CHEMISTRY

BOOKS - G.R. BATHLA & SONS CHEMISTRY (HINGLISH)

ORGANIC COMPOUNDS CONTAINING NITROGEN

EXAMPLES

1. Write the names and structures of four isomeric amines having molecular formula $C_{13}H_9N$

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2. Write the structures of eight isomeric amines having the molecular formula $C_4H_{11}N$

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3. Write the structures of isomeric amines with molecular formula C_7H_9N.

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4. Triemethylamine is less basic than dimethylamine or methylamine. Explain why it is so ?

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5. How will you differentiative between

(a) aniline and ethylamine (aromatic and aliphatic amines)?

(b) aniline and benzylamine?

(c)aniline (1°), methylaniline (2°) and dimethylaniline (3°)?

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6. Why p-nitroaniline is less basic then aniline

(b) Aniline dissolves in HCl.

(c).Aniline undergoes bromination in orhto and para position but in presence of strong acid it gives m-bromo aniline.

(d) Why aniline does not undergo Friedel-Craft reaction?

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7. Draw the product formed in each reaction.

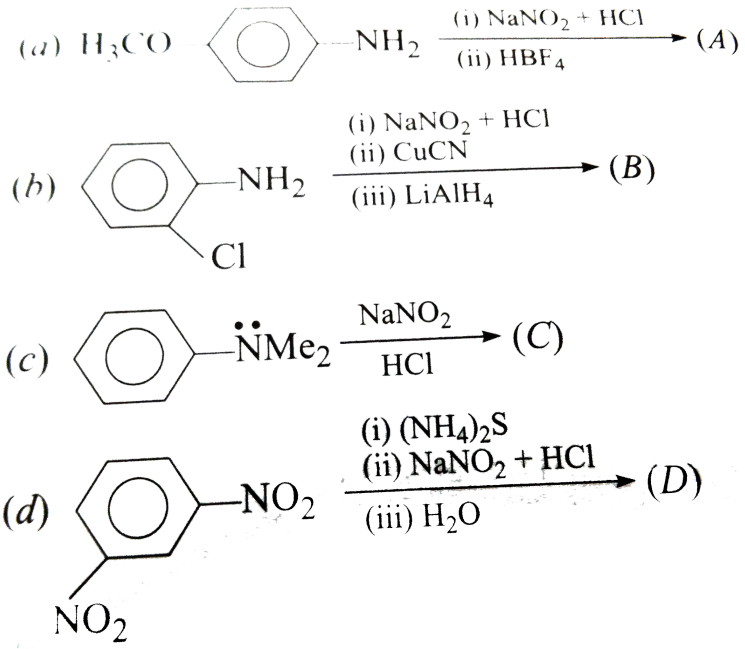

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ILLUSTRATION

1. Which of the following would undergo Hofmann's reaction to give a primary amine?

A. $RCONH_2$

B. $RCONHCH_3$

C. $RCOCl$

D. $RCOOR$

Answer: A

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2. Hinsberg's reagent is used to distinguish between:

A. 1° and 2° amines

B. 2° and 3° amines

C. a and b

D. none of these

Answer: C

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3. Which on reduction does not give primary amine?

A. CH_3CN

B. C_2H_5NC

C. CH_3CONH_2

D. All of these

Answer: B

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4. Primary amine+aldehyde $\rightarrow X$, What is X?

A. Nitro

B. Nitrosobenezene

C. Amino

D. Iminio

Answer: D

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5. Complete the following reaction:

$RNH_2 + H_2SO_4 \rightarrow$

A. $[RNH_3]^+ HSO_4^-$

B. $[RNH_3]_2^+ SO_4^{2-}$

C. $RNH_2 . H_2SO_4$

D. No reaction

Answer: B

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6. Acetamide any and ethy1 amine can distinguished by reacting with .

A. Br_2 water

B. acidic $KMnO_4$

C. aq. NaOH and heat

D. aq. HCl and heat

Answer: C

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

A. Alkyl nitrile

B. Carbylamine

C. Primary amine

D. Secondary nitro compound

Answer: B

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8. The basic of compounds I, II, III and IV

$\underset{I}{CH_3NH_2}, \underset{II}{(CH_3)_2NH}, \underset{III}{(CH_3)_3N}, \underset{IV}{C_6H_5CH_2NH_2}$

varies in the order.

A. $I > II > III > IV$

B. $II > I > III > IV$

C. $III > I > II > IV$

D. $IV > I > II > III$

Answer: B

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9. The end product of the reaction,

Ethyl amine $\xrightarrow{HNO_2}(A)\xrightarrow{PCl_5}(B)\xrightarrow{KCN}(C)\ (C)$ is,

A. propane nitrile

B. triethylamine

C. diethylamine

D. propylamine

Answer: A

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10. Tertiary alcohol on treatment with cyanide in presence cone. H_2SO_4 gives corresponding primary amine. T reaction is called as:

A. Schmidt reaction

B. Curtius degradation

C. Leuckart reaction

D. Ritter reaction

Answer: D

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11. Which of the following functional groups undergoes hydrolysis with alkali to yield an acid group

A. $-CHO$

B. $-CN$

C. $-COCH_3$

D. $-Br$

Answer: B

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12. N-ethyl formamide on dehydration with $POCI_3$ in presence of pyridine gives:

A. ethylamine

B. ethyl cyanide

C. ethyl isocyanide

D. methyl isocyanide

Answer: C

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13. Ethyl isocyanide on reduction with sodium and alcohol gives:

A. ethylamine

B. propylamine

C. dimethylamine

D. ethyl methylamine

Answer: D

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14. Cyanide is an:

A. Zwitterion

B. cation

C. ambident nucleophile

D. electrophile

Answer: C

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15. Acid hydrolysis of methyl isocyanide gives:

A. $CH_3NH_2 + HCOOH$

B. $CH_3NH_2 + CH_3COOH$

C. $C_2H_5NH_2 + HCOOH$

D. $CH_3NH_2 + CH_3CH_2COOH$

Answer: A

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16. Which of the following reagents can be used to prepare ethyl carbylarnine from ethyl iodide?

A. KCN

B. AgCN

C. CuCN

D. HCN

Answer: B

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17. Acetaldoxirne reacts with phosphorus pentoxide to give:

A. Methyl cyanide

B. methyl cyanate

C. ethyl cyanide

D. none of these

Answer: A

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18. Which of the following products is obtained when methyl isocyanide reacts with chlorine?

