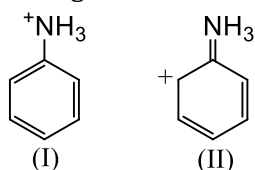


AMINES

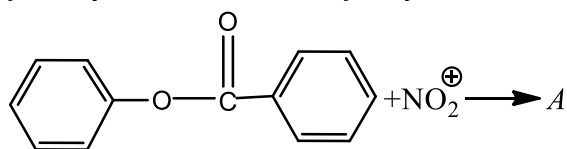
CHEMISTRY

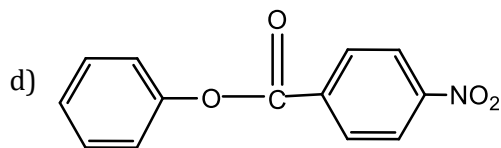
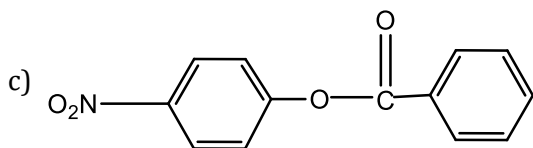
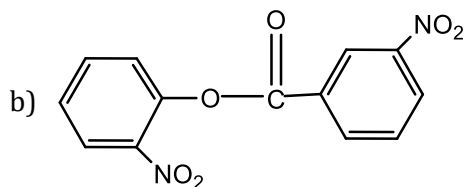
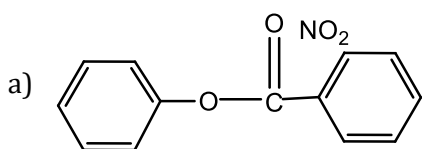
Single Correct Answer Type

- During diazotization of benzenamine with sodium nitrite and hydrochloric acid, the excess of hydrochloric acid is used primarily to
 - Check the hydrolysis of $\phi - OH$
 - Ensure a stoichiometric amount of nitrous acid
 - Check the concentration of free aniline
 - Neutralize any base formed during reaction
- Hofmann's bromamide reaction is to convert
 - Acid to alcohol
 - Alcohol to acid
 - Amide to amine
 - Amine to amide
- Examine the following two structures for the anilinium ion and choose the correct statement from the ones given below



- II is not acceptable as canonical structure because carbonium ions are less stable than ammonium ions
 - II is not an acceptable canonical structure because it is non-aromatic
 - II is not an acceptable canonical structure because in it N has 10 valence electrons
 - II is an acceptable as canonical structure
- Choose the amide which on reduction with $LiAlH_4$ yields a secondary amine
 - Ethanamide
 - N-methylethanamide
 - N, N-dimethylethanamide
 - Phenylmethanamide
 - When methyl cyanide is hydrolysed in presence of alkali, the product is:
 - Acetamide
 - Methane
 - $CO_2 + H_2O$
 - Acetic acid
 - In the following reactions, reactants A, B and C are:
 $Cl_2H_5NH_2 + A \rightarrow C_2H_5N = CH - C_6H_5 + H_2O$
 $Urea + B \rightarrow H_2N - NHCONH_2 + NH_3$
 $CH_2H_5NH_2 + C \rightarrow C_2H_5Cl + H_2O + N_2$
 - $CH_3CHO, NH_2 - NH_2$ and PCl_5
 - $C_6H_5CHO, NH_2 - NH_2$ and $SOCl_2$
 - $C_6H_5CHO, NH_2 - NH_2$ and $NOCl$
 - $CH_3CHO, NH_2 - NH_2$ and PCl_3
 - Toluene is nitrated and the resulting product is reduced with tin and hydrochloric acid. The product so obtained is diazotised and then heated with cuprous bromide. The reaction mixture so formed contains.
 - Mixture of *o*- and *p*-bromotoluenes
 - Mixture of *o*- and *p*-dibromobenzenes
 - Mixture of *o*- and *p*-bromoanilines
 - Mixture of *o*- and *m*-bromotoluenes
 - $>C=O$ compounds reacts with NH_3 or amines followed by H_2/Ni . The reaction is called
 - Mendius reaction
 - Hofmann bromamide
 - Reductive amination
 - Gabriel's phthalimide
 - A compound which on reaction with aqueous nitrous acid gives an oily nitrosoamine is:
 - Methylamine
 - Ethylamine
 - Diethylamine
 - Triethylamine





11. The active species produced in Hofmann's bromamide reaction is:

- a) Br^-
 b) Br_2
 c) OBr^-
 d) OBr_2

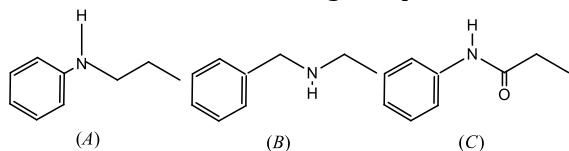
12. $\text{C}_5\text{H}_{13}\text{N}$ reacts with HNO_2 to give an optically active alcohol. The compound is

- a) Pentan-1-amine
 b) Pentan-2-amine
 c) N, N-dimethylpropan-2-amine
 d) N-methylbutan-2-amine

13. Reduction of alkyl nitriles, produces

- a) Secondary amine
 b) Primary amine
 c) Tertiary amine
 d) amide

14. Which one of the following compound is most basic?



- a) (A)
 b) (B)
 c) (C)
 d) All are equally basic

15. Alkyl halide (RX) on treatment with KCN followed by reduction leads to formation of:

- a) RNH_2
 b) RCH_2NH_2
 c) $\text{RH} + \text{NH}_3$
 d) $\text{RCH}_3 + \text{N}_2$

16. A gaseous carbon compound is soluble in dilute HCl. The solution on treating with NaNO_2 gives off nitrogen leaving behind a solution which smells of wood spirit. The carbon compound is

- a) HCHO
 b) CO
 c) $\text{C}_2\text{H}_5\text{NH}_2$
 d) CH_3NH_2

17. Benzaldehyde condenses with N, N-dimethylaniline in presence of anhydrous ZnCl_2 to give

- a) Azo dye
 b) Malachite green
 c) Michler's ketone
 d) Buffer yellow

18. Which of the following statements are correct?

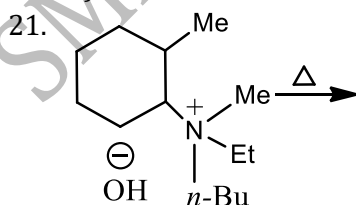
- a) Aniline is a stronger base ethyl amine
 b) Aniline is a stronger base than *p*-methoxyaniline
 c) Aniline must be acetylated before nitration with an acid mixture
 d) Aniline is soluble in an ammonium hydroxide solution

19. CHCl_3 and KOH on heating with a compound from a bad smelling product, compound is

- a) $\text{C}_2\text{H}_5\text{CN}$
 b) $\text{C}_2\text{H}_5\text{NC}$
 c) $\text{C}_2\text{H}_5\text{OH}$
 d) $\text{C}_2\text{H}_5\text{NH}_2$

20. On heating urea, a gas evolves along with formation of biuret. Identify the gas.

- a) CO
 b) NH_3
 c) CO_2
 d) H_2



The alkene formed as a major product in the above elimination reaction is

- a)
- b) $\text{CH}_2 = \text{CH}_2$
- c)
- d)

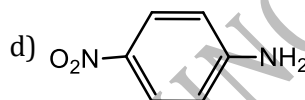
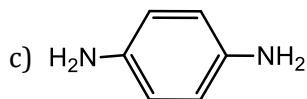
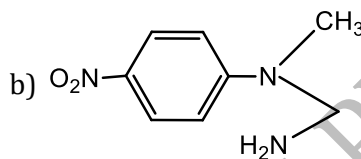
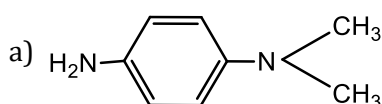
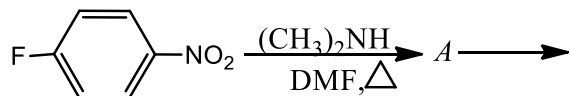
22. $\text{CH}_3\text{NH}_2 + \text{CHCl}_3 + \text{KOH} \rightarrow$ nitrogen containing compound + $\text{KCl} + \text{H}_2\text{O}$. Nitrogen containing compound is

- a) $\text{CH}_3 - \text{C} \equiv \text{N}$ b) $\text{CH}_3 - \text{NH} - \text{CH}_3$ c) $\text{CH}_3 - \bar{\text{N}} \equiv \text{C}^+$ d) $\text{CH}_3 \overset{+}{\text{N}} \equiv \text{C}$

23. A secondary amine is:

- a) A compound with two $-\text{NH}_2$ groups
 b) A compound with 2 carbon atoms and a $-\text{NH}_2$ group
 c) A compound with a $-\text{NH}_2$ group on the carbon atom in number 2 position
 d) A compound in which 2 of the hydrogens of NH_3 have been replaced by alkyl or aryl groups

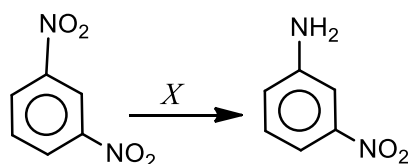
24.



25. The name urea given by:

- a) Wöhler b) Berzelius c) Roulle d) Lemery

26. In the reaction

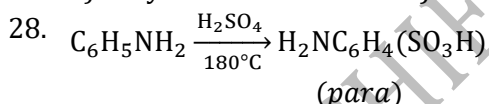


X is

- a) SiC b) H_2SO_4 c) KMnO_4 d) Fe/HCl

27. Which of the following enzymes can hydrolyse urea into CO_2 and NH_3 ?

- a) Amylase b) Urease c) Lipase d) Zymase



The true statement about the product is

- a) It does not exist as Zwitter ion
 b) $-\text{NH}_2$ displays a powerful basic character
 c) It does not act as inner salt
 d) $-\text{SO}_3$ diminishes the basic character of $-\text{NH}_2$

29. Aniline on treatment with NaNO_2 in HCl at 0°C followed by treatment with alkaline β -naphthol gives

- a) A violet solution b) A red solution
 c) A green solution d) A blue precipitate

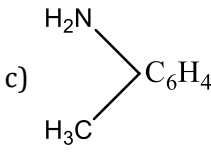
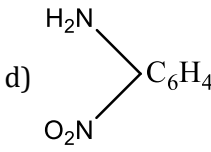
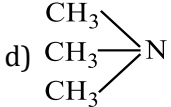
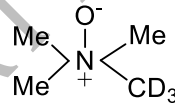
30. Which of the test is used for detection of secondary amines ?

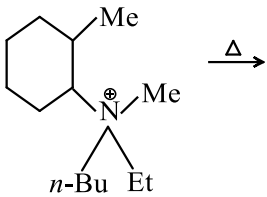
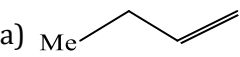
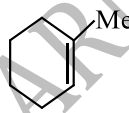
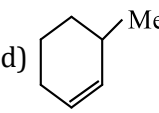
- a) Liebermann's nitroso test b) Lucas test
 c) Tollen's test d) Carbylamine reaction

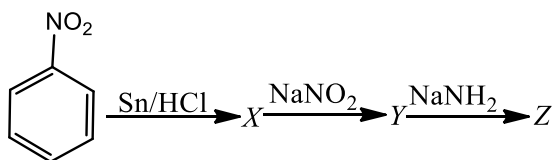
31. Gas evolved during the reaction of sodium metal on ethyl amine is:

- a) N_2 b) C_2H_2 c) H_2 d) CO_2

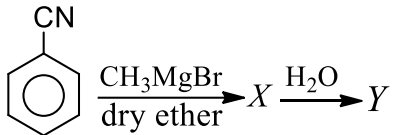
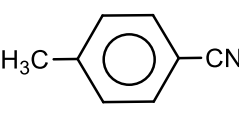
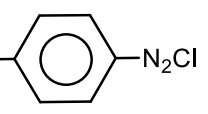
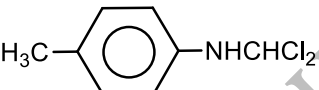
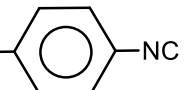
32. Which will not go for diazotization?

- a) $C_6H_5NH_2$ b) $C_6H_5CH_2NH_2$ c)  d) 
33. Aniline is prepared in presence of Fe/HCl from
 a) Benzene b) Nitrobenzene c) Dinitrobenzene d) None of these
34. Amines have:
 a) Garlic odour b) Fishy odour c) jasmine odour d) Bitter almonds odour
35. $CH_3CH_2NH_2$ contains a basic NH_2 group, but CH_3CONH_2 does not, because:
 a) Acetamide is amphoteric in character
 b) In $CH_3CH_2NH_2$ the electron pair on N-atom is delocalised by resonance
 c) In $CH_3CH_2NH_2$ there is no resonance, while in acetamide the lone pair of electron on N-atom is delocalised and therefore less available for protonation
 d) None of the above
36. High basicity of Me_2NH relative to Me_3N is attributed to
 a) Effect of solvent b) Inductive effect of Me c) Shape of Me_2NH d) Shape of Me_3N
37. In the reaction $RCONH_2 + X \rightarrow RNH_2$, the reagent X is
 a) Soda lime b) PCl_5 c) $NaOBr$ d) All of these
38. Which one of the following is most basic?
 a) FCH_2NH_2 b) $FCH_2CH_2NH_2$ c) $C_6H_5NH_2$ d) $C_6H_5CH_2NH_2$
39. Which one of the following amines will not react with HNO_2 acid to give nitrogen?
 a) CH_3NH_2 b) $CH_3CH_2NH_2$ c)  d) 
40. $(CH_3)_3N \xrightarrow[(ii) H_2O, \Delta]{(i) BrCN} [X]$, here [X] is
 a) CH_3NH_2 b) $(CH_3)_2NH$ c) $(CH_3)_3NO$ d) $(CH_3)_2NNO$
41. Hinsberg's method to separate amines is based on the use of:
 a) Benzene sulphonyl chloride
 b) Benzene sulphonic acid
 c) Ethyl oxalate
 d) Acetyl chloride
42. A primary amine heated with CS_2 in presence of excess of $HgCl_2$ gives isothiocyanate. The reaction is called:
 a) Hofmann's bromamide reaction
 b) Hofmann's mustard oil reaction
 c) Perkin's condensation
 d) Hofmann's elimination
43. 
 Pyrolysis of $Me_3N^+ - CD_3$ would give
 a) Mixture of $CH_2 = CH - CD_3$ and $CH_3 - CH = CD_2$ b) $CH_3 - CH = CD_2$
 c) $Me_2N^+ = C(CD_3)(CH_3)$ d) $CH_2 = CH - CD_3$
44. Ethyl isocyanide on hydrolysis in acidic medium generates
 a) Ethylamine salt and methanoic acid b) Propanoic acid and ammonium salt
 c) Ethanoic acid and ammonium salt d) Methylamine salt and ethanoic acid
45. When aniline is treated with sodium nitrite and hydrochloric acid at $0^\circ C$, it gives
 a) Phenol and N_2 b) Diazonium salt
 c) Hydrazo compound d) No reaction takes place
46. Which of the following is not correct?
 a) Ethylamine and aniline both have NH_2 group
 b) Ethylamine and aniline both dissolve HCl

- c) Ethylamine and aniline both react with CHCl_3 and KOH to form unpleasant smell
 d) Ethylamine and aniline both react with $\text{NaNO}_2 + \text{HCl}$ to give hydroxyl compounds in cold
47. Amine is not formed in the reaction
 (A) Hydrolysis of RCN
 (B) Reduction of $\text{RCH} = \text{NOH}$
 (C) Hydrolysis of RNC
 (D) Hydrolysis of RCONH_2
 The correct answer is
 a) A, B, D b) A, D c) B, C d) A, B, C
48. During coupling reaction of benzene diazonium chloride and aniline, the pH of reaction medium should be approximately
 a) 1–2 b) 9–10 c) 4–5 d) 7–8
49. The amine which will not liberate nitrogen on reaction with nitrous acid is
 a) Trimethyl amine b) Ethyl amine c) Sec-butyl amine d) *t*-butyl amine
50. 
- The alkane formed as a major product in the given elimination reaction is:
 a)  b) $\text{CH}_2 = \text{CH}_2$ c)  d) 
51. Carbylamine reaction is given by aliphatic
 a) Primary amine b) Secondary amine
 c) Tertiary amine d) Quaternary ammonium salt
52. Nitrobenzene is reduced by Zn and alcoholic potash mixture to get
 a) $\text{C}_6\text{H}_5 - \text{NH}_2$ b) $\text{C}_6\text{H}_5 - \text{NH} - \text{NH} - \text{C}_6\text{H}_5$
 c) $\text{C}_6\text{H}_5 - \text{N} - \text{N} - \text{C}_6\text{H}_5$ d) $\text{C}_6\text{H}_5 - \text{NH} - \text{CO} - \text{C}_6\text{H}_5$
53. The decreasing order of basic characters of the three amines and ammonia is
 a) $\text{NH}_3 > \text{CH}_3\text{NH}_2 > \text{C}_2\text{H}_5\text{NH}_2 > \text{C}_6\text{H}_5\text{NH}_2$ b) $\text{C}_2\text{H}_5\text{NH}_2 > \text{CH}_3\text{NH}_2 > \text{NH}_3 > \text{C}_6\text{H}_5\text{NH}_2$
 c) $\text{C}_6\text{H}_5\text{NH}_2 > \text{C}_2\text{H}_5\text{NH}_2 > \text{CH}_3\text{NH}_2 > \text{NH}_3$ d) $\text{CH}_3\text{NH}_2 > \text{C}_2\text{H}_5\text{NH}_2 > \text{C}_6\text{H}_5\text{NH}_2 > \text{NH}_3$
54. Which of the following is strongest base?
 a) $\text{C}_6\text{H}_5\text{NH}_2$ b) $p - \text{NO}_2 - \text{C}_6\text{H}_4\text{NH}_2$ c) $m - \text{NO}_2 - \text{C}_6\text{H}_4\text{NH}_2$ d) $\text{C}_6\text{H}_5\text{CH}_2\text{CH}_2$
55. Benzyl amine cannot be prepared by
 a) $\text{C}_6\text{H}_5\text{CONH}_2 \xrightarrow[\text{ether}]{\text{LiAlH}_4}$ b) $\text{C}_6\text{H}_5\text{CH}_2\text{CONH}_2 + \text{Br}_2 + \text{KOH} \rightarrow$
 c) $\text{C}_6\text{H}_5\text{CN} \xrightarrow{\text{LiAlH}_4}$ d) $\text{C}_6\text{H}_5\text{CH}_2\text{NC} \xrightarrow{\text{LiAlH}_4}$
56. Urea when heated a white residue is formed. Its alkaline solution when treated with few drops of CuSO_4 solution gives:
 a) Red colour b) Violet colour c) Green colour d) Yellow colour
57. An organic compound 'A' having molecular formula $\text{C}_2\text{H}_3\text{N}$ on reduction gave another compound B, upon treatment with nitrous acid 'B' gave ethyl alcohol. On warming with chloroform and alcoholic KOH , it formed an offensive smelling compound 'C'. The compound 'C' is
 a) $\text{CH}_3\text{CH}_2\text{NH}_2$ b) $\text{CH}_3\text{CH}_2\text{N} \rightleftharpoons \text{C}$ c) $\text{CH}_3\text{C} \equiv \text{N}$ d) $\text{CH}_3\text{CH}_2 \cdot \text{OH}$
58. What is 'Z' in the following reaction ?

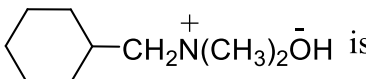
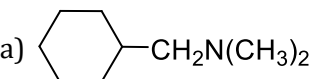
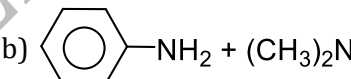
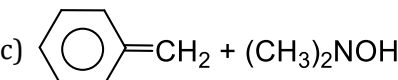
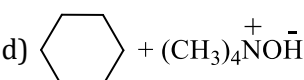
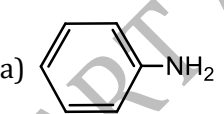
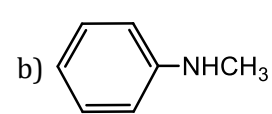
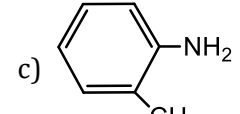
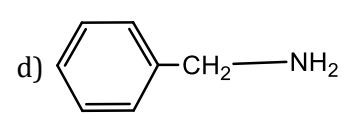
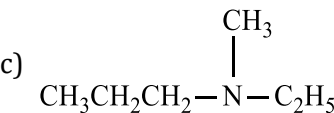


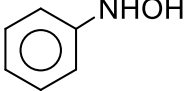
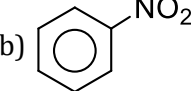
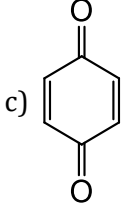
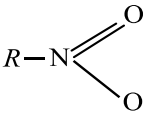
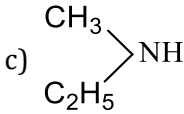
- a) Benzoic acid b) Cyanobenzoic acid c) Benzamide d) Aniline
59. Amino group is *ortho/para*-directing for aromatic electrophilic substitution. On nitration of aniline, a good amount of *m*-nitroaniline is obtained. This is due to
- a) In nitration mixture, *ortho, para*-activity of NH_2 group is completely lost
 b) $-\text{NH}_2$ because $-\text{NH}_3^+$, which is *m*-directing
 c) $-\text{NH}_2$ becomes $-\text{NH}^+\text{SO}_4^-$, which is *m*-directing
 d) $-\text{NH}_2$ becomes $-\text{NH}^-\text{NO}_2^+$, which is *m*-directing
60. Carbonyl chloride reacts with ammonia to form:
- a) CO_2 b) NH_2CONH_2 c) $\text{CH}_3\text{COONH}_4$ d) CH_3CONH_2
61. The action of nitrous acid on a primary amine gives:
- a) Nitroalkane b) Alkyl nitrite c) Alcohol d) Secondary amine
62. The reduction of CH_3CN to $\text{CH}_3\text{CH}_2\text{NH}_2$ is called:
- a) Rosenmund's reduction
 b) Clemmensen's reduction
 c) Mendius reduction
 d) Hofmann's reduction
63. Aniline is reacted with Br_2 water and the resulting product is treated with an aqueous solution of sodium nitrite in the presence of dilute HCl . The compound so formed is converted into tetrafluoroborate which is subsequently heated dry. The end product is
- a) *p*-bromofluorobenzene b) *p*-bromoaniline
 c) 2, 4, 6- tribromofluoro benzene d) 1, 3, 5- tribromobenzene
64. The reaction,
- $$\text{RCOOH} \xrightarrow{\text{NaN}_3/\text{conc. H}_2\text{SO}_4} \text{RNH}_2 + \text{N}_2 + \text{CO}_2$$
- is known as
- a) Curtius reaction b) Lossen reaction c) Schmidt reaction d) Hofmann reaction
65. Which of the following compounds on treatment first with NaNO_2/HCl and then coupled with phenol produces *p*-hydroxyazobenzene ?
- a) Nitrobenzene b) Azobenzene c) Phenol d) Aniline
66. The structural formula of methyl amino methane is:
- a) $(\text{CH}_3)_2\text{CHNH}_2$ b) $(\text{CH}_3)_3\text{N}$ c) $(\text{CH}_3)_2\text{NH}$ d) CH_3NH_2
67. An organic compound ($\text{C}_3\text{H}_9\text{N}$) (*A*), when treated with nitrous acid, gave an alcohol and N_2 gas was evolved. (*A*) on warming with CHCl_3 and caustic potash gave (*C*) which on reduction gave isopropylmethylamine. Predict the structure of (*A*).
- a) $\begin{array}{l} \text{CH}_3 \\ | \\ \text{CH}-\text{NH}_2 \\ | \\ \text{CH}_3 \end{array}$
 b) $\text{CH}_3\text{CH}_2-\text{NH}-\text{CH}_3$
 c) $\begin{array}{c} \text{CH}_3-\text{N}-\text{CH}_3 \\ | \\ \text{CH}_3 \end{array}$
 d) $\text{CH}_3\text{CH}_2\text{CH}_2-\text{NH}_2$
68. Urea when heated slowly, product formed is:
- a) N_2
 b) CO_2
 c) biuret
 d) Ammonium carbamate

