-CH_2COOC_2H_5 \rightleftharpoons CH_3\ \underset{\underset{OH}{|}}{C}=CHCOOC_2H_5$$

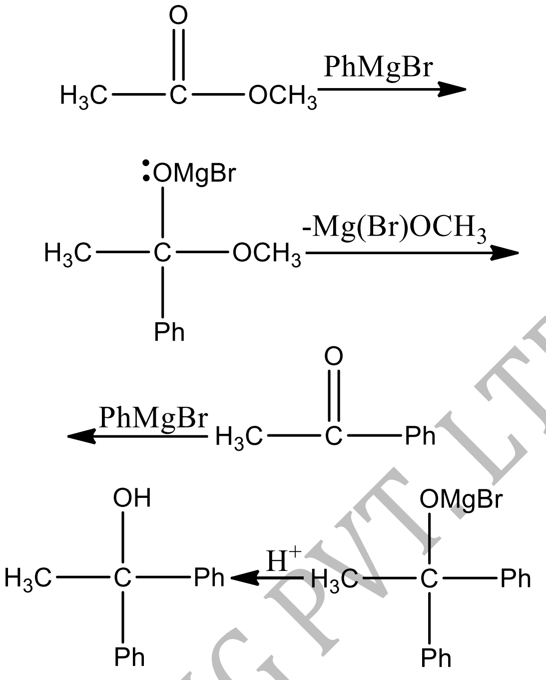
402 **(a)**

It gives benzoyl chloride (C_6H_5COCl).

$$C_6H_5COOH + PCl_5 \xrightarrow{100°C} \underset{\text{Benzoyl chloride}}{C_6H_5COCl + POCl_3 + HCl}$$

403 **(a)**

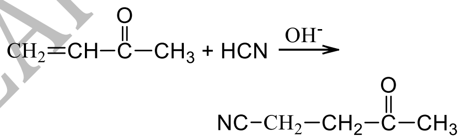
The reaction occurs as follows



1,1-diphenyl ethanol

404 **(b)**

When addition of HCN takes place at α, β-unsaturated carbonyl compounds, it gives β-cyano compounds



$$CH_2=CH-\overset{\overset{O}{\|}}{C}-CH_3 + HCN \xrightarrow{OH^-} NC-CH_2-CH_2-\overset{\overset{O}{\|}}{C}-CH_3$$

405 **(c)**

$$R—X \xrightarrow{CN^-} R—CN \xrightarrow{NaOH} RCOONa$$

406 **(d)**

Acidic strength is the tendency to give H^+ ions. The correct order of acidic strength of given acids is

$CH_3COOH < C_6H_5COOH < HCOOH$

407 **(a)**

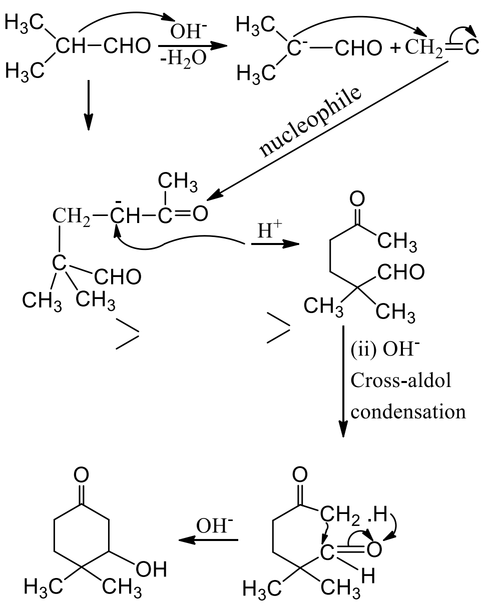
$$3HCOOH + PCl_3 \longrightarrow \underset{\text{(Less stable)}}{3HCOCl} + H_3PO_3$$

408 **(c)**

$RCOOH + CH_2N_2 \longrightarrow RCOOCH_3 + N_2$; methyl esters are formed.

409 **(c)**

The nucleophilic addition of carbanion of α, β-unsaturated carbonyl compounds is known as **Michael addition**



410 **(a)**

Tamarind contains *dextro*-rotatory pot. Salt of tartaric acid.

411 **(d)**

Rosenmund's reduction involves the reduction of acid halide into aldehyde by means of $Pd/BaSO_4$.

$$CH_3COCl \xrightarrow[H_2]{Pd/BaSO_4} CH_3CHO + HCl$$

412 **(a)**

HCHO does not have α C-atom and hence no α H − *atom*.

Therefore, it doesn't give aldol condensation.

413 **(c)**

Benzaldehyde reacts with methyl amine to give Schiff's base

$$C_6H_5-CHO + H_2NCH_3 \rightarrow C_6H_5CH = N.CH_3 + H_2O$$

Schiff's base

415 **(c)**

$$\% C = \frac{12 \times 0.66 \times 100}{44 \times 0.2} = 90$$

$$\therefore \%H = 100 - 90 = 10$$

417 **(b)**

A + NaOH →alcohol+acid

Thus, it is Cannizaro reaction. A is thus aldehyde without H at α-carbon.

(like C_6H_5CHO, HCHO)

$$2C_6H_5CHO + NaOH \rightarrow C_6H_5CH_2OH + C_6H_5COONa$$

benzaldehyde

418 **(c)**

$$R—CONH_2 + Br_2 + 4KOH \longrightarrow RNH_2 + K_2CO_3 + 2KBr + 2H_2O$$

This is Hofmann's bromamide reaction.

419 **(c)**

The presence of electron withdrawing gp. in carboxylic acid increases acidic character. Also electron withdrawing nature of F is more than Cl.

420 **(a)**

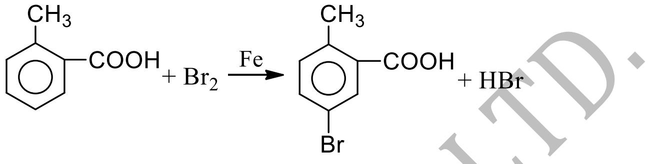
Higher is K_a or lower is pK_a, stronger is acid.

422 **(b)**

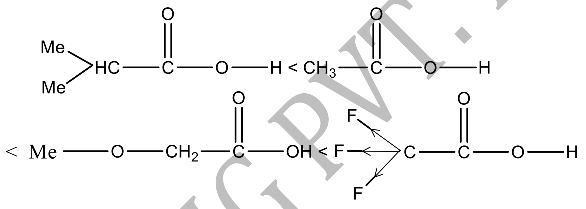
It is definition of polymerisation.

423 **(b)**

−COOH is *meta*-directing group



424 **(c)**



$-I$ effect increases acidity.

$+I$ effect decreases acidity.

$-CF_3$ exerting more $-I$ effect than Meo −

Me_2CH − exerting more $+I$ effect than − CH_3

425 **(a)**

Acetic acid on dehydration produce acetic anhydride. P_2O_5 is a dehydrating agent it dehydrate CH_3COOH to anhydride.

$$2CH_3COOH \xrightarrow[(-H_2O)]{P_2O_5} (CH_3CO)_2O$$

Acetic acid acetic anhydride

426 **(a)**

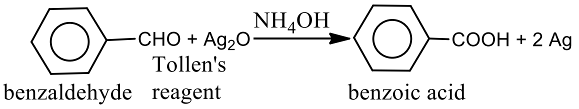
It is better to called aldol condensation.

428 **(c)**

$$2(CH_3COO)_2Ca \xrightarrow{\text{Dry distillation}} 2CH_3COCH_3 + 2CaCO_3$$

429 **(a)**

Aromatic aldehydes reduce Tollen's reagent. Since they are less reactive they do not reduce Fehling's solution and Benedict's solution.



431 **(c)**

Vinegar is 6 to 10% aqueous solution of CH_3COOH.

433 **(b)**

$CH_2{=}CHOH \rightleftharpoons CH_3CHO$

436 **(b)**

This is simple Cannizzaro's reaction, i.e., intermolecular.

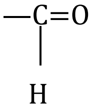
438 **(c)**

Tollen's reagent is ammoniacal $AgNO_3$.

$2AgNO_3 + 2NH_4OH \longrightarrow 2Ag(OH) + 2NH_4NO_3$

$2Ag(OH) \longrightarrow Ag_2O + H_2O$

439 **(b)**



$—\underset{H}{\underset{|}{C}}=O$

440 **(c)**

$CH_3CH_2CHCl_2 \xrightarrow{HOH} CH_3CH_2CH(OH)_2$

$\longrightarrow CH_3CH_2CHO$

Unstable

441 **(b)**

$CH_3CHO \xrightarrow{(C_2H_5O)_3Al} CH_3COOCH_2.CH_3$

This is Tischenko's reaction.

442 **(c)**

$nHCHO \xrightarrow{\text{Polymerisation}} (HCHO)n;\ n = 6$ to 100.

443 **(c)**

Magenta is rosaniline hydrochloride which is decolourised by H_2SO_3 to give Schiff's reagent.

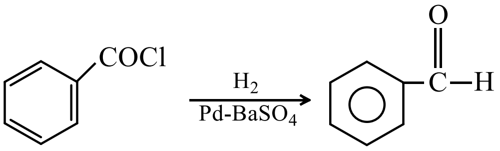
444 **(a)**

Methanal is formed during photosynthesis of plants.

445 **(a)**

$\beta -$ keto acids are readily decarboxylated.

447 **(a)**



It is Rosenmund reaction (reduction).

449 **(b)**

Acetaldoxime is the oxime of acetaldehyde.

$CH_3 - CH - O + \quad H_2NOH \rightarrow CH_3CH$

$= NOH + H_2O$

Acetaldehyde hydroxyl amine acetaldoxime

451 **(b)**

PCl_5 is a chlorinating agent. It adds to ethyl benzoate to give ethyl chloride and benzoyl chloride.

$C_6H_5COOC_2H_5 \xrightarrow{PCl_5} C_6H_5COCl + C_2H_5Cl + POCl_3$

452 **(b)**

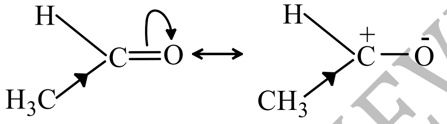
Lactic acid prepared from meat extract of muscles is *dextro*-rotatory and is therefore called sarcolactic acid (Greek word : *sarkos*—flash).

453 **(d)**

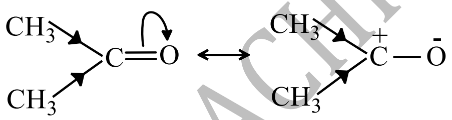
Phenols are weak acidic and thus, soluble in strong alkali.

454 **(c)**

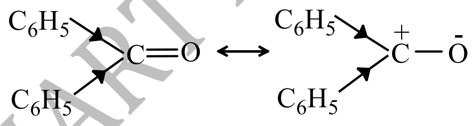
Carbonyl compound reacts with Grignard reagent following nucleophilic addition. More is +ve charge on C^+ centre of carbonyl group, easier is nucleophilic attack.



Positive charge on C+ is dispersed due to $-IE$ of —CH_3 gp.

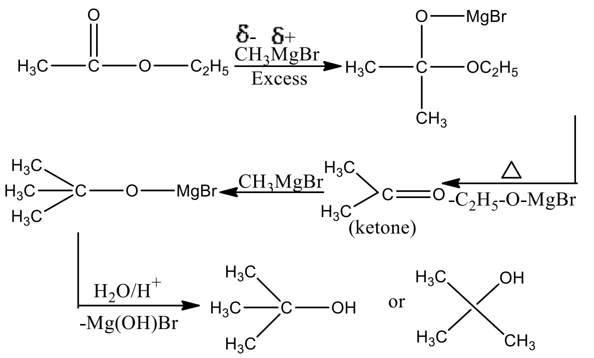


Positive charge on C^+ is dispersed more due to $-IE$ of two CH_3gp.



Positive charge on C^+ is intensified due to $+IE$ of two C_6H_5 gp. But $>$CO gp. is in conjugation with π system of benzene nuleus and the resonance in ring develops electron deficiency at C atom of $>$CO and thus deactivates C+ centre towards nuleophilic attack. The —R effect over powers $+IE$ and thus diphenyl ketone is least reactive.

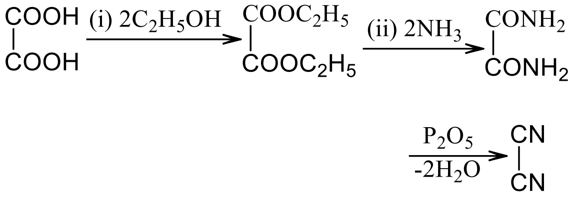
456 **(a)**



This ketone is further reacted with excess CH_3MgBr (Grignard reagent) and to give *t*-alcohol as the final product. Hence, it is a tertiary butyl alcohol.

457 **(a)**

The reaction series takes place as



$$\begin{matrix} COOH \\ | \\ COOH \end{matrix} \xrightarrow{\text{(i) } 2C_2H_5OH} \begin{matrix} COOC_2H_5 \\ | \\ COOC_2H_5 \end{matrix} \xrightarrow{\text{(ii) } 2NH_3} \begin{matrix} CONH_2 \\ | \\ CONH_2 \end{matrix} \xrightarrow[-2H_2O]{P_2O_5} \begin{matrix} CN \\ | \\ CN \end{matrix}$$

458 **(a)**

Citric acid is found in lemon. Therefore, lemon gives sour taste.

459 **(b)**

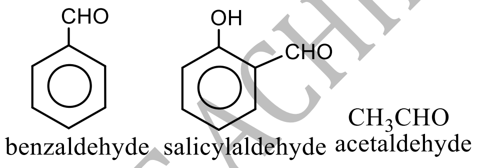
$$HCOOH + Ag_2O \longrightarrow H_2O + CO_2 + \underset{\text{Silver Mirror}}{2Ag}$$

461 **(a)**

Pyrene is CCl_4; find percentage of Cl in each.

462 **(c)**

Only aliphatic aldehydes give red ppt of Cu_2O with Fehling solution.



∴Only acetaldehyde gives red ppt. with Fehling solution.

465 **(d)**

All possible products are formed, *i.e.*, acetone from calcium acetate, formaldehyde from calcium formate and acetaldehyde from calcium acetate and calcium formate.

466 **(a)**

Aldehydes are oxidised by weak oxidising agents like Tollen's reagent (which is ammoniacal $AgNO_3$) but ketones cannot be oxidised by them.

$$RCHO + 2[Ag(NH_3)_2]^+ 3OH^- \xrightarrow{NH_4OH} RCO\overline{O} + 2Ag\downarrow + 2H_2O + 4NH_3$$

Aldehyde Tollen's reagent silver mirror

Ketone + Tollen's reagent → no reaction.

467 **(b)**

To remove halogen oxides and halogen.

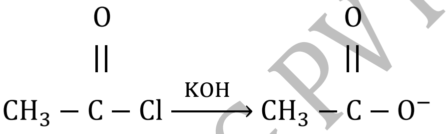
472 **(c)**

Urotropine is hexamethylene tetramine, *i.e.*, $(CH_2)_6N_4$, used as medicine for gout and urine infections.

473 **(a)**

$$(HCOO)_2Ca + (CH_3COO)_2Ca \xrightarrow{\text{Dry distillation}} 2CH_3CHO + 2CaCO_3$$

476 **(d)**



$$CH_3 - \overset{\overset{\displaystyle O}{||}}{C} - Cl \xrightarrow{KOH} CH_3 - \overset{\overset{\displaystyle O}{||}}{C} - O^-$$

$$CH_3CH_2Cl \longrightarrow CH_3CH_2OH$$

$$ClCH_2 - CH_2Cl \longrightarrow HOCH_2 - CH_2OH$$

$$CH_3CHCl_2 \longrightarrow \underset{\text{Intermediate}}{CH_3 - CH(OH)_2} \longrightarrow \underset{\text{Acetaldehyde}}{CH_3 - CH = O}$$

478 **(c)**

$$CH_3CH_2COOH \xrightarrow[\substack{\text{red P} \\ \text{(HVZ reaction)}}]{Cl_2} CH_3CHCOOH$$

|

Cl

$$\xrightarrow[\textbf{(elimination)}]{\text{alcoholic KOH}} \underset{\text{acrylic acid}}{CH_2 = CHCOOH}$$

480 **(d)**

Both (a) and (b) are for preparation of aldehydes only.

481 **(b)**

Percentage of N in urea $= \frac{28}{60} \times 100$

482 **(a)**

Collin's reagents is used to convert $-CH_2OH \rightarrow -CHO$

483 **(a)**

Only aldehydes react with both Tollen's reagent and Fehling's solution

CH_3CHO	CH_3COOH
(a)	(b)
Aldehyde	acid
CH_3COCH_3	CH_3CH_2COOH

(c) (d)
Ketone acid

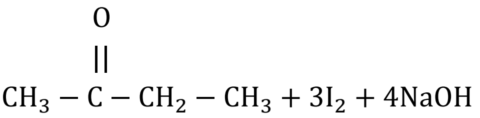
CH_3CHO (ethanal) is the only aldehyde in given choices.
So, it reacts with both Tollen's reagent and Fehling solution.

CH_3CHO +Ammoniacal $AgNO_3 \rightarrow$ Ag mirror
(Tollen's reagent)

$CH_3CHO + Cu^{2+}$ions complexed$\rightarrow Cu_2O$
With tartarate anion red ppt.

484 **(d)**
It is called Clemmensen reduction.

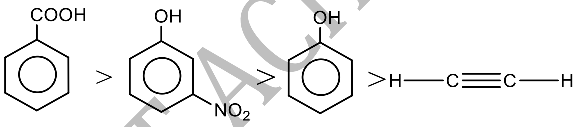
485 **(c)**
Tollen's reagent, Fehling solution and $NaOH/NaI/H^+$ are not able to change butan-2-one (ketone) into propanoic acid because these are mild oxidising agents, so $NaOH/I_2$ firstly from iodoform along with C_2H_5COONa with butan-2-one (ethyl methyl ketone). In these C_2H_5COONa reacts with acid (H^+) to give C_2H_5COOH (propanoic acid).


$$CH_3-\overset{\overset{\displaystyle O}{||}}{C}-CH_2-CH_3+3I_2+4NaOH$$
butan-2-one
(ethyl methyl ketone)

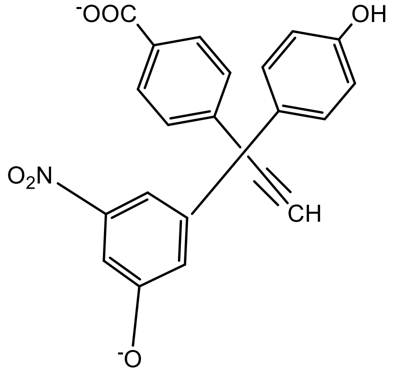
$$\rightarrow \underset{\text{iodoform}}{CHI_3}\downarrow + C_2H_5COONa + 3NaI + 3H_2O$$

$$C_2H_5COONa + H^+ \rightarrow \underset{\text{Propanoic acid}}{C_2H_5COOH} + Na^+$$

486 **(a)**
The acidic strength of the attached group is in the following order :

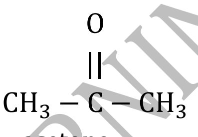


Note Due to attachment of electron attractive group acidic strength increases and carboxylic acids are more acidic than phenols.
The two moles of NH_2^- ions will abstract two moles of a most acidic hydrogen out of the four moles of hydrogen present per mole of the given acidic compounds. Hence, after abstraction of two moles of hydrogen and obtained product will be as shown



488 **(a)**
$$\underset{\text{methanal}}{HCHO} \xrightarrow{\text{Conc.NaOH}} \underset{\text{formic acid}}{HCOOH} + \underset{\text{methyl alcohol}}{CH_3OH}$$
Thus, reaction is called Cannizaro's reaction.