A. $CH_3N = CCl_2$

B. $CH_3NCl - CCl_2$

C. $CICH_2NC$

D. Cl_2CHNC

Answer: A

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19. Nitroethane on reduction with zinc dust and ammoniun chloride gives:

A. ethanamine

B. N-ethyl hydroxyl amine

C. ethyl nitrite

D. nitroso ethane

Answer: B

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20. Hydrolysis of $CH_3CH_2NO_2$ with 85% H_2SO_4 gives:

A. CH_3CH_2OH

B. C_2H_6

C. $CH_3CH = NOH$

D. CH_3COOH

Answer: D

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21. 2-Nitropropane on hydrolysis with boiling concentrate solution of HCI gives:

A. propane

B. propanal

C. propanone

D. propanoic acid

Answer: C

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22. Primary nitro compounds react with nitrous acid to form nitrolic acids which dissolve in sodium hydroxide to give

A. yellow solution

B. blue solution

C. Colourless solutio

D. red solution

Answer: D

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23. The different behaviour of nitrous acid with $1^\circ, 2^\circ$ and 3° nitroalkanes forms the bases of:

A. Victor Meyers test

B. Lucas test

C. Baker-Mulliken's test

D. Nef-Carbonyl synthesis

Answer: A

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24. In Nef-Carbonyl synthesis, primary nitroalkanes treatment with NaOH followed by acidification with 50%, H_2SO_4 gives:

A. aldehydes

B. ketones

C. ketoacids

D. esters

Answer: A

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25. Ethyl nitrite on reduction with Sn/HCI gives:

A. $C_2H_5NH_2 + HNO_2$

B. $C_2H_5NH_2 + H_2O$

C. $C_2H_5OH + NH_4OH$

D. $C_2H_5OH + NaNO_2$

Answer: C

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26. Which of the following isomerism is exhibited in nitroethane

A. Geometrical isomerism

B. Optical isomerism

C. Functional isomerism

D. Space isomerism

Answer: C

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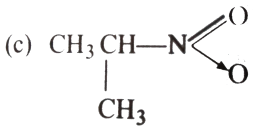
27. Which of the following is nitroproduct?

A. $C_6H_5NO_2$

B. CH_3CH_2ONO

C. 

D. $C_6H_4(OH)NO_2$

Answer: B

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PROBLEMS FOR PRACTISE

1. Complete the following equations.

(i) $CH_3NH_2 + CHCl_3 + KOH \xrightarrow{\text{Heat}}$

(ii) $R-\overset{\overset{O}{\|}}{C}-H + N_3H \xrightarrow{H_2SO_4}$

(iii) $C_2H_5NH_2 + C_2H_5I(\text{excess}) \longrightarrow$

(iv) $C_2H_5NH_2 + NaNO_2 + HCl \longrightarrow$

(v) $CH_3CONH_2 + Br_2 + NaOH \longrightarrow$

(vi) $C_2H_5NH_2 + CH_3COCl \longrightarrow$

(vii) $CH_3CN + CH_3MgBr \xrightarrow[H_2O]{H^+}$

(viii) $C_2H_5NC + H_2O \xrightarrow{\text{dil. HCl}}$

(ix) $C_2H_5NH_2 + AgCl \longrightarrow$

(x) $EtNH_2 + KCN + Br_2 \xrightarrow{KOH} KBr + (D)$

(xi) $C_2H_5NCO + 2KOH \longrightarrow$

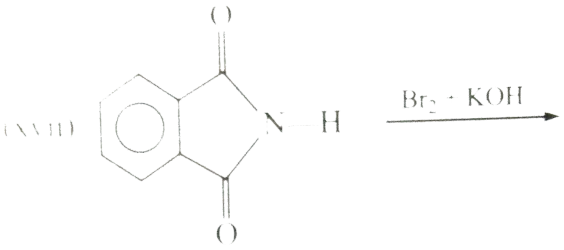
(xii) $CH_3CH{=}NOH + 4H \xrightarrow{Na\ C_2H_5OH}$

(xiii) $R_2NCN \xrightarrow{H_2O}$

(xiv) $X + 4H \xrightarrow{\text{Catalytically}} R\text{—}NHCH_3$

(xv) $X \xrightarrow{\text{Thermal decomposition}} (CH_3)_3N + CH_3OH$

(xvii) 

(xviii) 

(xviii) $X \xrightarrow[(NaOH)]{Heat} ON\text{—}C_6H_4\text{—}OH + (C_2H_5)_2NH$

(xix) $(CH_3)_2CH\text{—}NH_2 + 2HCHO + HCOOH \xrightarrow{Heat}$

(xx) $(CH_3)_3C\text{—}OH + HCN + H_2SO_4 \xrightarrow{Heat}$

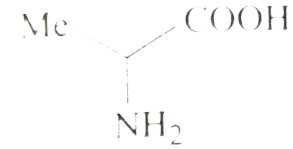
(xxi) $CH_3CH_2NH_2 \xrightarrow[\Delta]{(CH_3CO)_2O}$

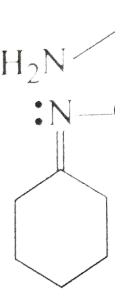
(xxii) $\begin{matrix} Et \\ Et \end{matrix}\!\!>\!\!=O + HCON(Me)_2 \xrightarrow{\Delta}$

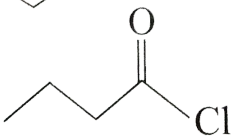
(xxiii) $CH_3\text{—}\overset{\overset{O}{\|}}{C}\text{—}NH\text{—}OH \xrightarrow[(ii)\ HOH]{(i)\ ^-OH}$

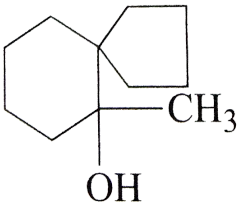
(xxiv) $CH_3CN + (CH_3)_3C\text{—}OH \xrightarrow{conc.\ H_2SO_4}$

(xxvi) $CH_3CH_2N(CH_3)_2$ $\xrightarrow[\text{(ii) } \Delta]{\text{(i) } H_2O_2 \text{ or } H_2SO_4}$

(xxvii)  $\xrightarrow{\text{Heat}}$

(xxviii)  $\xrightarrow{H_2SO_4}$

(xxix)  $\xrightarrow[\text{(iii) } CH_3OH]{\text{(i) } NaN_3 \text{ (ii) } \Delta, CHCl_3,}$

(xxx)  $\xrightarrow[\text{(ii) } H^+/H_2O]{\text{(i) } CH_3CN, H_2SO_4}$

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2. Complete the following equations.