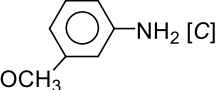
69. Which of the following statements is not correct?
 a) Primary amines show intermolecular hydrogen bonding
 b) Secondary amines show intermolecular hydrogen bonding
 c) Tertiary amines show intermolecular hydrogen bonding
 d) Amines have lower boiling points as compared to those of alcohols and carboxylic acids of comparable molar masses
70. Compare boiling point of isomeric alkyl amines.
 a) $1^\circ > 2^\circ > 3^\circ$ b) $1^\circ > 2^\circ < 3^\circ$ c) $1^\circ < 2^\circ < 3^\circ$ d) $1^\circ < 2^\circ > 3^\circ$
71. Hofmann's hypobromite reaction affords a method of:
 a) Preparing a tertiary amine
 b) Preparing a mixture of amines
 c) Stepping down a series
 d) Stepping up a series
72. A colourless, odourless and non-combustible gas is liberated when ethylamine reacts with:
 a) NaOH b) CH_3COCl c) $\text{NaNO}_2 + \text{HCl}$ d) H_2SO_4
73. Reaction of benzaldehyde with methylamine gives
 a) $\text{C}_6\text{H}_5\text{COOH}$ b) $\text{C}_6\text{H}_5\text{N} = \text{NCl}$
 c) $\text{C}_6\text{H}_5 - \text{CH} = \text{N} - \text{CH}_3$ d) $\text{C}_6\text{H}_5\text{NH}_2$
74. 
 Identify Y
 a) Benzophenone b) Acetophenone c) Benzoic acid d) phenol
75. What is the proper sequence of reagent in the Hofmann's degradation reaction?
 a) $\text{Br}_2, \text{KOH}, \text{H}_2\text{O}$ b) $\text{KOH}, \text{Br}_2, \text{H}_2\text{O}$ c) $\text{H}_2\text{O}, \text{KOH}, \text{Br}_2$ d) $\text{KOH}, \text{H}_2\text{O}, \text{Br}_2$
76. The reaction of chloroform with alcoholic KOH and *p*-toluidine form
 a)  b) 
 c)  d) 
77. Ethyl isocyanide on hydrolysis in acidic medium generated
 a) Ethyl amine salt and methanoic acid b) Propanoic acid and ammonium salt
 c) Ethanoic acid and ammonium salt d) Methyl amine salt and ethanoic acid
78. When methyl iodide is treated with ammonia, the product obtained is:
 a) Methylamine b) Dimethylamine c) Trimethylamine d) All of these
79. Aliphatic amines are soluble in water because:
 a) They are basic
 b) They are amino compounds
 c) They are lighter than water
 d) Of formation of hydrogen bonds with water
80. An organic amino compound reacts with aqueous nitrous acid at low temperature to produce an oily nitrosoamine. The compound is
 a) CH_3NH_2 b) $\text{CH}_3\text{CH}_2\text{NH}_2$ c) $\text{CH}_3\text{CH}_2\text{NHCH}_2\text{CH}_3$ d) $(\text{CH}_3\text{CH}_2)_3\text{N}$
81. Allyl isocyanide containsand.....bonds.
 a) $9\sigma, 3\pi$ b) $9\sigma, 9\pi$ c) $3\sigma, 4\pi$ d) $5\sigma, 7\pi$
82. Mendius method of preparation of amines consists of:
 a) Catalytic reduction of alkyl cyanides
 b) Reduction of amide with LiAlH_4
 c) Reduction of nitroparaffin with $\text{Sn} + \text{HCl}$

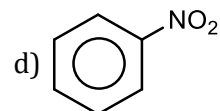
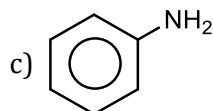
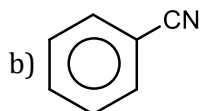
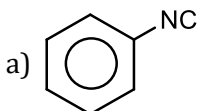
- d) Reduction of oximes with $\text{Na} + \text{C}_2\text{H}_5\text{OH}$
83. The compound having the molecular formula $\text{C}_3\text{H}_9\text{N}$ represent :
- a) Trimethylamine b) *n*-propylamine c) Isopropylamine d) All of these
84. From the following compounds which does not react with $\text{C}_6\text{H}_5\text{SO}_2\text{Cl}$?
- a) $\text{C}_2\text{H}_5\cdot\text{NH}_2$ b) $\text{CH}_3\cdot\text{NH}_2$
 c) $(\text{CH}_3)_2\text{NH}$ d) $(\text{C}_2\text{H}_5)_3\text{N}$
85. Identify *A* and *B* in the reaction given below.
- $$\text{Ethane nitrile} \xrightarrow[\substack{\text{aq. H}_2\text{SO}_4 \\ +2\text{H}_2\text{O} \\ -\text{NH}_3}]{\text{Hydrolysis}} \text{A} \xrightarrow[\substack{\text{Sodalime} \\ \Delta \\ -\text{CO}_2}]{\text{Decarboxylation}} \text{B}$$
- a) Acetic acid, methanol b) Acetone, methane
 c) Ethanoic acid, ethane d) Ethanoic acid, methane
86. The compound formed when malonic ester reacts with urea is:
- a) Cinnamic acid b) Butyric acid c) Barbituric acid d) Crotonic acid
87. Decreasing order of basicity of the three isomers of methoxyaniline is
- a) $p\text{-CH}_3\text{OC}_6\text{H}_4\text{NH}_2 > o\text{-CH}_3\text{OC}_6\text{H}_4\text{NH}_2 > m\text{-CH}_3\text{OC}_6\text{H}_4\text{NH}_2$
 b) $p\text{-CH}_3\text{OC}_6\text{H}_4\text{NH}_2 > m\text{-CH}_3\text{OC}_6\text{H}_4\text{NH}_2 > o\text{-CH}_3\text{OC}_6\text{H}_4\text{NH}_2$
 c) $o\text{-CH}_3\text{OC}_6\text{H}_4\text{NH}_2 > p\text{-CH}_3\text{OC}_6\text{H}_4\text{NH}_2 > m\text{-CH}_3\text{OC}_6\text{H}_4\text{NH}_2$
 d) $o\text{-CH}_3\text{OC}_6\text{H}_4\text{NH}_2 > m\text{-CH}_3\text{OC}_6\text{H}_4\text{NH}_2 > p\text{-CH}_3\text{OC}_6\text{H}_4\text{NH}_2$
88. Nitrogen of nitrobenzene at 125°C with mixed acids gives
- a) *meta*-dinitrobenzene b) *ortho*-dinitrobenzene
 c) *para*-dinitrobenzene d) 1, 3, 5-trinitrobenzene
89. The value of K_b is highest in case of:
- a) *p*-methoxy aniline b) *p*-chloroaniline c) *p*-nitroaniline d) *p*-methylaniline
90. Benzene diazonium chloride on reaction with phenol in weakly basic medium gives
- a) Diphenyl ether b) *p*-hydroxy azobenzene c) Chlorobenzene d) Benzene
91. $\text{R}-\text{N}=\text{C}+\text{HgO} \longrightarrow \text{A}+\text{Hg}_2\text{O}$; What is *A*?
- a) RNH_2 b) RCONH_2 c) $\text{R}-\text{NCO}$ d) RCOOH
92. Amine oxide, when heated forms alkene. The reaction is known as
- a) Curtius b) Cope elimination
 c) Mannich reaction d) Hofmann elimination
93. Identify the product in the following sequence 3, 4, 5-tribromoaniline
- (i) Diazotization
 (ii) $\text{H}_3\text{PO}_2 \longrightarrow ?$
- a) 3, 4, 5-tribromobenzene b) 1, 2, 3-tribromobenzene
 c) 2, 4, 6-tribromobenzene d) 3, 4, 5-tribromonitrobenzene
94. Identify the product *Z* in the following reaction scheme
- $$\text{C}_6\text{H}_5\text{NH}_2 \xrightarrow{\text{Ac}_2\text{O}} \text{X} \xrightarrow{\text{Br}_2/\text{CCl}_4} \text{Y} \xrightarrow{\text{HOH}} \text{Z}$$
- a) *p*-bromoaniline b) *p*-bromoacetophenone
 c) *p*-bromoacetanilide d) *o*-bromoacetophenone
95. In the following reaction, $\text{X} \xrightarrow{\text{Bromination}} \text{Y} \xrightarrow[\text{+HCl}]{\text{NaNO}_2} \text{Z} \xrightarrow[\text{C}_2\text{H}_5\text{OH}]{\text{Boiling}}$ tribromo benzene. *X* is
- a) Benzoic acid b) Salicylic acid c) Phenol d) Aniline
96. The compound, *N*-ethyl-*N*-methylpropanamine forms non- superimposable mirror image but does not show optical activity. This is due to
- a) Absence of a chiral N-atom b) Presence of a chiral N- atom
 c) Presence of lone pair on N-atom d) Rapid flipping of one from into another
97. Which of the following statement about primary amines is false?
- a) Alkylamines are stronger base than arylamines
 b) Alkylamines react with nitrous acid to produce alcohols

- c) Arylamines react with nitrous acid to produce phenols
d) Alkylamines are stronger bases than ammonia.
98. How many primary amines are possible for the formula $C_4H_{11}N$?
a) 1 b) 2 c) 3 d) 4
99. What is the decreasing order of basicity of *p*-, *s*-, *t*-ethyl amines and NH_3 ?
a) $NH_3 > C_2H_5NH_2 > (C_2H_5)_2NH > (C_2H_5)_3N$
b) $(C_2H_5)_3N > (C_2H_5)_2NH > C_2H_5NH_2 > NH_3$
c) $(C_2H_5)_2NH > C_2H_5NH_2 > NH_3 > (C_2H_5)_3N$
d) $(C_2H_5)_2NH > (C_2H_5)_3N > C_2H_5NH_2 > NH_3$
100. In the reaction

$$CH_3CN + 2H \xrightarrow[SnCl_2]{HCl} X \xrightarrow{\text{Boiling } H_2O} Y,$$
The term *Y* is,
a) Acetone b) Ethanamine c) Acetaldehyde d) Dimethyl amine
101. Which is not the property of ethanenitrile (CH_3CN)?
a) Undergoes acidic hydrolysis to give carboxylic acid
b) Undergoes alkaline hydrolysis to give salt of carboxylic acid
c) It tautomerises to give methyl isocyanide
d) It gives carbylamines reaction with chloroform
102. Acetoneoxime on catalytic hydrogenation gives:
a) 1-propanamine b) Isopropylamine c) Ethyl methyl amine d) CH_4 and ethanamine
103. The product of Hofmann elimination of
 is
a)  b) 
c)  d) 
104. Hofmann's rearrangement during the conversion of an amide to amine involves..... rearrangement.
a) Intermolecular b) Intramolecular. c) Both (a) and (b) d) None of these
105. Aniline reacts with ... to yield ... as the final product.
a) Bromine, 2-bromoaniline b) Bromine, 2, 4, 6-tribromoaniline
c) Chloroform/KOH, phenyl cyanide d) Acetyl chloride, benzanilide
106. Which of the following is the strongest base?
a)  b)  c)  d) 
107. Which of the following can be used to distinguish acetamide and urea?
a) Fehling's solution b) Biuret test c) Hofmann's reaction d) NaOH solution
108. Which of the following amines is optically active?
a) CH_3NH_2
b) CH_3NHCH_3
c) 
d) Sec. butylamine
109. Which one of the following is not the correct reaction of aryl diazonium salts?
a) $C_6H_5N_2^+Cl^- + Cu_2Cl_2 \rightarrow C_6H_5Cl$ b) $C_6H_5N_2^+Cl^- + HBF_4 \xrightarrow{\text{Heat}} C_6H_5F$

- c) $C_6H_5N_2^+Cl^- + H_3PO_2 \rightarrow C_6H_5PO_4$ d) $C_6H_5N_2^+Cl^- + SnCl_2/HCl \rightarrow C_6H_5NHNH_2$
110. Hinsberg's reagent is
 a) C_6H_5COCl b) CH_3COCl c) $C_6H_5CH_2Cl$ d) $C_6H_5SO_2Cl$
111. Which one of the following compound when heated with KOH and primary amines gives carbylamine test?
 a) $CHCl_3$ b) CH_3Cl c) CCl_4 d) CH_3NC
112. Ethyl amine on acetylation gives
 a) N-ethyl acetamide b) Acetamide c) Methyl acetamide d) None of these
113. The oxidation of aniline with per acetic acid in the presence of acetic acid by refluxing gives
 a)  b)  c)  d) None of these
114. Aniline reacts with acetaldehyde to form
 a) Schiff's base b) Carbylamine c) Immine d) None of these
115. Aniline gives a precipitate with bromine. The colour of precipitate is
 a) Red b) Black c) Blue d) White
116.  and $-R-O-N=O$ are....isomers.
 a) Chain b) Functional c) Position d) All of these
117. A compound of molecular formula C_3H_9N when reacts with benzene sulphonyl chloride gives a product soluble in dilute NaOH solution. The compound should be
 a) $(CH_3)_3N$ b) $(CH_3)_2CH-NH_2$ c)  d) All of these
118. Which one does not liberate NH_3 when undergoes hydrolysis?
 a) Acetanilide b) Acetonitrile c) Acetamide d) Phenyl isocyanide
119. *n*-butylamine (I), diethylamine (II) and N, N-dimethylethylamine (III) have the same molar mass. The increasing order of their boiling point is
 a) III < II < I b) I < II < III c) II < III < I d) II < I < III
120. Correct order of basic nature of CH_3NH_2 (A), CH_3CN (B) and $CH_3N=CHCH_3$ (C) is
 a) $A > B > C$ b) $B > C > A$ c) $A > C > B$ d) $C > A > B$
121. Nitroparaffins on reduction give:
 a) Amides b) Alkylamines c) Ammonium salts d) Acetanilides
122. Which of the following is not characteristic of amines?
 a) They smell like ammonia
 b) They are inflammable in air
 c) They show the property of hydrogen bonding
 d) They are amphoteric in nature
123. On heating benzyl amine with chloroform and ethanolic KOH, product obtained is
 a) Benzyl alcohol b) Benzaldehyde c) Benzoinitrile d) Benzyl isocyanide
124. Benzyl amine reacts with nitrous acid to give
 a) Azobenzene b) Benzene c) Benzyl alcohol d) Phenol
125. Which of the following statements is not correct?
 a) Alkyl isocyanides have bad odours while alkyl cyanides have pleasant odours
 b) Alkyl cyanides are not as poisonous as KCN

- c) Alkyl cyanides have lower boiling points than the corresponding alkyl isocyanides
d) Acetonitrile is soluble in water but methylcarbylamine is not
126. When NaNO_2 and dilute HCl were added to an amine at 0°C , a colourless gas was evolved and an ionic compound is formed. The amine is:
a) An primary amine
b) An aromatic primary amine
c) Any amine
d) None of the above
127. Which of the following reactions is given by only primary amines?
a) Reaction with HONO
b) Reaction with chloroform and alcoholic KOH
c) Reaction with acetyl chloride
d) Reaction with Grignard reagent
128. In hypobromite reaction of amide, carbonyl carbon atom is lost as:
a) CO
b) CO_2
c) CO_3^{2-}
d) None of these
129. Correct order of basicity of ϕNH_2 [A],  [B],  [C],  [D] is
a) $A > B > C > D$
b) $D > C > A > B$
c) $B > D > C > A$
d) $D > A > B > C$
130. The IUPAC name of $\text{CH}_3-\underset{\text{CH}_3}{\text{CH}}-\text{CH}_2-\underset{\text{CN}}{\text{CH}}-\text{CH}_3$ is:
a) 2-cyano-3-methyl hexane
b) 2-dimethyl-4-cyanopentane
c) 2,4-dimethyl pentane nitrile
d) 2-cyano-3-methyl hexane
131. Choose the incorrect statement.
a) Primary amines show intermolecular hydrogen bonds.
b) Tert-butylamine is primary amine.
c) Tertiary amines do not show intermolecular hydrogen bonds.
d) Isopropylamine is a secondary amine.
132. N_2 gas is liberated when $[\text{HCl} + \text{NaNO}_2]$ reacts with the following compounds
(A) $\text{CH}_3\text{CH}_2\text{NH}_2$ (B) Urea
(C) CH_3CONH_2 (D) $\text{C}_6\text{H}_5\text{NH}_2$
The answer is
a) A, B, C
b) B, C, D
c) A, C, D
d) A, B, D
133. Urea on heating with ethanol gives:
a) Urethane
b) Urea alcohol
c) Ureides
d) None of these
134. Treatment of nitrobenzene with acetyl chloride in the presence of anhydrous AlCl_3 gives
a) 2-nitroacetophenone
b) 3-nitroacetophenone
c) 4-nitroacetophenone
d) None of these
135. The correct sequence of reactions to convert p-nitrophenol into quinol involves
a) Reduction, diazotization and hydrolysis
b) Hydrolysis, diazotization and reduction
c) Hydrolysis, reduction and diazotization
d) Diazotization, reduction and hydrolysis
136. The reduction of which of the following compound would yield secondary amine?
a) Alkyl nitrile
b) Carbylamine
c) Primary amine
d) Secondary nitro compound
137. The compound with foul odour among the following is



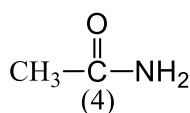
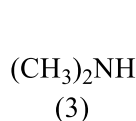
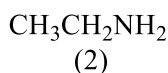
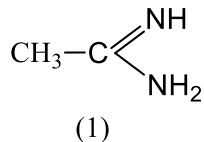
138. Reduction of nitrobenzene in the presence of Zn/NH_4Cl gives

- a) Azobenzene
b) Hydrazobenzene
c) N-phenyl hydroxylamine
d) Aniline

139. Name of method use to separate primary, secondary and tertiary amines is

- a) Hofmann method
b) Lucas method
c) Victor Meyer method
d) Kolbe method

140. The correct order of basicities of the following compound is



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

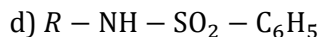
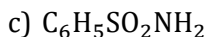
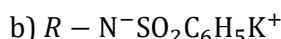
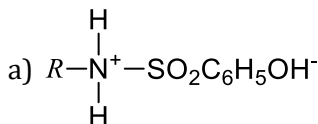
141. Dye test can be used to distinguish

- a) Ethyl amine and acetamide
b) Ethyl amine and aniline
c) Urea and acetamide
d) Methyl amine and ethyl amine

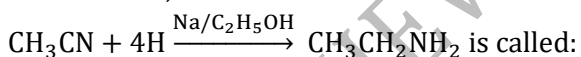
142. In the reaction of (S) 2-phenylpropamide with $NaBr/H_2O$ to give 1-phenylethylamine

- a) There is retention of configuration
b) There is inversion of configuration
c) A mixture of two products is obtained
d) There is no reaction

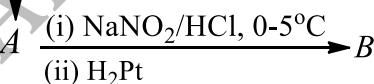
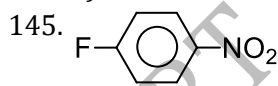
143. RNH_2 reacts with $C_6H_5SO_2Cl$ in aqueous KOH to give a clear solution. On acidification a precipitate is obtained which is due to the formation of



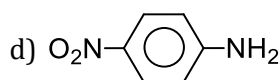
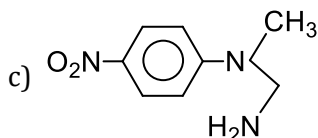
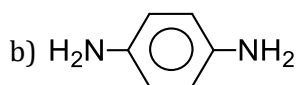
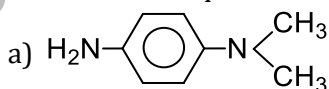
144. The reaction,



- a) Hofmann's bromamide reaction
b) Mendius reaction
c) Sabatier reaction
d) None of the above



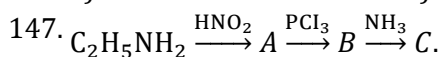
In the above sequence B is



146. A compound A when reacted with PCl_5 and then with ammonia gave B . B when treated with bromine and caustic potash produced C . C on treatment with $NaNO_2$ and HCl at $0^\circ C$ and then boiling produced

orthocresol. Compound A is:

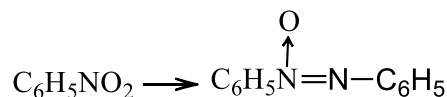
- a) *o*-toluic acid b) *o*-chlorotoluene c) *o*-bromotoluene d) *m*-toluic acid



Recognize the compound C from the following

- a) Propanenitrile b) Methylamine c) Ethylamine d) Acetamide

148. The conversion



Can be brought about by reduction with

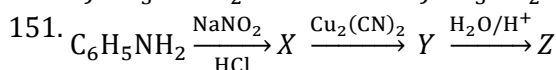
- a) $Na_3AsO_3/NaOH$ b) Glucose/HCl c) Zn/NaOH d) $LiAlH_4/ether$

149. Benzoyl chloride does not react with:

- a) Primary or secondary amines
b) Aliphatic compounds
c) Aromatic compounds
d) Carboxylic acids

150. Which compound will liberate CO_2 from $NaHCO_3$ solution?

- a) CH_3CONH_2 b) CH_3NH_2 c) $(CH_3)_4N^+OH^-$ d) $CH_3N^+H_3Cl^-$



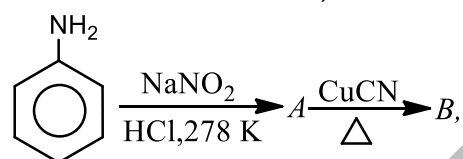
Z is identified as

- a) $C_6H_5-NH-CH_3$ b) C_6H_5-COOH c) $C_6H_5-CH_2-NH_2$ d) $C_6H_5-CH_2COOH$

152. Ketones and 1° amines react to form:

- a) Amides b) Oximes c) Urea d) Anils

153. In the chemical reactions,



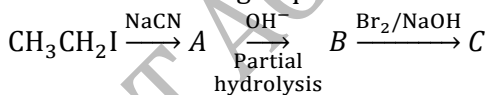
Compounds A and B respectively are

- a) Fluorobenzene and phenol b) Benzene diazonium chloride and benzonitrile
c) Nitrobenzene and chlorobenzene d) Phenol and bromobenzene

154. Dehydration of an amide gives:

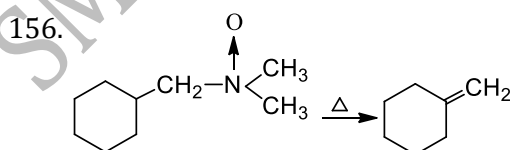
- a) Cyanide b) Amine c) Isocyanide d) Fatty acid

155. Given the following sequence of reactions,



The major product 'C' is

- a) $CH_3CH_2NH_2$ b) $CH_3 \cdot CH_2C(=O)NHBr$ c) $CH_3 \cdot CH_2COONH_4$ d) $CH_3 \cdot CH_2C(=O)NBr_2$



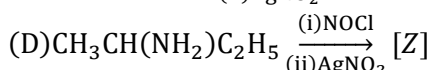
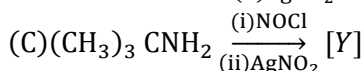
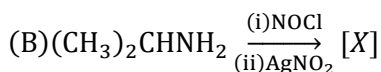
+ $(CH_3)_2NOH$

This reaction is called

- a) Cope reaction b) Ritter reaction c) Schmidt reaction d) Gabriel reaction

157. Which one of the following compounds forms a quaternary salt on reacting with excess methyl iodide?

- a) $C_2H_5OCH_3$ b) $(CH_3)_2CHOC_2H_5$ c) $C_6H_5NH_2$ d) $C_6H_5NO_2$



Which product will not show tautomerism?

- a) W b) X c) Y d) Z

168. Carcinogens are the products of the reaction between:

- a) $R_2\text{NH} + \text{HNO}_2$ b) $R_3\text{N} + \text{HNO}_2$ c) $\text{RNH}_2 + \text{HNO}_2$ d) None of these

169. Acetonitriles on hydrolysis produce which of the following?

- a) Amine b) Acid c) Amides d) Carbonyl compounds

170. Primary, secondary and tertiary nitroalkanes can be identified by the action of:

- a) $\text{HNO}_2 + \text{NaOH}(aq.)$ b) $\text{CHCl}_3 + \text{NaOH}(aq.)$ c) $\text{CHCl}_3 + \text{KOH}(alc.)$ d) None of these

171. Methyl cyanide gives on hydrolysis

- a) Methyl amine b) Acetic acid c) Formic acid d) Ethyl amine

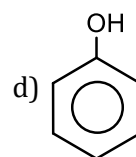
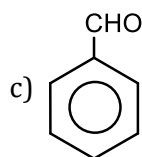
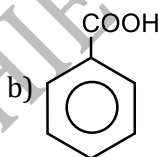
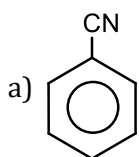
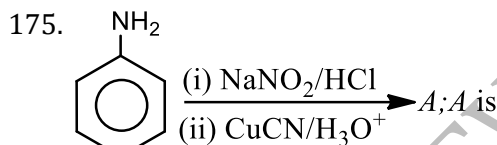
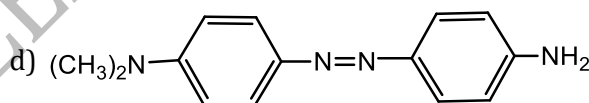
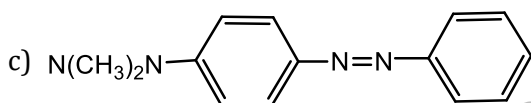
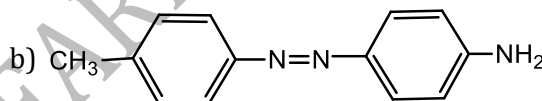
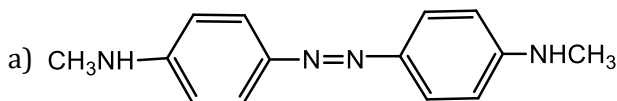
172. The hydrochlorides of amines form double salt with:

- a) PtCl_4 b) AuCl_3 c) Both (a) and (b) d) None of these

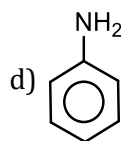
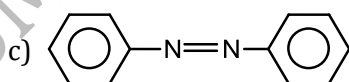
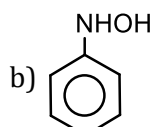
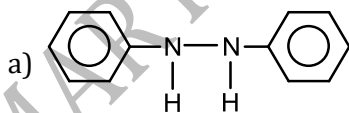
173. General formula of an amine is:

- a) $\text{C}_n\text{H}_{2n+1}\text{N}$ b) $\text{C}_n\text{H}_{2n+2}\text{N}$ c) $\text{C}_n\text{H}_{2n+3}\text{N}$ d) $\text{C}_n\text{H}_{2n}\text{N}$

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



176. The structure of the compound formed, when nitrobenzene is reduced by lithium aluminium hydride (LiAlH_4) is



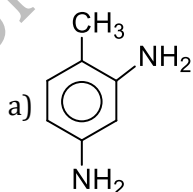
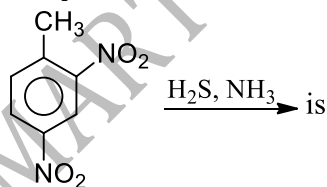
177. Aniline and ethylamine resembles in:

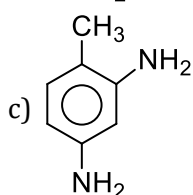
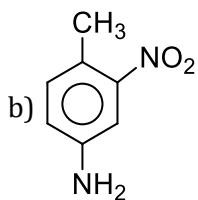
- a) Solubility
b) Action with HNO_2
c) Action of Grignard reagent
d) Coupling reaction