489 **(a)**
Fehling solution is cupric ion complex with tartarate anion. Aldehydes reduce it to red precipitate. The red precipitate is chemically Cu_2O


$$CH_3-\overset{\overset{\displaystyle O}{||}}{C}-CH_3$$
acetone
8.

CH_3CH_2CHO
propanal
(b)

CH_3COH
ethanal
(C)

$CH_3CH_2CH_2CHO$
butanal
(d)

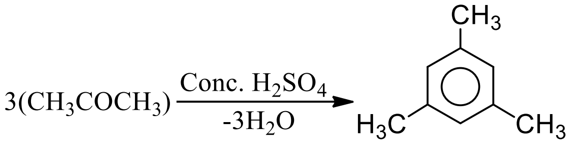
∴ Only acetone which is ketone not an aldehyde does not give iodoform test.

491 **(c)**
Hydrated oxalic acid is $H_2C_2O_4 \cdot 2H_2O$

493 **(c)**
$$RCH{=}CHCOOC_2H_5 \overset{[H]}{\rightarrow} RCH_2CH_2COOC_2H_5$$

495 **(d)**
Formaldehyde does not give iodoform reaction.

496 **(c)**
Acetone gives aromatic compound mesitylene on condensation with conc H_2SO_4



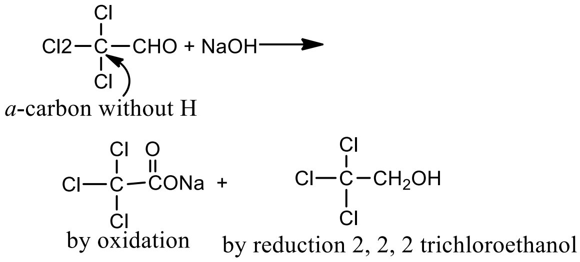
mesitylene

497 **(c)**
$$CH_3CH_2COOH \xrightarrow{H_2O_2} CH_3(OH)CH_2COOH$$

500 **(a)**
$$NH_2CONH_2 \xrightarrow{\text{Urease}} NH_3 + CO_2$$

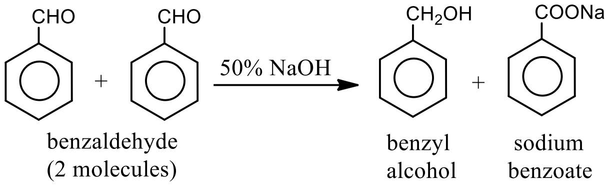
501 **(a)**
Cannizaro's reaction is given by aldehydes

(RCHO) lacking H at α-carbon or lacking α-carbon (as in HCHO). With NaOH, there is formation of acid salt ($RCOO^-$) by oxidation and alcohol (RCH_2OH) by reduction.



502 **(a)**

Aldehydes which does not contain α −hydrogen atom undergo self oxidation and reduction on treatment with conc. Solution of alkali. This reaction is called Cannizaro reaction.



504 **(a)**

$NaCN + AgNO_3 \longrightarrow AgCN + NaNO_3$

506 **(c)**

It is a fact.

508 **(b)**

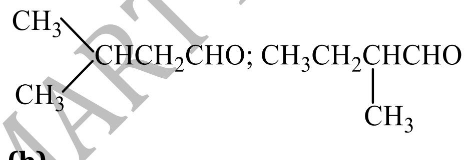
Acetaldehyde cannot show Lucas test because Lucas test is given by alcohols only. It is used in the distinction between primary, secondary and tertiary alcohols. Conc. HCl + anhydrous $ZnCl_2$ is called Lucas reagent.

509 **(a)**

Lassaigne's tests involves the preparation of sodium extract by fusing organic compounds with Na and then extracting them with water.

510 **(c)**

$CH_3CH_2CH_2CH_2CHO$; $(CH_3)_3CCHO$;



$(CH_3)_2CHCH_2CHO$; $CH_3CH_2CH(CH_3)CHO$

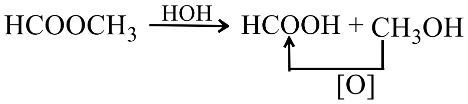
511 **(b)**

Out of all alternates

pK_a is smallest for $CH_3CH_2CF_2COOH$

512 **(a)**

HCOOH is reducing agent.



$HCOOCH_3 \xrightarrow{HOH} HCOOH + CH_3OH$, [O]

513 **(c)**

Presence of electron withdrawing atom ($-X$) increases the acidic nature. Presence of electron repelling gp. ($-CH_3$) decreases the acidic nature.

515 **(b)**

Mol. wt. of compound $= \frac{wRT}{PV}$

$= \frac{0.22 \times 0.0821 \times 273 \times 1000}{1 \times 112} = 44$

Now find % of C; % of H = 100 −% of C

Now find molecular formula.

516 **(d)**

The reactivity order for acid derivatives due to better leaving group is:

$RCOCl > (RCO)_2O > RCOOR > RCONH_2$

517 **(c)**

Out of the given acids, strongest is HCOOH.

highest K_a value

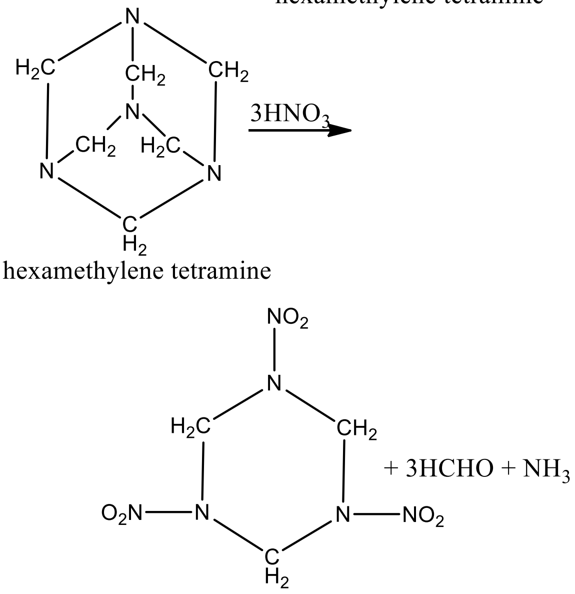
Since p$K_a = -\log K_a$

Thus lowest pK_a is of HCOOH.

518 **(d)**

Formaldehyde with ammonia gives a medicinal compound hexamethylene tetramine (urotropine), which on nitration gives one of the most powerful explosive, named cyclonite or *RDX*.

$6HCHO + 4NH_4 \longrightarrow \underset{\text{urotropine hexamethylene tetramine}}{(CH_2)_6N_4} + 6H_2O$

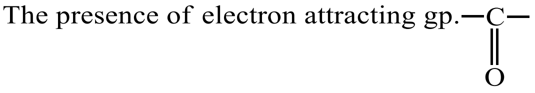


RDX (*sym*-trimethylene trinitramine)

519 **(a)**

Solubility of organic compounds in water decreases with mol. wt. due to increasing hydrophobic character of alkyl or aryl gps.

520 **(a)**



The presence of electron attracting gp. —C(=O)—

on —OH increases the tendency of oxygen to attract O—H bond pair more effectively towards it.

523 **(b)**

CCl_3CHO formed from CH_3CHO by the action of Cl_2 is used to prepare DDT.

525 **(c)**

Prior to Wöhler preparation, organic compounds were assumed to be derived only from living organisms.

526 **(b)**

$CH_3CHClCOOH \xrightarrow{\text{KOH alc.}} CH_2{=}CHCOOH$;

Elimination reaction.

528 **(b)**

$LiAlH_4$ reduces —COOH to — CH_2OH but does not influence C=C.

529 **(b)**

Acid derivatives do not show nucleophilic addition. Also, $CH_3COOCOCH_3$ is less reactive than CH_3CHO.

531 **(c)**

Y is CH_3CN; Z is CH_3COOH.

532 **(b)**

HVZ reaction occurs in presence of halogen and P (catalyst).

534 **(b)**

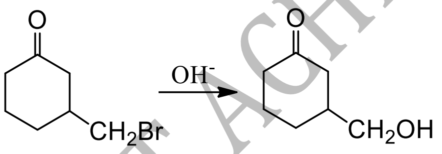
Both C—O bonds are identical and each O possesses partial negative charge.

535 **(c)**

$CH_3CHO \overset{[O]}{\rightarrow} CH_3COOH$

536 **(a)**

In the given reaction, OH^- group replaces the group present in side chain as ketonic group is less reactive



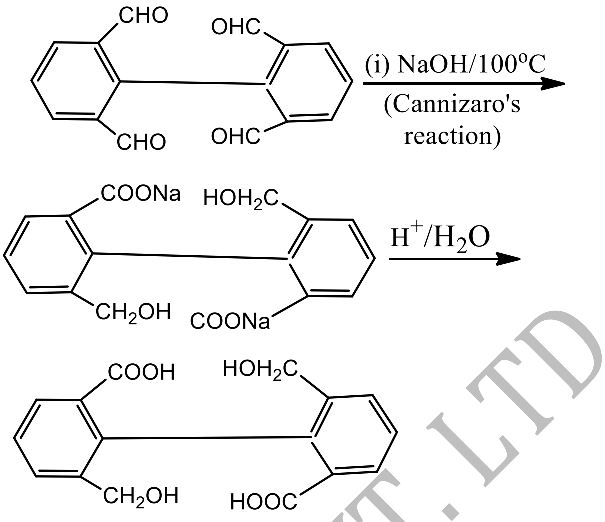
537 **(c)**

Due to pleasant odour, it is used in perfumery and also producing sleeping drug.

538 **(b)**

organic compound + HNO_3 + $BaCl_2$ $\longrightarrow$ $\underset{\text{(ppt.)}}{BaSO_4}$

539 **(d)**



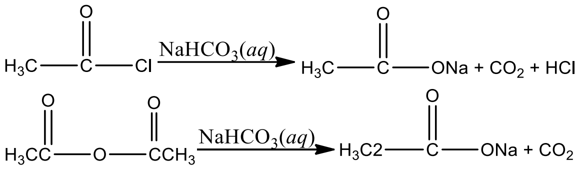
Note Cannizaro reaction is due to the absence of α −hydrogen atom.

541 **(d)**

Many fruits contain esters such as pineapple has ethyl butyrate, raspberry has isobutyl methanoate, banana has n-pentyl ethanoate, orange has octyl ethanoate, etc.

542 **(b)**

Due to strong negative inductive effect shown by –Cl and – $OCOCH_3$ group, acid chloride and acid anhydride are highly reactive among acid derivatives. They react independently with water even in the absence of catalyst to give carboxylic acid.



544 **(d)**

It exists as zwitter ion, an internal salt structure.

$CH_2NH_2COOH \longrightarrow \overset{+}{N}H_3CH_2COO^-$

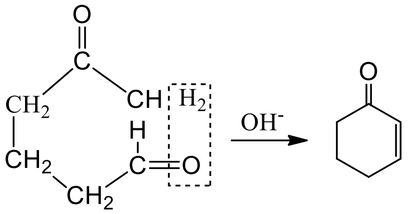
545 **(a)**

Aldehyde, having no α −hydrogen atom, undergoes Cannizaro reaction in which two molecules of the aldehyde are involved, one molecule being converted into the corresponding alcohol, and the other into the acid. The usual reagent for the Cannizaro reaction is aqueous or ethanolic alkali

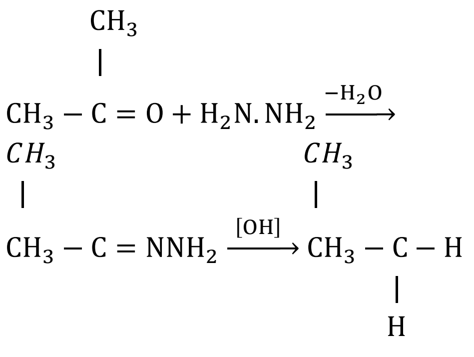
$2HCHO + NaOH \rightarrow HCOONa + CH_3OH$

547 **(a)**

In the presence of base catalyst, intramolecular aldol condensation and ring closure takes place



551 **(a)**

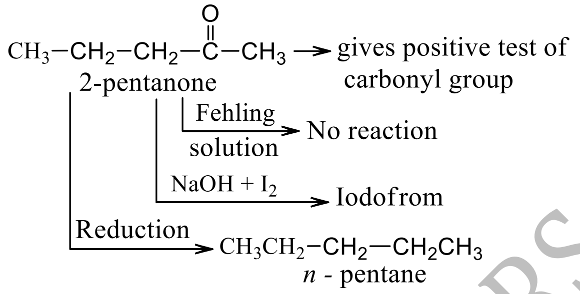


$$CH_3-\overset{\overset{CH_3}{|}}{C}=O+H_2N.NH_2\xrightarrow{-H_2O}CH_3-\overset{\overset{CH_3}{|}}{C}=NNH_2\xrightarrow{[OH]}CH_3-\underset{\underset{H}{|}}{\overset{\overset{CH_3}{|}}{C}}-H$$

propane

In Wolff-Kishner reduction carbonyl compounds are reduced to alkanes by using $NH_2.NH_2$ and KOH/glycol.

552 **(a)**



(1) Ketone gives negative test with Fehling solution

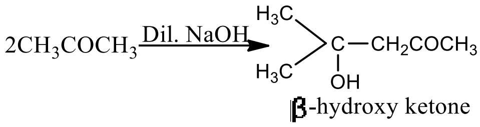
(2) Ketone containing – $COCH_3$ group gives positive haloform test

553 **(a)**
Esters are pleasant smelling liquids having fruity smell.

554 **(b)**
It is a test for —COOH gp.;
$R—COOH + NaHCO_3 \longrightarrow RCOONa + H_2O + CO_2 \uparrow$

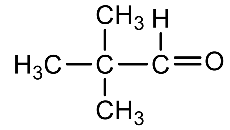
555 **(d)**
$H—C\equiv N \xrightarrow{HOH} HCOOH+NH_3$

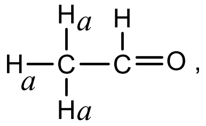
556 **(a)**
Aldehyde and ketone having α-hydrogen atom undergo aldol condensation in presence of dilute base to give β −hydroxy aldehydes or ketones. Acetone has α-hydrogen atom, hence it will give aldol condensation reaction

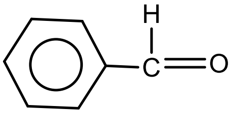


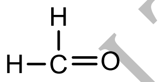
557 **(b)**
Benedict solution contains $CuSO_4$, sodium citrate and sodium carbonate.

559 **(b)**


trimethyl acetaldehyde


acetaldehyde


benzaldehyde


formaldehyde

Cannizaro reaction is given by only those aldehydes which does not have α −hydrogen atom. As such acetaldehyde will not give Cannizaro reaction.

560 **(c)**
$RCOOH + NaHCO_3 \rightleftharpoons RCOONa + H_2O + CO_2$
or $RCOOH + HCO_3^- \rightleftharpoons RCOO^- + H_2O + CO_2$
Conjugate base, $RCOO^-$ is more stable. That is why equilibrium shifts in the forward direction.

561 **(b)**
$\underset{(Cl)}{\text{Halogen compounds}} + HNO_3 + AgNO_3 \longrightarrow AgCl$

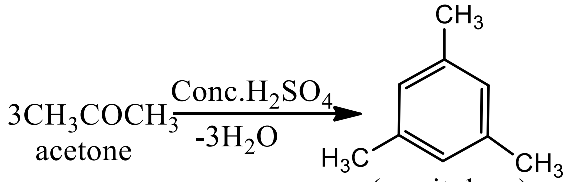
562 **(a)**
Positive *IE* of alkyl gp. decreases positive charge on C^+ centre of carbonyl gp. and thus, reactivity order is, $HCHO > CH_3CHO > C_2H_5CHO > CH_3COCH_3$

564 **(c)**
Acetophenone can be prepared by Friedel-Craft's reaction. By treating benzene with acetyl chloride in presence of anhydrous aluminium chloride acetophenone is obtained.

$$\underset{\text{Benzene}}{C_6H_5H} + \underset{\text{acetyl chloride}}{ClCOCH_3} \xrightarrow{\text{Anhyd.}AlCl_3} \underset{\text{acetophenone}}{C_6H_5COCH_3} + HCl$$

566 **(d)**
Bond energy for catenation of carbon is maximum (85 kcal mol^{-1}).

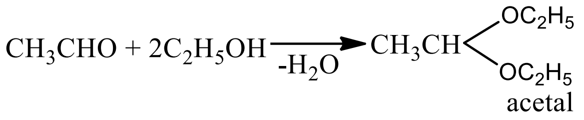
568 **(a)**
Three moles of acetone condense in presence of conc.H_2SO_4 to give mesitylene.



(mesitylene)

569 **(d)**

Aldehydes and ketones condense with alcohol to give aceta and ketals respectively, $e.g.$,



$$CH_3CHO + 2C_2H_5OH \xrightarrow[-H_2O]{} CH_3CH\begin{cases}OC_2H_5\\OC_2H_5\end{cases}$$

acetal

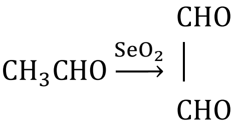
574 **(b)**

Caproic acid is $CH_3(CH_2)_4COOH$.

575 **(c)**

Anhydrous lime or C_6H_6 disturbs the nature of azeotropic mixture of alcohol and water.

576 **(c)**



$$CH_3CHO \xrightarrow{SeO_2} \begin{array}{c}CHO\\|\\CHO\end{array}$$

577 **(d)**

All are facts about CH_3CHO.

578 **(d)**

$$CH_3COOH \xrightarrow{CaCO_3} (CH_3COO)_2Ca$$

$$(CH_3COO)_2Ca \xrightarrow{\Delta} CH_3COCH_3 + CaCO_3$$

579 **(d)**

$$CH_3CHO + CH_3CHO \xrightarrow{Alkali} CH_3CH(OH)CH_2CHOH$$

581 **(c)**

$$CH_3CH_2OH \xrightarrow{Cl_2} CH_3CHO + 3HCl;$$

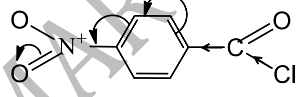
$$CH_3CHO \xrightarrow{Cl_2} CCl_3CHO$$

582 **(a)**

Paraldehyde is used as hypnotic and soporific (sleep producing) drug.

585 **(c)**

In p-nitrobenzoyl chloride, $-NO_2$ group has a $-I$ and $-R$ -effect and this is greater from the p-position than from m-or o-positions. Thus, $-NO_2$ group reduces the electron density at the carbon atom attached to – Cl atom and facilitate its releasing and hydrolysis of benzoyl chloride



Whereas, CH_3O -group has a strong $+R$ –effect and a weak $-I$-effect. At p-position CH_3O-group exerts its strong $+R$ effect. As a result, electron density at C-atom attached to – Cl atom increases and the cleavage of $C-Cl$ bond becomes difficult. Hence, the order of reactivity of hydrolysis of acid chlorides :

$$p-O_2NC_6H_4COCl > PhCOCl$$
$$> p-CH_3OC_6H_4COCl$$

586 **(c)**

Amides react with bromine and caustic soda to give their corresponding primary amines. Thus, acetamide gives methanamine. This reaction is known as Hofmann's bromamide degradation reaction.