(i) $C_6H_5NH_2 + CH_3COCl \xrightarrow{\text{Base}}$

(ii) $C_6H_5CONH_2 + Br_2 \quad KOH \longrightarrow$

(iii) $C_6H_5NH_2 \xrightarrow{Br_2, \text{ water}}$

(iii) $C_6H_5NH_2$

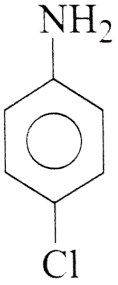
(iv) $C_6H_5NO_2 \xrightarrow{Sn/HCl}$

(v) $C_6H_5N_2Cl + H_3PO_2 + H_2O \longrightarrow$

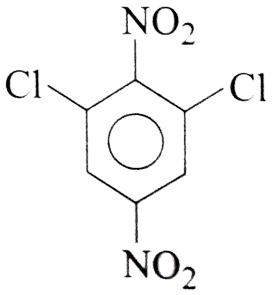
(vi) $C_6H_5N_2Cl \xrightarrow{Cu_2Cl_2/HCl}$

(vii) $C_6H_5N_2Cl + C_6H_5OH \longrightarrow$

(viii) $C_6H_5NH_2 \xrightarrow{H_2SO_4(conc.)}$

(ix) 

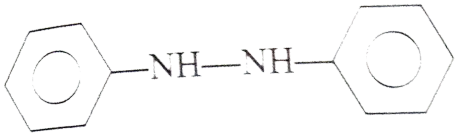
$\xrightarrow{CF_3CO_3H}$

(x) 

$\xrightarrow{OMe^-}$

(xi) 

$\xrightarrow{NaNO_2 + HBF_4}$

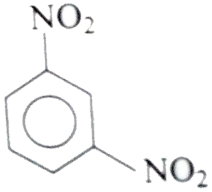
(xii)  $\xrightarrow[313K,\ 15\ atm.]{H_2,\ Ni}$

(xiii) $C_6H_5N_2Cl \xrightarrow[(ii)\ NaNO_2,\ Cu,\ \Delta]{(i)\ HBF_4}$

(xiv) $C_6H_5N(CH_3)_2 \xrightarrow[(ii)\ HOH,\ OH^-]{(i)\ HNO_2,\ HCl}$

(xv) $C_6H_5C{\equiv}N \xrightarrow[(ii)\ H_2O,\ boil]{(i)\ SnCl_2/HCl,\ ether}$

(xvi)  $\xrightarrow[\Delta]{KOH(solid)}$

(xvii)  $\xrightarrow[K_3Fe(CN)_6]{NaOH}$

(xviii)  $\xrightarrow[H_2SO_4(conc.)\ at\ 293\ K]{HNO_3(conc.)}$

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3. Name (A), (B), (C)…. In the following equations

(i) $CH_3CH_2COOH \xrightarrow{NH_3} (A) \xrightarrow{Heat} (B) \xrightarrow{Br_2/KOH} (C)$

(ii) $CH_3CH_2NH_2 \xrightarrow[H^+]{C_6H_5CHO} (A) \xrightarrow[\text{or } NaCNBH_3]{H_2/Ni, \Delta} (B)$

(iii) $C_2H_5NH_2 \xrightarrow{HNO_2} (A) \xrightarrow{[O]} (B) \xrightarrow{[O]} (C) \xrightarrow[H_2SO_4]{N_3H} (D)$

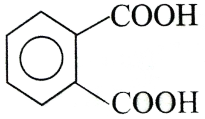
(iv) $CH_3CH_2Cl \xrightarrow{KCN} (A) \xrightarrow{H_2/Ni} (B) \xrightarrow{HNO_2} (C)$

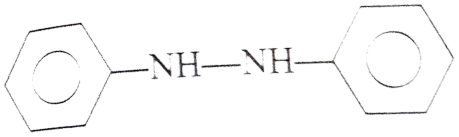
(v) $(A) \xrightarrow[NaOH]{Br_2} (B) \xrightarrow{HNO_2} (C) \xrightarrow[I_2]{\text{Red P}} CH_3I$

(vi) $(A) \xrightarrow{AgCN} (B) \xrightarrow{Sn/HCl} (C) \xrightarrow{HNO_2} C_2H_5N(N{=}O)-CH_3$

(vii) $PhSO_2Cl + EtNH_2 \xrightarrow[(-HCl)]{} (A) \xrightarrow{NaOH} (B) \xrightarrow{Et\ Br} (C) \xrightarrow{H_3O^+} (D) + (E)$

(viii) $RCH_2CH_2NH_2 \xrightarrow{MeI(excess)} (A) \xrightarrow{AgOH} (B) \xrightarrow{Heat} (C)$

(ix)  $+ NH_3 \xrightarrow{Heat} (A) \xrightarrow[(ii)\ RI]{(i)\ KOH} (B) \xrightarrow{H_2O} (C) + (D)$

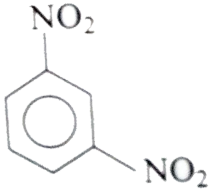
(xii)  $\xrightarrow[313K,\ 15\ atm.]{H_2,\ Ni}$

(xiii) $C_6H_5N_2Cl \xrightarrow[(ii)\ NaNO_2,\ Cu,\ \Delta]{(i)\ HBF_4}$

(xiv) $C_6H_5N(CH_3)_2 \xrightarrow[(ii)\ HOH,\ OH^-]{(i)\ HNO_2,\ HCl}$

(xv) $C_6H_5C{\equiv}N \xrightarrow[(ii)\ H_2O,\ boil]{(i)\ SnCl_2/HCl,\ ether}$

(xvi)  $\xrightarrow[\Delta]{KOH(solid)}$

(xvii)  $\xrightarrow[K_3Fe(CN)_6]{NaOH}$

(xviii)  $\xrightarrow[H_2SO_4(conc.)\ at\ 293\ K]{HNO_3(conc.)}$

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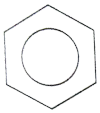
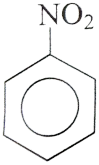
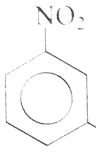
4. Identify the unknown compounds.