178. Reaction of cyclohexanone with dimethylamine in the presence of catalytic amount of an acid forms a

compound of water during the reaction is continuously removed. The compound formed is generally known as

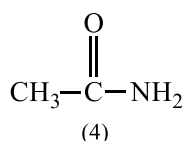
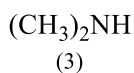
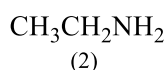
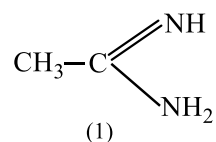
- a) An amine b) An imine c) An enamine d) A Schiff's base
179. Comparing basic strength of NH_3 , CH_3NH_2 and $\text{C}_6\text{H}_5\text{NH}_2$ it may be concluded that
 a) Basic strength remains unaffected b) Basic strength of alkyl amines is lowest
 c) Basic strength of aryl amines is lowest d) Basic strength of NH_3 is highest
180. The product obtained when methylamine is treated with nitrous acid is:
 a) CH_3OH b) $\text{CH}_3\text{—ONO}$ c) CH_3OCH_3 d) Both (b) and (c)
181. Hofmann bromamide reaction is used to prepare
 a) 1° amine b) 2° amine c) 3° amine d) All of these
182. Tertiary amine is obtained in the reaction
 a) Aniline $\xrightarrow{\text{CH}_3\text{I}} \xrightarrow{\text{CH}_3\text{I}}$ b) Aniline $\xrightarrow{\text{CH}_3\text{I}}$ c) Nitrobenzene $\xrightarrow{\text{Sn/HCl}}$ d) None of these
183. Which of the following on reduction with LiAlH_4 gives a secondary amine?
 a) CH_3NC b) CH_3CONH_2 c) CH_3CN d) CH_3NO_2
184. Which of the following is most basic in aqueous medium?
 a) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{NH}_2$ b) $\text{CH}_3\text{—CH}_2\text{—CH}_2\text{—NH}_2$
 c) $\text{CH}_3\text{—}\overset{\text{CH}_3}{\text{N}}\text{—CH}_3$ d) $\text{CH}_3\text{—CH}_2\text{—}\overset{\text{CH}_3}{\text{N}}\text{H—CH}_3$
185. The product *A* and *B* in the reaction are:
 $\text{C}_2\text{H}_5\text{NH}_2 + \text{CHCl}_3 + 3\text{KOH} \rightarrow \text{A} + \text{B} + 3\text{H}_2\text{O}$
 a) $\text{C}_2\text{H}_5\text{NC} + 3\text{KCl}$ b) $\text{C}_2\text{H}_5\text{CN} + 3\text{KCl}$ c) $\text{C}_2\text{H}_5\text{CONH}_2 + 3\text{KCl}$ d) $\text{C}_2\text{H}_5\text{NC} + \text{K}_2\text{CO}_3$
186. *p*-amine and *s*-amine are distinguished by:
 a) Br_2/KOH b) HClO c) HNO_2 d) NH_3
187. Which one of the following compounds will dissolve in an alkali solution after it has undergone reaction with Hinsberg reagent?
 a) CH_3NH_2 b) $(\text{CH}_3)_3\text{N}$ c) $(\text{C}_2\text{H}_5)_2\text{NH}$ d) $\text{C}_6\text{H}_5\text{NHC}_6\text{H}_5$
188. The reaction of chloroform with alcoholic KOH and *p*-toluidine from
 a)  b) 
 c)  d) 
189. Which one of the following functional groups undergoes hydrolysis with alkali to yield an acid group?
 a) —CN b) —CHO c) —COCH_3 d) —Br
190. Ethylamine reacts with nitrosyl chloride (NOCl) to form:
 a) Ethyl chloride b) Ethyl alcohol c) Ethyl nitrite d) Nitroethane
191. The product obtained in the reduction





d) The compound is not reduced

192. The correct order of basic nature of the following compounds is:



a) $2 > 1 > 3 > 4$

b) $1 > 3 > 2 > 4$

c) $3 > 1 > 2 > 4$

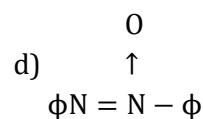
d) $1 > 2 > 3 > 4$

193. In reduction of nitrobenzene, which of the following is the intermediate?

a) ϕNO

b) $\phi\text{NHNH}\phi$

c) $\phi\text{N}=\text{N}-\phi$



194. Nitration of aniline also gives *m*-nitro aniline in strong acidic medium because

a) In electrophilic substitution reaction amino group is *meta* directive

b) In spite of substituents nitro group always goes to *m*-position

c) In strong acidic medium aniline present as anilinium ion

d) None of the above

195. Gabriel's synthesis is used frequently for the preparation of which of the following?

a) Primary amines

b) Primary alcohols

c) Tertiary amines

d) Tertiary alcohols

196. $\text{C}_6\text{H}_5\text{NO}_2 \xrightarrow{\text{Sn/HCl}} \text{C}_6\text{H}_5\text{X}$
'X' is identified as

a) NO

b) $-\text{NH}_2$

c) NHOH

d) None of these

197. $A \xrightarrow{\text{H}_2\text{NOH}} B \xrightarrow{\text{Reduction}} C \xrightarrow{\text{NOCl}} \text{CH}_3\text{CH}_2\text{Cl}$

In the above sequence A and C are

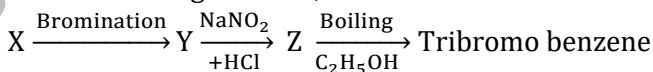
a) Methanal, methyl amine

b) Acetone, ethaneamine

c) Ethanal, diamethyl amine

d) Acetaldehyde, ethyl amine

198. In the following reaction, X is



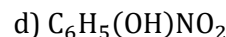
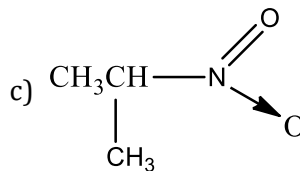
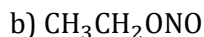
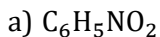
a) Benzoic acid

b) Salicylic acid

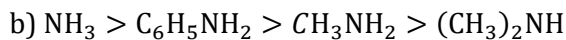
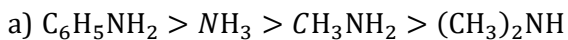
c) Phenol

d) Aniline

199. Which of the following is not a nitro-derivative?



200. Decreasing order of basic nature in aqueous solutions

201. The IUPAC name of, $CH_3-CH_2-CH-NH_2$ is :

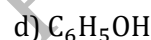
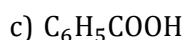
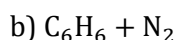
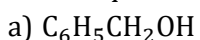
a) 1-methyl-amino propane

b) 2-aminobutane

c) 2-methyl-2-aminopropane

d) None of the above

202. When aqueous solution of benzene diazonium chloride is boiled, the product formed is



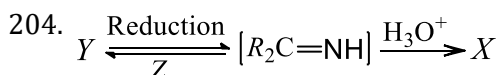
203. Methylethylpropylamine forms non-superimposable mirror images but it does not show optical activity because:

a) Of rapid flipping

b) Amines are basic in nature

c) Nitrogen has a lone pair of electron

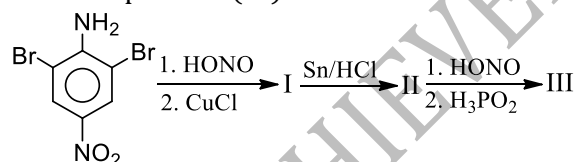
d) Of absences of asymmetric nitrogen



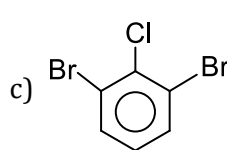
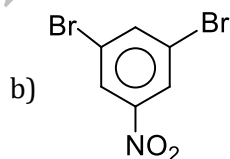
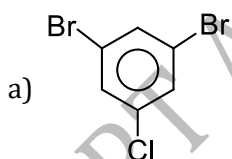
In the above sequence of reaction X, Y, Z are respectively

a) Aldehyde, ketone, NH_3 b) Ketone, 1° amine, $KMnO_4$ c) Ketone, 2° amine, $KMnO_4$ d) Ketimine, 1° amine, H_2SO_5

205. The final product (III) obtained in the reaction sequence



is



d) None of these

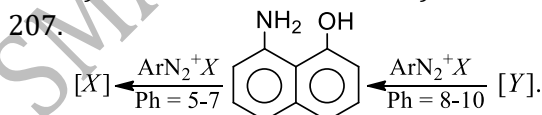
206. Which of the following compound reacts with chloroform and a base to form phenyl isocyanide?

a) Phenol

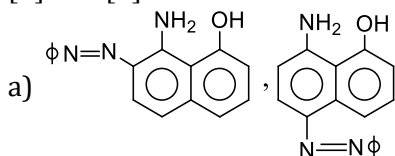
b) Aniline

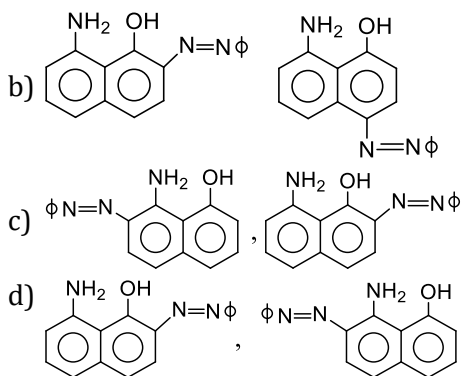
c) Benzene

d) Nitrobenzene

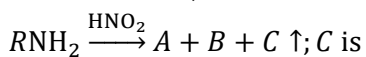


[X] and [Y] are





208. In the reaction,



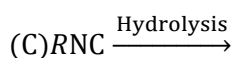
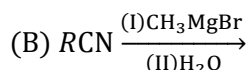
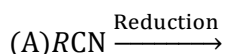
a) NH_3

b) N_2

c) O_2

d) CO_2

209. The correct set of the products obtained in the following reactions is



| A | B | C | D |
|-------------|---------------|----------|---------|
| a) 2° amine | Methyl ketone | 1° amine | Alcohol |

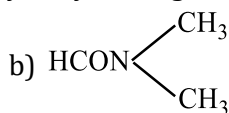
| | | | |
|-------------|---------------|----------|------|
| c) 2° amine | Methyl ketone | 2° amine | Acid |
|-------------|---------------|----------|------|

| | | | |
|-------------|---------------|----------|---------|
| b) 1° amine | Methyl ketone | 1° amine | Alcohol |
|-------------|---------------|----------|---------|

| | | | |
|-------------|---------------|----------|----------|
| d) 2° amine | Methyl ketone | 2° amine | aldehyde |
|-------------|---------------|----------|----------|

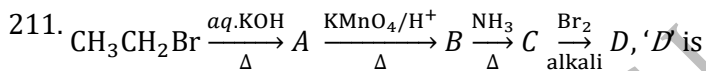
210. Which of the following is hydrolysed to give secondary amine?

a) Alkyl



c) Nitroparaffins

d) Acidamide



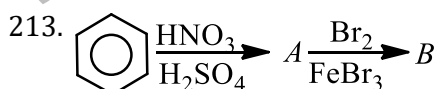
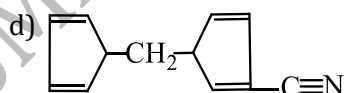
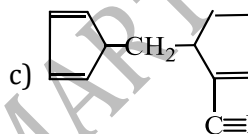
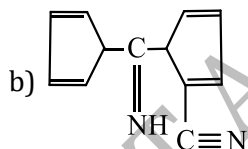
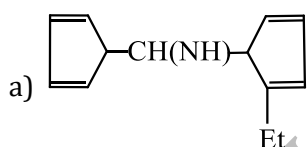
a) CH_3Br

b) CH_3CONH_2

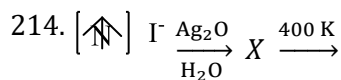
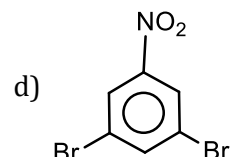
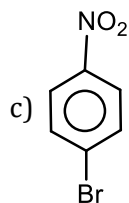
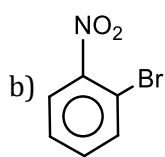
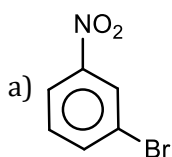
c) CH_3NH_2

d) $CHBr_3$

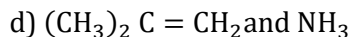
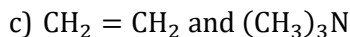
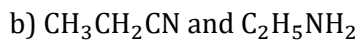
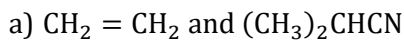
212. The product [A] formed in the reaction;



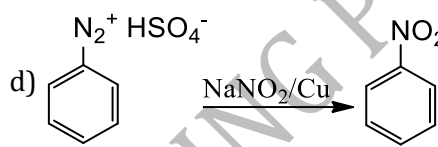
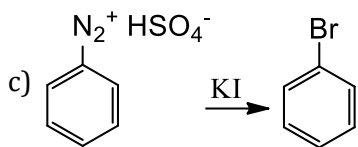
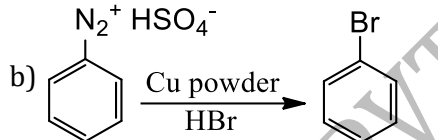
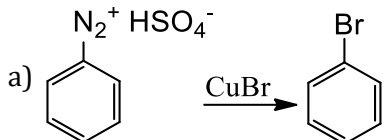
The compound B is



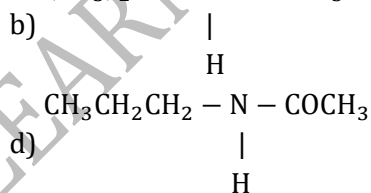
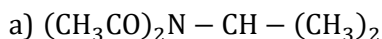
The products of above sequence of reactions are



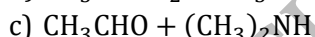
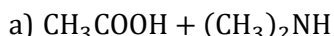
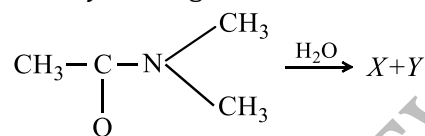
215. Which of the following reactions is an example of Sandmeyer reaction?



216. Isopropyl amine with excess of acetyl chloride will give



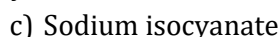
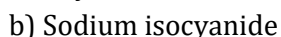
217. X and y in the given reaction are:



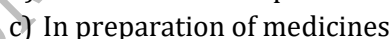
218. Primary nitroalkanes on hydrolysis give:



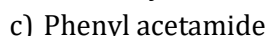
219. Aliphatic nitriles are prepared by the treatment of alkyl halides with



220. Urea is not used:



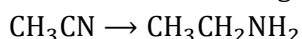
221. When aniline is heated with glacial acetic acid in presence of anhydrous ZnCl_2 , the product is:



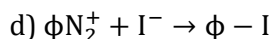
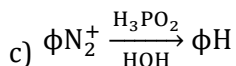
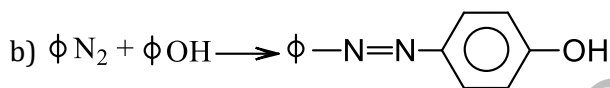
222. Benzene diazonium chloride on treatment with hypo phosphorous acid and water in presence of Cu^+ catalyst produce



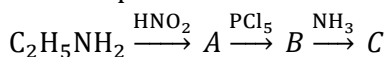
223. Which of the following cannot be used for following conversion?



- a) Pt/H₂ b) LiAlH₄ c) Na/C₂H₅OH d) SnCl₂/HCl
224. The bad smelling substance formed by the action of alcoholic caustic potash on chloroform and aniline is
 a) Nitrobenzene b) Phenyl isocyanide c) Phenyl cyanide d) Phenyl isocyanate
225. An amine reacts with C₆H₅SO₂Cl and the product is soluble in alkali, amine is:
 a) 1° b) 2° c) 3° d) All of these
226. Which of the following reaction will not occur?



227. The end product in the below reaction is



- a) Ethyl cyanide b) Ethyl amine c) Methyl amine d) Acetamide
228. Among the amines (A)C₆H₅NH₂, (B)CH₃NH₂, (C)(CH₃)₂NH, (D)(CH₃)₃N, the order of basicity is
 a) $A < B < D < C$
 b) $D < C < B < A$
 c) $A < B < C < D$
 d) $B < C < D < A$

229. 1 mole of ethyl amine on reaction with HNO₂ gives at NTP

- a) 11.2 L of N₂ b) 5.6 L of N₂ c) 22.4 L of N₂ d) 1 L of N₂

230. On heating benzyl amine with chloroform and ethanolic KOH, product obtained is

- a) Benzyl alcohol b) Benzaldehyde c) Benzonitrile d) Benzyl isocyanide

231. Which nitro compound will show tautomerism?

- a) C₆H₅NO₂ b) (CH₃)₃CNO₂ c) CH₃CH₂NO₂ d) *o*-nitrotoluene

232. Benzamide can be converted into benzonitrile with

- a) H₃O⁺ b) OH⁻/H₂O c) KCN d) P₂O₅

233. Choose the incorrect statement

- a) In the case primary, secondary and tertiary amines, the basic strength depends on the extent on the extent of hydrogen bonding in the protonated amines
 b) The presence of groups like -OCH₃ and -CH₃ increases the basic strength of amines
 c) The presence of groups like -NO₂, -CN and halogens reduces the basic strength of amines
 d) The basic strength of amines depends on their concentration

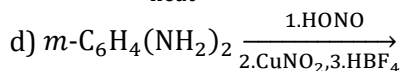
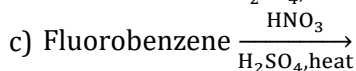
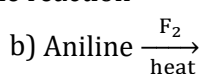
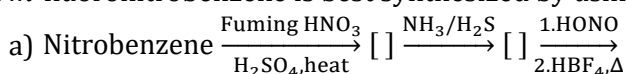
234. Nitrosoamines (R₂N - N = O) are soluble in water. On heating them with conc H₂SO₄, they give secondary amines. The reaction is called

- a) Perkin's reaction b) Fries reaction
 c) Liebermann nitroso reaction d) Etard reaction

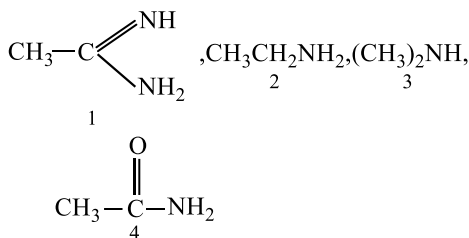
235. Which of the following is not used for nitration of organic compounds?

- a) A mixture of concentrated HNO₃ and concentrated H₂SO₄ b) A mixture of concentrated HNO₄ and acetic anhydride
 c) Fuming nitric acid and concentrated sulphuric acid d) Alcoholic potassium nitrate

236. *m*-fluoronitrobenzene is best synthesized by using the reaction

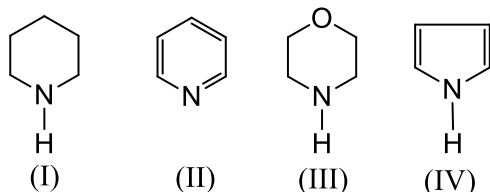


237. The correct order of basicities of the following compounds is:



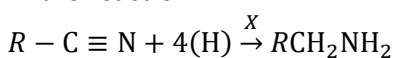
- a) 2 > 1 > 3 > 4 b) 1 > 3 > 2 > 4 c) 3 > 1 > 2 > 4 d) 1 > 2 > 3 > 4

238. Arrange the following compounds in increasing order of basic strength



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

239. In the reaction



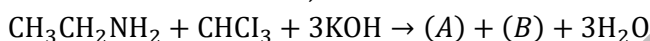
X can be

- a) LiAlH_4 b) H_2SO_4 c) Ni d) 2KBr

240. *p*-chloro aniline and anilinium hydrogen chloride can be distinguished by

- a) Sandmeyer reaction b) Carbylamines reaction
c) Hinsberg's reaction d) AgNO_3

241. In the chemical reaction,



The compounds (A) and (B) are respectively

- a) $\text{CH}_3\text{CH}_2\text{CONH}_2$ and 3KCl b) $\text{C}_2\text{H}_5\text{NC}$ and K_2CO_3
c) $\text{C}_2\text{H}_5\text{NC}$ and 3KCl d) $\text{C}_2\text{H}_5\text{CN}$ and 3KCl

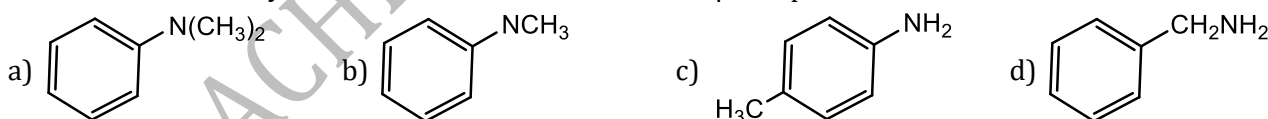
242. The reagent that reacts with nitromethane to form methyl hydroxylamine is

- a) Zn/HCl b) Zn/ NH_4Cl c) Zn/NaOH d) Sn/HCl

243. The compound which on reaction with cold HNO_2 gives only nitrosoamine is:

- a) CH_3NH_2 b) $(\text{CH}_3)_2\text{NH}$ c) $(\text{CH}_3)_3\text{N}$ d) $(\text{C}_2\text{H}_5)_3\text{N}$

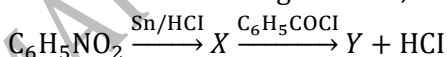
244. Amongst the compound given, the one that would form a brilliant coloured dye on treatment with NaNO_2 in dil. HCl followed by addition to an alkaline solution of β -naphthol is



245. Primary, secondary and tertiary amines may be separated by using:

- a) Ethanoyl chloride b) Diethyl oxalate c) Thionyl chloride d) None of these

246. Consider the following reaction,



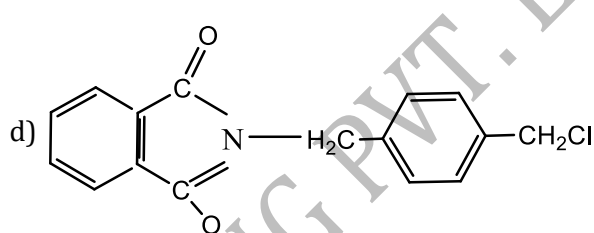
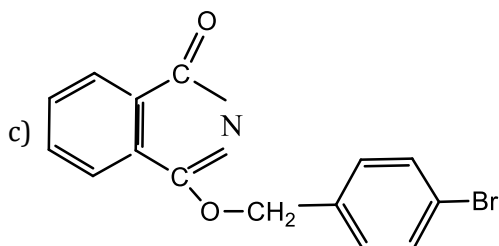
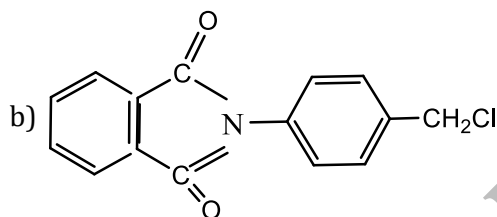
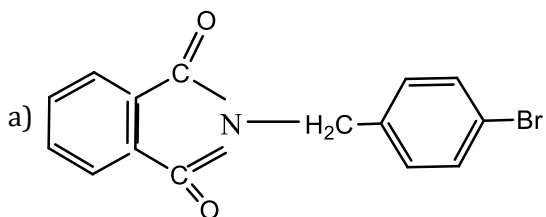
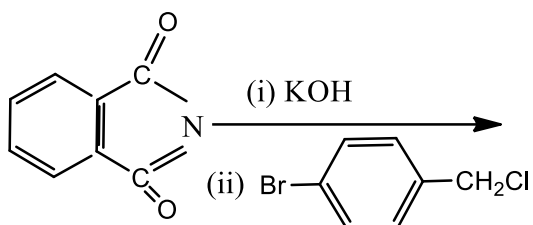
What is Y?

- a) Acetanilide b) Benzanilide c) Azobenzene d) Hydrazobenzene

247. Nitration of aniline in strongly acidic medium, result in the formation of *m*-nitroaniline also. This is because

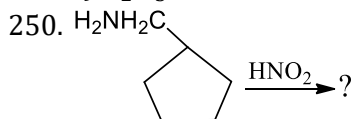
- a) Amino group is *meta* orienting during electrophilic substitution reaction.
b) Nitro group goes always to the *meta* position irrespective of the substituents.
c) Nitration of aniline is a nucleophilic substitution reaction in strongly acidic medium.
d) In strongly acidic conditions aniline is present as anilinium ion.