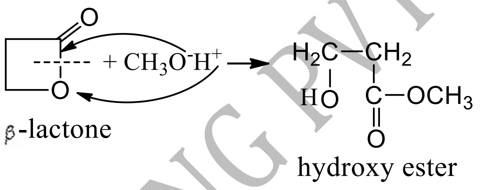
$$H_3C-\overset{\overset{\displaystyle O}{||}}{C}-NH_2 + Br_2 + 4KOH \xrightarrow{343\ K} 2KBr$$
$$+ K_2CO_3 + H_3C-NH_2 + 2H_2O$$

acetamide

methanamine

587 **(b)**

The reaction produced as



β-lactone do not exist but can only be made by special method

588 **(a)**

—COOH gp. of salicylic acid is replaced during nitrati

589 **(c)**

$$P_{N_2} = 715 - 15 = 700\text{ mm}$$
$$V = 55\text{mL}$$
$$\therefore \quad PV = \frac{w}{m}RT$$
$$\frac{700}{760} \times \frac{55}{1000} = \frac{w_{N_2}}{28} \times 0.0821 \times 300$$
$$w_{N_2} = 0.058\text{ g}$$
$$\therefore \quad \%N_2 = \frac{0.058}{0.35} \times 100 = 16.45$$

590 **(b)**

Paraldehyde is used as hypnotic and soporific (sleep producing) drug.

591 **(a)**

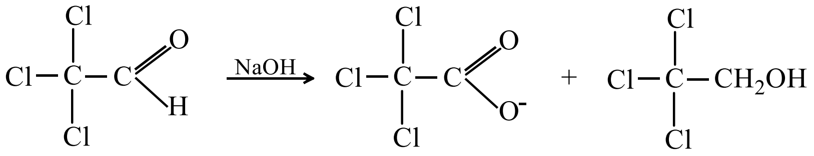
9. Organic compound gave an oxime with hydroxyl amine, therefore, it must be an aldehyde or ketone.

10. Organic compound did not give silver mirror with Tollen's reagent, therefore, it cannot be an aldehyde.

Therefore, compound is ketone and its molecular formulae with be CH_3COCH_3.

592 **(a)**

The cannizzaro product of given reaction yields 2,2,2-trichloroethanol.

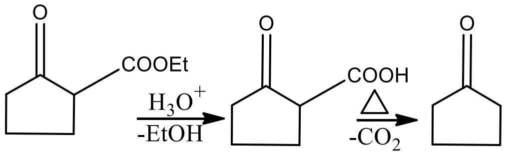


593 **(b)**

$CH_3COCl + CH_3COONa \rightarrow (CH_3CO)_2O + NaCl$

Acetylchloride sod. acetate acetic anhydride

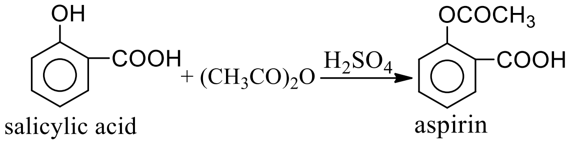
594 **(a)**



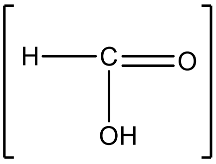
β –keto acid undergoes decarboxylation when heated.

595 **(b)**

Salicylic acid gives aspirin on reaction with acetic anhydride in presence of H_2SO_4



596 **(b)**

Formic acid  contains –COOH as well as –CHO group.

597 **(c)**

$CH_3NH_2 + CH_3COCl \longrightarrow CH_3NHCOCH_3 + HCl$

598 **(d)**

Fehling's solution is the solution of $CuSO_4 +$ NaOH + Rochel salt (sodium potassium tartarate). Aldehydes give red precipitate with Fehling's solution.

599 **(c)**

In the Rosenmund's reaction, acid chlorides are converted to corresponding aldehydes by catalytic reduction. The reaction is carried out by passing through a hot solution of the acid chloride in the presence of Pd deposited over $BaSO_4$.Here, barium sulphate decrease the activity of palladium

$$RCOCl + H_2 \xrightarrow{Pd/BaSO_4} RCHO + HCl$$

602 **(a)**

Acids shows H-bonding and thus, have higher b.p.

603 **(a)**

P_2O_5 is dehydrating agent, hence acid gives anhydrides on dehydration by P_2O_5.

$$2RCOOH \xrightarrow[-H_2O]{P_2O_5} (RCO)_2O$$

604 **(d)**

2, 3-dimethyl propanal does not undergo Cannizaro's reaction due to absence of α-H atom.

605 **(c)**

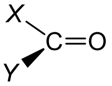
α-chloro butyric acid is more stronger than others due to $-I$ effect of Cl^-.

607 **(d)**

The Sulphur of organic compound gives Na_2S.

608 **(c)**

In the carbonyl group, carbon atom is in a state of sp^2 hybridisation. One sp^2 hybrid orbital overlap with a unhydridised p-orbital of oxygen to form $C-O$ σ-bonds. The remaining two sp^2 orbitals of carbon from σ-bonds with s-orbitals of hydrogen or sp^3-orbitals of carbon of the alkyl groups. The $C-O$ π-bond is formed by the sideways overlap of p-orbitals of carbon and oxygen. Thus, the three σ-bonds of carbonyl carbon lie in one plane and are 120° aprat



609 **(d)**

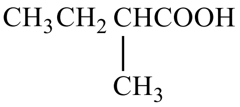
Both show reducing nature and thus, reduce each of the following. The distinction in these two can be however made by $NaHCO_3$ where HCOOH gives effervescences.

610 **(a)**

Oxidation of CH_3COOH is not possible.

611 **(c)**

e. g., $CH_3CH_2CH_2COOH$ and $(CH_3)_2CHCOOH$ are chain isomers $CH_3(CH_2)CHCH_2COOH$ and



$$CH_3CH_2\underset{\displaystyle CH_3}{\underset{|}{C}}HCOOH$$

is optical isomer

$CH_3CH_2CH_2COOH$ and $CH_3CH_2COOCH_3$ are functional isomers.

612 **(a)**

Carbonic acid is less acidic than carboxylic acids whereas more acidic than phenols and alcohols. Hence, order of acidic strength.

$RCOOH > H_2CO_3 > C_6H_5OH > ROH$

614 **(a)**

In presence of dil. HCl, acetamide is hydrolysed by boiling, the product obtained is acetic acid (CH_3COOH).

$CH_3CONH_2 + H_2O \rightarrow CH_3COOH + NH_3$

$CH_3CONH_2 + H_2O + HCl \rightarrow CH_3COOH + NH_4Cl$

617 **(c)**

A characteristic test for carbonyl gp., red salt is formed.

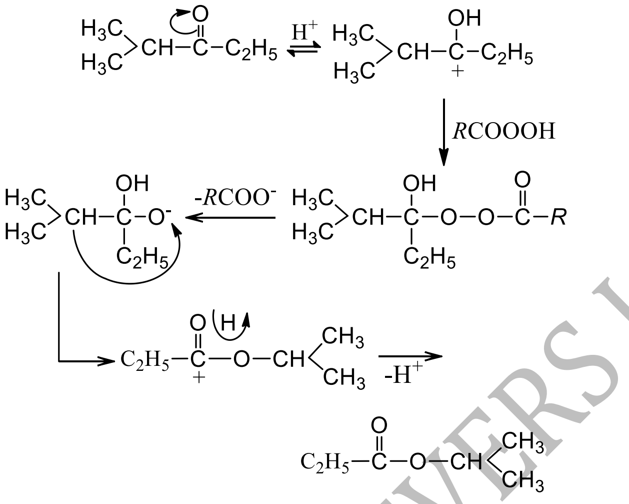
618 **(d)**

$$CH_3COOC_2H_5 + CH_3COOC_2H_5 \xrightarrow{C_2H_5ONa} CH_3COCH_2COOC_2H_5$$

This is Claisen condensation in presence of $NaOC_2H_5$ involving α-H-atom of ester.

619 **(b)**

This is the example of Baeyer-Villager oxidation and oxy-insertion takes place generally at the alkyl side



Hence, the migratory group must always be electron rich, *ie*, migratory aptitude t-butyl $>$ 2° alkyl $>$ 1° alkyl

620 **(b)**

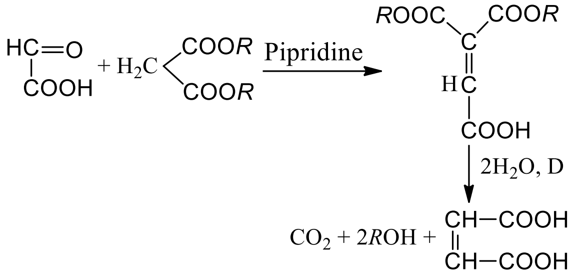
When some activating group, *eg*, −OH is present along with – COOH is *ortho* or *para* position, substitution occurs with respect to – OH preferably at *para*-position due to steric factors. In case the reagent used is strong, electrophile enters at all possible positions even with the replacement of – COOH group

621 **(b)**

$CH_3COOH + N_3H \longrightarrow CH_3NH_2 + N_2 + CO_2$

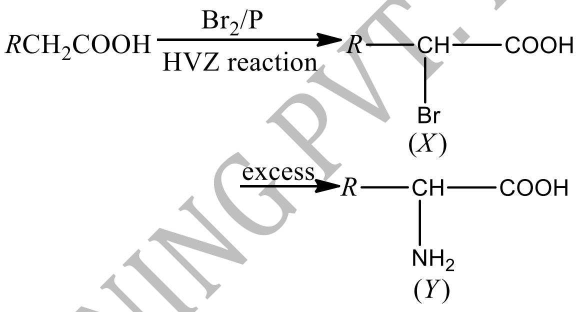
623 **(a)**

Following is the example of Knoevengel reaction, which is shown by aldehydes and ketones



625 **(b)**

When an acid is heated with Br_2 in presence of P, α −H atom of the acid is replaced by bromine atom. This reaction is called Hell-Volhard Zelinsky reaction. NH_2^- is a better nucleophile thanBr^-.



626 **(d)**

With Fehling's solution, benzaldehyde as well as acetone do not react while with Tollen's reagent, benzaldehyde gives precipitate but acetone done not react. Hence, Tollen's reagent is used to distinguish them.

628 **(a)**

As $-$ CH_3 group has a strong $+I$ effect and – OCH_3 group has a weak – I but strong $+R$ effect, hence they increase the electron density on oxygen atom and $O - H$ bond becomes stronger. On the other hand, $-NO_2$ group has a strong – I and – R effect. It withdraws electrons from benzene ring as well as oxygen atom of – OH group and proton is easily removed. Order of esterification is I $> II > III > IV$

631 **(c)**

The N_2 evolved during the process is measured at desired P and T.

632 **(c)**

CH_3COCH_3 gives red colour with sodium nitroprusside solution but does not reduce Tollen's reagent. Acetone yields chloroform with $NaOH/Cl_2$

$CH_3COCH_3 + Cl_2 \rightarrow Cl_3C - COCH_3 \xrightarrow{NaOH} CHCl_3$

Acetone

chloroform

633 **(d)**

The effect of electron-withdrawing substituent in the benzene ring fastens the Cannizaro reaction

634 **(b)**

First find % of H by $= \frac{2 \times \text{wt. of } H_2 \times 100}{\text{wt. ofcompound} \times 18}$

Find percentage of C = 100—percentage of H

635 **(c)**

No doubt the reaction involves the synthesis of chiral centre, however; the stereosphecity cannot be controlled and both the enantiomers are formed to give a racemic mixture.

636 **(d)**

The order of reactivity of acid derivatives is as

$RCOCl > (RCO)_2O > RCOOR' > RCONH_2$

Hence, acetyl chloride is the most reactive among these.

637 **(a)**

$CH_3CONH_2 \xrightarrow{HOH} CH_3COOH$

638 **(b)**

Addition of HCN to a carbonyl compound is a nucleophilic addition reaction. $-NO_2$ group being electron withdrawing increases the polarity (or electron deficiency) of carbonyl carbon and thus, makes the C=O group of benzaldehyde more reactive towards HCN.

640 **(c)**

$CH_2{=}CH_2 + PdCl_2 + H_2O \xrightarrow{CuCl_2} CH_3CHO + Pd +$ 2HCl; This is Wacker method.

642 **(b)**

Meq. of NH_3 formed $= 29 \times \frac{1}{5}$;

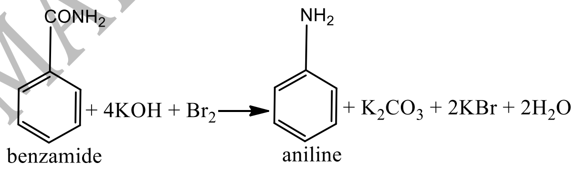
$$\text{Wt. of } NH_3 = \frac{29}{5} \times \frac{17}{1000} \text{ g}$$

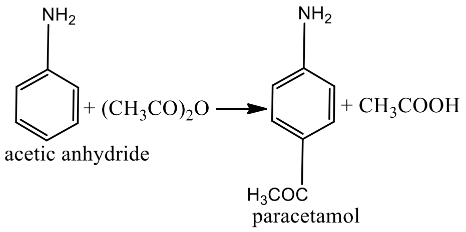
$$\therefore \text{Wt. of } N_2 \text{ in } NH_3 = \frac{14}{17} \times \frac{29 \times 17}{5 \times 1000} \text{ g}$$

$$\therefore \% \text{ of N} = \frac{14 \times 29 \times 17 \times 100}{17 \times 5 \times 1000 \times 0.5} = 16.24$$

643 **(b)**

Benzamide undergoes Hofmann-bromamide reaction with Br_2/KOH to give aniline. This aniline give paracetamol (antipyretic drug) with acetic anhydride.



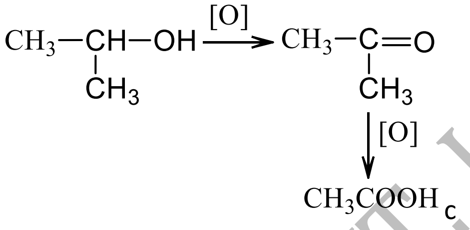


644 **(c)**

$$\underset{(X)}{CH_3COOC_2H_5} + H_2O \longrightarrow CH_3COOH + C_2H_5OH$$

645 **(b)**

On oxidation, secondary alcohol produces ketone with same number of carbon atom and on further oxidation ketone produces an acid with a lesser number of carbon atoms



$$CH_3-\underset{CH_3}{\underset{|}{CH}}-OH \xrightarrow{[O]} CH_3-\underset{CH_3}{\underset{|}{C}}{=}O \xrightarrow{[O]} CH_3COOH$$

647 **(a)**

HCHO is gas at room temperature.

648 **(c)**

Beilstein test (or Cu wire test of halogens) is also given by some other compounds such as urea, thio urea, etc.

649 **(c)**

Proton donors are acids. Electrons withdrawing groups increase acidity. More the number of electrons withdrawing groups more will be acidity. Closer the electrons withdrawing group to proton more will be acidity.

$\therefore Cl_2CHCOOH$, has highest acidity among $CH_3COOH, ClCH_2COOH, Cl_2CHCOOH, Cl_2CHCH_2COC$

650 **(c)**

$RCH_2NH_2 + HO\,NO \longrightarrow RCH_2OH + N_2 + H_2O$

651 **(d)**

The intermediate formed during Hofmann's bromamide reaction is $RCH_2{—}N{=}C{=}O$. Follow mechanism of the reaction.

652 **(c)**

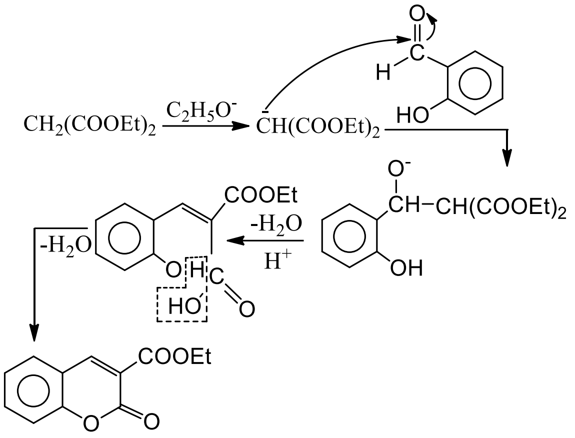
Rosenmund's reaction.

653 **(d)**

Solubility of organic compounds in water decreases with mol. wt. due to increasing hydrophobic character of alkyl or aryl gps.

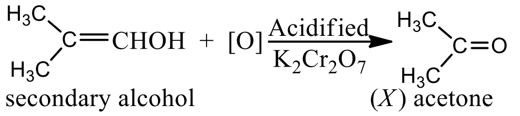
655 **(a)**

Formation of α, β-unsaturated carboxylic acid by the action of acetic anhydride and sodium acetate on aromatic aldehyde as Perkin reaction. The other Perkin like condensation involve condensation of aromatic aldehyde and α-hydrogen containing compound



656 **(d)**
$LiAlH_4$ is used for converting —COOH to —CH_2OH.

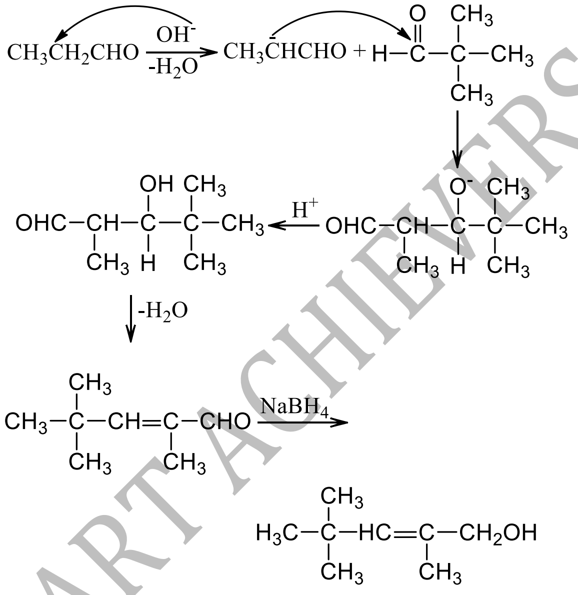
657 **(c)**



Ketone (*i.e.*, acetone reacts with phenyl hydrazine but does not give silver mirror test.)

659 **(c)**
Given vapour density of $CH_4 = 1$, *i.e.*, $8 = 1$.

660 **(b)**
Aldol condensation takes place as,



664 **(c)**
It absorbs only CO_2.

666 **(a)**
$$CH_3COOH \xrightarrow[\Delta]{Cl_2/Red\ P} CH_2ClCOOH$$

α − chloroacetic acid

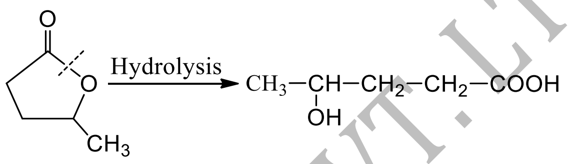
This reaction is called Hell-Volhard-Zelinsky reaction.

667 **(c)**
If two liquids have a difference in their b. p. ≈ 5°C, a fractionating column is used in distillation assembly. The lower b. p. liquid comes down when it passes through fractionating column.

668 **(d)**
Ni formate is better catalyst than Ni for hydrogenation of oils.

669 **(b)**
Carbon + xyl = Carboxyl.

671 **(c)**
The following is the reaction



672 **(a)**
$$CH_3-COCl+H_2 \xrightarrow{Pd.BaSO_4} CH_3CHO+HCl$$
acetyl chloride acetaldehyde

This reaction is called Rosenmund's reaction.