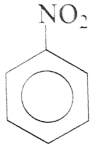
(a)  $\xrightarrow[H_2SO_4,\ 323K]{HNO_3}$ (A) $\xrightarrow[FeBr_3]{Br_2}$ (B) $\xrightarrow[HCl]{Sn}$ (C)

(b)  $\xrightarrow[H_2SO_4,\ 323K]{HNO_3}$ (A) $\xrightarrow[H_2SO_4,\ 373K]{HNO_3}$ (B) $\xrightarrow{(NH_4)_2S}$ (C)

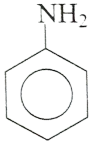
(c) 

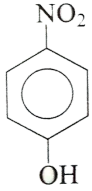
$\xrightarrow[HCl]{Sn}$ (A) $\xrightarrow[HCl,\ 273K]{NaNO_2}$ (B) $\xrightarrow[\Delta]{H_2O}$ (C)

(d)  $\xrightarrow{(NH_4)_2S}$ (A) $\xrightarrow[HCl,\ 273K]{NaNO_2}$ (B) $\xrightarrow[HCl]{Cu_2Cl_2}$ (C)

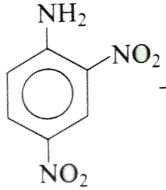
(e)  $\xrightarrow{Br_2/Fe}$ (A) $\xrightarrow{Sn+HCl}$ (B) $\xrightarrow[273\text{-}278K]{NaNO_2+HCl}$ (C)

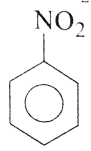
$\xrightarrow[HCl]{Cu_2Cl_2}$ (D)

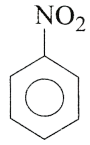
(f)  $\xrightarrow[273\text{-}278K]{NaNO_2/HCl}$ (A) $\xrightarrow[(warm)]{H_2O}$ (B) $\xrightarrow[KOH]{CHCl_3}$ $(C) + (D)$

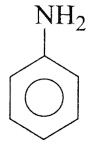
(g)  $\xrightarrow[OH^-]{(C_2H_5)_2SO_4}$ (A) $\xrightarrow{Zn/HCl}$ (B) $\xrightarrow[278K]{NaNO_2/HCl}$ (C)

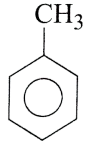
$\xrightarrow{C_6H_5OH}$ (D)

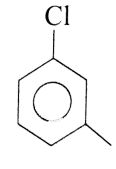
(h)  $\xrightarrow[278K]{NaNO_2/HCl}$ (A) $\xrightarrow{Anisole}$ (B)

(i)  $\xrightarrow{Sn/HCl}$ (A) $\xrightarrow[273\ K]{NaNO_2/HCl}$ (B) $\xrightarrow{SnCl_2/NaOH}$ (C)

(j)  $\xrightarrow[FeCl_3]{Cl_2}$ (A) $\xrightarrow{Sn/HCl}$ (B) $\xrightarrow[278\ K]{NaNO_2/HCl}$ (C) $\xrightarrow{H_2O}$ (D)

(k)  $\xrightarrow[273\ K]{NaNO_2/HCl}$ (A) $\xrightarrow{KCN}$ (B) $\xrightarrow{LiAlH_4}$ (C)

(l)  $\xrightarrow[conc.\ H_2SO_4]{conc.\ HNO_3}$ (A) $\xrightarrow[\Delta]{conc.\ H_2SO_4}$ (B) $\xrightarrow[(ii)\ H^+]{(i)\ NaOH\ fuse}$ (C)

(m)  $\xrightarrow[\Delta]{\overset{+}{K}\overset{-}{CN}}$ (A) $\xrightarrow{\overset{+}{H_3O}}$ (B)

(n)  $\xrightarrow[\Delta]{\overset{+}{K}\overset{-}{CN}}$ (A) $\xrightarrow{\overset{+}{H_3O}}$ $\mathbf{(B)}$

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5. What happens when?

(i) Acetamide is heated with bromine and potassium hydroxide.

(ii) Methylamine is treated with chloroform and alcoholic solution of potassium hydroxide.

(iii) Ethylamine is treated with acetic anhydride.

(iv) Ethylamine reacts with carbon disulphide in presence $HgCl_2$

(v) Ethylamine is treated with nitrous acid.

(vi) Ethyl cyanide is treated with methyl magnesium bromide followed by hydrolysis.

(vii) Nitroethane is reduced with zinc and ammonium chloride.

(vii) Nitropropane is treated with nitrous acid.

(ix) Ethyl nitrite is reduced with $LiAIH_4$.

(x) Alkyl cyanide is reduced with sodium metal in

(xi) Aniline reacts with sodium nitrite and hydrochloric

(xii) o-Bromoanisole is treated with sodamide in liquid amonia.

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6. (i) Name the reaction that is used to convert an amide into primary amine containing one carbon atom less than the parent.

(ii) Name the product obtained when ethyl cyanide is treated with (a)

alkaline hydrogen peroxide and (b) dilute hydrochloric acid.

(iii) Write the position isomers of $C_3H_7NO_2$.

(iv) Name the compounds that are formed by heating $\left[(CH_3)_4NC_2H_5\right]^+OH^-$

(v) Name the compounds that are formed by heating $\left[(CH_3)_4N\right]^+OH^-$

(vi) Name the reaction used to convert primary amine into isocyanide.

(vii) Name the reaction used to convert primary amine into isocyanide.

(viii) Name the type of amine if it reacts with benzene sulphonyl chloride to form a solid soluble in alkali.

(ix) Give the structure of $A(C_3H_9N)$ if it reacts with benzene sulphonyl chloride to form a solid insoluble in alkali.

(x) Primary amines are formed by the use of phthalimide. What is the name of the reaction?

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7. Write short notes on the following :

i. Carbylamine reaction

ii. Diazotisation

iii . Hofmann bromamide reaction

iv.Coupling reaction

v. Ammonolysis

iv. Acetylation

vii. gabriel phthalimide synthesis

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8. How would you distinguish between?

(a) Ethylamine and diethylamine or primary amine and secondary amine.

(b) Ethylamine and acetamide.

(c) Diethylamine and triethylamine.

(d) Nitro ethane and ethyl nitrite.

(e) Aniline and ethylamine.

(f) Nitrobenzene and aniline.

(g) Aniline and N-methylaniline

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9. How would you bring the following conversions?

(i) Ethylamine to ethyl alcohol.

(i) Acetic acid to methylamine.

(iii) Propionamide to ethylamine.

(iv) Ethyl chloride to n-propylamine (in 2 steps).

(v) Ethyl amine to ethyl isocyanide.

(vi) Ethyl alcohol to methylamine.

(vii) Acetic acid to ethylamine.

(viii) Ethylamine to methylamine.

(ix) Methylamine to ethylamine.

(x) Ethylamine from CH3 OH (3 steps).

(xi) n-Butylamine from propene (3 steps).

(xii) Isopropylamine from acetone.

(xii) Acetic acid into dimethylamine.

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10. Give the reactions of nitrous acid with primary secondary and tertiary amines..