248. The major product of the following reaction is

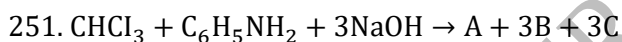
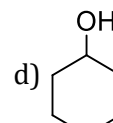
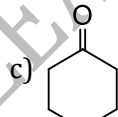
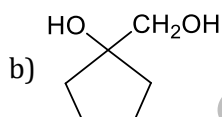
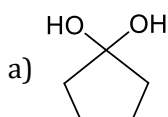


249. Which of the following compounds is soluble in benzene but almost insoluble in water?

- a) C_2H_5OH b) CH_3CO_2H c) CH_3CHO d) $C_6H_5NO_2$



Product is



In the above reaction, the product 'A' is

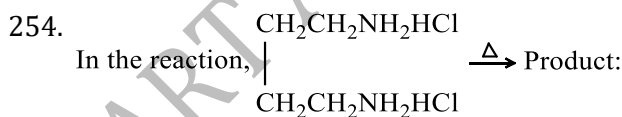
- a) Chlorobenzene b) Phenyl isocyanide c) Phenyl cyanide d) Phenyl chloride

252. Alkyl cyanides undergo Stephen reduction to produce

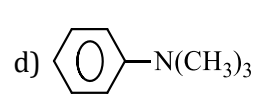
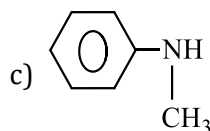
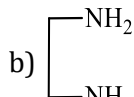
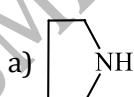
- a) Aldehyde b) Secondary amine c) Primary amine d) amide

253. Which of the following is not a nitro derivative?

- a) $C_6H_5NO_2$ b) CH_3CH_2ONO c) d) $C_6H_4(OH)NO_2$



The product is:



255. In alkyl cyanide alkyl group attached with

- a) C of CN group b) N of CN group
c) Either C or N of CN group d) Both C and N of CN group

256. The diamide of carbonic acid is:

- a) Acetamide b) Formamide c) Benzamide d) Urea

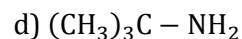
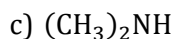
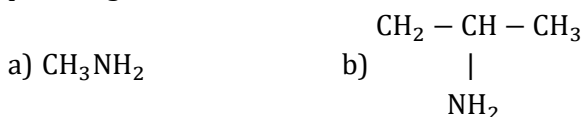
257. A positive carbylamine test is given by

- a) N, N-dimethylaniline b) 2,4-dimethylaniline

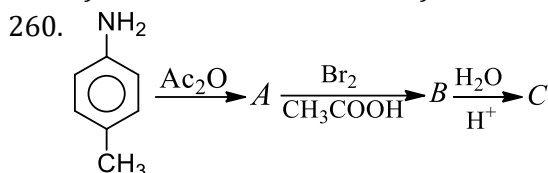
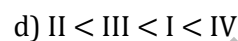
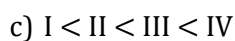
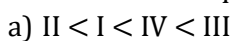
c) N-methy-*o*-methylaniline

d) N-methylbenzylamine

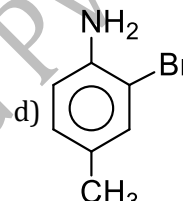
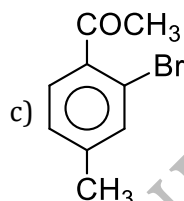
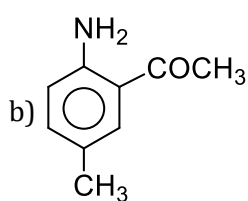
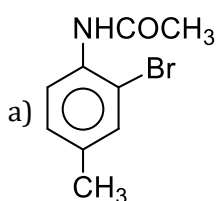
258. Which of the following amines can be directly oxidized to the corresponding nitro compound by potassium permanganate?



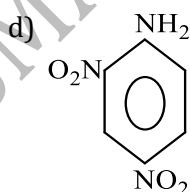
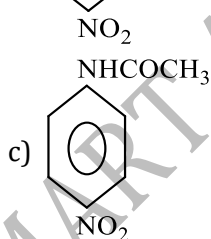
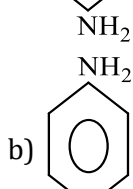
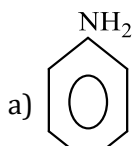
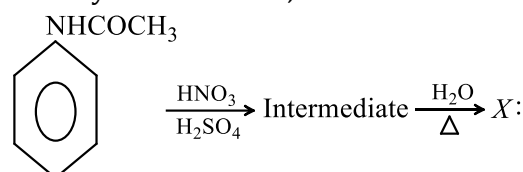
259. Arrange the following CH_3NH_2 (I); CH_3NH (II); $\text{C}_6\text{H}_5\text{NH}_2$ (III); $(\text{CH}_3)_3\text{N}$ (IV) in increasing order of basic nature in aqueous medium:



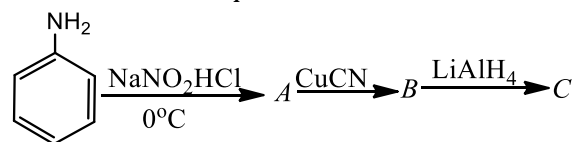
The final product 'C' in the above reaction is



261. Identify X in the series,

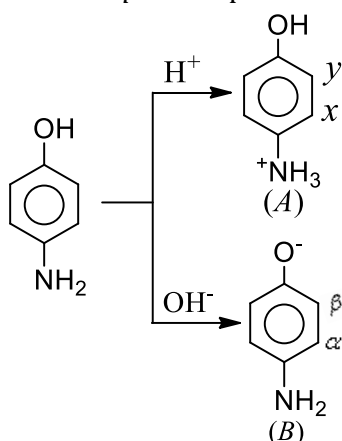


262. In the reaction sequence



The product 'C' is

- a) Benzonitrile b) Benzaldehyde c) Benzoic acid d) Benzyl amine
263. Nitroalkane is acidic only towards :
a) Na_2CO_3 b) NaOH c) Alcohol d) Liquid NH_3
264. Urea reacts with hydrazine to form:
a) Nitrogen b) Phenyl hydrazine c) Semicarbazide d) Urethane
265. Phenyl cyanide cannot be obtained by
a) $\text{C}_6\text{H}_5\text{CONH}_2 \xrightarrow{\text{P}_2\text{O}_5, \Delta}$ b) $\text{C}_6\text{H}_5 - \text{CH} = \text{NOH} \xrightarrow{\text{Ac}_2\text{O}, \Delta}$
c) $\text{C}_6\text{H}_5\text{Cl} \xrightarrow{\text{alc. KOH}}$ d) $\text{C}_6\text{H}_5\text{NH}_2 \xrightarrow[2. \text{CuCN}]{1. \text{NaNO}_2/\text{HCl}}$
266. Substitution of one alkyl group by replacing hydrogen of primary amines:
a) Increases the base strength
b) Decreases the base strength
c) Remains the same
d) None of the above
267. Acetanilide is prepared by the reaction of acetyl chloride on:
a) Acetamide b) Aniline c) Acetaldehyde d) Benzene
268. Aqueous solution of urea is:
a) Acidic b) Alkaline c) Almost neutral d) Amphoteric
269. Consider *p*-aminophenol



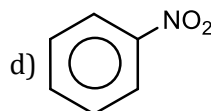
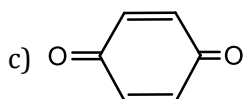
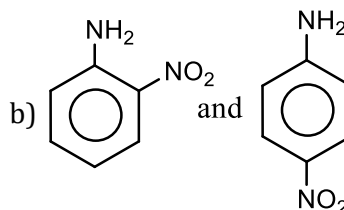
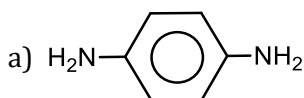
Which positions are activated for coupling reaction in acidic and basic media respectively?

- a) x in A and β in B b) x in A and α in B c) y in A and α in B d) y in A and β in B
270. The general formula of quaternary ammonium compound is:
a) $R-\text{NH}_2$ b) $R_3\text{N}$ c) $[\text{R}_4\text{N}]^+\text{X}^-$ d) NH_4X
271. Reaction of nitrous acid on 1° aliphatic amines in cold will give:
a) A diazonium salt b) An alcohol c) A nitrile d) A dye
272. In pyridine, the state of hybridization of the nitrogen atom is
a) sp^2 b) sp^3 c) sp d) None of these
273. Which of the following will give a primary amine on hydrolysis?
a) Nitroparaffin b) Alkyl cyanide c) Oxime d) Alkyl isocyanate
274. Which of the following compounds will form alcohol on treatment with $\text{NaNO}_2, \text{HCl}/\text{H}_2\text{O}$ at 0°C ?
a) $(\text{CH}_3)_2\text{CHNH}_2$ b) $\text{C}_6\text{H}_5\text{NH}_2$
c) $\text{CH}_3-\text{C}_6\text{H}_4-\text{NH}_2$ d) $\text{H}_2\text{N}-\text{C}_6\text{H}_4-\text{NH}_2$

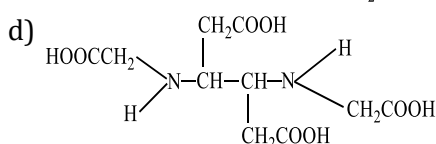
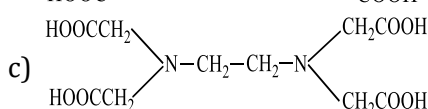
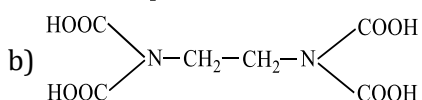
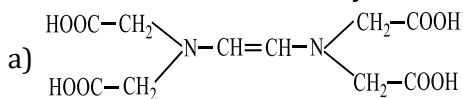
275. Which of the following statements is correct?

- a) Aniline is stronger base than ammonia
b) Methylamine is a stronger base than aniline and ammonia
c) Aniline is stronger than ammonia, but weaker base than methylamine

- d) Methylamine is stronger than aniline, but weaker base than ammonia
276. Benzenediazonium chloride on reaction with phenol in weakly basic medium gives
- Diphenyl ether
 - p*-hydroxyazobenzene
 - Chlorobenzene
 - benzene
277. Which of the following methods neither means for the synthesis nor for separation of amines?
- Hinsberg's method
 - Hofmann's method
 - Wurtz reaction
 - Curtius method
278. Which substance when boiled with NaOH will evolve NH₃?
- Ethylamine
 - Aniline
 - Acetamide
 - Acetoxime
279. Acetonitrile on reduction gives
- Propanamine
 - Methanamine
 - Ethanamine
 - None of these
280. When ethanol is mixed with ammonia and passed over catalyst, the compound formed is:
- C₂H₅NH₂
 - C₂H₄
 - C₂H₅OC₂H₅
 - CH₃OCH₃
281. The molecular formula of benzonitrile is
- C₆H₅CN
 - C₆H₅NC
 - C₆H₅CNO
 - C₆H₅NCO
282. Which of the following amines form maximum hydrogen bonds within themselves?
- CH₃NH₂
 - (CH₃)₂NH
 - (CH₃)₃N
 - None of these
283. The correct order of the increasing basic nature of methyl amine, ammonia and aniline is:
- Methylamine < aniline < ammonia
 - Aniline < ammonia < methylamine
 - Aniline < methylamine < ammonia
 - Ammonia < aniline < methylamine
284. Diazotisation can be carried out by the action of NaNO₂ and dilute HCl at ice cold temperature on:
- Aromatic secondary amine
 - Aromatic primary amine
 - Aromatic nitro compound
 - Aromatic amine
285. Aliphatic amines are basic than NH₃ but aromatic amines are basic than NH₃.
- More, less
 - Less, more
 - Both (a) and (b)
 - None of these
286. Aniline is weaker base than ethylamine because:
- Lone pair of electrons of N-atom is not freely available for coordination with a proton due to resonance than in ethylamine
 - Its b. p. is higher than that of ethylamine
 - It does not produce sufficient concentration of OH⁻ ions in solution
 - It is insoluble in water while ethylamine is soluble in water
287. The basic character of methylamines in vapour phase is:
- 3° > 2° > 1° > NH₃
 - 2° > 3° > 1° > NH₃
 - 1° > 2° > 3° > NH₃
 - None of these
288. Isopropylamine $\xrightarrow{\text{KMnO}_4}$ X $\xrightarrow{\text{H}_3\text{O}^+}$ Y. In the above sequence X and Y are respectively
- Acetaldimine, ethanal
 - Ethanal, ketimine
 - Ketimine, acetone
 - Acetone, propan-2-ol
289. Which of the following compound does not undergoes Schotten-Baumann reaction?
- Phenol
 - Primary amine
 - Secondary amine
 - Tertiary amine
290. Production of amines by ammonia and alkyl halides is called
- Frankland reaction
 - Hofmann's ammonolysis
 - Hofmann's mustard oil reaction
 - Hofmann's bromamide reaction
291. Which of the following is carbamide?
- CH₃CONH₂
 - NH₂CONH₂
 - CH₂(NH₂)CONH₂
 - CO(OH)NH₂
292. Aniline reacts with conc. HNO₃ to give



293. The correct structure of ethylenediamine-tetra acetic acid (EDTA) is :



294. Hydrazobenzene $\xrightarrow{\text{NaIO}_3}$ (X) $\xrightarrow{\text{CH}_3\text{CO}_3\text{H}}$ (Y)

Both X and Y on reduction with Sn/HCl give Z. Which of the following does not represent X, Y or Z?

- a) Azobenzene b) Phenol c) Aniline d) Azoxybenzene

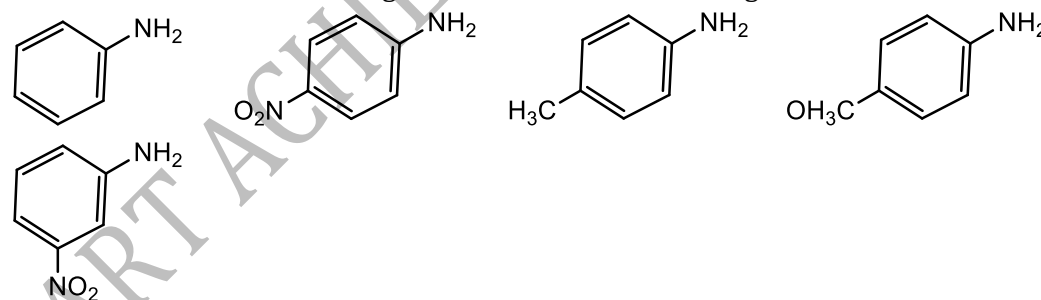
295. The pri., sec. and ter. amines can be distinguished by:

- a) Hinsberg's reagent b) Grignard reagent c) Fehling's solution d) Tollen's reagent

296. Final product of hydrolysed alkyl cyanide is

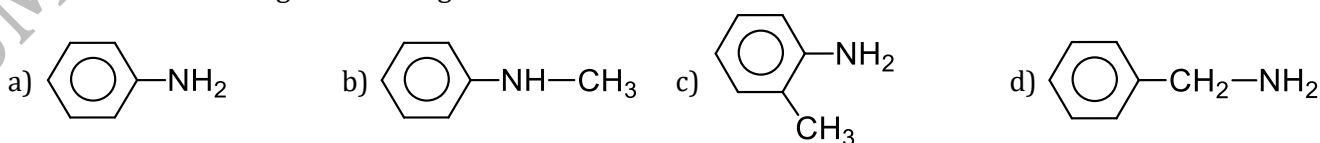
- a) RCOOH b) RCONH_2 c) $\begin{matrix} \text{R} - \text{C} = \text{NH} \\ | \\ \text{OH} \end{matrix}$ d) $\text{R} - \text{C} \equiv \text{NH}^{\oplus}$

297. The correct order of increasing basic nature of the following bases is



- a) II < V < I < III < IV b) V < II < I < III < IV c) II < V < I < IV < III d) V < II < I < IV < III

298. Which of the following is the strongest base?



299. The basicity of compounds I, II, III and IV

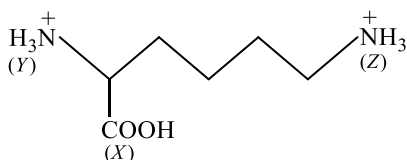
CH_3NH_2 , $(\text{CH}_3)_2\text{NH}$, $(\text{CH}_3)_3\text{N}$, $\text{C}_6\text{H}_5\text{CH}_2\text{NH}_2$

I II III IV

varies in the order

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

300. Which one of the following does not have sp^2 hybridised carbon?
 a) Acetone b) Acetic acid c) Acetonitrile d) Acetamide
301. The basic character of amines can be explained:
 a) In terms of Lewis and Arrhenius concept
 b) Only in terms of Lowry Bronsted concept
 c) It terms of Lewis and Lowry Bronsted concept
 d) Only in Lewis concept
302. In the compound given below,



- the correct order of acidic nature of the positions (X), (Y) and (Z) is:
 a) $Z > X > Y$ b) $X > Y > Z$ c) $X > Z > Y$ d) $Y > X > Z$
303. KCN reacts readily to give a cyanide
 a) Ethyl alcohol b) Ethyl bromide c) Bromobenzene d) chlorobenzene
304. A colourless organic compound gave brisk effervescence with a mixture of NaNO_2 and dil. HCl. It could be:
 a) Glucose b) Oxalic acid c) Urea d) Benzoic acid
305. Which of the following reactions can be used to prepare ethyl isocyanide?
 a) $\text{CH}_3\text{CH}_2\text{I} + \text{NaCN} \xrightarrow{\text{C}_2\text{H}_5\text{OH}/\text{H}_2\text{O}}$ b) $\text{CH}_3\text{CH}_2\text{I} + \text{KCN} \xrightarrow[\Delta]{\text{Alcohol}}$
 c) $\text{CH}_3\text{CH}_2\text{NH}_2 + \text{CHCl}_3 + \text{KOH} \xrightarrow[\Delta]{\text{Alcohol}}$ d) None of the above
306. Diethyl oxalate is used for distinguishing primary, secondary and tertiary
 a) Alcohols b) Amines
 c) Alkyl halides d) Hydrogens in hydrocarbons
307. Identify X in the sequence,
 $X \xrightarrow{\text{HNO}_2} \text{C}_3\text{H}_8\text{O} \xrightarrow{\text{H}_2\text{SO}_4} \text{C}_3\text{H}_6\text{O}_2$:
 a) $\text{CH}_3\text{—NH—CH}_2\text{—CH}_3$
 b) $\text{CH}_3\text{—CH}_2\text{—CH}_2\text{—NH}_2$
 c) $(\text{CH}_3)_3\text{N}$
 d) None of the above
308. $\text{CH}_3\text{CONH}_2 + \text{NaOH} \rightarrow \text{CH}_3\text{COONa} + A$
 Urea is obtained if product 'A' in the above reaction reacts with the following compound
 a) Ethyl carbonate b) Ethyl urethane c) Phosgene d) All of these
309. Which of the following is involved in Sandmeyer's reaction?
 a) Ferrous salt
 b) Diazonium salt
 c) Ammonium salt
 d) Cupraammonium salt
310. RMgX on reacting with cyanogen chloride gives:
 a) R—NC b) R—Cl c) R—CN d) None of these
311. Methyl amine reacts with methyl iodide. For completion of reaction, how many moles of methyl iodide are required ?
 a) 1 b) 2 c) 3 d) 4
312. Aniline on oxidation with $\text{Na}_2\text{Cr}_2\text{O}_7$ and H_2SO_4 gives
 a) Benzoic acid b) *m*-amino benzoic acid c) Schiff's base d) *p*-bezoquinone
313. Among the following the weakest base is
 a) $\text{C}_6\text{H}_5\text{CH}_2\text{NH}_2$ b) $\text{C}_6\text{H}_5\text{CH}_2\text{NHCH}_3$ c) $\text{O}_2\text{NCH}_2\text{NH}_2$ d) CH_3NHCHO
314. Why do 2° and 3° amines fail to undergo the carbylamines test?

- a) They combine with chloroform to give a stable compound
 b) They react with alcoholic KOH
 c) The nitrogen atom of the amine group does not have the required number of hydrogen atoms
 d) All the given reasons are correct

315. The compound that will react most readily with NaOH to form methanol is

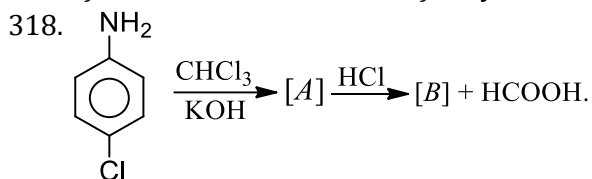
- a) $(\text{CH}_3)_4\text{N}^+\text{I}^-$ b) CH_3OCH_3 c) $(\text{CH}_3)_3\text{S}^+\text{I}^-$ d) $(\text{CH}_3)_3\text{CCl}$

316. Alkanamide, which on Hofmann's reaction gives 1-phenylethylamine, is:

- a) 2-phenylpropanamide
 b) 3-phenylpropanamide
 c) 2-phenylethanamide
 d) *N*-phenylethanamide

317. Which of the following compounds is expected to be most basic?

- a) Aniline b) Ethylamine c) Hydroxylamine d) Methylamine



What is [B]?

- a)  b)  c)  d) 

319. Aniline is not the major product in one of the following reactions. Identify that reaction.

- a) $\text{C}_6\text{H}_5\text{OH} + \text{NH}_3 \xrightarrow[300^\circ\text{C}]{\text{ZnCl}_2}$
 b) $\text{C}_6\text{H}_5\text{NO}_2 + \text{Zn powder} \xrightarrow{\text{Alcoholic KOH}}$
 c) $\text{C}_6\text{H}_5\text{Cl} + \text{NH}_3 \xrightarrow[200^\circ\text{C}]{\text{Cu}_2\text{O}}$ High pressure
 d) $\text{C}_6\text{H}_5\text{NO}_2 + 6(\text{H}) \xrightarrow[\text{HCl}]{\text{Fe}+\text{H}_2\text{O}}$

320. In the reaction between CH_3NC and HgO , the product obtained is

- a) Methyl isothiocyanate b) Methyl isocyanate
 c) Methyl amine d) Methyl cyanide

321. Complete the following reaction



322. Which one of the following is the strongest base in aqueous solution?

- a) Trimethylamine b) Aniline c) Dimethylamine d) Methylamine

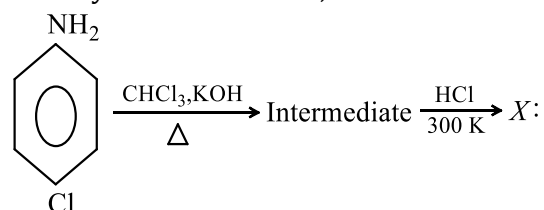
323. Nitrobenzene on reduction with Al-Hg and water gives:

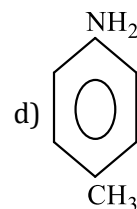
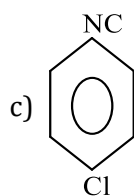
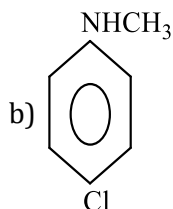
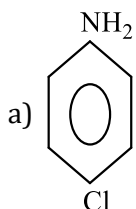
- a) Azobenzene
 b) Aniline
 c) Azoxy benzene
 d) phenylhydroxylamine

324. Gabriel's phthalimide reaction is used to prepare:

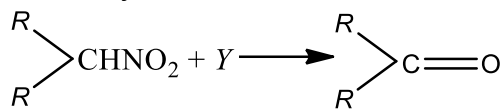
- a) *p*-amine b) *s*-amine c) *t*-amine d) All of these

325. Identify X in the reaction,





326. Secondary nitroalkanes can be converted into ketones by using Y . Identify Y from the following



a) Aqueous HCl

b) Aqueous NaOH

c) $KMnO_4$

d) CO

327. The strongest base among the following is

a) $C_6H_5NH_2$

b) $(C_6H_5)_2NH$

c) NH_3

d) $(C_2H_5)_2NH$

328. Alkyl nitrite on reduction with Sn/HCl gives:

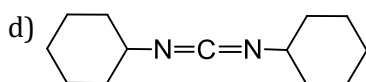
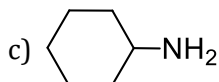
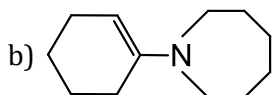
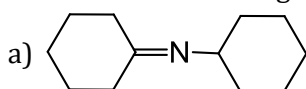
a) Alcohol

b) Hydroxylamine

c) Both (a) and (b)

d) hydrazine

329. Which of the following is an enamine?



330. The number of π -bonds in the formula given below, $NC-CH=CH-CN$ are:

a) 5

b) 4

c) 3

d) 2

331. Which of the following is most basic in nature?

a) NH_3

b) CH_3NH_2

c) $(CH_3)_2NH$

d) $C_6H_5N(CH_3)_2$

332. Diazomethane reacts with carboxylic acids to produce:

a) Ester

b) Alcohol

c) Amine

d) Imines

333. Which compound is known as alkyl carbamylamines?

a) $R.CN$

b) $R.NC$

c) $Ar.CN$

d) $Ar.NC$

334. n -propylamine yields a volatile compound X on warming with alc. alkali and chloroform. X has an offensive odour. The structure of X is

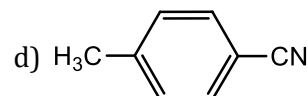
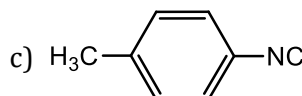
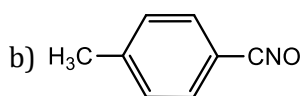
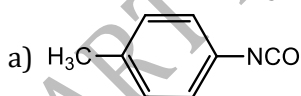
a) $CH_3CH_2CH_2CN$

b) $(CH_3)_2CHCN$

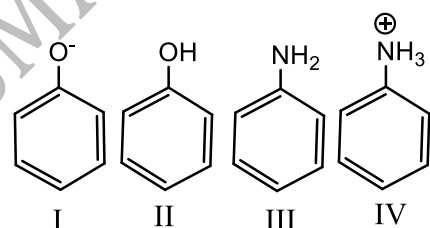
c) $CH_3CH_2CH_2NC$

d) $(CH_3)_2CHNC$

335. The reaction of $CHCl_3$ and alcoholic KOH with p -toluidine gives



336. Coupling of diazonium salts of following takes place in the order



a) $IV < II < III < I$

b) $IV > III < II < I$

c) $II < IV < I < III$

d) $I < II < III < IV$

337. Tertiary nitroalkane cannot tautomerise because

a) Their tautomeric forms are highly unstable

b) They do not contain any multiple bond

c) They do not have labile H-atom

d) They are not basic in nature

338. In aqueous solutions, the basic strength of amines decreases in the order
- a) $\text{CH}_3\text{NH}_2 > (\text{CH}_3)_2\text{NH}_2 > (\text{CH}_3)_3\text{N}$ b) $(\text{CH}_3)_2\text{NH} > (\text{CH}_3)_3\text{N} > \text{CH}_3\text{NH}_2$
 c) $(\text{CH}_3)_3\text{N} > (\text{CH}_3)_2\text{NH} > \text{CH}_3\text{NH}_2$ d) $(\text{CH}_3)_2\text{NH}_2 > \text{CH}_3\text{NH}_2 > (\text{CH}_3)_3\text{N}$

339. Dichlorocarbene does not form as an intermediate in this reaction

- a) phenol + $\text{CHCl}_3 + 4\text{KOH}$ b) Ethyl amine + $\text{CHCl}_3 + \text{KOH}$
 c) Phenol + $\text{CCl}_4 + 4\text{KOH}$ d) $\text{CHCl}_3 + \text{KOH}$

340. Which of the following is not a nitroderivative?

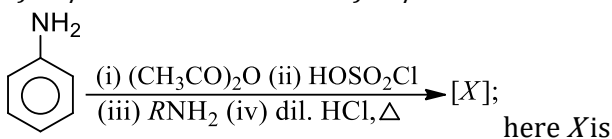
- a) $\text{C}_6\text{H}_5\text{NO}_2$ b) $\text{CH}_3\text{CH}_2\text{ONO}$ c)  d) $\text{C}_6\text{H}_4(\text{OH})\text{NO}_2$

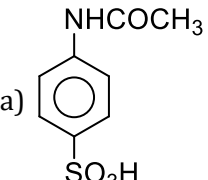
341. Urea reacts with HNO_3 to give:

- a) Urea nitrite b) Urea nitrate c) H_2CO_3 d) None of these

342. Which of the following reagents will convert nitromethane into methylamine?

- a) Zn/HCl b) Zn/NaOH c) $\text{Zn}/\text{C}_2\text{H}_5\text{OH}$ d) Ni/H_2

343. 