675 **(c)**
o-hydroxy benzoic acid contain intramolecular hydrogen bonding

677 **(d)**
$CH_3COCH_3+Cl_2 \longrightarrow CCl_3COCH_3$; chlorine attacks α-H-atoms of carbonyl compounds.

679 **(a)**
$$CH_3COOCH_3 \xrightarrow{LiAH_4} CH_3CH_2OH+CH_3OH$$

684 **(d)**
C_6H_5COOH reacts with sodium bicarbonate but phenol not.

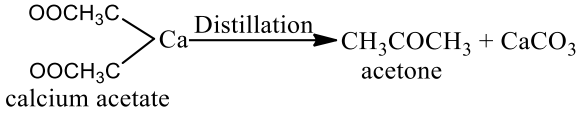
685 **(a)**
Acetophenone burns with sooty flame due to aromatic nature.

686 **(a)**
Only ethyl acetate undergoes reduction with $LiAlH_4$ to give only ethyl alcohol, other esters given in option on reduction gives a mixture of alcohols.
$$CH_3COOCH_2CH_3+2H_2 \xrightarrow[ether]{LiAlH_4} 2CH_3CH_2OH$$

687 **(a)**
$CH_3CONH_2 \xrightarrow{HNO_2} CH_3COOH+H_2O+N_2$; the function of HNO_2 is to convert —NH_2gp. to —OH gp.

688 **(b)**
$$CH_3COOC_2H_5+CH_3COOC_2H_5 \xrightarrow{C_2H_5ONa} CH_3CO.CH_2COOC_2H_5+C_2H_5OH$$

689 **(c)**
Calcium acetate on distillation produce acetone.

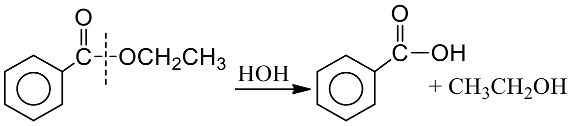


691 **(d)**

See the influence of $-IF$ of Cl and F-atoms.

692 **(b)**

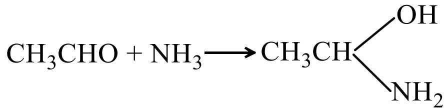
Ethyl benzoate hydrolyses to give benzoic acid and ethanol in the presence of aqueous acid (H_2SO_4) or aqueous base (NaOH). In both cases the reaction is bimolecular and it is the $C-O$ bond between the acyl group and oxygen that is cleaved



694 **(c)**

Formaldehyde and acetaldehyde react to different manner towards NH_3.

$6HCHO + 4NH_3 \longrightarrow (CH_2)_6N_4$



$$CH_3CHO + NH_3 \longrightarrow CH_3CH\begin{matrix} OH \\ NH_2 \end{matrix}$$

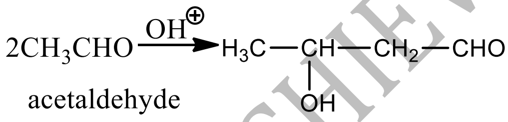
695 **(b)**

$CH_4 + 2O_2 \longrightarrow CO_2 + 2H_2O$.

The volume ratio is 1 : 2 ; Thus, 20 mL of CH_4 will react with 40 mL of O_2.

696 **(b)**

Two molecules of acetaldehyde gives aldol on aldol condensation.



$$\underset{\text{acetaldehyde}}{2CH_3CHO} \xrightarrow{OH^{\oplus}} H_3C-\underset{\large OH}{\underset{|}{CH}}-CH_2-CHO$$

697 **(b)**

Tartaric acid reduces Tollen's reagent.

698 **(a)**

Trioxane or trioxyl methylene is a white solid polymer (m. p. 62°C) formed when HCHO gas is allowed to stand at room temperature.

699 **(c)**

Hydrocarbons are oxidised to aldehydes because only these two are present in atmosphere.

701 **(d)**

NH_4CNO is inorganic compound.

702 **(a)**

Organic compound + conc. HNO_3 + magnesia. mixture $\longrightarrow Mg_2P_2O_7$ as precipitate.

705 **(a)**

Aldehydes and ketones with $NH_2.NH_2$ forms hydrazones.

$RCHO + H_2N.NH_2 \rightarrow \underset{\text{alde. hydrazone}}{RCH = N.NH_2} + H_2O$

$R_2CO + H_2N.NH_2 \rightarrow R_2C = N.NH_2 + H_2O$

706 **(b)**

Only steam volatile liquids are purified by steam distillation, *e.g.*, aniline, nitrobenzene, benzaldehyde, essential oils, etc.

707 **(a)**

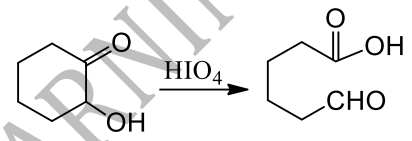
Aqueous NaCl is neutral hence there is no reaction between ethyl acetate and aqueous NaCl.

708 **(c)**

2 ×78 g C_6H_6 requires 15 ×22.4 litre O_2.

710 **(b)**

The characteristic property of periodic acid is the oxidative cleavage of bonds with adjacent oxidisable group such as 1, 2-diols, α-hydroxy carbonyl, 1,2-diketones, etc. The reagent does not react with 1, 3- or 1, 4-diols or carbonyl compounds



714 **(b)**

Crotonaldehyde is $CH_3.CH{=}CH.CHO$.

715 **(c)**

Removal of CO_2 from carboxylic acid is called decarboxylation.

716 **(c)**

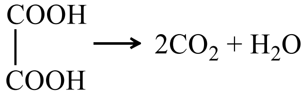
The acid with 3 carbon atoms.

717 **(c)**

$CH_3COOH \xrightarrow{X_2,P} CH_2X-COOH$.

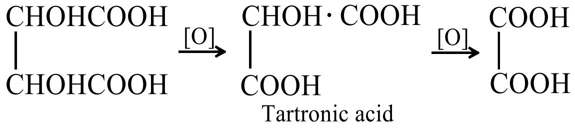
718 **(d)**

Oxalic acid is oxidized as,



$$\begin{matrix} COOH \\ | \\ COOH \end{matrix} \longrightarrow 2CO_2 + H_2O$$

Tartaric acid oxidizes as:



$$\begin{matrix} CHOHCOOH \\ | \\ CHOHCOOH \end{matrix} \xrightarrow{[O]} \underset{\text{Tartronic acid}}{\begin{matrix} CHOH \cdot COOH \\ | \\ COOH \end{matrix}} \xrightarrow{[O]} \begin{matrix} COOH \\ | \\ COOH \end{matrix}$$

Formic acid oxidizes as;

$HCOOH \xrightarrow{[O]} H_2O + CO_2$

Thus, all are used as reducing agent.

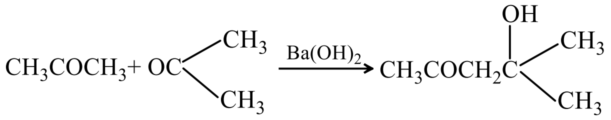
719 **(a)**

$RCOOH + Na \longrightarrow RCOONa + \frac{1}{2}H_2$

720 **(b)**

HCOOH reacts with $NaHCO_3$ giving out effervescences of CO_2. Note that HCOOH is also strong reducing agent.

721 **(a)**



This is diacetone alcohol.

722 **(c)**

$\mathrm{CH_3CONH_2 + NaOH \longrightarrow CH_3COONa + NH_3}$

723 **(c)**

%	Relative no. of atoms	Simplest ratio
C 40	$\frac{40}{12} = 3.33$	$\frac{3.33}{3.33} = 1$
H 13.33	$\frac{133.33}{1} = 13.33$	$\frac{13.33}{3.33} = 4$
N 46.67	$\frac{46.67}{14} = 3.33$	$\frac{3.33}{3.33} = 1$

724 **(d)**

All are facts.

725 **(c)**

$\mathrm{CH_3COOH + NH_3}$

$$\mathrm{\longrightarrow CH_3COONH_4 \overset{\Delta}{\rightarrow} CH_3CONH_2 \xrightarrow{P_2O_5} CH_3CN}$$

$\mathrm{CH_3CN}$ is ethane nitrile or acetonitrile or methyl cyanide.

728 **(a)**

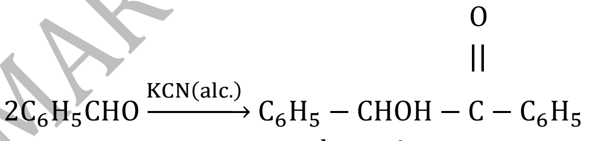
The acidic order is: $\mathrm{ClCH_2COOH > CH_3COOH > C_6H_5OH > C_2H_5OH}$.

733 **(d)**

$-\mathrm{NO_2}$ group at any position shows electron withdrawing effect, thus acid strength is increased. But *o*-nitro benzoic acid believed to have *ortho* effect. As a result, resonance gets prevented. Hence, its acid strength is maximum, thus , the order of acid strength
(II)<(III)<(IV)<(I)
(The effect is more at *para* position than *meta*.)

734 **(d)**

Benzaldehyde on reaction with alc.KNC undergo condensation reaction to give benzoin.



$$\mathrm{2C_6H_5CHO \xrightarrow{KCN(alc.)} C_6H_5-CHOH-\overset{\overset{\displaystyle O}{\|}}{C}-C_6H_5}$$

benzoin

736 **(c)**

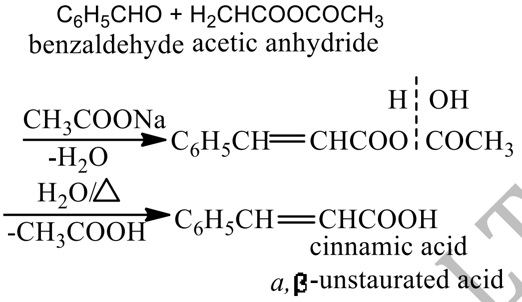
$\mathrm{CH_3CH_2CHO \overset{[O]}{\rightarrow} CH_3CH_2COOH}$

737 **(b)**

Acetaldehyde shows addition reaction; whereas ketone shows condensation with $\mathrm{NH_3}$.

738 **(a)**

When benzaldehyde is heated with acetic anhydride in the presence of sodium acetate, condensation product is obtained which on hydrolysis give α,β −unsaturated acid (such as cinnamic acid) and the reaction is known as Perkin's reaction.

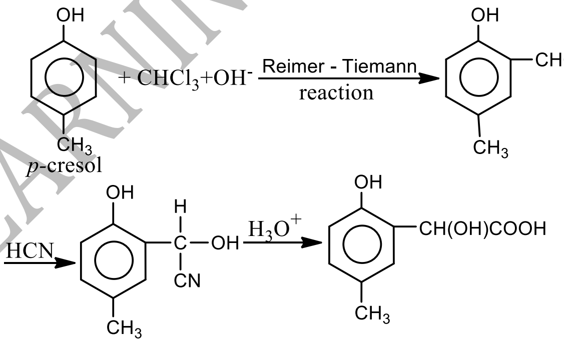


739 **(d)**

$\%\ \text{of N} = \frac{28 \times 224 \times 100}{22400 \times 1.18} = 23.72$

740 **(c)**

$-\mathrm{OH}$ is more activating than $-\mathrm{CH_3}$ in *o, p* directing thus – CHO goes to *ortho* w.r.t., $-\mathrm{OH}$ group.



741 **(c)**

This is iodoform reaction.

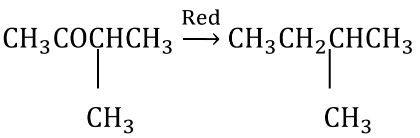
742 **(a)**

$\mathrm{CO + H_2 \overset{arc}{\longrightarrow} HCHO}$

$\mathrm{CH_4 + O_2 \xrightarrow{MoO} HCHO + H_2O}$

743 **(d)**

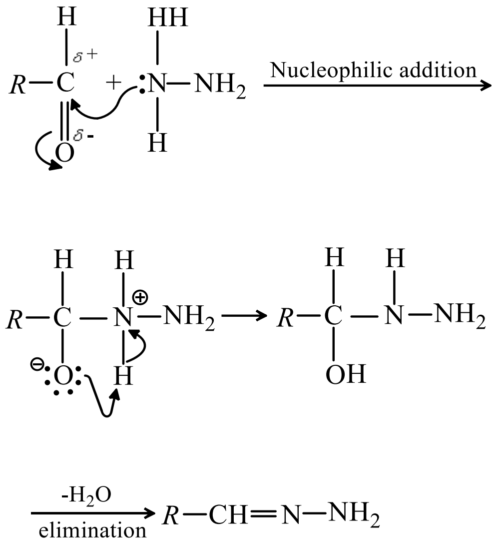
It forms hydrazone thus, carbonyl compound; gives +ve iodoform test thus has $\mathrm{CH_3}$—CO—or $\mathrm{CH_3CHOH}$— unit. Gives Wolff-Kishner's reaction to form isobutane thus compound is 3-methyl butan-2-one.



$$\mathrm{CH_3CO\underset{\underset{\displaystyle CH_3}{|}}{C}HCH_3 \xrightarrow{Red} CH_3CH_2\underset{\underset{\displaystyle CH_3}{|}}{C}HCH_3}$$

744 **(d)**

The reaction is nucleophilic addition-elimination reaction.



745 **(b)**

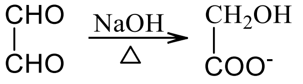
Pd – $CaCO_3$ + $BaSO_4$ is called Lindlar's catalyst.

746 **(c)**

As Cannizaro reaction is shown by aldehydes lacking α-hydrogen, hence the combination $CH_3CHO + HCHO$ is not possible

$$HCHO + HCHO \xrightarrow[\Delta]{NaOH} CH_3OH + HCOO^-Na^+$$

$$C_6H_5CHO + HCHO \xrightarrow[\Delta]{NaOH} C_6H_5CH_2OH + HCOO^-Na^+$$



$$\begin{matrix} CHO \\ | \\ CHO \end{matrix} \xrightarrow[\triangle]{NaOH} \begin{matrix} CH_2OH \\ | \\ COO^- \end{matrix}$$

747 **(a)**

$CH_3COCH_3 \overset{Cl_2}{\rightarrow} CCl_3.COCH_3$;

Halogen attacks α-carbon atom.

748 **(b)**

$$2C_6H_5CHO \xrightarrow[\text{Cannizaro's reaction}]{NaOH} C_6H_5CH_2OH + C_6H_5COONa$$

This reaction is given by aldehydes which doesn't have α-hydrogen atom.

749 **(a)**

Acetone (CH_3COCH_3) and propanal (CH_3CH_2CHO) have same molecular formula C_3H_6O and are functional isomers.

750 **(d)**

To remove SO_2; which will otherwise be absorbed in lime water.

751 **(d)**

H_2SO_4 acts as protonating (catalyst) agent as well as dehydrating agent.

752 **(b)**

Molecular formula of A = C_2Cl_3OH

As (A) reduces Fehling's solution and on oxidation gives a monocarboxylic acid (B). It means (A) must be an aldehyde.

CCl_3CHO

(A)

This is further confirmed by the reaction

$$C_2H_5OH + Cl_2 \xrightarrow[\text{oxidation}]{[O]} CH_3CHO \xrightarrow[\text{chlorination}]{Cl_2} CCl_3CHO$$

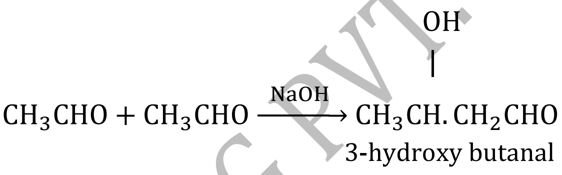
A=Chloral [CCl_3CHO]

753 **(a)**

Glycine is NH_2CH_2COOH.

754 **(d)**

Aldehydes having α −H-atoms undergoes aldol condensation in the presence of dil.NaOH and yield β −hydroxy aldehydes.



$$CH_3CHO + CH_3CHO \xrightarrow{NaOH} CH_3\overset{\overset{OH}{|}}{C}H.CH_2CHO$$

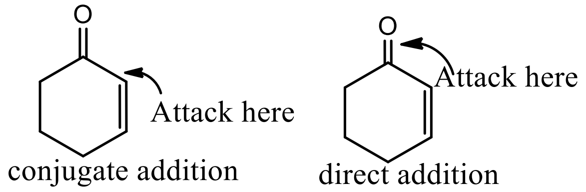
3-hydroxy butanal

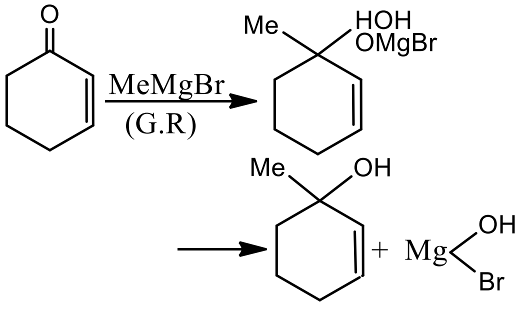
755 **(a)**

The carboxylic and terminal methyl groups in even carbon atom acids lie on opposite side to provide more close packing in crystal lattice which provide higher m.p.

757 **(b)**

Nucleophiles that are relatively weak bases such as CN^-, $RNH_2$and X^- give conjugate addition, whereas strong bases such as $R-$ Li, $R-$ Mg $-$ X give direct addition.



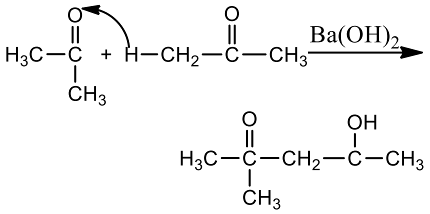


758 **(c)**

$$CH_3COOC_2H_5 \overset{HOH}{\longrightarrow} CH_3COOH + C_2H_5OH$$

759 **(b)**

Aldehydes and ketones containing α-hydrogen atom undergo self condensation in the presence of dilute alkali to form β −hydroxy aldehyde or β −hydroxy ketone. This reaction is called aldol condensation.



β-hydroxy ketone
(4-hydroxy-4-methyl pentan-2-one)

760 **(d)**

Meq. of acid = Meq. of NaOH

$$\frac{0.14}{E} \times 1000 = 12.5 \times 0.1$$

$$\therefore \quad E = 112$$

761 **(c)**

Lower aldehydes have pungent odour.

762 **(b)**

CH_3COOH (acetic acid) cannot reduce Fehling solution while HCOOH, HCHO and CH_3CHO reduce Fehling solution.

763 **(a)**

It is Cannizzaro's reaction shown by aldehydes lacking with α-H-atom.

764 **(b)**

$$C_6H_5CHO + CH_3CHO \xrightarrow{\text{Alkali}} \underset{\text{Cinnamaldehyde}}{C_6H_5CH{=}CHCHO}$$

This is claisen condensation.