(b) Name the products with chemical reactions when the following compounds are hydrolysed:

(i) CH_3CJH_2CN woth dil. HCl

(ii) CH_3CN with alkaline H_2O_2

(iii) C_2H_5NC with di. HCl

(iv) $C_2H_5NO_2$ with dil. HCl

(c) Explain the formation of the mixture of (i) $PhCH_2CHO$ and (ii) PhCOMe $Ph(CHOH)CH_2NH_2$ (A) is treated with nitrous acid

(d) How nitrobenzene is identified by using Mulliken-Baker test?

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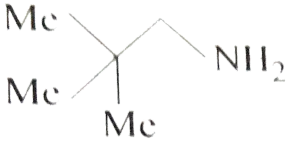
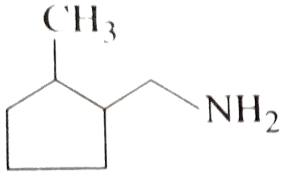
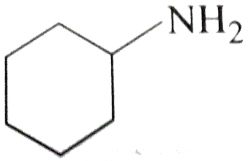
11. Complete the following reactions:

(a) 

(b) 

(c) 

(d) 

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12. Explains the following

$$CH_3NH_2 > CH_3N{=}CHCH_3 > CH_3CN.$$

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13. $\underset{\text{Optically active}}{\underset{(X)}{C_5CH_{13}N}} \xrightarrow[N_2]{NaNO_2/HCl} (Y)\text{Tertiary alcohol} + \text{Other product}$

Find (X) and (Y) . Is (Y) optically active ? Write the intermediate steps .

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14. Which products are obatined by reduction of nitrobenzene

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15. Match the following

(A) $C_6H_5SO_2Cl$	(1) Carbylamine reaction
(B) Conversion of amide to amine	(2) Quaternary salt
(C) Conversion of primary amine to isocyanide	(3) Schmidt reaction
(D) Dimethylamine	(4) Primary amine
(E) Tetraethyl ammonium iodide	(5) Hinsberg's reagent
(F) $\rightarrow C-NH_2$	(6) Tertiary amine
(G) $RCOOH + N_3H$ + conc. H_2SO_4	(7) Hofmann's bromamide reaction
(H) R_3N	(8) Secondary amine

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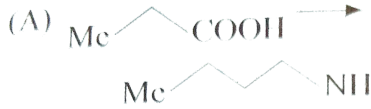
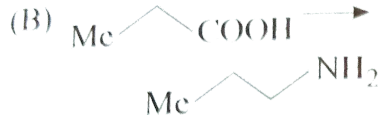
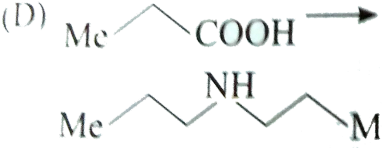
16. Match the following

Column I Reaction	Column II Reagents
(A) 	(1) (i) $SOCl_2$ (ii) NH_3 (iii) $Br_2 + NaOH/H_2O$
(B) 	(2) (i) $LiAlH_4$ (ii) PBr_3 (iii) KCN (iv) $LiAlH_4$
(C) 	(3) (i) $SOCl_2$ (ii) NH_3 (iii) $LiAlH_4$
(D) 	(4) (i) $SOCl_2$ (ii) $C_3H_7NH_2$ (iii) $LiAlH_4$

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17. Match the following

23. Match the following:

(A) Dye test	(1) $p\text{-}H_2NC_6H_4SO_3H$
(B) Sandmeyer's reaction	(2) $C_6H_5N_2Cl \xrightarrow[(ii)\ H^+]{(i)\ Na_3AsO_3}$
(C) Picric acid	(3) $R-\overset{\overset{O}{\|}}{C}-N_3 \rightarrow R-NH_2$
(D) Schmidt reaction	(4) $C_6H_5N_2Cl + Cu_2Cl_2 + HCl$
(E) Sulphanilic acid	(5) $C_6H_5N_2Cl \xrightarrow{Cu/HBr}$
(F) Bart reaction	(6) Aniline
(G) Gattermann reaction	(7) $C_6H_5N_2Cl \xrightarrow[(ii)\ Heat]{(i)\ HBF_4}$
(H) Balz-Schiemann reaction	(8) 2,4,6-Trinitrophenol

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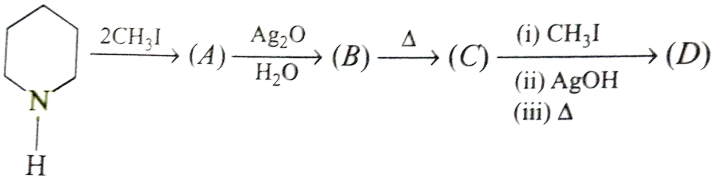
BRAIN STROMING

1. Complete the following reaction,



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2. $CH_3NH_2 \xrightarrow{(CH_3)_2O} (A)$

What is (A)? Explains why (A) is less reactive than methylamine?

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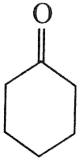
3. Complete the following reaction,

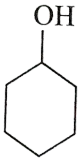
(a) $HO-\overset{O}{\overset{\|}{C}}-(CH_2)_3-\overset{O}{\overset{\|}{C}}-OH \xrightarrow{SOCl_2}$

$$(A) \xrightarrow{NH_3} (B) \xrightarrow[H_2O]{LiAlH_4} (C)$$

(b) $CH_3(CH_2)_2CH_2OH \xrightarrow[[O]]{PCC} (A) \xrightarrow[NaBH_3CN]{CH_3NH_2} (B)$

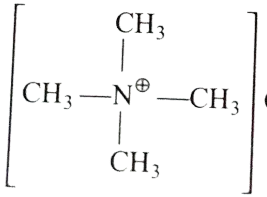
(c)  $\xrightarrow{CH_3COCl} (A) \xrightarrow[H_2O]{LiAlH_4} (B)$

(d)  $+ NH_2OH \longrightarrow (A) \xrightarrow{LiAlH_4} (B)$

(e) 

$\xrightarrow[H_2SO_4]{K_2Cr_2O_7} (A) \xrightarrow{NH_3} (B) \xrightarrow[\Delta]{H_2/Pt} (C)$

$\xrightarrow{PBr_3} (D) \xrightarrow{NH_3} (E)$

(f)  $\xrightarrow{\Delta} (A) + CH_3OH$

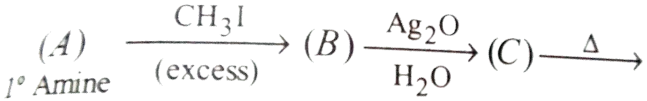
(g) $CH_3CH_2OH \xrightarrow{PBr_3} (A) \xrightarrow{NaCN} (B) \xrightarrow[573K]{H_2/Ni} (C)$