- a)  b) 
 c)  d) 

344. In which reaction, nitrene is not the intermediate?

- a) Schmidt b) Curtius
 c) Hofmann bromamide d) Gabriel's phthalimide

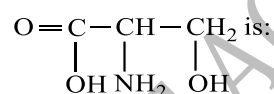
345. CH_3CONH_2 , Br_2 and KOH give CH_3NH_2 as the product. The intermediates of the reaction are

- (A) $\text{CH}_3-\overset{\text{O}}{\parallel}{\text{C}}-\text{NHBr}$ B) $\text{CH}_3-\text{N}=\text{C}=\text{O}$
 (C) CH_3NHBr (D) $\text{CH}_3\text{CONBr}_2$

The correct answer is

- a) A, B b) A, C c) C, D d) B, D

346. The IUPAC name of the compound having formula,



- a) 3-aminohydroxy propionic acid
 b) 2-amino-propan-3-oic acid
 c) Amino hydroxy propanoic acid
 d) 2-amino-3-hydroxy propanoic acid

347. An organic amino compound reacts with aqueous nitrous acid at low temperature to produce an oily nitroso amine. The compound is

- a) CH_3NH_2 b) $\text{CH}_3\text{CH}_2\text{NH}_2$
 c) $(\text{CH}_3\text{CH}_2)_3\text{N}$ d) $\text{CH}_3\text{CH}_2-\text{NHCH}_2\text{CH}_3$

348. Biuret test is not given by:

- a) Proteins b) Carbohydrates c) Polypeptides d) Urea

349. Among the following compounds, the most basic is

- a) Aniline b) Acetanilide c) *p*-nitroaniline d) Benzyl amine

350. The geometry of ethylamine is:

- a) Pyramidal b) Tetrahedral c) Triangular d) Square planar

351. When $(\text{NH}_4)_2\text{SO}_4 + \text{KCNO}$ are heated, we get:

- a) Nitrogen
- b) Carbon dioxide
- c) Biuret
- d) Ammonium carbonate

352. Grignard reagent and acetyl chloride does not react with:

- a) RNH_2
- b) R_2NH
- c) R_3N
- d) None of these

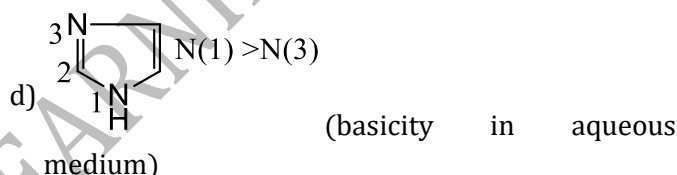
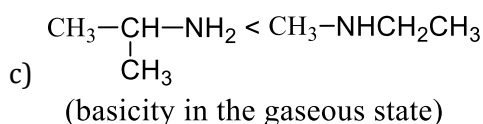
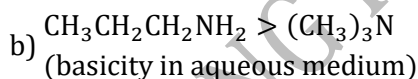
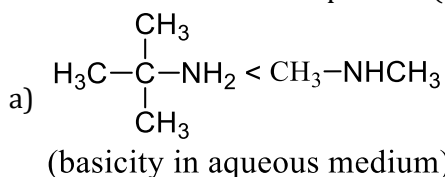
353. Acetaldoxime reacts with P_2O_5 to give:

- a) CH_3CN
- b) $\text{C}_2\text{H}_5\text{CNO}$
- c) $\text{C}_2\text{H}_5\text{CN}$
- d) All of these

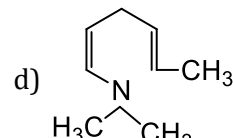
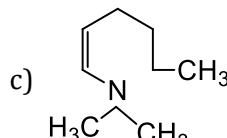
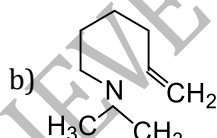
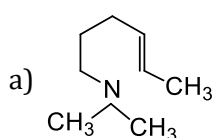
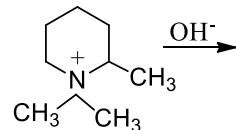
354. 2,4,6-tribromo aniline is a product of:

- a) Electrophilic addition on $\text{C}_6\text{H}_5\text{NH}_2$
- b) Electrophilic substitution on $\text{C}_6\text{H}_5\text{NH}_2$
- c) Nucleophilic addition on $\text{C}_6\text{H}_5\text{NH}_2$
- d) Nucleophilic substitution on $\text{C}_6\text{H}_5\text{NH}_2$

355. Choose the incorrect comparison(s)



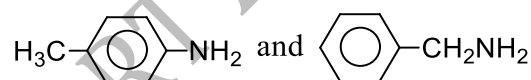
356. Identify the major product of the reaction



357. Which of the following compounds gives a secondary amine on reduction?

- a) Nitromethane
- b) Nitrobenzene
- c) Methyl isocyanide
- d) Methyl cyanide

358. Which of the following reagents will be useful as the basic for a simple chemical test to distinguish between?



- a) $\text{C}_6\text{H}_5\text{SO}_2\text{Cl}$ and OH^- in H_2O
- c) Dilute HCl

- b) HONO , then β -naphthol
- d) AgNO_3 in H_2O

359. Amine may contain:

- a) $-\text{NH}_2$ gp.
- b) $>\text{NH}$ gp.
- c) $\Rightarrow\text{N}$ gp.
- d) All of these

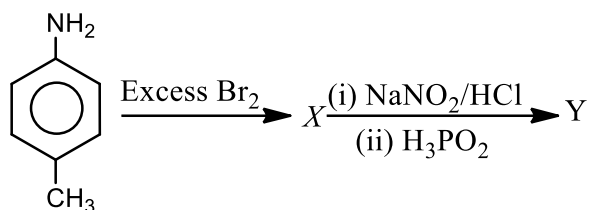
360. Diethylamine on oxidation with KMnO_4 gives:

- a) Ethanal
- b) Propanone
- c) Tetraethyl hydrazine
- d) None of these

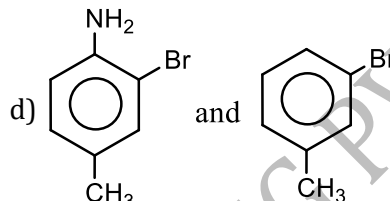
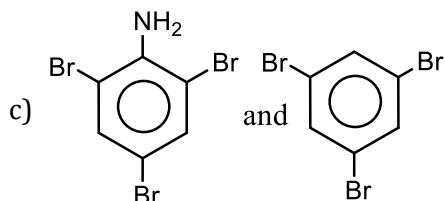
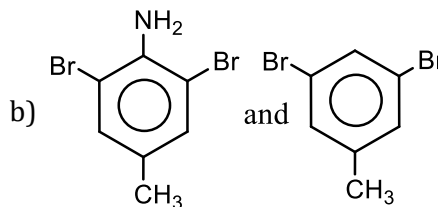
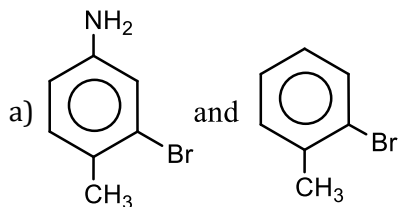
361. An aliphatic nitro compound turns red with the addition of a concentrated NaOH solution, followed by the addition of an excess of an NaNO_2 solution and then dilute H_2SO_4 . The colour disappears with the addition of the excess of an acid but reappears if the solution is made alkaline. The aliphatic nitro compound is

- a) $\text{CH}_3\text{CH}_2\text{NO}_2$
- b) $(\text{CH}_3)_2\text{CHNO}_2$
- c) $(\text{CH}_3)_3\text{CNO}_2$
- d) All of these

362. In the following reaction sequence predict the compound X and Y .



The compound *X* and *Y* are



363. Primary amine (RNH_2) reacts with nitrous acid to give

- a) $RNH_3^+NO_2$ b) ROH c) ROR d) None of these

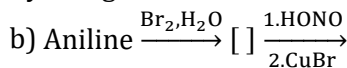
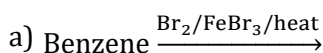
364. Carbylamine reaction tubes are not thrown into sink, to avoid bad odour, but are treated with conc. HCl to give:

- a) $RCOOH + NH_3$ b) RNH_2 c) $RNH_2 + HCOOH$ d) $RCOOH + N_2$

365. The compound obtained by heating a mixture of 1° amine and chloroform with ethanolic potassium hydroxide is

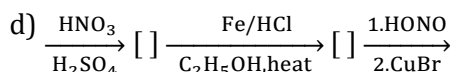
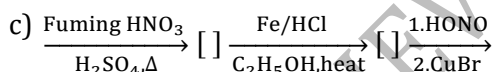
- a) An alkyl isocyanide b) An alkyl isothiocyanate
c) An amide d) An amide and nitro compound

366. The best method to synthesise *m*-dibromobenzene is by using the reaction

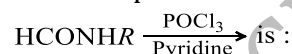


Nitrobenzene

Bromobenzene



367. The main product in the reaction,



- a) RCN b) RNC c) RCNO d) RNCO

368. The type of isomerism shown by C_6H_5CN and C_6H_5NC is:

- a) Position b) Functional c) Enantiomerism d) Tautomerism

369. Which among the following has the highest boiling point?

- a) $CH_3CH_2CH_2NH_2$ b) $CH_3CH_2-NH-CH_3$ c) $CH_3-N(CH_3)-CH_3$ d) CH_3NH_2

370. Benzaldehyde reacts with methyl amine to give:

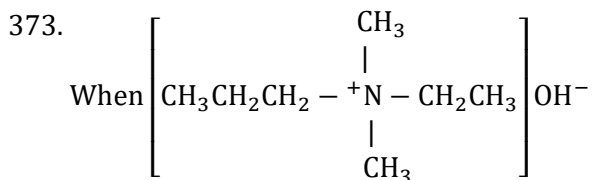
- a) $C_6H_5NH_2$ b) $C_6H_5CH_2NH_2$ c) $C_6H_5CH=NCH_3$ d) $C_6H_5CONH_2$

371. In the above sequence *Y* is

- a) Tertiary amine b) Secondary amine c) Primary amine d) 2-nitropropane

372. Ethylamine undergoes oxidation in the presence of $KMnO_4$ followed by hydrolysis to form:

- a) An acid b) An alcohol c) An aldehyde d) a N-oxide



Is heated, then

- a) Propene is the major product
 b) Ethane and $\text{C}_3\text{H}_7\text{N}(\text{CH}_3)_2$ are the only product
 c) Ethane and propene are obtained while ethane as the major product
 d) Equimolar amounts of ethane and propene are obtained

374. Diethyl carbonate on heating with ammonia gives:

- a) $\text{C}_2\text{H}_5\text{NH}_2$
 b) $(\text{C}_2\text{H}_5)_3\text{N}$
 c) $(\text{C}_2\text{H}_5)_2\text{NH}$
 d) Urea

375. In which case formation of butane nitrile is possible?

- a) $\text{C}_3\text{H}_7\text{Br} + \text{KCN}$ b) $\text{C}_4\text{H}_9\text{Br} + \text{KCN}$ c) $\text{C}_3\text{H}_7\text{OH} + \text{KCN}$ d) $\text{C}_4\text{H}_9\text{OH} + \text{KCN}$

376. Ethyl amine reacts with nitrous acid to form

- a) $\text{C}_2\text{H}_5\text{OH}$ b) $\text{C}_2\text{H}_5\text{OH}, \text{N}_2, \text{H}_2\text{O}$ c) $\text{C}_2\text{H}_5\text{N}_2^+\text{Cl}^-$ d) $\text{C}_2\text{H}_5\text{NHOH}, \text{NH}_3$

377. Which of the following compounds will undergo carbylamine reactions?

- a) $(\text{CH}_3\text{CH}_2)_2\text{NH}$ b) $(\text{CH}_3)_2\text{NH}$ c) $\text{C}_6\text{H}_5\text{NH}_2$ d) $(\text{CH}_3)_3\text{N}$

378. Aniline first reacts with acetyl chloride producing compound 'A'. 'A' reacts with nitric acid/sulphuric acid mixture and produces compound 'B', which hydrolyses to compound 'C'. What is the identify of 'C'?

- a) Acetanilide b) *p*-nitroacetanilide c) *p*-nitroaniline d) Aniline

AMINES

CHEMISTRY

: ANSWER KEY :

| | | | | | | | | | | | | | | | |
|------|---|------|---|------|---|------|---|------|---|------|---|------|---|------|---|
| 1) | c | 2) | c | 3) | c | 4) | d | 177) | c | 178) | c | 179) | c | 180) | d |
| 5) | d | 6) | c | 7) | a | 8) | c | 181) | a | 182) | a | 183) | a | 184) | d |
| 9) | c | 10) | c | 11) | c | 12) | d | 185) | a | 186) | c | 187) | a | 188) | d |
| 13) | b | 14) | d | 15) | b | 16) | d | 189) | a | 190) | a | 191) | b | 192) | b |
| 17) | b | 18) | b | 19) | b | 20) | b | 193) | a | 194) | c | 195) | a | 196) | b |
| 21) | b | 22) | b | 23) | d | 24) | a | 197) | d | 198) | d | 199) | b | 200) | c |
| 25) | c | 26) | d | 27) | b | 28) | d | 201) | b | 202) | d | 203) | a | 204) | b |
| 29) | d | 30) | a | 31) | c | 32) | b | 205) | b | 206) | b | 207) | c | 208) | b |
| 33) | b | 34) | b | 35) | c | 36) | a | 209) | b | 210) | b | 211) | c | 212) | b |
| 37) | c | 38) | d | 39) | d | 40) | b | 213) | a | 214) | c | 215) | a | 216) | c |
| 41) | a | 42) | b | 43) | a | 44) | a | 217) | a | 218) | a | 219) | a | 220) | d |
| 45) | b | 46) | d | 47) | b | 48) | c | 221) | b | 222) | a | 223) | d | 224) | b |
| 49) | a | 50) | d | 51) | a | 52) | b | 225) | a | 226) | b | 227) | b | 228) | a |
| 53) | b | 54) | b | 55) | d | 56) | b | 229) | c | 230) | d | 231) | c | 232) | d |
| 57) | b | 58) | d | 59) | a | 60) | b | 233) | d | 234) | c | 235) | c | 236) | a |
| 61) | c | 62) | c | 63) | c | 64) | c | 237) | b | 238) | b | 239) | a | 240) | d |
| 65) | d | 66) | c | 67) | a | 68) | c | 241) | c | 242) | b | 243) | b | 244) | c |
| 69) | c | 70) | a | 71) | c | 72) | c | 245) | b | 246) | b | 247) | b | 248) | a |
| 73) | c | 74) | b | 75) | a | 76) | d | 249) | d | 250) | d | 251) | b | 252) | a |
| 77) | a | 78) | d | 79) | d | 80) | c | 253) | b | 254) | d | 255) | a | 256) | d |
| 81) | a | 82) | a | 83) | d | 84) | b | 257) | b | 258) | c | 259) | b | 260) | d |
| 85) | d | 86) | c | 87) | c | 88) | a | 261) | b | 262) | d | 263) | b | 264) | c |
| 89) | a | 90) | b | 91) | c | 92) | b | 265) | c | 266) | a | 267) | b | 268) | c |
| 93) | b | 94) | a | 95) | d | 96) | b | 269) | b | 270) | c | 271) | b | 272) | a |
| 97) | c | 98) | d | 99) | d | 100) | c | 273) | d | 274) | a | 275) | b | 276) | a |
| 101) | d | 102) | b | 103) | c | 104) | b | 277) | c | 278) | c | 279) | c | 280) | a |
| 105) | b | 106) | d | 107) | b | 108) | d | 281) | a | 282) | a | 283) | b | 284) | b |
| 109) | c | 110) | d | 111) | a | 112) | a | 285) | a | 286) | a | 287) | a | 288) | c |
| 113) | b | 114) | a | 115) | d | 116) | b | 289) | d | 290) | b | 291) | b | 292) | c |
| 117) | b | 118) | d | 119) | a | 120) | c | 293) | c | 294) | b | 295) | a | 296) | a |
| 121) | b | 122) | d | 123) | d | 124) | c | 297) | a | 298) | d | 299) | b | 300) | c |
| 125) | c | 126) | b | 127) | b | 128) | c | 301) | c | 302) | b | 303) | b | 304) | c |
| 129) | d | 130) | c | 131) | d | 132) | a | 305) | c | 306) | b | 307) | b | 308) | d |
| 133) | a | 134) | c | 135) | a | 136) | b | 309) | b | 310) | c | 311) | c | 312) | d |
| 137) | a | 138) | c | 139) | a | 140) | b | 313) | d | 314) | b | 315) | a | 316) | a |
| 141) | b | 142) | a | 143) | d | 144) | b | 317) | b | 318) | a | 319) | b | 320) | b |
| 145) | a | 146) | a | 147) | c | 148) | a | 321) | d | 322) | c | 323) | d | 324) | a |
| 149) | d | 150) | d | 151) | b | 152) | d | 325) | a | 326) | a | 327) | d | 328) | c |
| 153) | b | 154) | a | 155) | a | 156) | a | 329) | a | 330) | a | 331) | c | 332) | a |
| 157) | c | 158) | d | 159) | c | 160) | b | 333) | b | 334) | c | 335) | c | 336) | a |
| 161) | b | 162) | c | 163) | a | 164) | c | 337) | c | 338) | d | 339) | c | 340) | b |
| 165) | d | 166) | d | 167) | c | 168) | a | 341) | b | 342) | a | 343) | b | 344) | d |
| 169) | b | 170) | a | 171) | b | 172) | c | 345) | a | 346) | d | 347) | d | 348) | b |
| 173) | c | 174) | c | 175) | b | 176) | c | 349) | d | 350) | a | 351) | c | 352) | c |

| | | | | | | | |
|--------|--------|--------|--------|--------|--------|--------|--------|
| 353) a | 354) b | 355) d | 356) b | 369) a | 370) c | 371) c | 372) c |
| 357) c | 358) b | 359) d | 360) c | 373) c | 374) d | 375) a | 376) b |
| 361) a | 362) d | 363) b | 364) c | 377) c | 378) c | | |
| 365) a | 366) c | 367) b | 368) b | | | | |

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AMINES

CHEMISTRY

: HINTS AND SOLUTIONS :

- 2 (c) Hofmann's bromamide reaction is used to convert amide to amine.

$$RCONH_2 + Br + 4KOH \rightarrow RNH_2 + K_2CO_3 + 2KBr + 2H_2O$$
 amide amine
- 4 (d) Secondary amides such as N-methylethanamide on reduction with $LiAlH_4$ give secondary amines.

$$CH_3CONHCH_3 + [H] \xrightarrow{LiAlH_4} CH_3CH_2NHCH_3 + H_2O$$
 N-methylethanamide 2° amine
- 5 (d) $CH_3CN \xrightarrow{HOH} CH_3COOH$
- 6 (c)
$$C_2H_5NH_2 + O = \overset{H}{\underset{|}{C}} - C_6H_5 \rightarrow C_2H_5N = HCC_6H_5 + H_2O$$
 Benzaldehyde
 (A)

$$NH_2CO\overset{H}{\underset{|}{N}}H_2 + H_2NH\cdot NH_2 \rightarrow NH_2CONHNH_2 + NH_3$$
 urea hydrazine
 (B)

$$C_2H_5NH_2 + NOCl \rightarrow C_2H_5Cl + H_2O + N_2$$
 (C)
- 11 (c) The reaction is believed to follow the mechanism.

$$R-CONH_2 + OBr^- \rightarrow RCONHBr + OH^-$$

$$RCONHBr + OH^- \rightarrow RCONBr + H_2O$$

$$RCONBr \rightarrow R-\overset{O}{\underset{||}{C}} + Br^- \quad R-\overset{O}{\underset{||}{C}} \rightarrow R-\overset{O}{\underset{||}{N}}=C=O$$

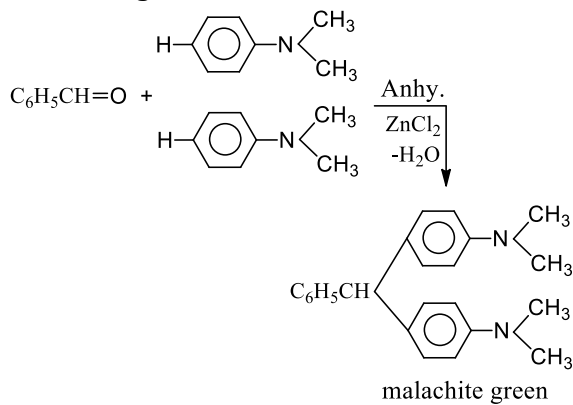
$$R-\overset{O}{\underset{||}{N}}=C=O + 2OH^- \rightarrow RNH_2 + CO_3^{2-}$$
- 12 (d) HNO_2 reacts to give an alcohol means the compound is primary amine.
 $C_5H_{13}N$ means $C_5H_{11}NH_2$ (primary amine)
 Optically active alcohol means C_5H_{11} segment contain a chiral carbon.

$$CH_3 - CH_2 - CH_2 - \overset{H}{\underset{|}{C}} - NH_2$$
 1 CH₃
- 13 (b) Pentan-2-amine

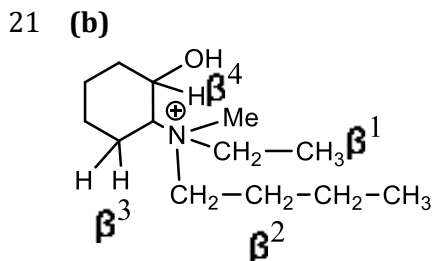
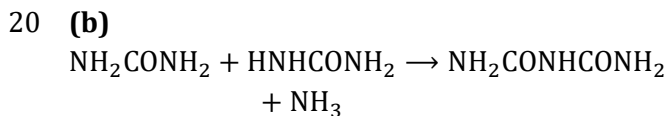
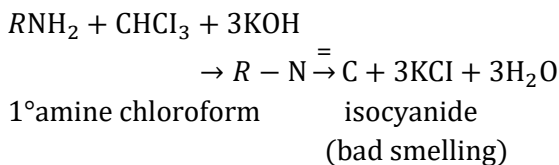
$$R-CN + 4[H] \xrightarrow{LiAlH_4} R-CH_2NH_2$$
 Alkyl nitriles primary amine
- 14 (d) Electron donors are bases. In the given choices structure which does not involve resonance will have electron easily available for donation, hence most basic.
 \therefore Only in choice (b) electrons are not in conjugation with double bond of adjacent atom.
 \therefore Compound in choice (b) is most basic.
- 15 (b) $RBr + KCN \rightarrow RCN \xrightarrow{\text{Reduction}} RCH_2NH_2$
- 16 (d) It is methyl amine which, being basic dissolves in dilute HCl. It with $NaNO_2$ evolves nitrogen gas leaving behind methyl alcohol which has smell of wood-spirit.

$$CH_3NH_2 \xrightarrow{HCl} CH_3NH_2 \cdot HCl$$

$$CH_3NH_2 + HNO_2 \xrightarrow{NaNO_2/HCl} CH_3OH + N_2 \uparrow + H_2O$$
 methyl alcohol
- 17 (b) Benzaldehyde condenses with N, N-dimethyl aniline in presence of anhydrous $ZnCl_2$ to give malachite green

$$C_6H_5CH=O + 2 \text{ (N,N-dimethylaniline) } \xrightarrow[\text{-H}_2\text{O}]{\text{Anhy. ZnCl}_2}$$

 malachite green
- 19 (b) This is carbylamine reaction which is used to distinguish 1° amines from other amines. The reaction is given by 1° amines only.