765 **(c)**

As benezoic condensation is the reaction of aromatic aldehydes, but phenyl ethanal is an aryl substituted aliphatic aldehydes. Hence, it could not show benzoin condensation

766 **(a)**

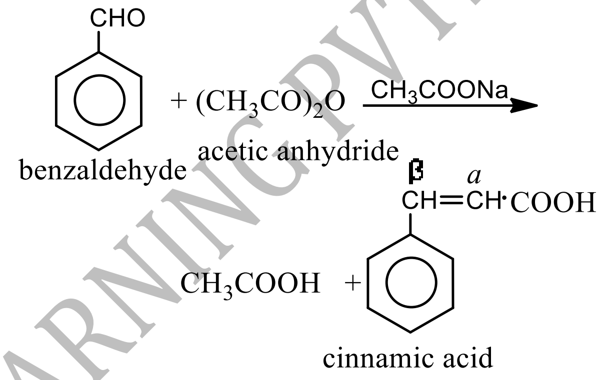
When acetaldehyde is heated with Fehling solution, a red precipitate of Cu_2O is obtained,

$$CH_3CHO + 2Cu(OH)_2 + NaOH \rightarrow CH_3.COONa + Cu_2O\downarrow + 3H_2O$$

red

768 **(b)**

Perkin reaction is the condensation reaction in which aromatic aldehyde is heated with an anhydride of an aliphatic acid in the presence of sodium salt of the same acid to form α, β −unsaturated acid.



769 **(c)**

$\rangle C{=}O \leftrightarrow \rangle \overset{+}{C}{-}\overset{-}{O}$ the +ve *IE* of alkyl groups decreases +ve charge on C^+ centre more effectively in ketones.

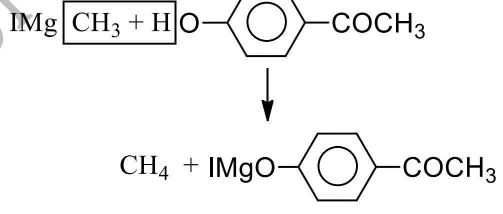
Also, steric hindrance caused by bulky groups for nucleophiles to attack C^+ centre.

770 **(b)**

$2CH_3COCl + R_2Cd \longrightarrow 2CH_3COR + CdCl_2$

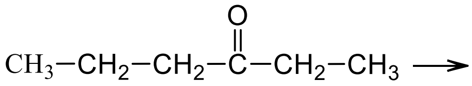
771 **(a)**

As the compound having active hydrogen produces alkane on reaction with Grignard reagent, hence – H atom of hydroxyl group is replaced by methyl magnetism iodine



772 **(b)**

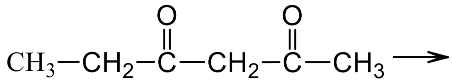
A compound that contains a $-CH_2-$ or $-CH-$ group flanked by two electron-withdrawing group such as $\rangle C{=}O$ group, becomes acidic compound and hydrogen atoms are called acidic hydrogen



$CH_3-CH_2-CH_2-\overset{O}{\overset{\|}{C}}-CH_2-CH_3 \longrightarrow$

3-hexanone

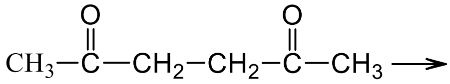
contains no acidic hydrogen



$CH_3-CH_2-\overset{O}{\overset{\|}{C}}-CH_2-\overset{O}{\overset{\|}{C}}-CH_3 \longrightarrow$

2,4-hexanedione

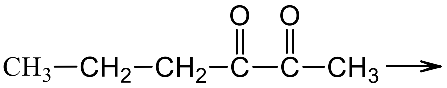
contains 2 acidic hydrogen



$CH_3-\overset{O}{\overset{\|}{C}}-CH_2-CH_2-\overset{O}{\overset{\|}{C}}-CH_3 \longrightarrow$

2,5-hexanedione

contains no acidic hydrogen



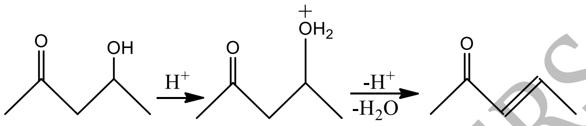
$CH_3-CH_2-CH_2-\overset{O}{\overset{\|}{C}}-\overset{O}{\overset{\|}{C}}-CH_3 \longrightarrow$

2,3-hexanedione

contains no acidic hydrogen

773 **(a)**

β −hydroxy aldehydes or β −hydroxy ketones ($i.e.$,aldol) readily dehydrated under acidic condition to give $\alpha-\beta$ −unsaturated aldehyde or ketone.



776 **(c)**

Group or atom attached with – COOH group shows negative inductive effect, makes the acid stronger or acid has larger dissociation constant. – Br shows poor negative inductive effect and also far away from – COOH, which makes $BrCH_2CH_2COOH$ weakest acid and hence, it has smallest dissociation constant.

777 **(d)**

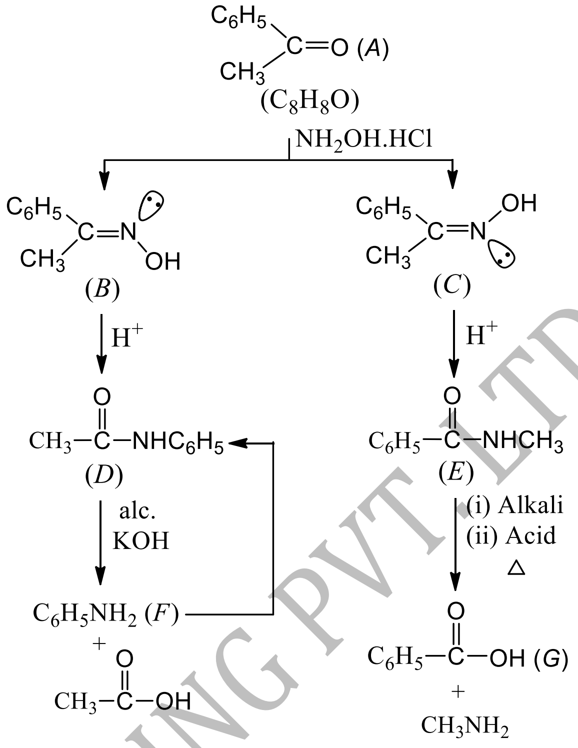
It is an use of salol.

778 **(d)**

NaH_2PO_4 does not react with carbonyl compounds.

780 **(a)**

The compound is acetophenone

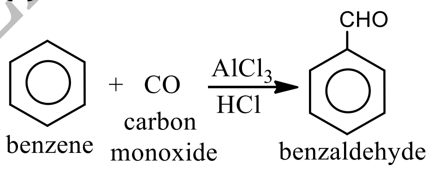


781 **(a)**

Aqueous NaCl is neutral hence, there is no reaction between ethyl acetate and aqueous NaCl

$CH_3COOC_2H_5 + NaCl\ (aq) \rightarrow$ No reaction

782 **(c)**



The reaction is known as Gattermann-Koch reaction.

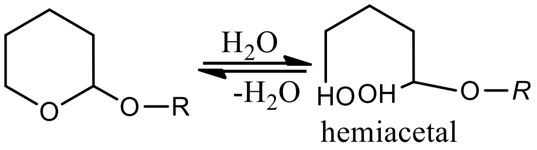
785 **(b)**

In highly acidic medium, NH_2OH forms salts with acidic molecule and loses its capacity to act as nucleophile.

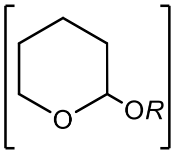
786 **(a)**

$CH_3CHOHCH_2CHO$ is aldol.

787 **(d)**



∴The given compound



is a hemiacetal.

789 **(b)**

Ketone and aldehyde can be distinguished by Tollen’s reagent, Fehling’s solution and Schiff’s reagent.

CH_3COCH_3 (ketone) and CH_3CH_2CHO(aldehyde) can be distinguised by Tollen's reagent.CH_3CH_2CHO reacts with Tollen's reagent to give silver mirror while CH_3COCH_3 does not react.

$$CH_3CH_2CHO + Ag_2O \xrightarrow{\Delta} CH_3CH_2COOH + \underset{\text{Silver mirror}}{2Ag}$$

$$CH_3COCH_3 + Ag_2O \xrightarrow{\Delta} \text{No reaction}$$

790 **(a)**

$HCOOH$ and CH_3CH_2COOH.

791 **(a)**

Para nitrophenol has higher b. p. due to H-bonding.

792 **(c)**

$$CH_3CN \xrightarrow{Na/C_2H_5OH} CH_3CH_2NH_2 \xrightarrow{HNO_2} CH_3CH_2OH \xrightarrow{[O]} CH_3COOH$$

793 **(c)**

Urea ($NH_2 - CO - NH_2$)can be use for all types of crops and soil. It is hazardous hence can be store easily and it is cheap as it can be manufactured from crude nephthalein. After assimilation of urea by plants through the interaction of nitrifying bacteria, it leaves behind only carbon di oxide in the soil.

795 **(b)**

Acetophenone is hypnotic agent and called hypnone in medicinal use.

799 **(a)**

The alkaline hydrolysis of ester is irreversible whereas, acid hydrolysis of ester is reversible.

$$CH_3COOC_2H_5 + H_2O \overset{H^+}{\rightleftharpoons} CH_3COOH + C_2H_5OH$$

$$CH_3COOC_2H_5 + NaOH \xrightarrow{OH^-} CH_3COONa + C_2H_5OH$$

800 **(d)**

When ammonia (NH_3) reacts with formaldehyde ($HCHO$), hexamethylenetetramine which is also known as urotropine, is formed. Urotropine is used as a medicine to treat urinary infections.

$$\underset{\text{formaldehyde}}{6HCHO} + \underset{\text{ammonia}}{4NH_3} \rightarrow \underset{\text{urotropine}}{(CH_2)_6N_4} + 6H_2O$$

801 **(c)**

Generally soda-lime removes CO_2 from an acid but in case of alkali formate it gives alkali carbonate and hydrogen.

$$HCOONa + NaOH \xrightarrow{CaO} Na_2CO_3 + H_2$$

802 **(c)**

2, 4-D or 2, 4-dichlorophenoxy acetic acid is used as a herbicide.

803 **(b)**

$$C_6H_5CHO + CH_3CHO \xrightarrow{\text{Alkali}} \underset{\text{Cinnamaldehyde}}{C_6H_5CH{=}CHCHO}$$

This is claisen condensation.

804 **(d)**

$$C_2H_2 + H_2O \xrightarrow[1\%HgSO_4]{40\%\ H_2SO_4} \underset{\text{acetaldehyde}}{CH_3CHO}$$

$$\text{Acetaldehyde} + \text{Fehling's solution} \xrightarrow{\Delta} \text{Cuprous oxide}$$

(Red ppt.)

806 **(b)**

Aldehydes lacking with α-H atom undergoes Cannizzaro's reaction; in Cannizzaro's reaction one molecule of such aldehydes is oxidized on the cost of other.

807 **(d)**

The acidity of halogenated acid increases almost proportionately with the increase in electronegativity of the halogen present.

Therefore, the correct order is

$$FCH_2COOH > ClCH_2COOH > BrCH_2COOH > CH_3COOH$$

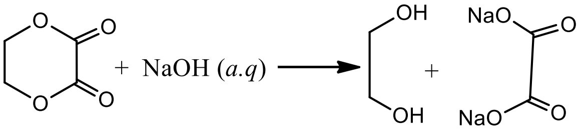
808 **(b)**

Ellution means separation of process.

809 **(c)**

Pyroligneous acid obtained by destructive distillation of wood contains ~10% acetic acid, ~ 2 – 2.5% methanol and ~ 0.5%acetone.

811 **(a)**

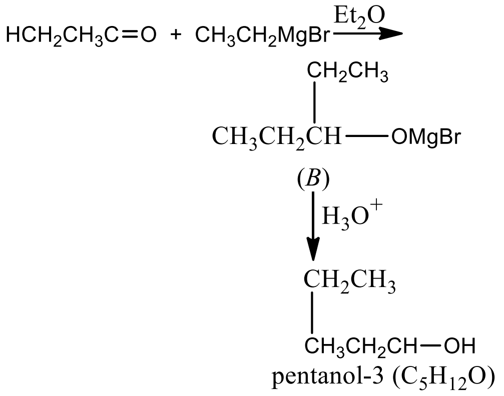


It is like the saponification reaction of esters.

813 **(b)**

Alcohols on reacting with Grignard reagent ($RMgX$) give hydrocarbon on hydrolysis, hence the compound 'A'cannot be an alcohol as the product is a oxygen containing compound.

The compound 'A' must be propanal. The reaction will be as fallows



816 **(a)**

$$\underset{(A)}{CH_3CH_2\cdot CH_2OH}\xrightarrow{K_2Cr_2O_7/H_2SO_4}$$

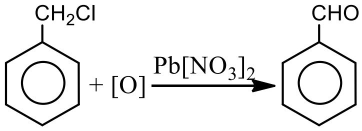
$$\underset{(B)}{CH_3CH_2CHO}\xrightarrow{\text{Amm. }AgNO_3}\text{Silver mirror}$$

Thus, (B) is aldehyde and (A) is primary alcohol.

$$CH_3CH_2CHO + H_2N.NHCONH_2 \longrightarrow$$

$$\underset{(C)}{CH_3CH_2CH{=}N.NHCONH_2}$$

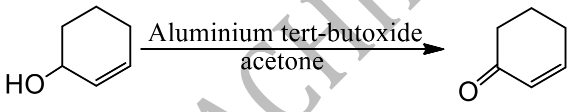
818 **(a)**



It is a laboratory method of the preparation of benzaldehyde.

821 **(c)**

Secondary alcohols can be conveniently oxidized to ketones without any danger of being further oxidized to acids or oxidation occurring at the end of double bond by **Oppanauer oxidation**



824 **(a)**

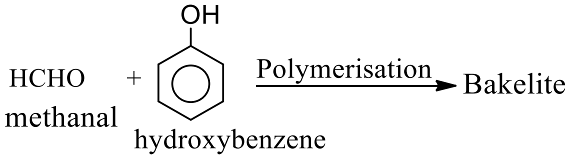
Cl_2 reacts with CH_3CHO, CH_3COCH_3 and C_6H_5CHO t respectively.

825 **(b)**

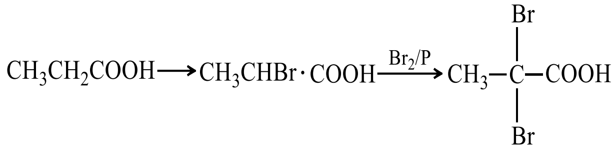
$HCOOH \xrightarrow{P_2O_5} H_2O + CO$ (burns with pale blue flame).

826 **(b)**

Methanal and phenol (or hydorxy benzene) gives Bakelite polymer on polymerization.



827 **(a)**



$$CH_3CH_2COOH \longrightarrow CH_3CHBr\cdot COOH \xrightarrow{Br_2/P} CH_3-\underset{Br}{\overset{Br}{C}}-COOH$$

This is Hell-Volhard-Zelinsky reaction.

828 **(a)**

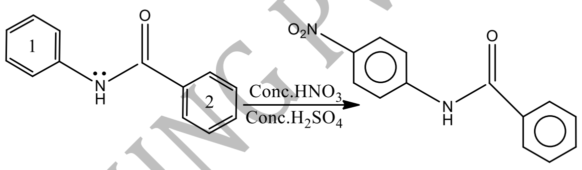
Cannizzaro's reaction is shown by aldehydes lacking α-H-atom.

Condensation reactions are shown by aldehydes having α-H-atoms.

829 **(c)**

Collin's reagent (CrO_3-pyridine) converts 2° alcohol to ketone and 1° alcohol to aldehyde.

832 **(b)**

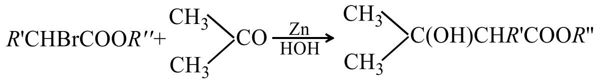


Ring 1 is more active, electrophilic shbstitution takes place over ring.1.

$-NH-\underset{\underset{O}{||}}{C}-Ph$ is *ortho para* directing. *Para* product is predominating.

833 **(b)**

The Reformatsky reaction is the reaction between an α-bromo acid ester and carbonyl compound (aldehyde or ketone) in the presence of Zn to form a β-hydroxy ester.



$$R'CHBrCOOR'' + \begin{matrix}CH_3\\CH_3\end{matrix}\!\!>\!CO \xrightarrow[HOH]{Zn} \begin{matrix}CH_3\\CH_3\end{matrix}\!\!>\!C(OH)CHR'COOR''$$

835 **(c)**

$RCH_3 \xrightarrow{[O]} RCH_2OH \xrightarrow{[O]} RCHO \xrightarrow{[O]} RCOOH$

837 **(c)**

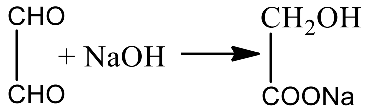
The reduction of carboxylic acids to alcohols is carried out by $LiAlH_4$ and boranes (BH_3 or B_2H_6) in THF

839 **(a)**

Amides on acidic hydrolysis give acid and an amine. Hence, N-dimethylacetamide will give acetic acid and dimethyl amine on hydrolysis.

840 **(c)**

Cannizaro reaction It is given by aldehydes which do not have α −hydrogen atom. Half of the molecules are oxidised and half are reduced in presence of base.



842 **(d)**

It is a characteristic of acetamide.

843 **(d)**

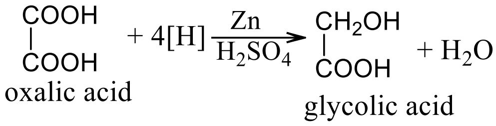
No reaction.

844 **(b)**

$CH_3CHO \xrightarrow{Na/C_2H_5OH} CH_3CH_2OH$

845 **(c)**

Oxalic acid is reduced by Zn and H_2SO_4 to give glycolic acid



$$\begin{matrix}COOH\\|\\COOH\end{matrix} + 4[H] \xrightarrow[H_2SO_4]{Zn} \begin{matrix}CH_2OH\\|\\COOH\end{matrix} + H_2O$$

oxalic acid glycolic acid

846 **(a)**

Only compounds having $-\overset{\overset{O}{||}}{C}-$ are reduced to alcohol using $NaBH_4$in ethanolic solution.

$R-\overset{\overset{O}{||}}{C}-l, R-\overset{\overset{O}{||}}{C}-OH,$

$R-\overset{\overset{O}{||}}{C}-H$ have$-\overset{\overset{O}{||}}{C}-$

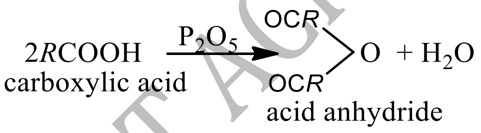
∴They are reduced to alcohols by reaction with ethanolic $NaBH_4$solution.

∴ $R-O-R$ does not have$-\overset{\overset{O}{||}}{C}-$ group.

∴It cannot be reduced to alcohol by alcoholic solution of $NaBH_4$.

847 **(d)**

Carboxylic acid is converted into its anhydride by using phosphorus pentaoxide.



$$2RCOOH \xrightarrow{P_2O_5} \begin{matrix}OCR\\ \quad\rangle O\\OCR\end{matrix} + H_2O$$

carboxylic acid acid anhydride

848 **(b)**

$HCOONH_4 \overset{\Delta}{\rightarrow} HCONH_2 + H_2O$

849 **(b)**

Calcium salts of carboxylic acid on heating give carbonyl compound.

(a)$(HCOO)_2Ca + (CH_3CH_2COO)_2Ca$

Calcium formate calcium propanoate

$\rightarrow 2CH_3CH_2\overset{\overset{O}{||}}{C}-H + 2CaCO_3$

propanal

(b)$(CH_3COO)_2Ca + (CH_3CH_2COO)_2Ca$

Calcium acetate calcium propanoate

$\rightarrow 2CH_3-\overset{\overset{O}{||}}{C}-CH_2-CH_3 + 2CaCO_3$

2-butanone

(c)$(CH_3COO)_2Ca + (CH_3COO)_2Ca$

Calcium acetate calcium acetate

$\rightarrow 2CH_3-\overset{\overset{O}{||}}{C}-CH_3 + 2CaCO_3$

acetone

(d)$(HCOO)_2Ca + (CH_3COO)_2Ca$

Calcium formate calcium acetate

$\rightarrow 2CH_3-\overset{\overset{O}{||}}{C}-H + 2CaCO_3$

ethanal

850 **(d)**

Rest all show elimination of carbonylic oxygen.