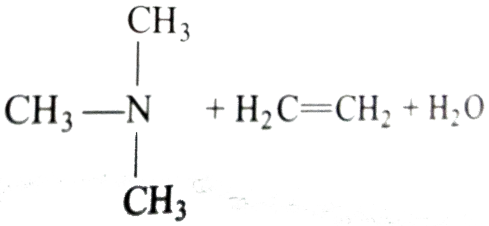
(h) $CH_3CH_2OH \xrightarrow{KMnO_4} (A) \xrightarrow{SOCl_2} (B) \xrightarrow{NH_3}$

$$(C) \xrightarrow[\Delta]{NaOH\ Br_2} (D)$$

(i) $CH_3CH_2OH \xrightarrow{Cu} (A) \xrightarrow{(i)\ NH_3}$ (B)

573K (iii) H_2/Ni, 573K





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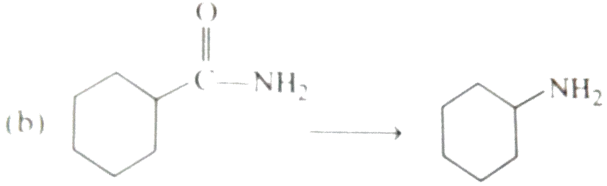
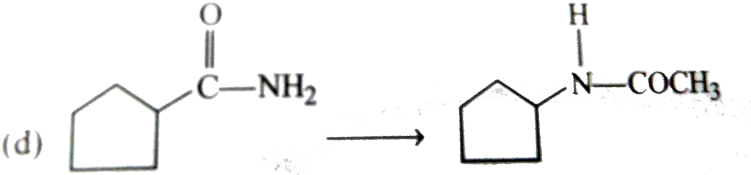
4. How will you bring out following conversions involving three steps at most?

(a) $CH_3-\underset{\displaystyle CONH_2}{\underset{|}{CH}}-C_2H_5 \longrightarrow CH_3-\underset{\displaystyle NH_2}{\underset{|}{CH}}-C_2H_5$

(b) 

(c) $CH_3-CH_2-CN \longrightarrow CH_3-CH_2-CH_2-NH_2$

(d) 

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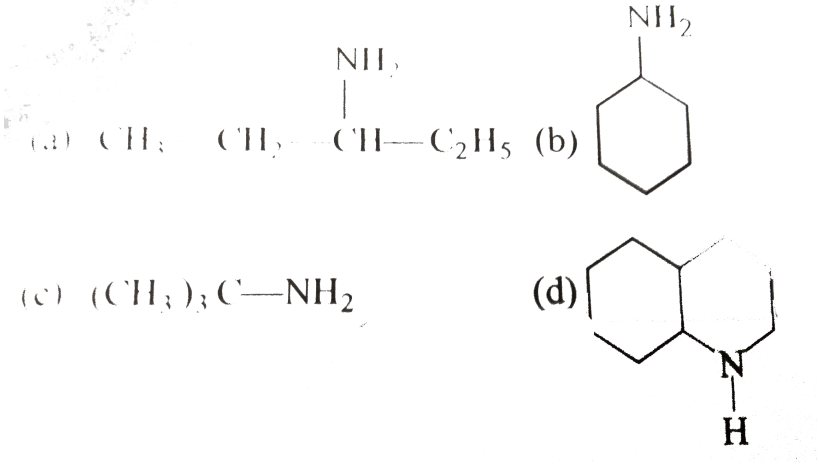
5. Select the starting substance and reagent for synthesis of following amines:



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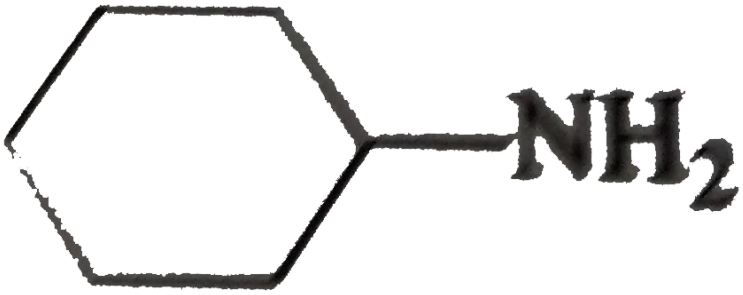
6. Arrange the following in decreasing order of basicity:



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7. Give the produce when following compounds are treated with nitrous acid.

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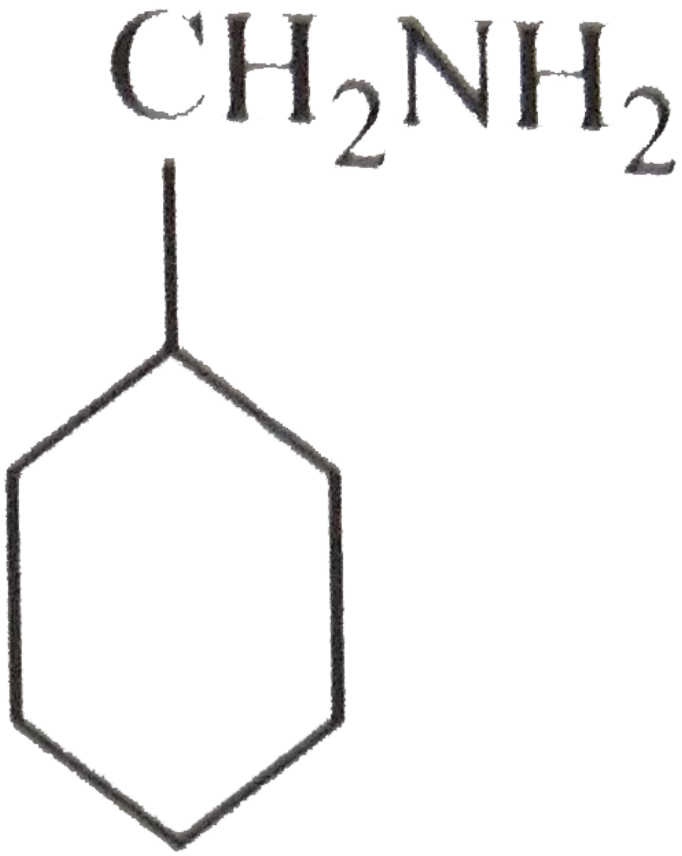
8. Write down all possible products when



is treated with nitrous acid.

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9. $H - \underset{\displaystyle CH_2CH_3}{\overset{\displaystyle CH_3}{\overset{|}{\underset{|}{C}}}} - NH_3$ is an optically active amine. Give the possible products when it is treated with nitrous acid. Discuss optical activity of the products.