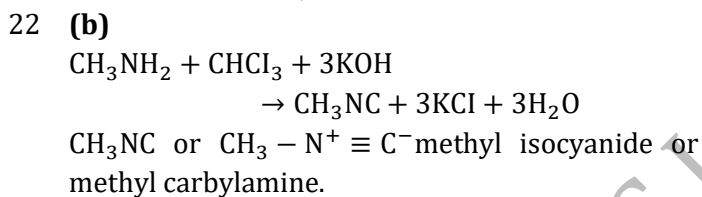
$$C_2H_5NH_2 + CHCl_3 + 3KOH \rightarrow C_2H_5N \equiv C + 3KCl + 3H_2O$$



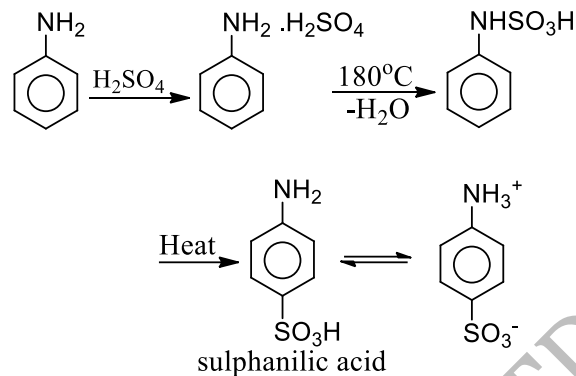
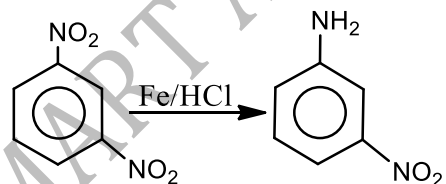
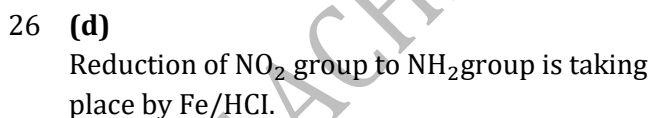
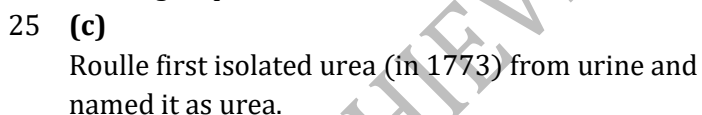
There are four β -hydrogens, in this quaternary ammonium salt.

On heating quaternary ammonium salt gives Hofmann elimination (abstraction of most acidic hydrogen which is β^1).

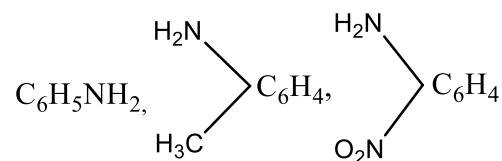
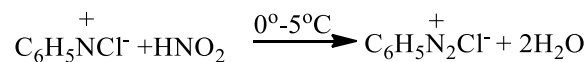
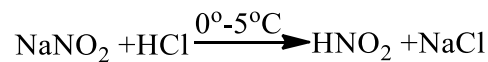
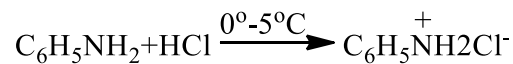
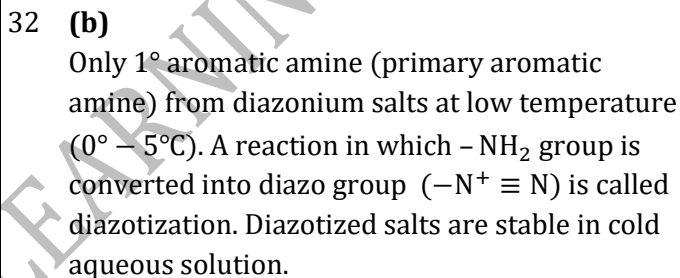
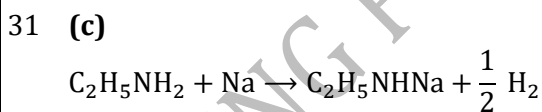
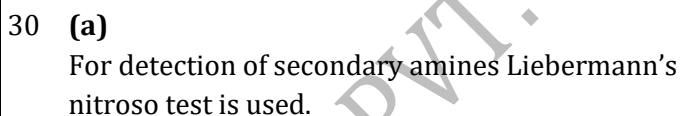
Hence, major product is $\text{CH}_2 = \text{CH}_2$. (Least substituted alkene).



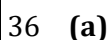
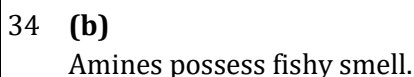
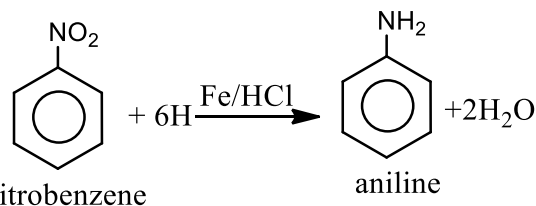
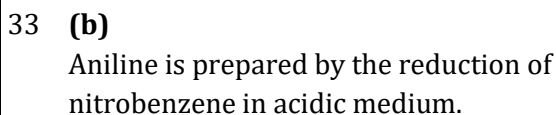
This reaction is an example of carbylamine reaction and it is used for the distinction of *p*-amines from *s*- and *t*-amines or identification of *p*-amino group.



Sulphanilic acid exists as a dipole ion which has acidic and basic groups in the same molecule. Such ions are called Zwitter ions or inner salts



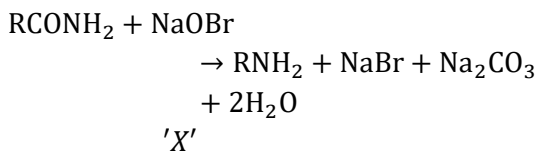
Amines, so undergo diazotization but $\text{C}_6\text{H}_5\text{CH}_2\text{NH}_2$ (aliphatic amine) will not undergo diazotisation.



Electrons donors are bases. Greater the stabilisation of cation formed by loss of electron more will be basicity of amine.

2° amine is more basic than 3° amine because 2° amine is stabilized by hydrogen bonding with solvent molecule.

37 (c)



38 (d)

Benzyl amine ($\text{C}_6\text{H}_5\text{CH}_2\text{NH}_2$) is more basic than aniline ($\text{C}_6\text{H}_5\text{NH}_2$) because N-atom of aniline is delocalized over the benzene ring. However in benzyl amine the lone pair of electrons on the N-atom is not conjugated with the benzene ring and therefore it is not delocalized. Hence, the lone pair of electrons on the N-atom in benzyl amine is more readily available for protonation than that on the N-atom of aniline. Thus, the benzyl amine is a stronger base than aniline.

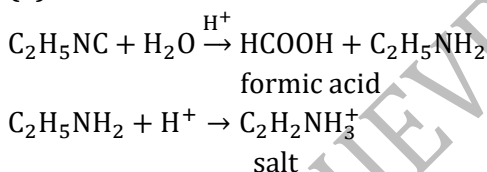
39 (d)

Tertiary amines react as,
 $(\text{CH}_3)_3\text{N} + \text{HNO}_2 \rightarrow (\text{CH}_3)_3\text{NHNO}_2$

41 (a)

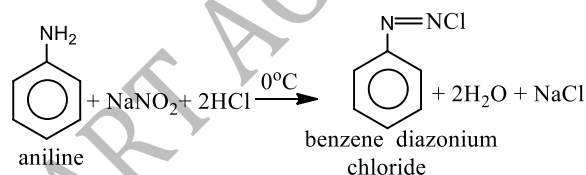
Follow text.

44 (a)



45 (b)

It gives diazonium salt.

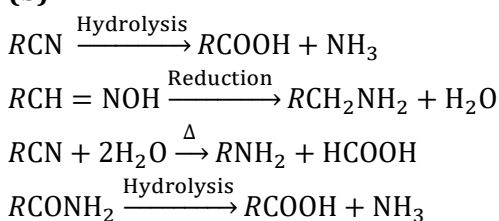


It is known as diazotization reaction.

46 (d)

Aniline undergoes diazotisation.

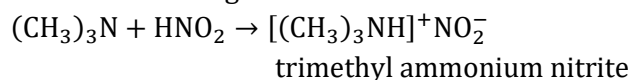
47 (b)



49 (a)

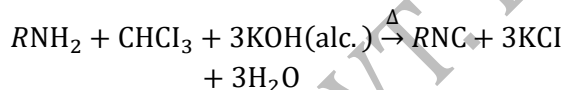
Trimethyl amine is a tertiary amine. It dissolve in

cold nitrous acid to form salts which decompose on warming to nitrosoamine and alcohol. It will not liberate nitrogen.



51 (a)

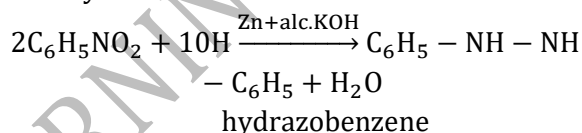
Carbylamine reaction is given by aliphatic and aromatic primary amine hence, it can be used for the distinguish of primary amine with secondary and tertiary amine. In this reaction, a primary amine reacts with chloroform and alcoholic KOH to give poisonous substance isocyanide.



Primary amine alkyl isocyanide

52 (b)

Nitrobenzene is reduced by Zn and alcoholic KOH into hydrazobenzene.



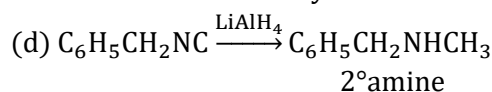
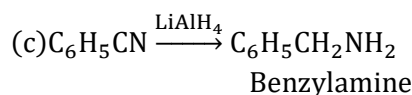
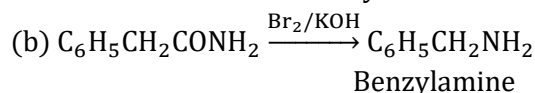
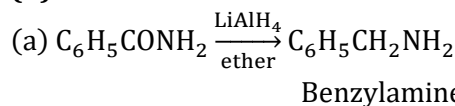
53 (b)

Electron withdrawing groups (*e.g.*, benzyl) because the basicity of amines. Electron donating groups (*e.g.*, alkyl) increase the acidity of amines. ∴ The correct order of basicity of amines is $\text{C}_2\text{H}_5\text{NH}_2 > \text{CH}_3\text{NH}_2 > \text{NH}_3 > \text{C}_6\text{H}_5\text{NH}_2$

54 (b)

Aliphatic amines (in which amino group is attached with alkyl group) are more basic than aromatic amines (in which amino group is bonded directly with benzene nucleus). Hence, $\text{C}_6\text{H}_5\text{CH}_2\text{NH}_2$ (benzyl amine), being an aliphatic amine, is the most basic among the given the compounds.

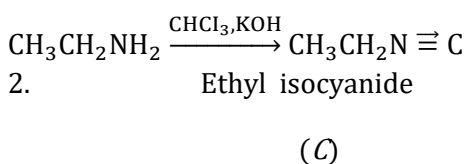
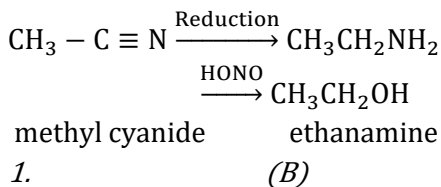
55 (d)



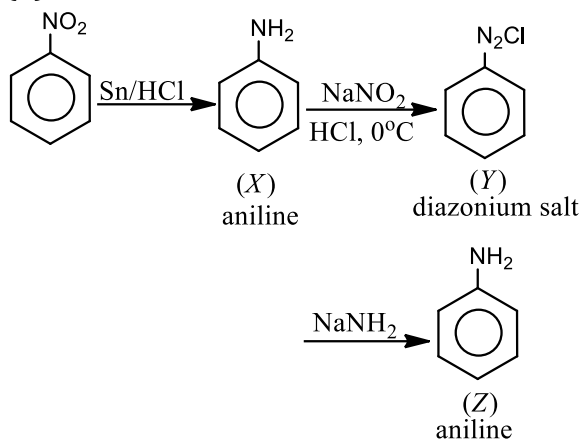
56 (b)

Biuret formed gives violet colour with CuSO_4 in alkaline medium.

57 (b)



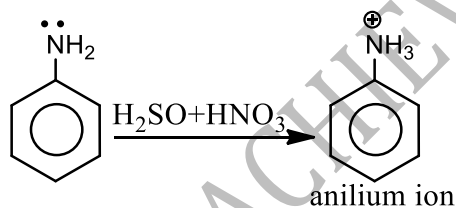
58 (d)



∴ Z is aniline

59 (a)

On direct nitration of aniline, lone pair of electrons present at nitrogen atom will accept proton from the nitrating mixture to give anilium ion which is *meta* directing.



61 (c)

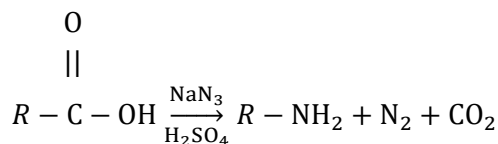
$R-\text{NH}_2 + \text{HNO}_2 \rightarrow \text{ROH} + \text{N}_2 + \text{H}_2\text{O}$; But note that CH_3NH_2 gives CH_3ONO or CH_3OCH_3 on treating with HNO_2 .

62 (c)

The conversion of $-\text{CN}$ to $-\text{CH}_2\text{NH}_2$ by catalytic reduction is called Mendius reaction.

64 (c)

Schmidt reaction

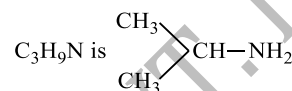
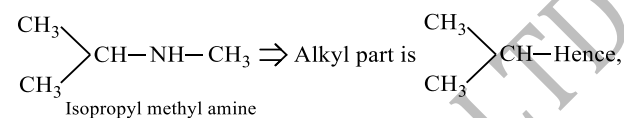
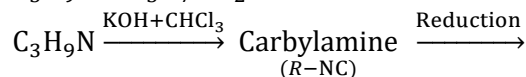
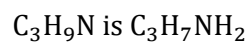
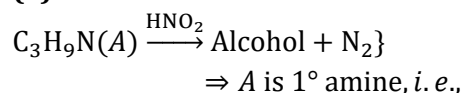


66 (c)

Methylaminomethane is trivial name of *N*-methyl methanamine $(\text{CH}_3)_2\text{NH}$.

67

(a)



68 (c)



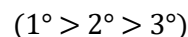
69 (c)

In tertiary amines, no H-atom is attached directly to the more electronegative N-atom. Hence, it has no tendency to form H-bond

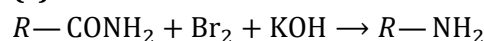
70 (a)

The order of boiling points of the isomeric amines is as follows :

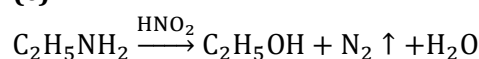
Primary amines > secondary amines > tertiary amines



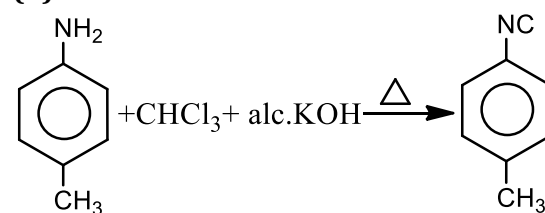
71 (c)



72 (c)



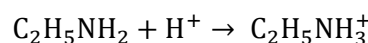
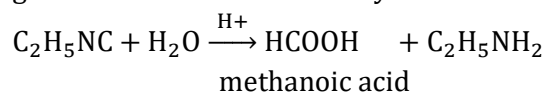
76 (d)



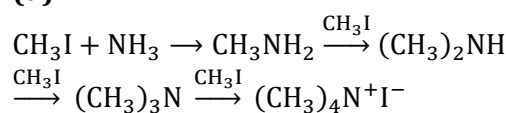
p-toluidine (a carbylamine reaction)

77 (a)

Ethyl isocyanide on hydrolysis in acidic medium gives methanoic acid and ethyl amline salt



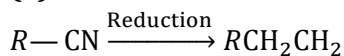
78 (d)



80 (c)

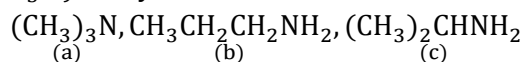
Secondary amine on reaction with aq. HNO_2 at low temperature produces yellow oily nitrosoamines. $\text{CH}_3\text{CH}_2\text{NHCH}_2\text{CH}_3$ is secondary amine.

82 (a)



83 (d)

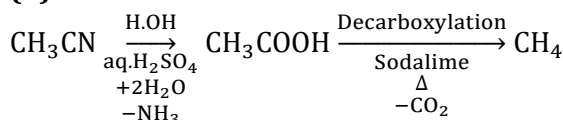
$\text{C}_3\text{H}_9\text{N}$ may have the structures as:



84 (b)

Tertiary amines, due to lack of H-atom, attached directly with N, does not react with benzene sulphonyl chloride ($\text{C}_6\text{H}_5\text{SO}_2\text{Cl}$), i.e., Hinsberg's reagent. $(\text{C}_2\text{H}_5)_3\text{N}$ is a tertiary amine, so does not react with $\text{C}_6\text{H}_5\text{SO}_2\text{Cl}$.

85 (d)

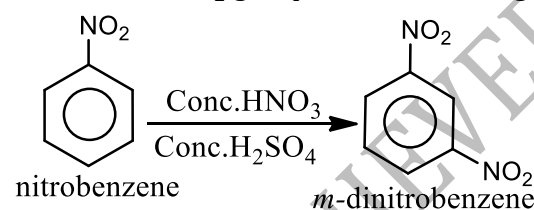


Ethane ethanoic acid methane

Nitrile (A)

88 (a)

Nitrobenzene on nitration gives *m*-dinitrobenzene as $-\text{NO}_2$ group is meta-directing.



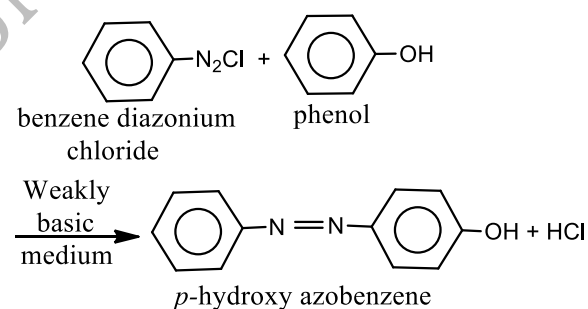
In this reaction the attacking reagent is NO_2^+ .

89 (a)

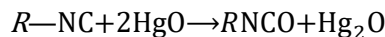
Presence of $-\text{OCH}_3$ gp. on aniline makes it more basic than the presence of $-\text{NO}_2$, $-\text{Cl}$ or $-\text{CH}_3$ gp.

90 (b)

Benzene diazonium chloride reacts with phenol in weakly basic medium gives *p*-hydroxy azobenzene.

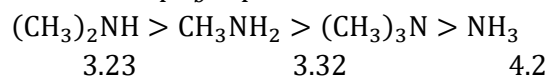


91 (c)



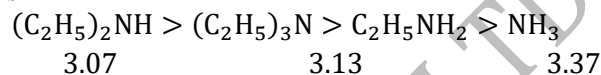
99 (d)

The abnormal trend of 3° amines is explained in terms of steric effect. Note basic order of amines on the basis of $\text{p}K_b$ reported in Finar



4.73

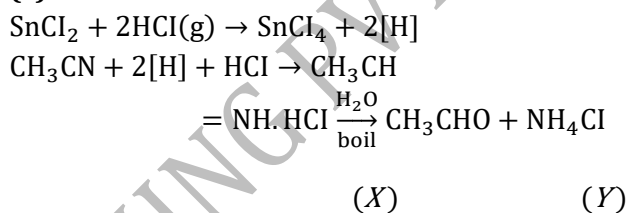
$\text{p}K_b$



4.73

$\text{p}K_b$

100 (c)



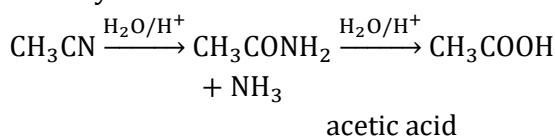
(X) is acetaldimine hydrochloride and (Y) is acetaldehyde.

101 (d)

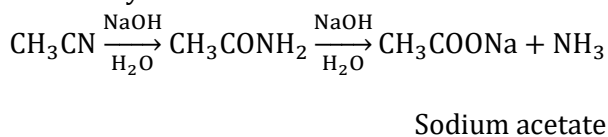
Carbylamine reaction is given by aliphatic and aromatic primary amine.

CH_3CN does not give carbylamine reaction with chloroform because it is not an amine.

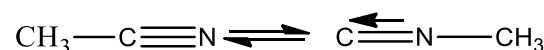
CH_3CN undergoes acidic hydrolysis to give carboxylic acid.



CH_3CN undergoes alkaline hydrolysis to give salt of carboxylic acid.

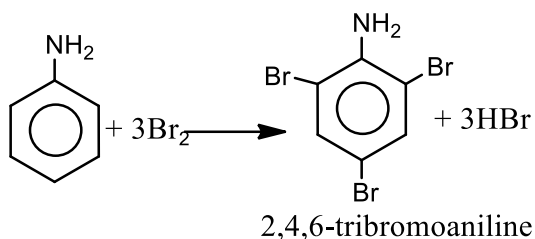


CH_3CN tautomerises to give methyl isocyanide.



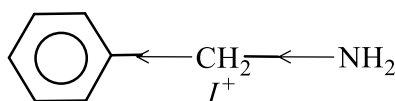
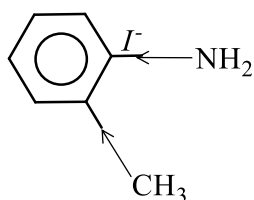
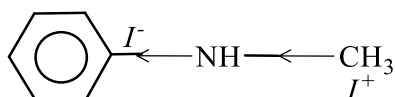
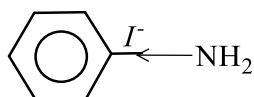
105 (b)

Aniline reacts with Br_2 to give 2, 4, 6-tribromoaniline not bromoaniline as



106 (d)

CH_3 – (an electron releasing (+I) group) increases electron density at N-atom hence, basic nature is increased.



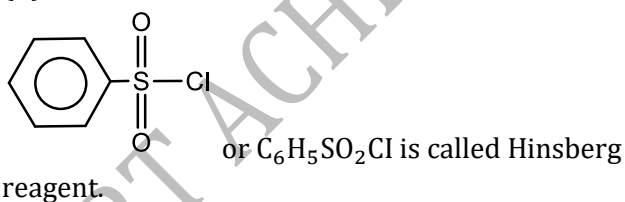
C_6H_5 decreases electron density at N-atom thus basic nature is decreased. (Lone-pair on N in aniline compounds is delocalised along with π -electrons in benzene).

Thus, (d) is the strongest base.

107 (b)

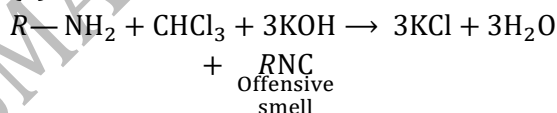
Urea gives biuret test. Biuret formed gives violet colour with CuSO_4 in alkaline medium.

110 (d)



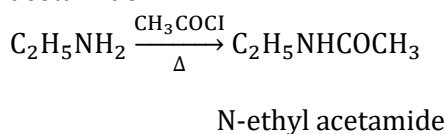
It is used for the distinction of 1°, 2°, 3° amine.

111 (a)



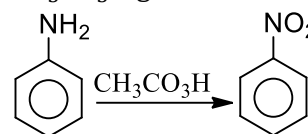
112 (a)

Ethyl amine, on acetylation, gives N-ethyl acetamide.



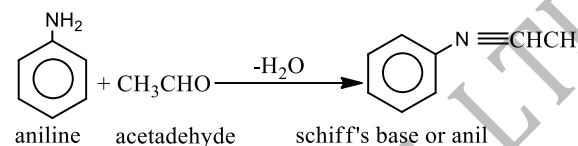
113 (b)

Aniline on oxidation with per acetic acid, $\text{CH}_3\text{CO}_3\text{H}$ gives nitrobenzene



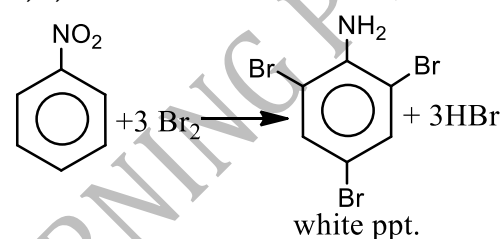
114 (a)

Aniline or any 1° amine reacts with aldehyde to form Schiff's base or anils.

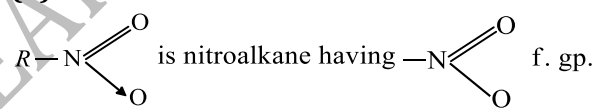


115 (d)

Aniline reacts with bromine and give white ppt. of 2, 4, 6 tribromoaniline.



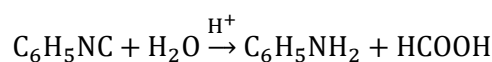
116 (b)



$\text{R}-\text{O}-\text{N}=\text{O}$ is alkyl nitrite having $-\text{O}-\text{N}=\text{O}$ f. gp. ; f. gps are different.

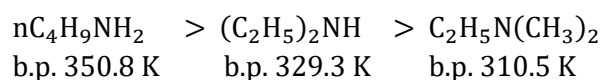
118 (d)

Isocyanide on hydrolysis forms primary amine not ammonia.

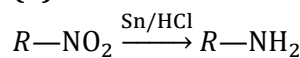


119 (a)

Intermolecular H-bonding is more in primary amines than in secondary amines as there are two H-atom available for H-bonding. Tertiary amines do not have intermolecular H-bonding due to absence of H-atom available for H-bonding. Therefore, the order of boiling points of the given amines is as follows

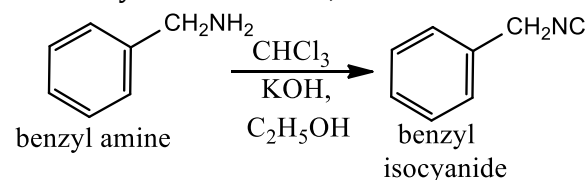


121 (b)

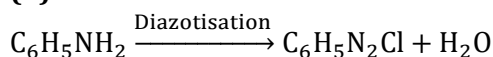


123 (d)

It is carbylamine reaction,



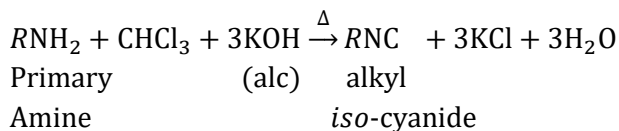
126 (b)



127 (b)

In carbylamines reaction, when a primary amine reacts with chloroform in presence of alc. KOH, it gives iso-cyanide which has abnoxious odour.