851 **(c)**

$CH_3CH(OH)COOH \xrightarrow[\text{[O]}]{\text{Fenton's reagent}} \underset{\text{Pyruvic acid}}{CH_3COCOOH};$

Fenton's reagent $FeSO_4 + H_2O_2$ as well as Tollen's reagent give pyruvic acid.

853 **(c)**

Urotropine is hexamethylene tetramine, *i.e.*, $(CH_2)_6N_4$, used as medicine for gout and urine infections.

854 **(b)**

$$\frac{\text{Wt. of } B_2H_2PtCl_6}{2B + 410} = \frac{\text{Wt. of Pt}}{195}$$

$$\therefore \quad \frac{0.75}{2B + 410} = \frac{0.245}{195}$$

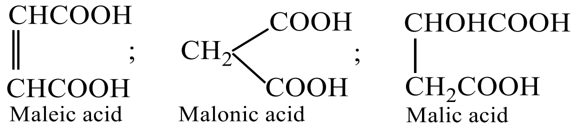
$$\therefore \quad B = 93.5$$

Eq. wt. of base = 93; since it is monoacidic.

∴ Mol. wt. of base $= 93.5 \times 1 = 93.5$

855 **(d)**

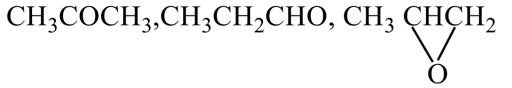
Mandelic acid $C_6H_5CHOHCOOH$ is aromatic hydrox
.


Maleic acid
Malonic acid
Malic acid

857 **(b)**

Halogen attacks α-carbon atom of acid in presence of I_2 or P (HVZ reaction).

859 **(d)**



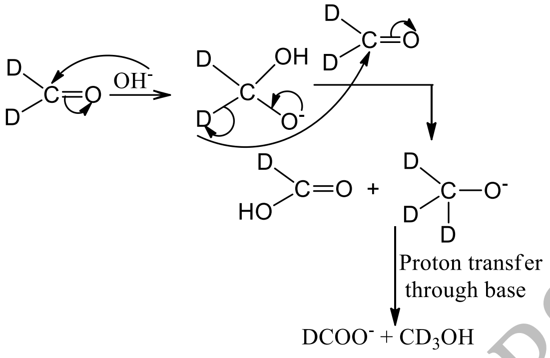
$CH_2 = CHCH_2OH, CH_2 = CHOCH_3$

860 **(a)**

Percentage of N $= \frac{28 \times V \times 100}{22400 \times W}$

862 **(d)**

Cannizaro reaction takes place as,

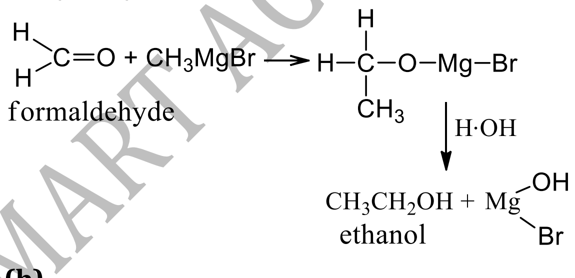


863 **(a)**

$(CH_3)_2CHCHO$ shows both reactions, *i.e.*, aldol condensation and Cannizzaro's reaction.

864 **(a)**

Formaldehyde reacts with methyl magnesium bromide to give a addition product which ethanol on hydrolys



865 **(b)**

Stronger acids possess low pK_a value.

866 **(b)**

Clemmensen's reduction.

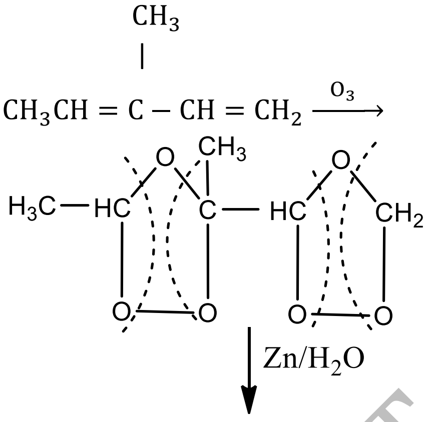
867 **(d)**

$$CH_3COOH \xrightarrow{CaCo_3} \underset{'A'}{(CH_3COO)_2Ca}$$

$$\xrightarrow[-CaCo_3]{\Delta} (CH_3)_2CO \xrightarrow[-H_2O]{NH_2OH} (CH_3)_2C = NOH$$

acetoxime

868 **(c)**

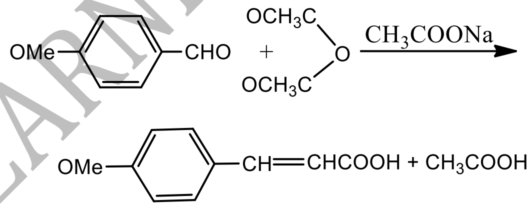


$CH_3CHO + CH_3COCHO + CH_2O$

869 **(c)**

This reaction is an example of Perkin's reaction because in it α, β-unsaturated acid is obtained with aromatic aldehydes.

Therefore, (X) is acetic anhydride *i.e.*, $(CH_3CO_2)O$.

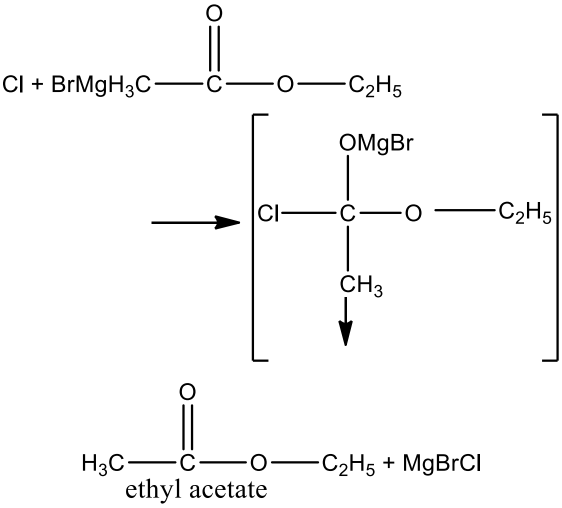


871 **(d)**

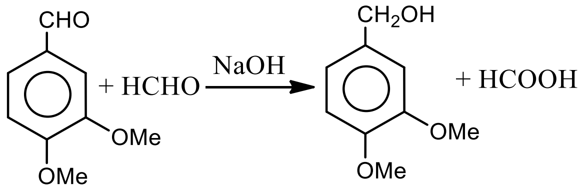
$CH_4 \xrightarrow{[O]} H_2O + CO$

872 **(b)**

Ethyl acetate is obtained when methyl magnesium bromide reacts with ethyl chloroformate.



874 **(a)**



It is an example of crossed Cannizaro's reaction.

875 **(a)**

Reduction of ketone to corresponding alkane using Zn/HCl is called Clemmensen reduction.

876 **(c)**

$3CH_3COOH + PCl_3 \longrightarrow 3CH_3COCl + H_3PO_3$

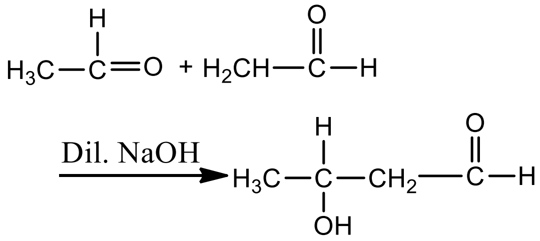
879 **(d)**

Acetamide reacts with HNO_2 to give acetic acid and nitrogen gas

$\underset{\text{acetamide}}{CH_3CONH_2} + HNO_2 \rightarrow CH_3COOH + H_2O + N_2$

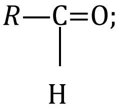
881 **(b)**

The self condensation of acetaldehyde in presence of dilute alkalies is called aldol condensation and the product is known as aldol.



aldol

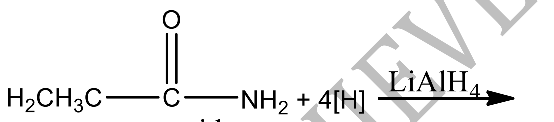
882 **(b)**



$R—\underset{\displaystyle H}{\underset{|}{C}}=O$; 3$\sigma$-bonds on carbon of —CHO.

884 **(c)**

Amides are reduced by lithium aluminium hydride ($LiAlH_4$) or sodium and ethyl alcohol into primary amines.



$H_2CH_3C—\overset{\displaystyle O}{\overset{\|}{C}}—NH_2 + 4[H] \xrightarrow{LiAlH_4}$

propanamide

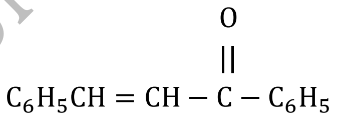
$CH_3CH_2CH_2NH_2 + H_2O$

propyl amine

886 **(a)**

In presence of sodium hydroxide, benzaldehyde reacts with acetophenone, to give phenyl cinnamate.

$C_6H_5CHO + CH_3COC_6H_5 \xrightarrow{NaOH(aq)}$



$C_6H_5CH = CH - \overset{\displaystyle O}{\overset{\|}{C}} - C_6H_5$

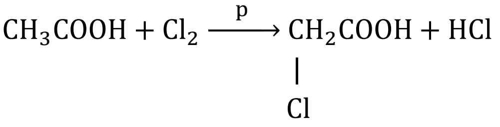
888 **(d)**

Cannizaro reaction is given by only those aldehydes and ketones in which α-H atom is absent.

Formaldehyde (HCHO)and benzaldehyde (C_6H_5CHO) both due to the absence of α-H atom undergo Cannizaro reaction.

889 **(a)**

In this reaction α-H is replaced by chlorine.



$CH_3COOH + Cl_2 \xrightarrow{p} \underset{\displaystyle Cl}{\underset{|}{CH_2COOH}} + HCl$

This reaction is called the Hell-Volhard-Zelinsky reaction.

890 **(d)**

Presence of NO_2 gp. makes it best hydride donor.

891 **(c)**

Aldehydes form white crystalline solid with $NaHSO_3$.

893 **(b)**

$CH_3CHO + HCH_2COCH_3 \xrightarrow{NaOH}$

$\underset{\text{major}}{CH_3CH(OH)CH_2COCH_3} + CH_3CH(OH)CH_2CHO$

$+(CH_3)_2C(OH)CH_2COCH_3$

$+(CH_3)_2C(OH) - CH_2CHO$

$CH_3CH(OH)CH_2COCH_3 \xrightarrow[-H_2O]{\Delta} CH_3CH = CHCOCH_3$

major product major

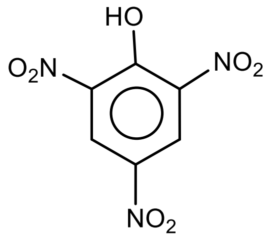
product(25%)

894 **(b)**

$2CH_3COCl + (CH_3)_2Cd \rightarrow 2CH_3COCH_3 + CdCl_2$

895 **(c)**

Picric acid doesn’t contain –COOH group. It is 2, 4, 6 trinitrophenol.



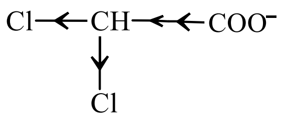
897 **(c)**

$\text{Organic compound} + CaO + Na_2CO_3 \xrightarrow[\text{a Pt crucible}]{\text{Heat in}}$

Cool the solution and add dil. HNO_3 and then $AgNO_3$. A precipitate of AgX is dried and weighed and the % of halogen is obtained as usual. This is Schiffs and Piria method.

898 **(a)**

See the influence of –*IE* of Cl-atom. The negative charge on carboxy late ion is dispersed more in presence of two Cl-atoms.



The *IE* order F > Cl > Br > I.

899 **(a)**

Any electron withdrawing group increases the acidity due to $-I$ effect. The $-I$ effect of chlorine is greater than phenyl group. Hence, $ClCH_2COOH$ is the most acidic compound among these.

900 **(c)**

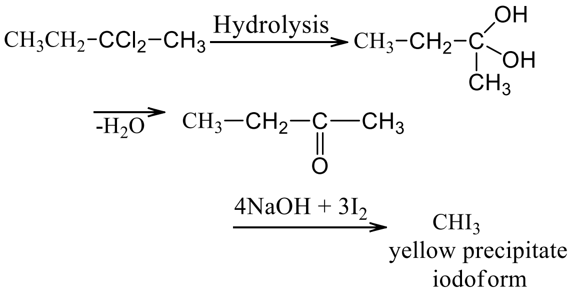
Molecular formula = integer × empirical formula.

901 **(d)**

Carboxylic acids when treated with either diborane or LAH, get reduced to primary alcohols. Diborane is a better reagent than LAH for such conversion, as it does not affect other functional groups such as ester, intro, holo etc.

$$R - COOH + B_2H_6 \xrightarrow[H_3O^+]{} R - CH_2OH$$

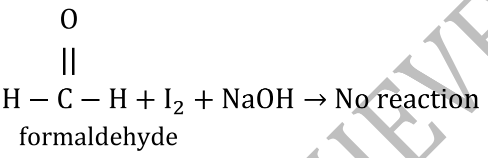
902 **(b)**



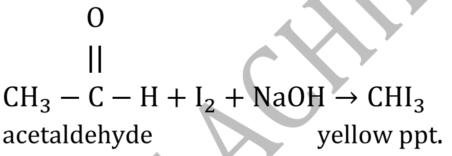
(Remember! Only methyl ketones give iodoform test.)

903 **(d)**

Iodine in presence of base is used to detect presence of CH_3CO group in compound.



$$\underset{\text{formaldehyde}}{H - \overset{\overset{O}{||}}{C} - H} + I_2 + NaOH \rightarrow \text{No reaction}$$



$$\underset{\text{acetaldehyde}}{CH_3 - \overset{\overset{O}{||}}{C} - H} + I_2 + NaOH \rightarrow \underset{\text{yellow ppt.}}{CHI_3}$$

∴Formaldehyde and acetaldehyde are distinguished by using I_2 and base.

906 **(d)**

Acetaldehyde reduces Tollen's reagent and itself is oxidised to acetic acid.

$$CH_3CHO + Ag_2O \rightarrow CH_3COOH + 2Ag \downarrow$$

909 **(a)**

Ascorbic acid ($C_6H_8O_6$) is called vitamin C, found in citrus fruits.

910 **(c)**

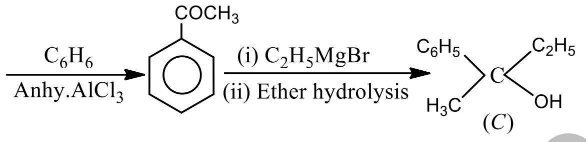
$$C_6H_5COCH_3 \overset{Cl_2}{\rightarrow} \underset{\text{Tear gas}}{C_6H_5COCH_2Cl}$$

911 **(c)**

$$CH_3CONH_2 \xrightarrow{HOH} CH_3COOH + NH_3 \xrightarrow{\text{Nessler's reagent}} \text{a test for } NH_3.$$

912 **(b)**

$$CH_3COOH + PCl_5 \rightarrow \underset{(A)}{CH_3COCl}$$

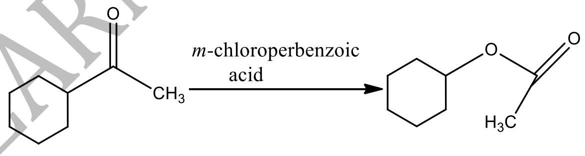


915 **(a)**

Notice + IE of alkyl group which intensifies the –ve charge on carboxylate ion and thus, makes it more reactive. The acid therefore becomes more stable.

916 **(d)**

Baeyer-Villiger oxidation involves transformation of a ketone into ester by reaction with a peracid. The net change is the insertion of an oxygen atom between the carbonyl carbon and an adjacent carbon of the ketone. So, it is an example of Baeyer-Villiger oxidation, the most suitable reagent is m-chloroperbenzoic acid



917 **(c)**

Aldol condensation, haloform reaction and knovengel reaction involve the formation of a resonance stabilised anion, while the Wittig reaction involves the addition of a nucleophile on the carbonyl carbon. The driving force for the Wittig reaction is the formation of a very strong $P - O$ bond

918 **(d)**

Better is leaving gp, higher will be reactivity of acyl compound towards nucleophile acyl substitution. Weaker is the base, better is leaving gp. Stronger is base, weaker is its acid and *vice-versa*.

922 **(c)**

Presence of electron withdrawing atom ($-X$) increases the acidic nature. Presence of electron repelling gp. ($-CH_3$) decreases the acidic nature.

923 **(c)**

$$CH_3CH_2CHO \overset{[O]}{\rightarrow} CH_3CH_2COOH$$

924 **(d)**

All aldehydes give silver mirror with Tollen's reagent.

925 **(c)**

Organic compound + CuO ⟶ CO_2 will come out if carbon is present.

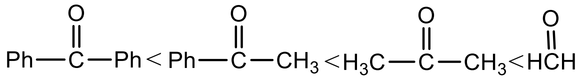
926 **(b)**

As compared to alcohol, the O − H bond in carboxylic acids is more strongly polarised due to the adjacent electron withdrawing carbonyl group. Therefore carboxylic acid from stronger intermolecular H-bonds than alcohols, and the boiling points of carboxylic acids are much higher than those of alcohol of comparable molecular masses

927 **(c)**

Addition of HCN is nucleophilic addition. Greater the electron deficiency of carbonyl group higher the rate of reaction.

Hence,



$\mathrm{Ph-\overset{O}{\overset{\|}{C}}-Ph < Ph-\overset{O}{\overset{\|}{C}}-CH_3 < H_3C-\overset{O}{\overset{\|}{C}}-CH_3 < H\overset{O}{\overset{\|}{C}}H}$

928 **(d)**

Benzaldehyde when heated with ethanolic KCN, it gives α −hydroxy ketone, benzoin.

$$C_6H_5CHO + H - \overset{O}{\overset{\|}{C}} - C_6H_5 \xrightarrow[\Delta]{\text{Alc.KCN}}$$

Benzaldehyde (2 mol)

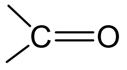
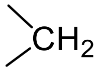
$$C_6H_5CH(OH)\overset{O}{\overset{\|}{C}} - C_6H_5$$

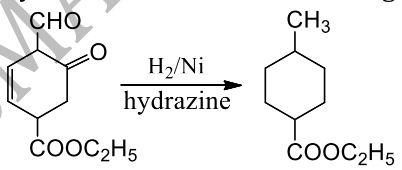
benzoin

929 **(c)**

Gastric juice has pH ≈ 2.5; lemon juice and pepsi cola have pH ≈ 7. Human blood has pH 7.2.