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10. Give (a) conjugate acid (b) conjugate base of $HO(CH_2)_3NH_2$

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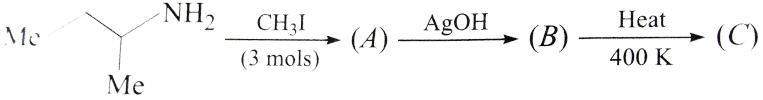
11. Complete the following reaction,



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12. Identify (A) and (B)

$$\underset{\text{active amine}}{\text{An optically}} \xrightarrow[\text{methylation and elimination}]{\text{Hofmann exhaustive}} \underset{\text{B}}{\text{Alkene}} \xrightarrow{\text{Ozonolysis}} CH_3CH_2CH_2 + CHO$$

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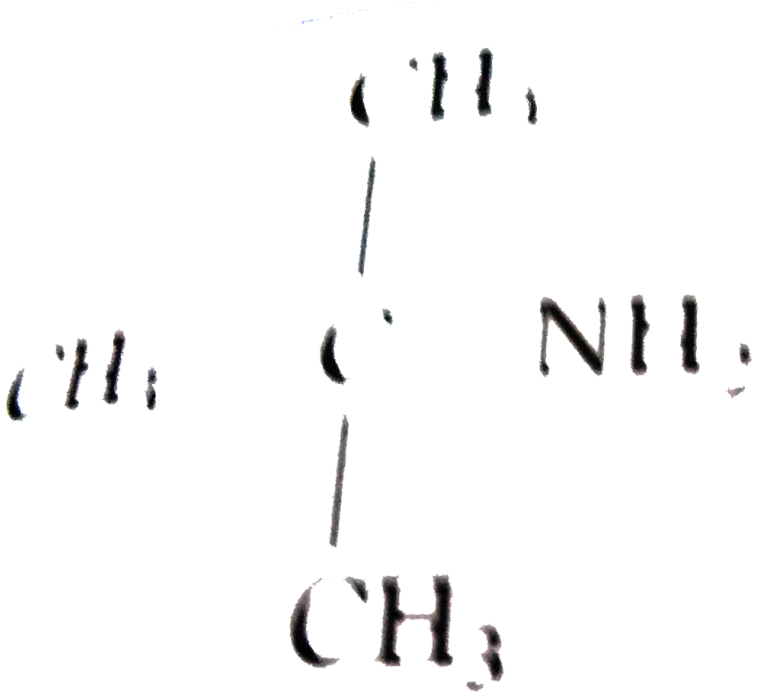
Level A

1.



A. primary amine

B. secondary amine

C. amine

D. quaternary salt

Answer: A

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2. Ethylammc reacts with nitrous acid to form:

A. methyl alcohol

B. ethyl alcohol

C. ethane

D. ethyl nitrite

Answer: B

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3. The reaction between primary amine, chloroform and few drops of alcoholic KOH is known as:

A. Hofmann's reaction

B. Gabriel phthalimide synthesis

C. Carby lam inc reaction

D. Leibermann nitrosoreaction

Answer: C

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4. The compound which on rection with aqueous nirous acid at low temperature produces an oily nitrosamine, is

A. methylamine

B. ethylamine

C. triethylamine

D. diethylamine

Answer: D

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5. Gabriel phthalimide synthesis can be used to prepare:

A. ethanamine

B. N-methylmcthanaminc

C. benzeneaminc

D. N,N-dirnthylme-thanannnc

Answer: A

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6. Which one of the following is the weakest base?

A. ethylaminc

B. Diethylamine

C. Elhylaminc

D. Ammonia

Answer: A

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7. Methylamine can be prepared by:

A. Wunz reaction

B. Friedel-Crafts reaction

C. Hofmann's bromamide reaction

D. Clemmensen's reaction

Answer: C

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8. Nitroparaffins on reduction give:

A. amides

B. alkylamtncs

C. ammonium salts

D. acetanilides

Answer: B

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9. Primary amines are identified by:

A. Hofmann's reaction

B. Cylamine reaction

C. Friedel-Crafts reaction

D. Biuret reaction

Answer: B

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10. Which one of the following give amine on heating with amide?

A. Cl_2 in sodium

B. Sodium in ether

C. Br_2 in alcoholic KOH

D. Br_2 in aquesous KOH

Answer: D

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11. A colourless odourless and non-combustible gas is liberated when ethylamine reacts with:

A. NaOH

B. CH_3COCl

C. $NaNO_2 + HCl$

D. H_2SO_4

Answer: C

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12. The product (D) in the following sequence of reactions is:

$$CH_3COOH \xrightarrow{NH_3} (A) \xrightarrow{\text{Heat}} (B) \xrightarrow{P_2O_5} (C) \xrightarrow{Na+C_2H_5OH} (D)$$

A. ester

B. amine

C. acid

D. alcohol

Answer: B

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13. Considering the basic strength of amines in aqueous sloution which one has the smallest pk_b value .

A. $C_6H_5NH_2$

B. CH_3NH_2

C. $(CH_3)_2NH$

D. $(CH_3)_2N$

Answer: C

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14. When a primary amine is warmed with carbon disulphide in the presence of mercuric the product is:

A. carbylamine

B. alkyl isothiocyanate

C. mercaptan

D. alkyl cyanide

Answer: B

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15. The correct order of increasing basic nature of the bases NH_3, CH_2NH_2 and $(CH_3)_2NH$ is-

A. $CH_3NH_2 > (CH_3)_2NH > (CH_3)_3N > NH_3$

B. $(CH_3)_3N > (CH_3)_2NH > CH_3NH_2 > NH_3$

C. $(CH_3)_2NH > CH_3NH_2 > (CH_3)_3N > NH_3$

D. $NH_3 > (CH_3)_3N > CH_3NH_2 > (CH_3)_2NH$

Answer: C

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16. Acid anhydrides on reaction with primary amine gives...

A. amide

B. imide

C. imine

D. 2° amine

Answer: A

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17. Ethylamine reacts with nitrosyl chloride (NOCI) to form:

A. ethyl chloride

B. ethyl alcohol

C. ethyl nitrite

D. nitroethane

Answer: A

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18. Which of the suggested tests can be used to differentiate the given compounds?

A. CH_3OH and C_2H_5OH (Lucas test)

B. CH_3CHO and CH_3CH_2CHO (Tollens's test)

C. 1° and 2° amine(Carbylamine test)

D. CH_3COCH_3 and CH_3CH_2COCH (Brady's reagent)

Answer: C

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19. Which one of the following will give a primary amine of hrdrolysis?