This reaction is given by primary amine



128 (c)

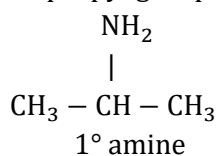
K_2CO_3 is formed in Hofmann's degradation reaction

129 (d)

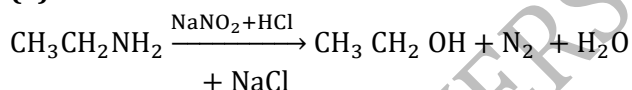
Electron withdrawing groups result in decreased basicity while electron releasing groups increases the basicity. Thus, the order of basic character is $D > A > B > C$

131 (d)

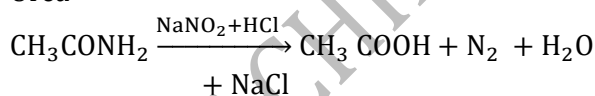
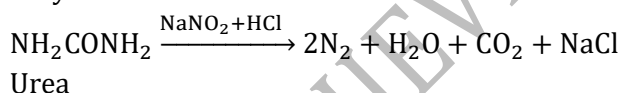
Isopropyl amine is a primary amine because one hydrogen atom of ammonia is replaced by isopropyl group.



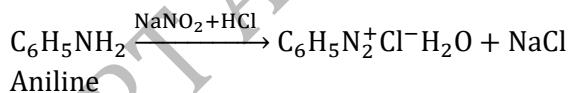
132 (a)



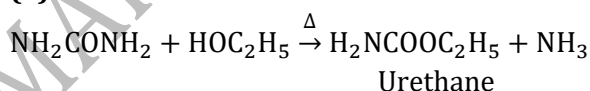
Ethylamine



Acetamide

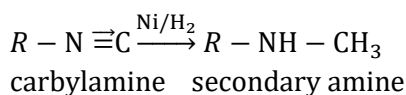


133 (a)



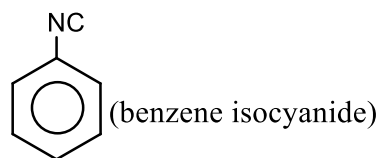
136 (b)

Carbylamine (or isocyanides) give secondary amine on reduction.



137 (a)

Isocyanides (carbylamines) are foul odour compounds.

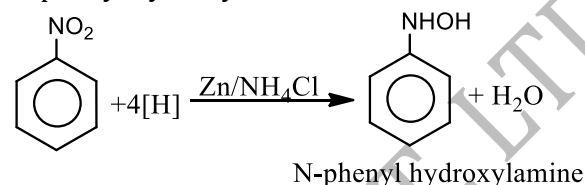


∴

As foul odour

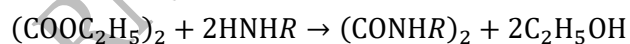
138 (c)

Reduction of nitrobenzene by Zn and NH_4Cl gives N-phenyl hydroxylamine.



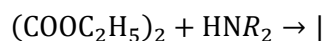
139 (a)

3. In Hofmann method, a mixture of primary, secondary and tertiary amines is treated with diethyloxalate, when primary amine forms solid oxamide, secondary amine forms a liquid oxamic ester whereas tertiary amine remains unaffected.



Diethyl oxalate 1° amine solid

CONR_2



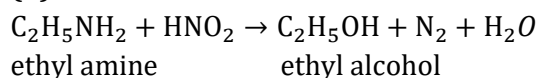
$\text{COOC}_2\text{H}_5 + \text{C}_2\text{H}_5\text{OH}$

2° amine liquid

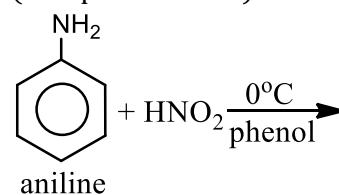


3° amino

141 (b)



(1° aliphatic amine)



1° aromatic amine

∴ Dye test is used to distinguish between

1° aliphatic and

1° aromatic amine

142 (a) Hofmann bromamide degradation takes place with complete retention of stereochemical configuration in the migrating alkyl group

143 (d) $C_6H_5SO_2Cl + RNH_2 \rightarrow RNHSO_2C_6H_5 \xrightarrow{KOH} R-NKSO_2C_6H_5$
Benzene sulphonyl chloride N-alkyl benzene sulphonamide
soluble in KOH

144 (b) The conversion of $-CN$ to $-CH_2NH_2$ by catalytic reduction is called Mendius reaction.

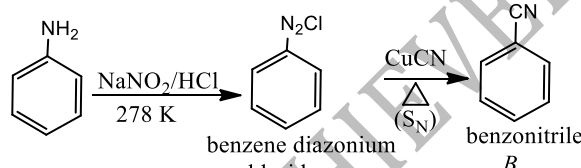
147 (c) $C_2H_5NH_2 \xrightarrow[-N_2]{HNO_2} C_2H_5OH \xrightarrow{PCl_3} C_2H_5Cl \xrightarrow{NH_3} C_2H_5NH_2$

ethyl amine ethanol ethyl chloride ethyl amine
4. (B) (C)

148 (a) Azoxybenzene is the main product when reducing agent used is $Na_3AsO_3/NaOH$

149 (d) C_6H_5COCl has no reaction with carboxylic acids.

150 (d) CH_3NH_3Cl is acidic in nature.

153 (b) 

Formation of *A* is by diazotization and formation of *B* from *A* is by S_N reaction.

154 (a) $RCONH_2 \xrightarrow{P_2O_5} RCN + H_2O$

155 (a) $CH_3CH_2I \xrightarrow{NaCN} CH_3CH_2CN \xrightarrow{OH^-} CH_3CH_2CONH_2$
 $\xrightarrow{Br_2/NaOH} CH_3CH_2NH_2$

157 (c) Amines react with alkyl halide (excess) to give quaternary ammonium salt.

$C_6H_5NH_2 + 3CH_3I \rightarrow C_6H_5N^+(CH_3)_3I^-$

159 (c) Reaction of aniline with benzaldehyde is condensation reaction.

H
|

$C_6H_5-C=O + H_2NC_6H_5 \xrightarrow{\text{Condensation}} C_6H_5CH=NC_6H_5 + H_2O$
Benzaldehyde aniline benzylidene aniline

161 (b) $-\ddot{N}H$ and $-\overset{O}{\parallel}C-$ gp. are *o*- and *p*-directing (activating) and *m*-directing gps. (deactivating) respectively. In such case *o*- (minor) and *p*-isomers (major) predominates.

162 (c) $C_2H_5NH_2$ is stronger base than NH_3 . The presence of alkyl group on N-atom intensifies $-ve$ charge on N-atom and thus, electron pair is donated more readily.

$R-\ddot{N}H_2$ $H-\ddot{N}H_2$
(+ve IE of alkyl gp.)

163 (a) $(CH_3)_4N^+I^- + NaOH \rightarrow (CH_3)_4N^+OH^- + NaI$
 $(CH_3)_4N^+OH^- \xrightarrow{\Delta} (CH_3)_3N + CH_3OH$
methanol

164 (c) Electron deficient group decreases the electron density of N-atom, thus, makes its lone pair less available for donation

165 (d) $C_6H_5NH_2 + Cl-COCH_3 \xrightarrow{NaOH} C_6H_5NHC(=O)CH_3 + HCl$
aniline acetyl chloride acetanilide

166 (d) C_3H_9N represent following structures

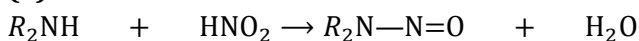
$CH_3CH_2CH_2NH_2$
Propanamine
(1° amine)
H
|
 $CH_3CH_2-N-CH_3$
N-methyl ethanamine
(2° amine)

CH₃
|
 CH_3-N-CH_3
N,N-dimethyl methanamine
(3° amine)

167 (c) Presence of α -H atom is the main condition for exhibiting tautomerism.
The reactant taken in reaction (C) does not

contain any α -H atom, thus the product (Y) will also show the absence of α -H atom, Hence, Y will show tautomerism

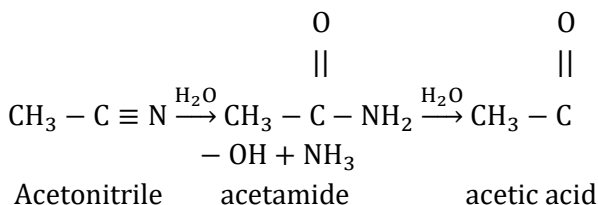
168 (a)



Nitrosoamines are carcinogens.

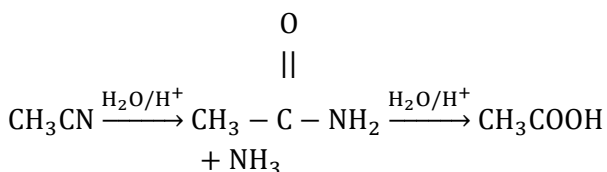
169 (b)

Acetonitriles on hydrolysis produce carboxylic acids with the evolution of ammonia.

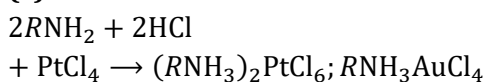


171 (b)

Methyl cyanide gives acetic acid on hydrolysis.



172 (c)

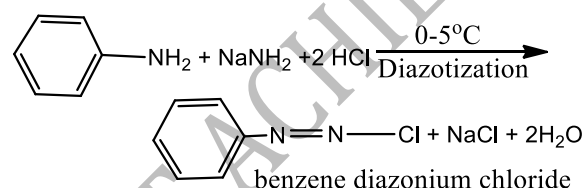


173 (c)

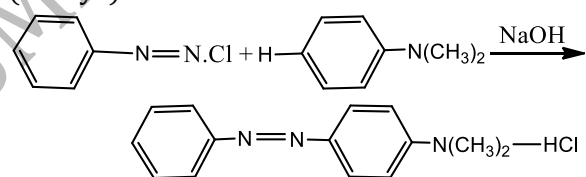
General formula for any amine is $C_nH_{2n+3}N$; also note that for primary amine, it is $C_nH_{2n+1}NH_2$; for secondary amine, it is $C_nH_{2n+2}NH$ and for tertiary amine, it is $C_nH_{2n+3}N$.

174 (c)

Aniline on diazotization in cold (at 0° to $5^\circ C$) gives benzene diazonium chloride.

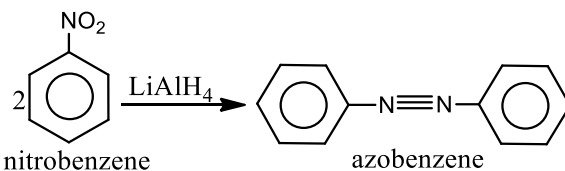


This benzene diazonium chloride on coupling reaction with dimethyl aniline gives a coloured product *i.e.*, *p*-(N, N dimethyl)amino azobenzene (azodye)



176 (c)

Nitrobenzene on reduction with lithium aluminium hydride ($LiAlH_4$) gives azobenzene.



177 (c)

Both gives alkane (RH) with Grignard reagents $RMgX$ due to the presence of acidic hydrogen (N—H)

179 (c)

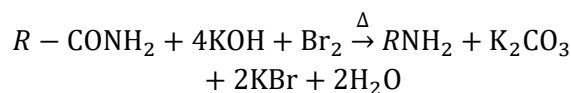
Presence of methyl group increase the electron density on nitrogen. So, increases the basicity. Aniline is weaker base than the primary aliphatic amines and this may be explained by resonance. The lone pair of N is involved in resonance, thus not available for donation. That's why basic strength of aryl amines (aniline) is lowest.

180 (d)

All primary (aliphatic) amines give alcohol with H which forms $CH_3-O-N=O$ and CH_3OCH_3 .

181 (a)

Hofmann bromamide reaction is used to prepare 1° amine from primary amides. In this method, amides are treated with bromine in presence of KOH.



184 (d)

The amines are basic in nature due to presence of lone pair of electron on nitrogen. The 2° amines are basic among 1° , 2° and 3° amines because of steric effect and hydration effect

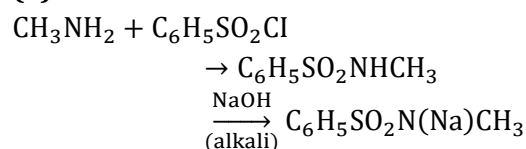
185 (a)

This is carbylamine reaction.

186 (c)

p-amine forms alcohol; *s*-amine forms only nitrosoamine.

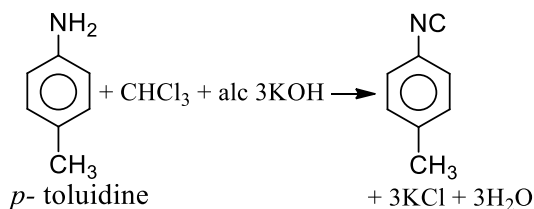
187 (a)



1° amine hinsberg's N-methyl benzene
soluble sodium salt

Reagent sulphonamide

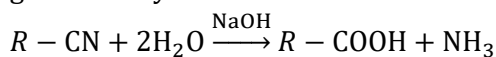
188 (d)



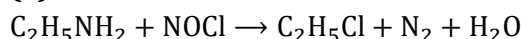
it is a example of carbylamines reaction

189 (a)

Cyanides are hydrolysed either by alkali or acid to give carboxylic acid.

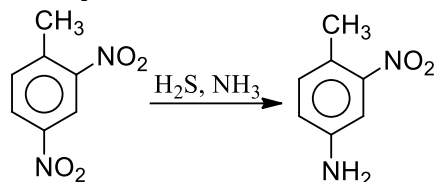


190 (a)



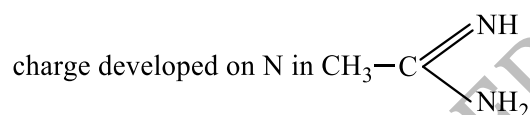
191 (b)

By using H_2S , NH_3 as reagent, selective reduction takes place



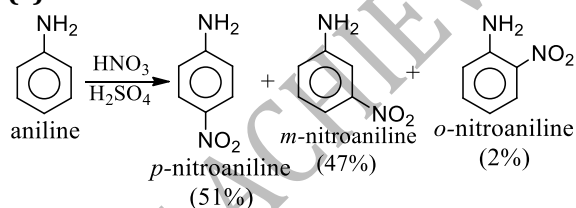
192 (b)

2° amines are more basic than 1° amines due to +ve IE of $-\text{CH}_3$ gp. In amide the resonance give rise to less availability to electron pair for coordination and thus less basic. The negative



due to resonance makes it more basic.

194 (c)

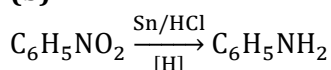


Nitration of aniline also gives *m*-nitro aniline in strong acidic medium because in strong acidic condition protonation of $-\text{NH}_2$ group gives anilinium ion ($+\text{NH}_3$) which is deactivating in nature and of *m*-directive nature

195 (a)

Gabriel's synthesis : Phthalimide is reacted with KOH to form potassium phthalimide. The potassium salt is treated with an alkyl halide. The product *N*-alkyl phthalimide is put to hydrolyse with hydrochloric acid, then primary amine is formed.

196 (b)

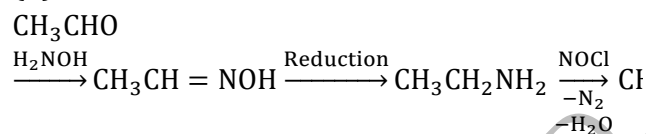


Nitrobenzene Aniline

Nitrobenzene in reduction with Sn and HCl

produce aniline. Hence, 'X' is identified as $-\text{NH}_2$ group.

197 (d)



Acetaldehyde

ethyl amine

ethyl

chloride

(A)

(B)

(C)

199 (b)

$\text{CH}_3\text{CH}_2 - \text{O} - \text{N} = \text{O}$ is a nitrite derivative, hence it is not a nitro derivative.

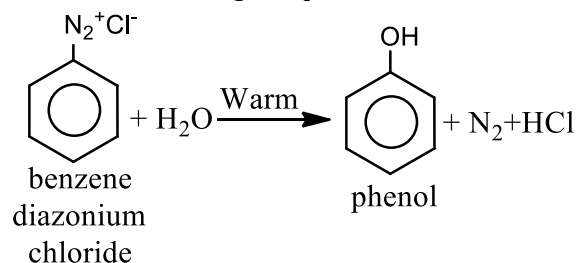
200 (c)

Basic nature of an amine depends upon availability of lone pair on nitrogen atom. If lone pair is easily available the compound would be more basic.

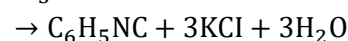
Due to +I effect of methyl group, methyl amine is more basic than ammonia and dimethyl amine is more basic than methyl amine. While aniline is a weaker base than ammonia due to delocalization of lone pair of nitrogen atom at different position.

202 (d)

When aqueous solution of benzene diazonium chloride boiled, it gives phenol.



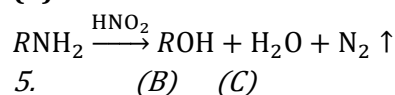
206 (b)



Aniline chloroform phenyl isocyanide

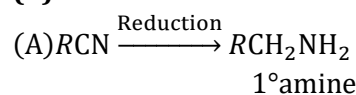
Thus in this reaction phenyl isocyanide is produced. This is called carbylamine reaction.

208 (b)

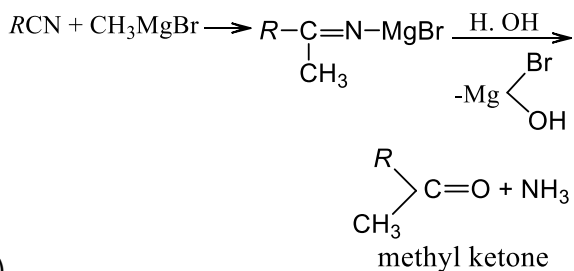


5. (B) (C)

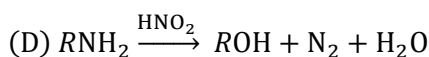
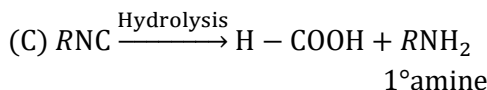
209 (b)



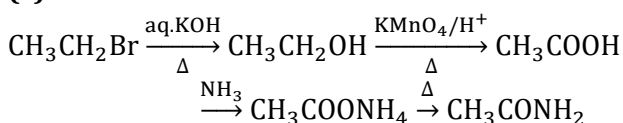
1° amine



(B)



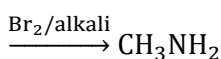
211 (c)



6. Acetic acid
acetamide

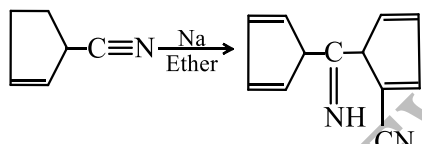
(B)

(C)



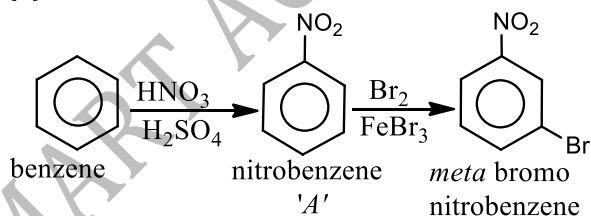
Methyl amine
(D)

212 (b)



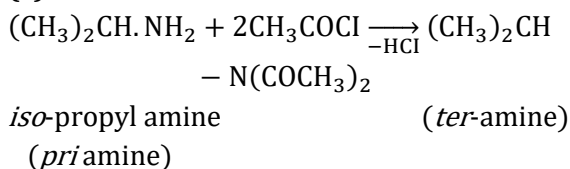
This is Thorpe nitrile condensation involving only α -H-atom of nitrile due to strong attraction nature of CN gp.

213 (a)



$-\text{NO}_2$ is a *meta* directing group. As it is also a deactivating group, so no chance of introduction of second -Br atom.

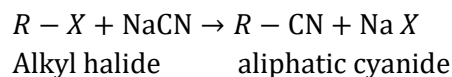
216 (c)



218 (a)



219 (a)



220 (d)

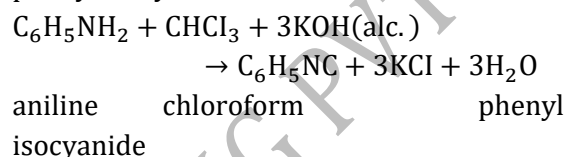
It is not used in purification of water.

223 (d)

The mixture of $\text{SnCl}_2 + \text{HCl}$, reduces, $-\text{CN}$ group partially

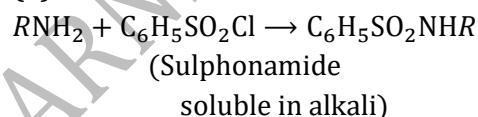
224 (b)

Action of alcoholic caustic potash on chloroform and aniline forms a bad smelling compound phenyl isocyanide.

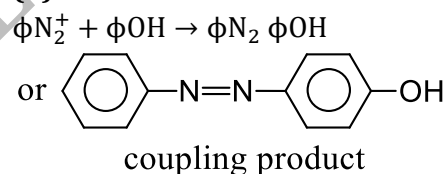


This reaction is called carbylamine reaction and it is actually the test of primary amines.

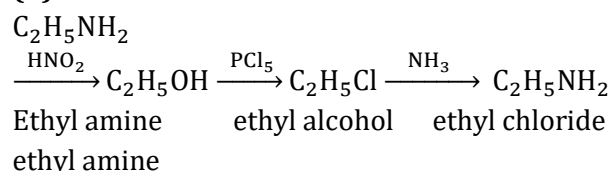
225 (a)



226 (b)



227 (b)



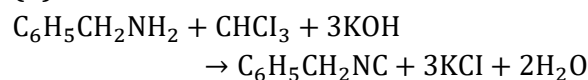
(A)

(B)

228 (a)

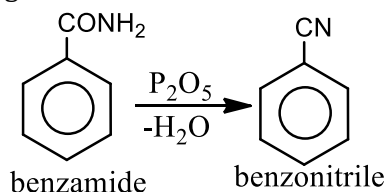
The order of basicity among the following amines is
 $(CH_3)_2NH > (CH_3)_3N > CH_3NH_2 > C_6H_5NH_2$

230 (d)



232 (d)

With P_2O_5 benzamide loses a water molecule and gives benzonitrile.



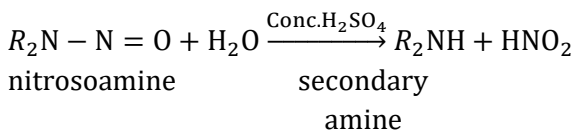
Here, P_2O_5 is a dehydrating agent.

233 (d)

Concentration does not affect the basic strength of amines

234 (c)

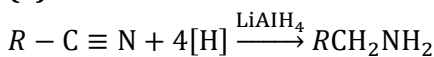
Nitrosoamine on heating with conc. H_2SO_4 gives secondary amine. This reaction is called Liebermann nitroso reaction.



237 (b)

Negative charge developed on N in the resonance hybrid makes it more basic as it loses electron pair readily. Also 2° amine is more basic than 1° amine due to +ve *IE* of alkyl group. In amide the lone pair remains less available due to delocalisation in resonance.

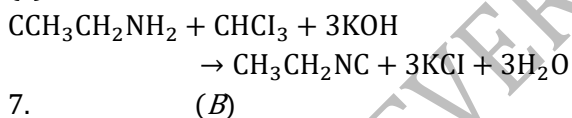
239 (a)



240 (d)

Anilinium hydrogen chloride ($C_6H_5NH_2 \cdot HCl$) gives white precipitate. With $AgNO_3$ solution as it gives Cl^- ion, *p*-chloro aniline has Cl atom attached directly to the nucleus, hence cannot be ionised.

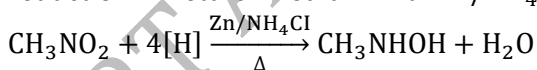
241 (c)



This reaction is known as carbylamine reaction

242 (b)

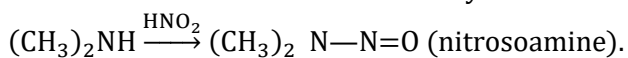
Nitromethane forms methyl hydroxylamine on reduction in neutral medium with Zn/NH_4Cl .



Nitromethane N-methyl hydroxyl amine

243 (b)

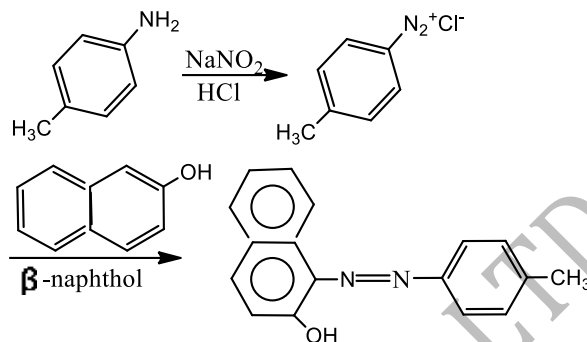
A characteristic reaction of secondary amines.



244 (c)

As we know, benzenediazonium salt forms brilliant coloured dye with β -naphthol, the compound under consideration must be *p*-toluidine (c) as it is a primary aromatic amine.

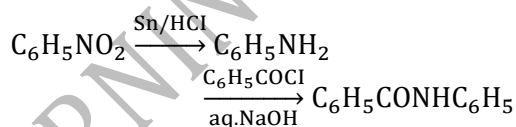
Primary aromatic amine, on treatment with $NaNO_2$ in dil. HCl forms the corresponding diazonium chloride salt.