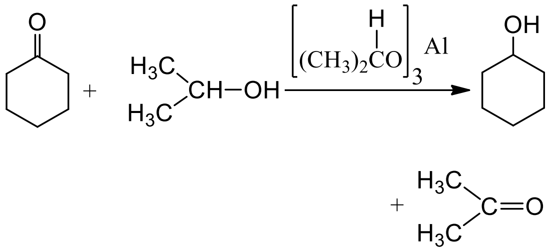
931 **(b)**

The reagent Ni/H_2 reduces double bond and hydrazine converts  group to 

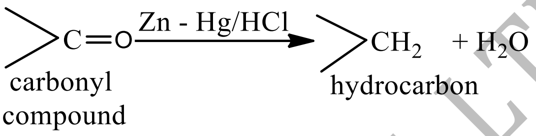


932 **(a)**

In Meerwein-Ponndorff-Verley reduction, the carbonyl compound is heated with aluminium *iso*-propoxide in *iso*-propanol solution, it gets reduced to alcohol. The *iso*-propoxide is oxidized to acetone, which is removed from the equilibrium mixture by slow distillation



934 **(d)**



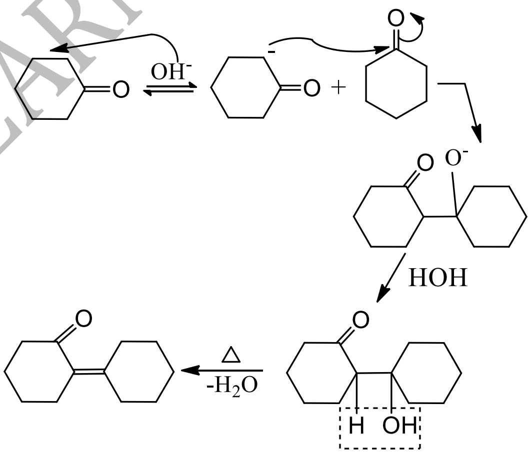
Carbonyl compounds can be converted into hydrocarbons by treating with zinc-amalgam/HCl (Clemmensen's reduction).

935 **(b)**

Cannizzaro's reaction is shown by aldehydes lacking with α-H-atom.

936 **(c)**

In the presence of base, cyclohexanone show aldol condensation



937 **(a)**

Magenta is rosaniline hydrochloride which is decolourised by H_2SO_3 to give Schiff's reagent.

938 **(b)**

Propanal is not formed during the dry distillation of a mixture of calcium formate and calcium acetate.

$(HCOO)_2Ca \xrightarrow{\text{Dry distilllation}} HCHO + CaCO_3$

$(CH_3COO)_2Ca \xrightarrow{\Delta} CH_3COCH_3 + CaCO_3$

$(HCOO)_2Ca + (CH_3COO)_2Ca \xrightarrow{\Delta} 2CH_3CHO + 2CaCO_3$

939 **(b)**

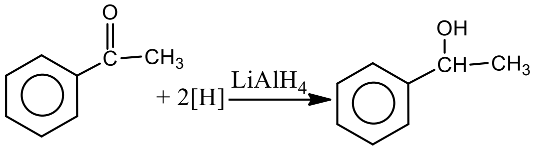
$RCOOH + N_3H \xrightarrow{\text{Conc } H_2SO_4} RNH_2 + CO_2N_2$

hydrazoic acid primary amine

It is Schmidt reaction.

941 **(b)**

Ketones on reduction with $LiAIH_4$ gives secondary alcohol.



942 **(a)**

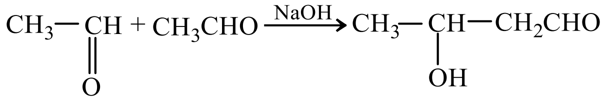
Petrol, kerosene, diesel, etc., have difference in their b. p. of more than 50°C.

943 **(c)**

Halogen attacks α-carbon of carboxylic acid. This is HVZ reaction.

944 **(b)**

Aldol condensation is shown by the molecules having α-carbon atom



$$CH_3-\underset{\underset{O}{\|}}{C}H + CH_3CHO \xrightarrow{NaOH} CH_3-\underset{\underset{OH}{|}}{C}H-CH_2CHO$$

945 **(d)**

CH_3CONH_2 on treatment with metallic sodium produce hydrogen.

$$CH_3CONH_2 + Na \to CH_3CONH^-Na^+ + \frac{1}{2}H_2\uparrow$$

946 **(b)**

More is the tendency for H-bonding, more will be boiling point. In carboxylic acid H-bonding is more than alcohols.

948 **(d)**

$$CH_3CONH_2 \xrightarrow{P_2O_5,\Delta} CH_3CN$$

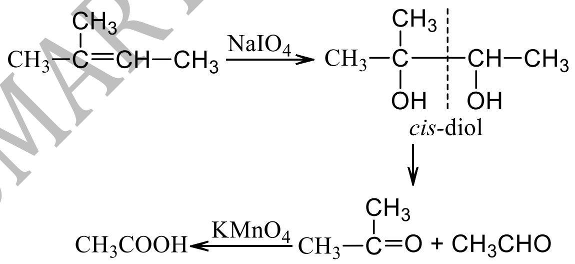
Acetamide ethane mitrile

949 **(a)**

This is Hofmann's bromamide reaction.

950 **(b)**

An aqueous solution of sodium periodate and a trace of potassium permanganate is known as **Lemieux reagent.** The alkene is oxidized to *cis*-diol, which is cleaved by periodate to aldehydes and/or ketones. Aldehydes are further oxidized by $KMnO_4$to acids



This is better for both determining the position of double bond and for preparing carbonyl compounds, because in this method, formaldehyde is usually obtained from terminal alkene, instead of producing CO_2 and water

951 **(a)**

Alkali used is $Ba(OH)_2$.

954 **(c)**

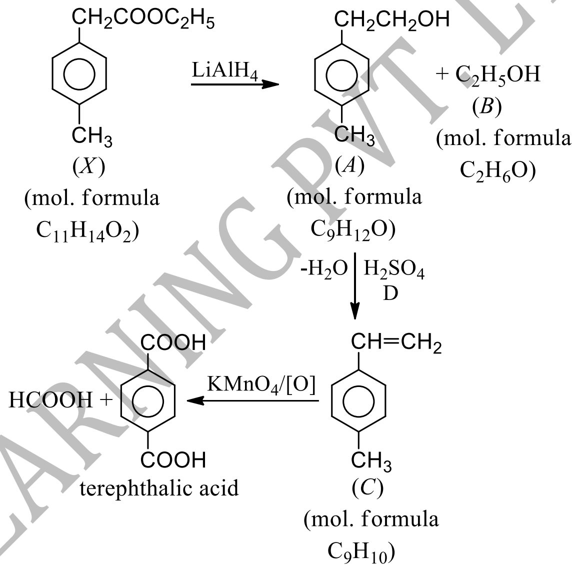
Among the carbonyl compounds, the reactivity decreases with increase in number of alkyl group and size of alkyl group because the positive charge on the carbon atom decreases due to $+I$ effect of alkyl groups.

Thus, the correct order reactivity is

$HCHO > CH_3CHO > C_6H_5CHO$

955 **(b)**

Reaction proceeds as



957 **(c)**

Waxes are esters of higher fatty acids $RCOOR'$.

958 **(b)**

O is more electronegative than C.

961 **(d)**

The formation of canary yellow precipitate with am. molybdate confirms the presence of P of As or both due to the formation of $(NH_4)_3\ PO_4 \cdot 12MoO_3$ or $(NH_4)_3\ As\ O_4 \cdot 12MoO_3$.

964 **(c)**

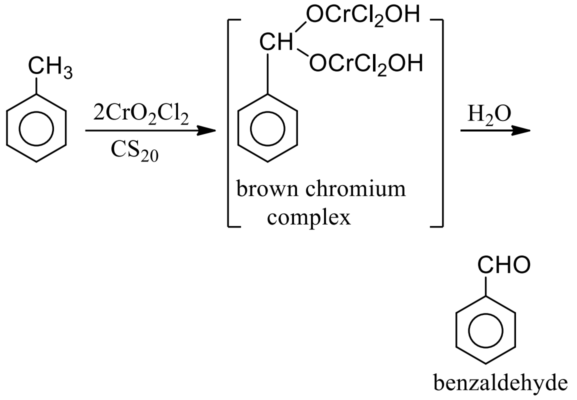
$NH_2CH_2COOH \rightleftharpoons NH_3^+CH_2COO^-$

965 **(a)**

CH_3CHO and CH_3COCH_3 forms condensation product with NH_3.

968 **(a)**

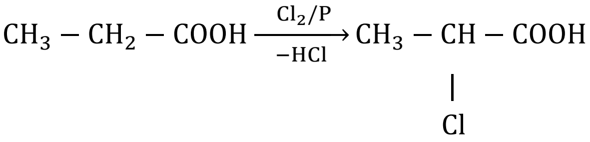
Toluene can be oxidized to benzaldehyde with a solution of chromyl chloride (CrO_2Cl_2) in CS_2 or CCl_4. This is known as Etard reaction



Further oxidation of benzaldehyde to benzoic acid is avoided by protection of carbonyl group

969 **(c)**

The Hell-Volhard-Zelinsky reaction is used for preparing α-halo acid.



$$CH_3 - CH_2 - COOH \xrightarrow[-HCl]{Cl_2/P} CH_3 - \underset{\underset{Cl}{|}}{CH} - COOH$$

∝-chloropropanoic acid

970 **(a)**

This is Rosenmund's reaction.

971 **(d)**

$CH_3OH \overset{Cu}{\rightarrow} HCHO \xrightarrow{NaOH} HCOONa + HCH_2OH$;

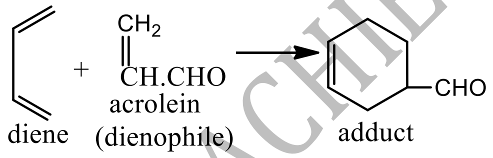
Cannizzaro's reaction.

972 **(a)**

$CH_3CHO + H_2NOH \longrightarrow CH_3CH{=}NOH + H_2O$

973 **(b)**

The addition of α, β-unsaturated carbonyl compound, with conjugated diene is called Diel's-Alder reaction.

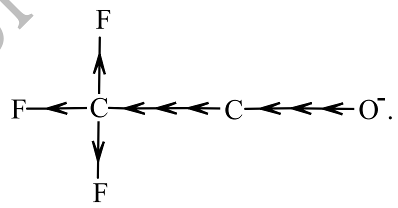


974 **(d)**

The given statement is of Cannizzaro's reaction.

976 **(c)**

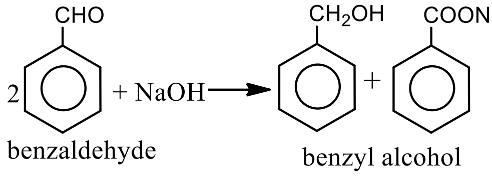
Follow applications of inductive effect. The negative charge on carboxylate ion is dispersed more due to $-IE$ of F-atom.



The carboxylate ion thus becomes more stable and acid more active.

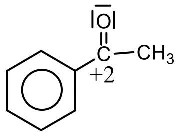
980 **(d)**

Cannizaro reaction aldehydes which does not have α −hydrogen atom undergo disproporation reaction (half of the molecule are oxidised and half are reduced).



∴Benzaldehyde is converted into benzyl alcohol by Cannizaro reaction.

981 **(c)**



Thus, oxidation number of carbonyl carbon in acetophenone is +2.

982 **(a)**

$CH_3COOH + NH_2CONH_2$
$\longrightarrow CH_3CONH_2 + CO_2 + NH_3$

983 **(d)**

$C_6H_5CHO \overset{Cl_2}{\rightarrow} C_6H_5COCl$

984 **(b)**

$Na + C + N \xrightarrow{Fusion} NaCN$.

986 **(d)**

It attacks acidic H (H attached on N, O, F) to show acylating nature.

987 **(b)**

Stinges of bees and wasps contain formic acid.

988 **(c)**

$NaNO_2 + HCl \rightarrow HNO_2 + NaCL$

$\underset{\text{urea}}{H_2NCONH_2} + HNO_2 \rightarrow CO_2 + NH_3 + H_2O + N_2$

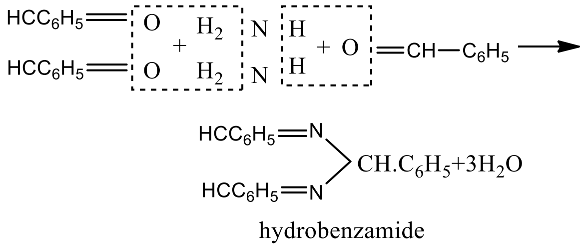
CO_2 gas evolves with brisk effervescence

989 **(a)**

$C_2H_5OH \overset{[O]}{\rightarrow} CH_3CHO \overset{[O]}{\rightarrow} CH_3COOH$

991 **(a)**

Benzaldehyde reacts with ammonia to form hydrobenzamide.



992 **(d)**

RCHO or RCOR can be reduced t

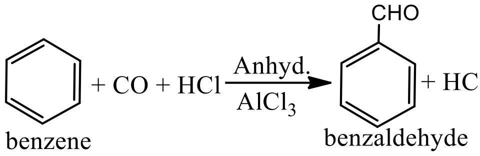
RCH$_2$OH or RCHOHR respectively by H_2 + catalyst, $LiAlH_4$, $NaBH_4$,etc.

993 **(d)**

$RCOOR' \xrightarrow{\text{NaOH}} \underset{\text{Soap}}{RCOONa} + R'OH$

994 **(d)**

The Gattermann-Koch aldehyde synthesis is as follows.



995 **(c)**

Carboxylic acids are weak acids.

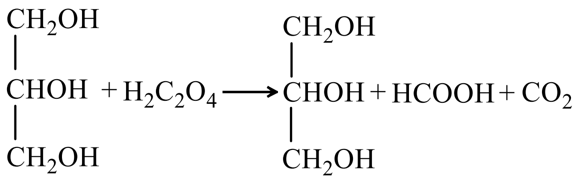
997 **(a)**

$PCl_5, PCl_3, SOCl_2$ are used in organic reactions to replace —OH group or to replace carbonylic oxygen.

998 **(b)**

$C = O + H_2NNHC_6H_5 \longrightarrow C{=}N{\cdot}NHC_6H_5$

999 **(c)**



$$\begin{matrix} CH_2OH \\ | \\ CHOH \\ | \\ CH_2OH \end{matrix} + H_2C_2O_4 \longrightarrow \begin{matrix} CH_2OH \\ | \\ CHOH \\ | \\ CH_2OH \end{matrix} + HCOOH + CO_2$$

The intermediate formed decomposes to give glycerol back and formic acid.

100 **(d)**
0 Benedict solution is readily reduced by aldehyde. It doesn’t oxidise anhydrides.

100 **(d)**
1 7-9% dilute solution of acetic acid is known as vinegar.

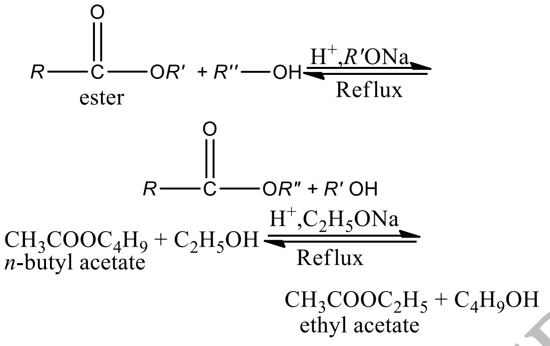
Vinegar can be obtained by the fermentation of ethyl alcohol in the presence of enzyme acetobactor.

100 **(a)**
2 $CH_3COOH + NH_3 \longrightarrow CH_3COONH_4$

100 **(b)**
3 Unlike $KMnO_4$ acid Jone’s reagent ($K_2Cr_2O_7 + H_2SO_4$) does not attack C=C.

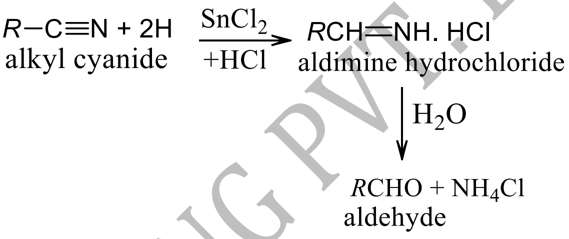
100 **(c)**
4 $CH_3CHO \xrightarrow{PCl_5} CH_3CHCl_2$

100 **(c)**
5 Transesterification is the process of conversion of one ester to another ester.



$\underset{n\text{-butyl acetate}}{CH_3COOC_4H_9} + C_2H_5OH \underset{\text{Reflux}}{\overset{H^+, C_2H_5ONa}{\rightleftharpoons}} \underset{\text{ethyl acetate}}{CH_3COOC_2H_5} + C_4H_9OH$

100 **(a)**
6 The formation of aldehyde from alkyl cyanide takes place by Stephen’s reaction



$$\underset{\text{alkyl cyanide}}{R{-}C{\equiv}N + 2H} \xrightarrow[+HCl]{SnCl_2} \underset{\text{aldimine hydrochloride}}{RCH{=}NH.\,HCl} \xrightarrow{H_2O} \underset{\text{aldehyde}}{RCHO} + NH_4Cl$$

100 **(d)**
7 PCl_5 usually used to replace — OH gp. or oxygen of

100 **(c)**
9 Fehling’s solution is produced by mixing two solutions. Fehling (*A*) containing alkaline $CuSO_4$ and Fehling (*B*) $NaKC_4H_6O_8$ or sod. pot. tartrate.

101 **(c)**
1 The compound which contains – $COCH_3$ group in its structure, give positive iodoform test and the compound which contains – CHO group give positive Fehling test.

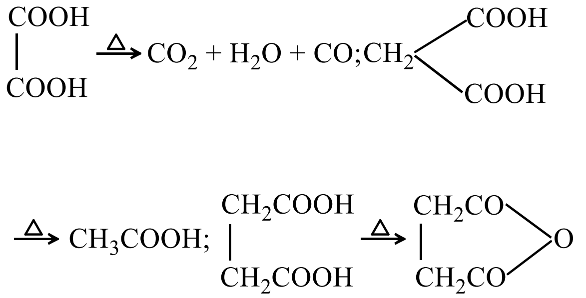
In ethanal, CH_3CHO both the groups are present, hence it responds to both iodoform test and Fehling’s test.

$CH_3CHO + I_2 + NaOH \rightarrow \underset{\text{iodoform}}{CHI_3} + NaI + H_2O$

$CH_3CHO + \underset{\text{Fehling's Solution}}{Cu(OH)_2} \rightarrow CH_3COOH + \underset{\text{red ppt.}}{Cu_2O \downarrow} + 2H_2O$

101 **(b)**
2 $P_{\text{mixture}} = P_{\text{compound}} + P_{\text{steam}} = 1\text{ atm (at b. p.)}$

101 **(a)**
5 Two —COOH gp. on one carbon atom gives CO_2 on heating . Two —COOH gp. on adjacent carbon atoms lose H_2O to give anhydride on heating

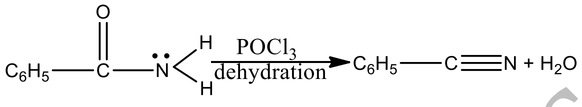


101 **(b)**
7 The nitrogen of an organic compound is quantitatively converted to $(NH_4)_2SO_4$ on heating with H_2SO_4.

101 **(a)**
8 Propionic acid and KOH reacts to produce potassium propionate.

$$\underset{\text{Propionic acid}}{CH_3CH_2COOH} \xrightarrow{KOH} \underset{\text{pot. propionate}}{CH_3CH_2COOK} + H_2O$$

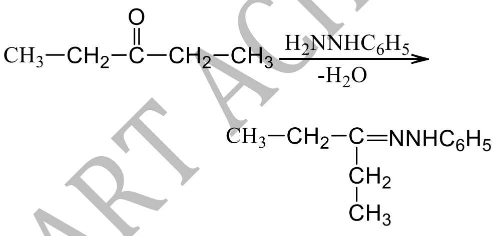
102 **(b)**
0 Benzamide on treatment with $POCl_3$ gives benzonitrile (phenyl cyanide) because in this reaction $POCl_3$ acts as dehydrating agent and on dehydration of benzamide, benzonitrile is obtained.

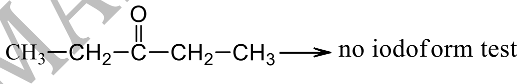


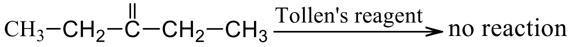
102 **(c)**
1 Both have nearly same boiling point (HCOOH=100.5°C;H_2O =100°C).

102 **(b)**
2 $3NaCNS + FeCl_3 \longrightarrow \underset{\text{(Red)}}{Fe(CNS)_3} + 3NaCl$

102 **(c)**
4 The compound is pentanone-3

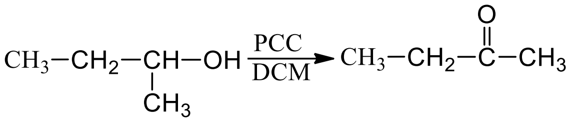






102 **(d)**
5 An exceptional aldehyde which does not reduce Fehling's solution.

102 **(c)**
6 Oxidation of 2-butanol to ethyl methyl ketone can be made effective by using oxidizing agent PCC/DCM (pyridinium chlorochromate in dichloro methane)



102 **(a)**
7 The reaction occurs as follows

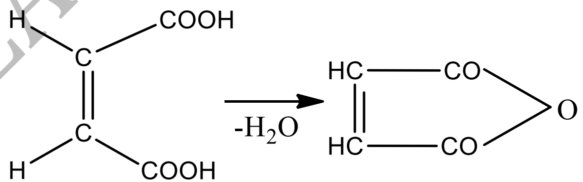
$$\underset{\text{ethyl benzoate}}{C_6H_5COOC_2H_5} + KOH \xrightarrow{\Delta} C_6H_5COOK + C_2H_5OH$$

$$C_6H_5COOK + HCl \rightarrow \underset{\text{white solid}}{C_6H_5COOH} + KCl$$

102 **(c)**
8 Al_2O_3 is used as absorbent. the other absorbents a powder, animal charcoal, etc.

102 **(d)**
9 The monocarboxylic acids are called fatty acids, because some of the higher members were obtained from fats. The general formula is $C_nH_{2n+1}COOH$ or RCOOH or $C_nH_{2n}O_2$.

103 **(b)**
1 *Cis*-dioic acid readily gives anhydride on heating. Since maleic acid is a dioic acid gives maleic anhydride readily.

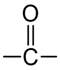


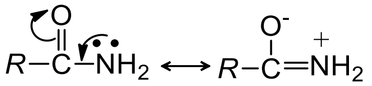
maleic acid maleic anhydride

103 **(c)**
3 $Na_2S + \underset{\text{Sod.nitroprusside}}{Na_2[Fe(CN)_5NO]} \longrightarrow$
$\underset{\text{Sod.thio nitroprusside}}{Na_4[Fe(CN)_5NOS]}$

103 **(c)**
4 $BrCH_2CH_2COOH$ is the weakest acid and have lowest dissociation constant $-IE$ of Br is lesser than F and is far away from —COOH group.

103 **(c)**
7 Acid amides are least reactive towards nucleophile amongst the all acid derivatives because of electron deficiency of the acyl carbon due to – I effect of the – NH_2 group. In other way, lone pair of electrons undergoes resonance with

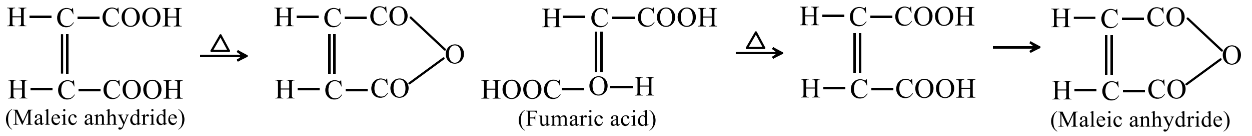
 group as



It is because of this alkanamides are amphoteric in nature

103 **(c)**

8 Maleic and fumaric acid are geometrical isomers (*cis*- and *trans*-respectively) having different physical properties but almost same chemical nature.



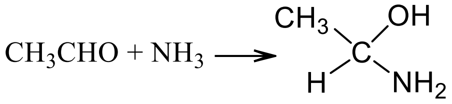
103 **(c)**

9 $3NaCNS + FeCl_3 \longrightarrow \underset{\text{Red colour}}{Fe(CNS)_3} + NaCl$

104 **(d)**

1 HCHO and CH_3CHO give different reaction with NH_3

$$6HCHO + 4NH_3 \longrightarrow \underset{\text{urotropine}}{(CH_2)_6N_4} + 6H_2O$$



acetaldehyde ammonia

104 **(c)**

2 $R - X \xrightarrow[\text{KCN}]{\text{Alcoholic}} R - \text{CN} \xrightarrow{\text{Dil HCl}} R - \text{COOH}$

alkyl cyanide carboxylic acid

104 **(d)**

3 Formic acid HCOOH also contain a – CHO group, so gives some reducing properties of aldehydes

HC = O 3 aldehyde group
 |
 OH

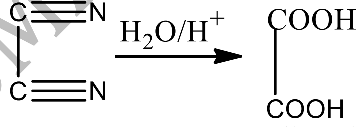
Formic acid is a very strong reducing agent. It reduces Tollen's reagent, Fehling's solution and mercruric chloride.

Acetic acid does not give these reaction.

Formic acid distinguishes from acetic acid by Fehling's solution. Formic acid gives red ppt of cuprous oxide with Fehling's solution while acetic acid does not.

104 **(c)**

5 Oxalic acid is prepared by the acidic hydrolysis of cyanogen.



oxalic acid

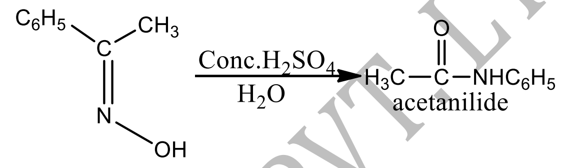
104 **(b)**

6 Urea on show heating gives biuret.

$$H_2N.CONH.\boxed{H + H_2N}CONH_2 \xrightarrow{\Delta} \underset{\text{biuret}}{H_2NCONH.CONH_2} + \underset{\text{ammonia}}{NH_3}$$

104 **(a)**

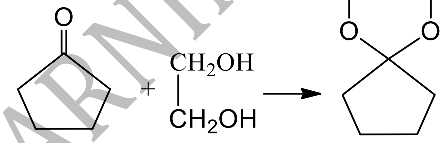
7 Beckmann rearrangement oximes on treatment with catalysts such as conc.H_2SO_4 undergo rearrangement to form substituted amide.



anti-phenyl acetophenone oxime

104 **(c)**

8 Ethylene glycol is used to protect the carbonyl group of cyclopentanone



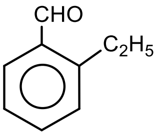
104 **(c)**

9 These are characteristics of C_6H_5CHO.

105 **(a)**

2
1. X forms 2, 4-DNP derivatives, it shows that it is a carbonyl compound (>C=0).
2. It reduces Tollen's reagent, it shows that it has an aldehyde group.
3. It undergoes Cannizaro reaction, that also shows the presence of an aldehyde having no α-hydrogen.
4. On vigorous oxidation, it produces 1, 2-benzenedicarboxylic acid. It shows that groups are present at 1,2-position on benzene ring.

Thus, the correct structure of the compound X is



105 **(a)**

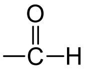
4 Two H-atoms of alkane are replaced by O.

105 **(d)**

5 $CH_3CN \xrightarrow{H_2O} CH_3COOH \xrightarrow{NH_3} CH_3COONH_4$

$\xrightarrow{\Delta} CH_3CONH_2 + H_2O$

1056 **(d)**

Formic acid has  (aldehyde) group. It reduces Tollens reagent to silver mirror like other aldehydes

1058 **(d)**

By NH_2-NH_2/C_2H_5ONa

Aldehyde and ketones are reduced with hydrazine NH_2-NH_2 and C_2H_5ONa to give hydrocarbon (paraffins). This reaction is called Wolff-Kishner reaction.

$$-CHO \xrightarrow[C_2H_5ONa]{NH_2-NH_2} -CH_3 - CO - \xrightarrow[C_2H_5ONa]{NH_2-NH_2} -CH_2 -$$

1059 **(a)**

$$CO + NaOH \xrightarrow{\text{High } P,T} HCOONa \xrightarrow{NaHSO_4} HCOOH + Na_2SO_4$$

1060 **(c)**

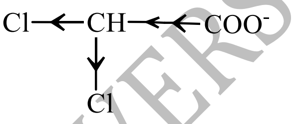
$$CH_3CHOHCH_3 \xrightarrow{[O]} CH_3COCH_3$$

1062 **(c)**

6-8 % solution of acetic acid is called vinegar.

1063 **(d)**

See the influence of $-IE$ of Cl-atom. The negative charge on carboxylate ion is dispersed more in presence of two Cl-atoms.



1065 **(b)**

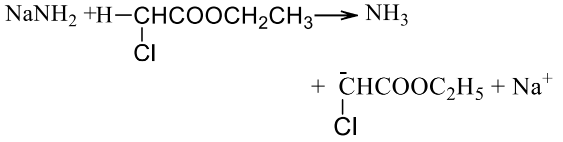
C_6H_5COOH sublimes on heating.

1066 **(a)**

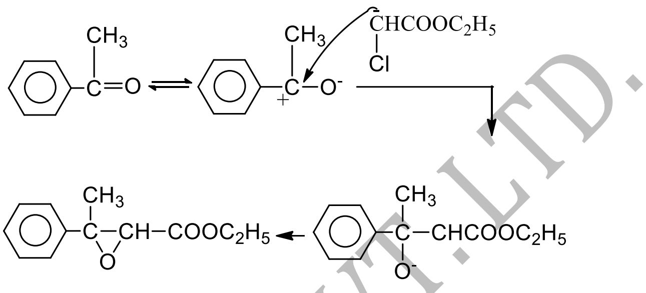
Tollen's reagent is $[Ag(NH_3)_2]NO_3$.

1068 **(a)**

NH_2^- withdraws acidic H from active methylene group of $ClCH_2COOC_2H_5$ and it combines with $C_6H_5COCH_3$ to form intermediate that undergoes intramolecular cyclisation



$$NaNH_2 + H-\underset{Cl}{CH}COOCH_2CH_3 \longrightarrow NH_3 + \underset{Cl}{\bar{C}H}COOC_2H_5 + Na^+$$



1069 **(a)**

$$CH \equiv CH \xrightarrow[Dil.H_2SO_4]{HgSO_4} CH_3CHO$$

acetaldehyde

$[A]$

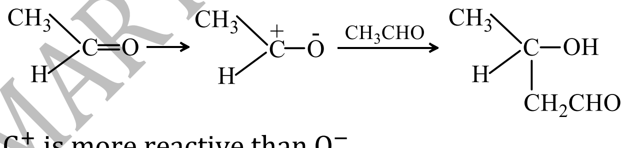
$$\xrightarrow[\substack{NaOH\\ \text{[aldol condensation]}}]{Dil} CH_3 - \underset{\substack{|\\ OH}}{CH} - CH_2 - CHO$$

aldol

$[B]$

This reaction is followed by acidic oxidation and aldol condensation respectively.

1070 **(b)**



C^+ is more reactive than O^-.

1071 **(a)**

$$(CH_3CO)_2O \xrightarrow{NH_3} 2CH_3CONH_2 + H_2O$$

1076 **(c)**

CH_3CHO, CH_3CH_2CHO and CD_3CHO each possess α-H/D atom and will show aldol condensation.

1077 **(c)**

$13.5 \text{ g} \equiv 9 \text{ g C} \equiv 1 \text{ g H} \equiv 3.5 \text{ g N}$

$\therefore 100 \text{ g} \equiv \frac{9\times100}{13.5} \text{g C} \equiv \frac{1\times100}{13.5} \text{g H} \equiv \frac{3.5\times100}{13.5} \text{g N}$

$\equiv \frac{9\times100}{13.5\times12} \text{mole C} = \frac{1\times100}{13.5\times1} \text{mole H}$

$= \frac{3.5\times100}{13.5\times14} \text{ mole N}$

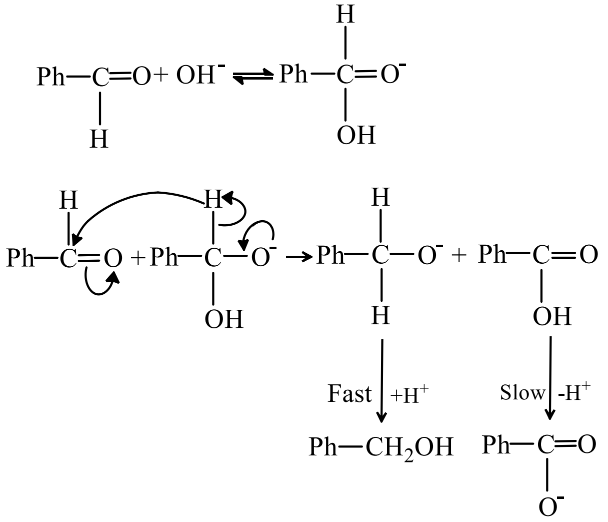
$\therefore$ Mol. formula $= C_6H_8N_2$

1078 **(c)**

It gives acid; $R\text{—}CN \xrightarrow{HOH} RCOOH$.

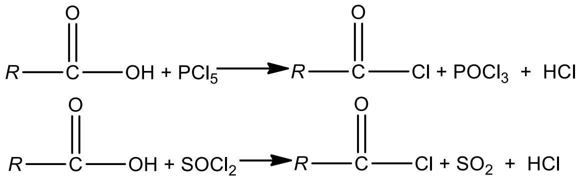
1079 **(b)**

The slowest step is the transfer of hydride ion to the carbonyl group as shown in mechanism.



108 **(a)**
0 This is the required order based on *ortho*-effect and electron withdrawing nature of — NO_2 group.

108 **(b)**
1 PCl_3, PCl_5 and $SOCl_2$ are used to replace –OH group of an alcohol or an acid by –Cl group



$$R-\overset{O}{\overset{\|}{C}}-OH + PCl_5 \longrightarrow R-\overset{O}{\overset{\|}{C}}-Cl + POCl_3 + HCl$$

$$R-\overset{O}{\overset{\|}{C}}-OH + SOCl_2 \longrightarrow R-\overset{O}{\overset{\|}{C}}-Cl + SO_2 + HCl$$

When acid reacts with Cl_2 in presence of red phosphorus, ∝-chloro acid is obtained. (Hell-Vohlard-Zelinsky reaction).

$$CH_3CH_2COOH + Cl_2 \xrightarrow[\Delta]{\text{Red P}} CH_3\overset{Cl}{\overset{|}{C}}HCOOH + HCl$$

∝-chloropropionic acid

108 **(d)**
2 Fractional distillation of petroleum produces a large number of compounds.

108 **(b)**
3 Aldol condensation aldehydes containing α −hydrogen undergo self addition in presence of a base to form products called ‘aldols’. The reaction is called ‘aldol condensation’.

Example Two molecules of acetaldehyde combine with each other in presence of dil. NaOH to form 3-hydroxybutanal.

$$CH_3CHO + HCH_2CHO \xrightarrow{OH^-} CH_3 - \overset{OH}{\overset{|}{C}H} - CH_2 - CHO$$

3-hydroxybutanal
(aldol)

108 **(c)**
4 Aldehydes are reduced by $LiAlH_4$ to alcohols and alcohols are oxidised by copper to give aldehydes.

$$\underset{(X)}{CH_3CHO} \xrightarrow{LiAlH_4} \underset{(Y)}{CH_3CH_2OH} \xrightarrow[\Delta]{Cu} \underset{(X)}{CH_3CHO}$$

108 **(c)**
5 This is Cannizzaro’s reaction.

108 **(b)**
6 Methyl ketones (acetone) and acetaldehyde both give indoform test.

$$CH_3\overset{O}{\overset{\|}{C}}H/R + 3I_2 + 4NaOH$$

$$\rightarrow CHI_3 + H/R - \overset{O}{\overset{\|}{C}} - ONa + 3NaI + 3H_2O$$

108 **(b)**
7 When acetaldehyde is treated with aqueous sodium hydroxide solution, it sundergoes aldol condensation (because of the presence of α −H atom) as.

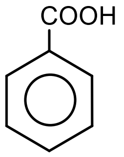
$$CH_3CHO + HCH_2CHO \xrightarrow[NaOH]{\text{Dil.aqueous}} CH_3CH$$

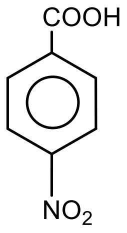
$*$

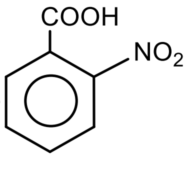
$$= CHCHO \xleftarrow{\Delta} CH_3CH(OH)CH_2CHO$$

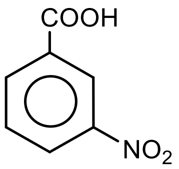
(shows geometrical isomerism)
aldol
(shows optical isomerism)

108 **(d)**
8

(I)


(II)


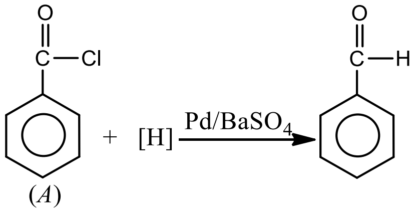
(III)


(IV)


$-NO_2$ group at any position shows electron withdrawing effect. Thus, acid strength is increased. But *o*-nitro benzoate ion is stabilised by intramolecular H-bonding like forces. Hence its acid strength is maximum.
Thus, the order of acid strength is (II) > (III) > (IV) > (I).

1089 **(d)**
Cyclohexylamines are more basic than aniline; the later shows resonance.

1091 **(a)**
Rosenmund reaction,



So, compound (*A*) is benzoyl chloride.

1092 **(b)**
Grignard reagent produce carboxylic acid on reaction with CO_2

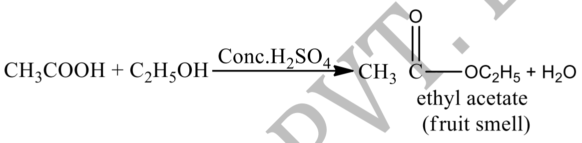
$$CH_3MgBr + CO_2 \rightarrow CH_3COOMgBr \xrightarrow{H_2O} CH_3COOH + Mg(OH)Br$$

1094 **(c)**
It is the reason why organic compounds studied as separate branch.

1096 **(d)**

$$\text{A liquid} + C_2H_5OH \xrightarrow{Conc.H_2SO_4} \underset{\text{(fruity smell)}}{\text{Compound}}$$

Fruity smell is the characteristic property of ester, thus reaction can be considered as follows



$$CH_3COOH + C_2H_5OH \xrightarrow{Conc.H_2SO_4} CH_3\overset{O}{\overset{\|}{C}}—OC_2H_5 + H_2O$$

1097 **(a)**
$CH_3CH_2OH \xrightarrow{[O]} CH_3CHO$