245 (b)

Hofmann's method is used to separate primary, secondary and tertiary amines. The compound used is diethyl oxalate for this purpose.

246 (b)



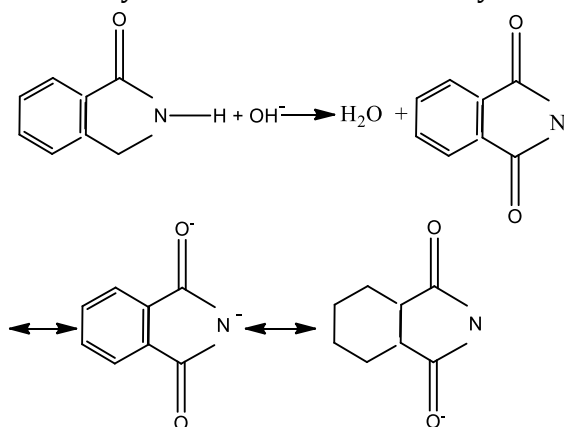
Nitrobenzene aniline benzanilide

247 (b)

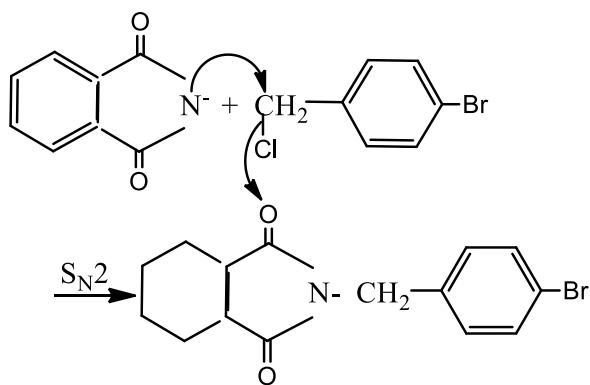
Nitro group goes always to meta position, in aromatic compounds, irrespective to the substituents.

248 (a)

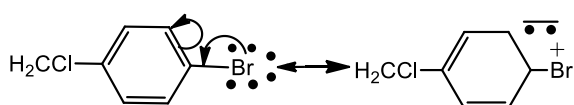
It is the first step of Gabriel's phthalimide synthesis. The hydrogen bonded to nitrogen is sufficiently acidic due to two α -carbonyls.



The conjugate base forms above act as nucleophile in the subsequent step of reaction. As shown above, the nucleophile exist in three resonating form, one may think of oxygen being the donor atom in the nucleophilic attack. However, nitrogen act as donor as it is better donor than oxygen.



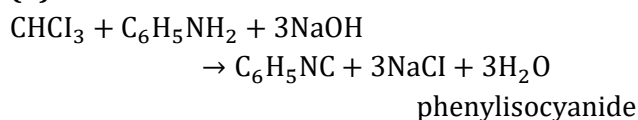
Bromine is not substituted in the above reaction as it is in resonance with benzene ring giving partial double bond character to C – Br bond, hence difficult to break.



249 (d)

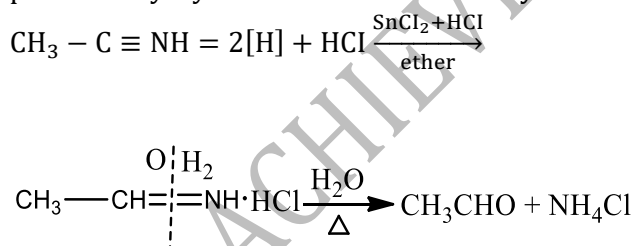
Nitrobenzene is insoluble in water but soluble in benzene alcohol etc.

251 (b)



252 (a)

An alkyl cyanide is dissolved in ether or better in ethyl formate or ethyl acetate, and reduced with SnCl_2 and HCl and then steam distilled. The whole process is called Stephen reaction. In this process alkyl cyanide is reduced to aldehyde.



There is no analogous method for the preparation of ketones.

253 (b)

$\text{CH}_3\text{CH}_2 - \text{O} - \text{N} = \text{O}$ is a nitrite derivative, hence, it is not a nitro derivative

255 (a)

$\text{R} - \text{C} \equiv \text{N}$
 \therefore Alkyl group is attached to carbon.

257 (b)

Only primary amines give positive carbylamine test

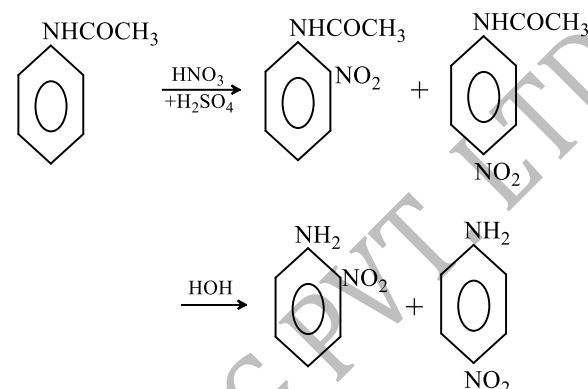
258 (c)

Tertiary amine can be directly oxidised to corresponding nitro compound by KMnO_4 .

259 (b)

Due to +ve IE in alkylamines and resonance in $\text{C}_6\text{H}_5\text{NH}_2$.

261 (b)

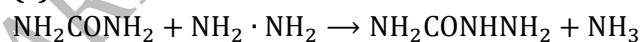


($-\text{NHCOCH}_3$ is *o*- and *p*-directing)

263 (b)



264 (c)



267 (b)



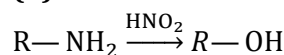
268 (c)

The aqueous solution of urea is neutral in nature but urea behaves as a weak monoacid-base and forms salts with strong acids, e.g.,
 $\text{NH}_2\text{CONH}_2 + \text{HNO}_3 \rightarrow \text{NH}_2\text{CONH}_2 \cdot \text{HNO}_3$
 Urea nitrate

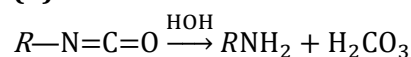
270 (c)

Quaternary ammonium compounds, e.g., $[\text{R}_4\text{N}]^+\text{X}^-$, tetra alkyl amm. halide or $[\text{R}_4\text{N}]^+\text{OH}^-$, tetra alkyl amm. Hydroxide.

271 (b)

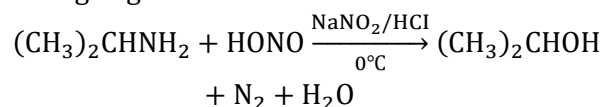


273 (d)



274 (a)

Aliphatic primary amines on treatment with NaNO_2/HCl gives alcohols with evolution of nitrogen gas.



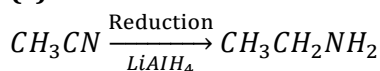
275 (b)

Due to +ve IE in alkylamines and resonance in $\text{C}_6\text{H}_5\text{NH}_2$.

278 (c)

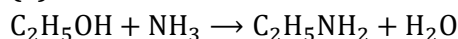


279 (c)



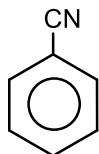
acetonitrile ethanamine

280 (a)



281 (a)

Molecular formula of benzonitrile is C_6H_5CN .



phenyl cyanide or
benzonitrile

282 (a)

Primary amines have tendency of forming H-bonds

283 (b)

Due to +ve *IE* in alkylamines and resonance in $C_6H_5NH_2$.

284 (b)

Only these aromatic primary amines undergo diazotisation in which $-NH_2$ is attached to nucleus.

285 (a)

Due to +ve *IE* in alkylamines and resonance in $C_6H_5NH_2$.

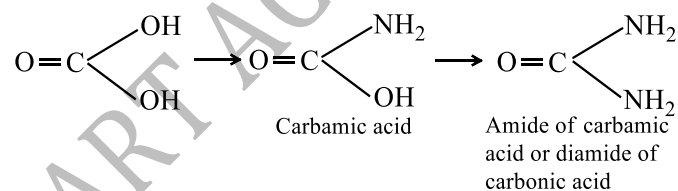
287 (a)

In vapour phase the basic character of methylamines is $3^\circ > 2^\circ > 1^\circ > NH_3$.

This is due to less acidic character in conjugate

291 (b)

Urea is monoamide of carbamic acid or diamide of carbonic acid,

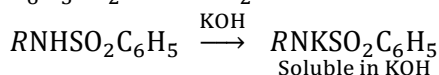
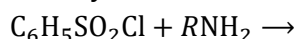


293 (c)

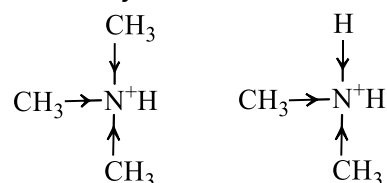
EDTA is ethylenediamine-tetra acetic acid.

295 (a)

Hinsberg reagent $C_6H_5CO_2Cl$ reacts with primary amines and gives alkali soluble benzene sulphonamide; with secondary amine it gives alkali insoluble benzene sulphonamide, with tertiary amines it does not react.



acid of amines because of +ve *IE* of methyl group which disperses +ve charge on N-atom more effectively in 3° ion.

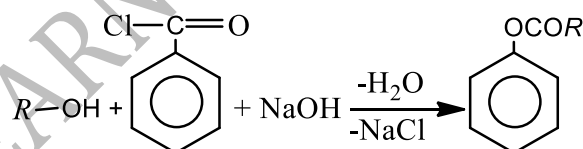


+ve charge on N is more dispersed and thus, more stable.

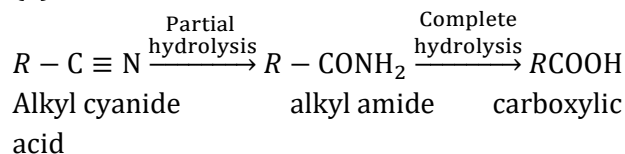
In case of solution phase steric hindrance or solvation effect play role to give the basic order $2^\circ > 1^\circ > 3^\circ > NH_3$.

289 (d)

Compounds having active hydrogen such as, phenols, alcohols, primary or secondary amines and amides show Schotten-Baumann reaction. But tertiary amines do not have active hydrogen, hence, do not undergo Schotten-Baumann reaction.



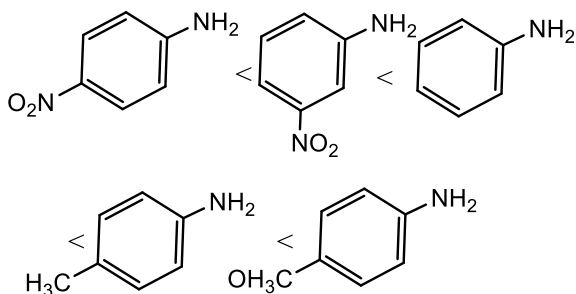
296 (a)



297 (a)

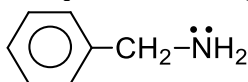
$-OCH_3$ is strongest electron releasing group (+*M* effect) which opposes most the dispersion of lone pair of electron of nitrogen into the ring. Thus, $-OCH_3$ being at *para* position imparts highest basicity. NO_2 being at *meta* position

stabilises the electron pair of nitrogen only by $-I$ effect. While NO_2 being present at *para* position due to $-M$ effect and $-I$ effect stabilizes the lone pair of electron of nitrogen, most and impart least basicity.



298 (d)

Benzyl amine is the strongest base among the given compounds because lone of $\ddot{\text{N}}$ are not taking part in conjugation whereas in other compounds lone pairs are taking part in conjugation



299 (b)

Basicity of amines increases with increasing $+I$ effect of alkyl group. 3° amine has greater $+I$ effect than 2° and 1° amines but less basic than these, due to steric hindrance of bulky groups. Moreover, benzyl amine is a weaker base than aliphatic amines. Hence, the following compounds has the order of basicity.

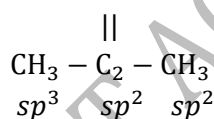
$\text{CH}_3\text{NH}_2(1^\circ)$, $(\text{CH}_3)_2\text{NH}(2^\circ)$, $(\text{CH}_3)_3\text{N}(3^\circ)$, $\text{C}_6\text{H}_5\text{CH}$

I II III IV
 $\text{II} > \text{I} > \text{III} > \text{V}$

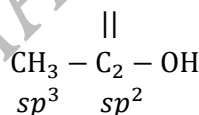
300 (c)

8.

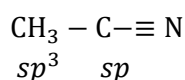
0



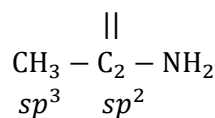
(b) 0



(c)



(d) 0



Acetonitrile does not contain sp^2 hybridised carbon.

301 (c)

Availability of lone pair on N-atom (Lewis concept),

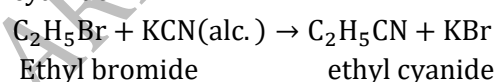
$\text{RNH}_2 + \text{H}_2\text{O} \rightarrow \text{RNH}_3^+ + \text{OH}^-$ (Bronsted concept proton acceptor).

302 (b)

The order for acidic nature depends upon the ease to lose H^+ ion. $-\text{COOH}$ is resonance stabilized and thus lose H^+ at the earliest. Also NH_3^+ near to $-\text{COOH}$ releases H^+ more easily due to electron withdrawing nature of $-\text{COOH}$ than NH_3^+ far away from $-\text{COOH}$.

303 (b)

Ethyl bromide reacts with KCN to give ethyl cyanide.



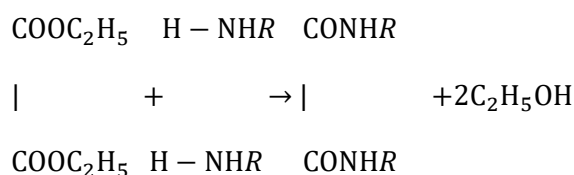
305 (c)

Carbylamine reaction is used to prepare isocyanides.

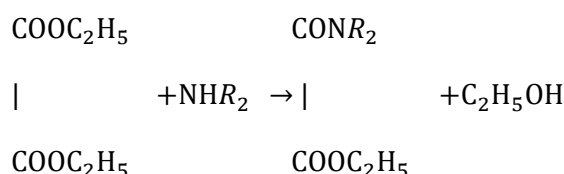
306 (b)

Dimethyl oxalate is used for distinguishing primary, secondary and tertiary amines (Hofmann's method).

9. The primary (1°) amine forms the corresponding substituted oxamide which is usually a crystalline solid.



10. The secondary amine forms a diethyl oxamic ester which is generally a liquid.



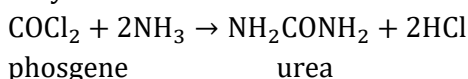
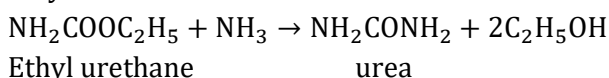
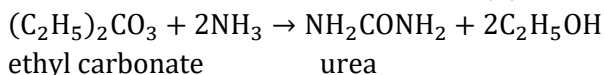
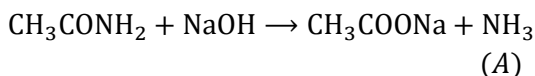
11. The tertiary amine under these conditions does not react at all since it does not

contain a replaceable hydrogen atom.

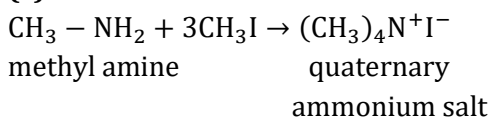
307 (b)

C_3H_8O is alcohol and $C_3H_6O_2$ is acid. Thus, C_3H_9N is

308 (d)



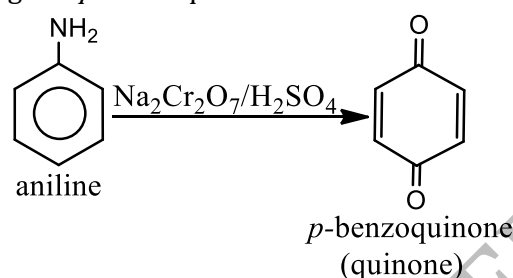
311 (c)



therefore, 3 moles of CH_3I (methyl iodide) are required for reaction with methyl amine.

312 (d)

Aniline on oxidation with $Na_2Cr_2O_7$ and H_2SO_4 gives *p*-benzoquinone.



313 (d)

Presence of electron withdrawing group like $-CN$, $-CHO$, $-NO_2$ etc decreases the electron density over N-atom of amines, and thus decreases their basic character as lone pair is less available for donation

314 (b)

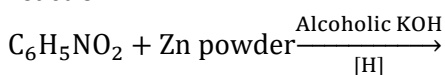
Secondary and tertiary amines fail to undergo the carbylamine test because they react with alcoholic KOH.

317 (b)

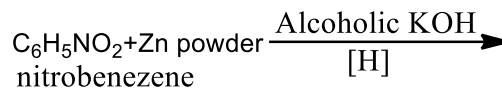
Due to +ve IE of alkyl gp., N-atom of amines acquires partial -ve charge and thus, electron pair is easily donated.

319 (b)

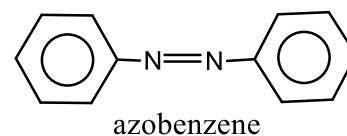
Aniline is not obtained as a major product by the reaction.



Nitrobenzene



nitrobenzene

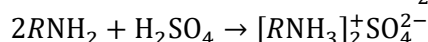


321 (d)

Bases react with acid to form salt.

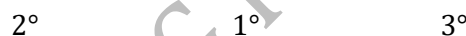
∴ Amines are basic in nature.

∴ It forms salt on reaction with H_2SO_4



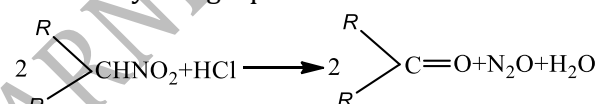
322 (c)

In aqueous solution, basicity order
dimethyl amine > methyl amine > trimethyl amine > aniline



326 (a)

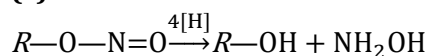
Secondary nitroalkanes can be converted into ketones by using aqueous HCl.



327 (d)

$(C_2H_5)_2\ddot{N}H$ (2° amine) is strongest base. Basic nature of amines due to presence of lone pair of electron on nitrogen atom which is available for the bond formation with Lewis acid. Due to the +I effect 2° amine is better base than 1° amine and NH_3 . In case of aromatic amines the lone pair on nitrogen atom involved in resonance, therefore, not available for bond formation, so aromatic amines are less basic.

328 (c)



330 (a)

$N \equiv C-CH=CH-C \equiv N$; It has five π -bonds.

331 (c)

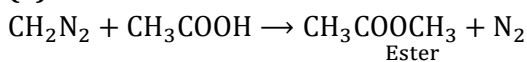
The basic character of amines depends upon the capacity nitrogen atom to donate an electron pair. More the ability of nitrogen atom to donate electron pair, more will be the basic character. In presence of electron releasing groups (+I showing group, $-CH_3$) the basic character of amines increases due to more availability of electrons on nitrogen atom.

Tertiary amines are least basic due to steric hindrance caused by three bulky alkyl groups.

∴ The order of basic character is



332 (a)

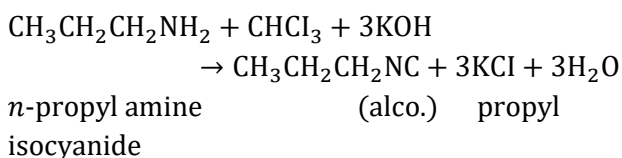


333 (b)

The name of isocyanides is carbylamine, and when it is attached with an alkyl group, the compound is called alkyl carbylamine, *i.e.*, RNC.

334 (c)

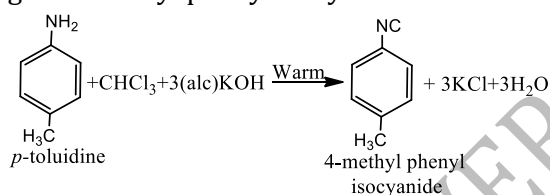
Primary amines react with alc alkali and chloroform to give an offensive odour compound *i.e.*, isocyanide. This reaction is called carbylamine reaction.



335 (c)

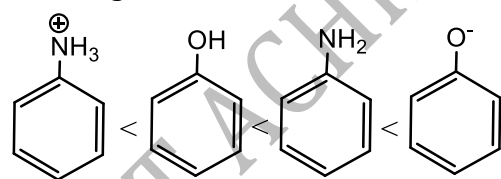
Aliphatic and aromatic primary amines on warming with CHCl_3 and alcoholic KOH form isocyanide or carbylamine which has very unpleasant smell. This reaction is known as carbylamine reaction.

Since *p*-toluidine contains an aromatic primary amine group, it undergoes similar reaction and give 4-methyl phenyl isocyanide.



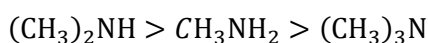
336 (a)

Coupling of diazonium salts takes place in the following order as

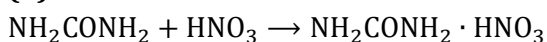


338 (d)

Basicity of amines depends upon the availability of lone pair of electrons of nitrogen for donation. Electron releasing group increases the electron density over nitrogen, thus increases the basic character. 3° methyl amine although contains three electron releasing groups but is least basic because of steric hindrance. Hence, the order of basic character is



341 (b)

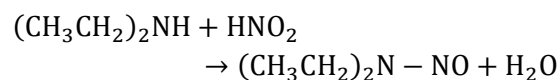


344 (d)

Nitrene is not the intermediate of Gabriel's phthalimide reaction

347 (d)

Secondary amines give oily nitrosoamine with nitrous acid



Secondary amine nitrous acid oily nitrosoamine

348 (b)

Biuret test is given by compounds having $-\text{CONH}_2$ gp.

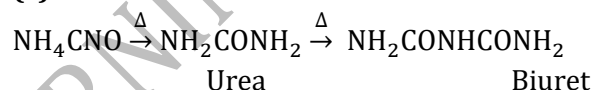
349 (d)

Benzyl amine is most basic because positive inductive effect (+I) increases due to presence of methylene group.

350 (a)

Due to sp^3 -hybridisation and lone pair of electron (like NH_3)

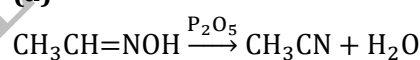
351 (c)



352 (c)

Tertiary amines do not have replaceable H-atom.

353 (a)



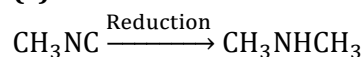
354 (b)

H-atom of C_6H_6 ring is replaced by S_E reactions

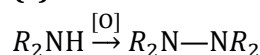
356 (b)

Less substituted alkene is the main product

357 (c)

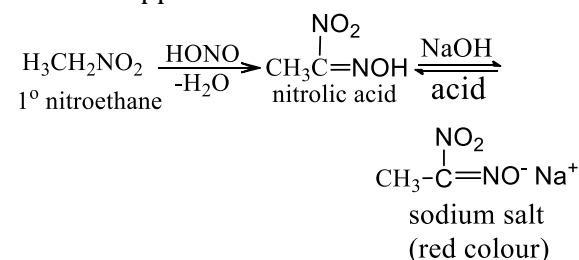


360 (c)



361 (a)

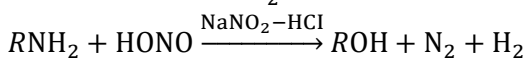
Primary nitro alkanes when treated with nitrous acid from nitrolic acid which when dissolve in alkali gives, salt of nitrolic acid which is red in colour. In excess of acid, the salt dissociated, thus colour disappears while in excess of alkali the red colour reappears



363 (b)

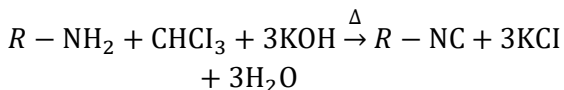
1^oaliphatic amines on reduction with HNO_2 form

alcohol and evolve N_2 .



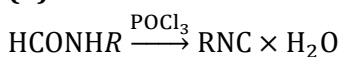
365 (a)

Primary amines on heating with chloroform and ethanolic KOH, give alkyl isocyanide. This reaction is called carbylamine reaction.



1° amine alcohol alkyl isocyanide

367 (b)



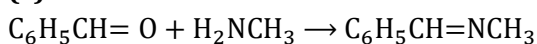
368 (b)

—CN and —NC are different functional groups.

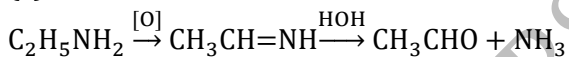
369 (a)

As the molecular mass increase, boiling point increases. In case of isometric amines, however, as the number of H-atoms attached directly to N-atom decreases, boiling point decreases because tendency to form H-bonds decreases. Hence, the order of boiling points of given amines is $CH_3NH_2 < (CH_3)_3N < CH_3CH_2N(NH_3) < CH_3CH_2CH_2NH_2$

370 (c)



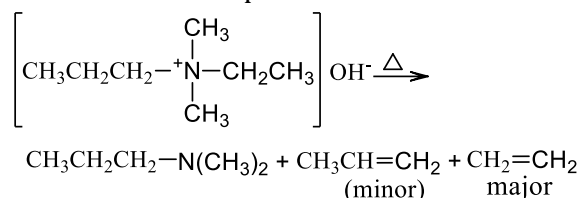
372 (c)



373 (c)

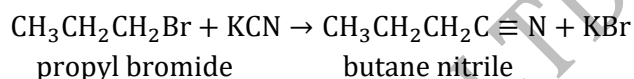
In Hofmann elimination reaction, less substituted

alkene is the main product



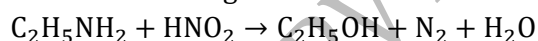
375 (a)

When propyl bromide is reacted with KCN, butanenitrile is formed.



376 (b)

Ethyl amine reacts with nitrous acid to give ethyl alcohol and nitrogen.



377 (c)

Carbylamine reaction is given by only primary amines (both aliphatic and aromatic). In this reaction a primary amine reacts with chloroform in basic medium, to form a very bad smelling compound, called carbylamines