A. Nitroparaffin

B. Alkyl cyanide

C. Amide

D. Alkyl isocyanide

Answer: D

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20. Reaction involves isocyanate as intermediate product

A. Curtius rearrangement

B. Lossen rearrangement

C. Hofmann-bromamide rearrangement

D. All oflhc above

Answer: D

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21. Mendius reaction converts an alkyl cyanide to"

A. a primary amine

B. an aldehyde

C. a ketone

D. an oxine

Answer: A

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22. Which on reduction does not give primary amine?

A. $CH_3CN \xrightarrow{LiAlH_4}$

B. $CH_3NC \xrightarrow{LiAlH_4}$

C. $CH_3CONH_2 \xrightarrow{LiAlH_4}$

D. $CH_3CONH_2 \xrightarrow{LiAlH_4}$

Answer: B

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23. Among the following amines. which one has the highest pK_b, value in aqueous solution?

A. Methanamine

B. Ethanamine

C. N.N-Diethylethanamine

D. Benzeneamine

Answer: D

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24. Organic compound containing carbon, hydrogen and nitrogen, can be either amine or nitrate. How many amine isomers are possible with molecular formula $C_4H_{11}N$?

A. 4

B. 6

C. 7

D. 8

Answer: D

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25. Butanenitrile may be prepared by heating

A. propyl alcohol+KCN

B. butyl alcohol+KCN

C. butyl chloride+KCN

D. propyl chloride+KCN

Answer: D

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26. Which one of the following is a secondary amine?

A. 2-Butanamine

B. N-Methyl-2-pentanamine

C. p-Anilisine

D. N-Methyl piperidine

Answer: B

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27. Choose the correct order or decreasing basic strength of the following compound, in aqueous solution $C_6H_5NH_2$ (II) $C_2H_5NH_2$ (III) NH_3 (IV) $(CH_3)_2NH$

A. $I > II > III > IV$

B. $II > I > III > IV$

C. $IV > II > III > I$

D. $IV > III > II > I$

Answer: C

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28. On heating an aliphatic primary amine with chloroform and enthanolic potassium hydrozide, the organic compound formed is

A. an alkanol

B. an alkandiol

C. an alkyl cyanide

D. an alkyl isocyanide

Answer: D

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29. Which of these reactions can be used for the preparation of prinmary amines?

A. Curtius rearrangement

B. Gabriel synthesis

C. Schmidt rearrangement

D. All of the above

Answer: D

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30. In the given reaction

$$CH_3 - CH_2 - \underset{\underset{NaOH}{||}}{C} - CH_3 \xrightarrow[(H_2O/H^+), \Delta]{H_2SO_4} (A) + (B)$$

A and B are:

A. CH_3COOH and $C_2H_5NH_2$

B. CH_3CH_2COOH and CH_3NH_2

C. CH_3NH_2 and $C_2H_5NH_2$

D. CH_3COOH and CH_3CH_2COOH

Answer: A

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31. The best method for preparation of $Me_3C - CN$ is:

A. to react $Me_3C \rightarrow OH$ with HCN

B. to react $Me_3C \rightarrow Br$ with $NaCN$

C. to react $Me_3C \rightarrow MgBr$ with $ClCN$

D. to react $Me_3C \rightarrow Li$ with NH_2CN

Answer: C

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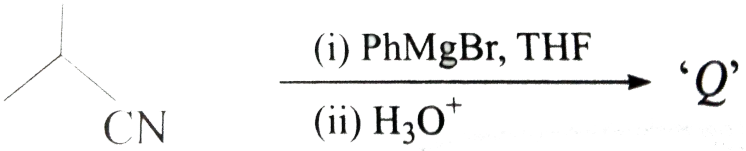
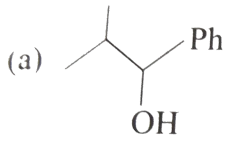
32. For the reaction below,



The structure of the product 'Q' is:

A.



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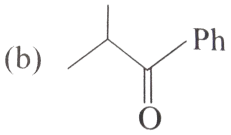
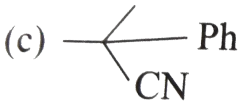
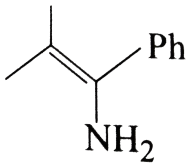


C.



(d) 

D.

Answer: B

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33. Amines behave as:

A. aprotic acid

B. netural compound

C. Lewis acid

D. Lewis base

Answer: D

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34. Which one of the following reagent will convert acetamide to ethanamine?

A. P_2O_5

B. $SOCl_2$

C. $LiAlH_4$

D. KCN

Answer: C

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35. An orgnic compound (A) on reduction gave a compound (B). Upon treatment with HNO_2 ,(B) gave ethyl alcohol and on warming with $CHCI_3$, and alcoholic KOH, (b) gave offensive smell. The compound (A) is:

A. CH_3CN

B. C_2H_5CN

C. CH_3NH_2

D. CH_3NC

Answer: A

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36. Silver chloride is soluble in methylamine due to the formation of:

A. $[Ag(CH_3NH_2]Cl$

B. $\left[Ag(CH_3NH_2)_2\right]Cl$

C. $\left[Ag(CH_3NH_2)_3\right]Cl$

D. $[Ag(CH_3NH_2)]Cl$

Answer: B

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37. Hinsberg's reagent is:

A. benzene sulphonomide

B. benzene sulphonic acid

C. benzene sulphuryl chloride

D. benzene ,sulphonyl chloride

Answer: D

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38. The gas leaked from a storage tank of the Union Carbide plant in Bhopal gas tragedy was :

A. phosgene

B. methyl isocyanate

C. methylmine

D. ammoia

Answer: B

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39. The reduction of benzenediazonium chloride to phenyl hydrazine can be accomplished by:

A. CH_3CH_2OH

B. H_3PO_2

C. $SnCl_2$, HCl

D. Na_2SO_3

Answer: C::D

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40. C_3H_9N represents a

A. primary amine

B. secondary amine

C. tertiary amine

D. all of these

Answer: D

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41. The conjugate base of $\left[(CH_3)_3NH\right]^+$ is:

A. $(CH_3)_3N$

B. $(CH_3)_3N^-$

C. $(CH_3)_2N^+$

D. $(CH_3)_3N^+$

Answer: A

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42. $CH_3CH_2NH_2$ contains a basix NH_2 group but CH_3CONH_2 does not because:

A. in CH_3CONH_2, the lone pair of electron on N-atom is delocalised due to resonance.

B. CH_3CONH_2 is amphoteric in nature

C. in $CH_3CH_2NH_2$ the lone pair of electrons on N-atom is delocalised due to resonance

D. CH_3CONH_2 is an acidic derivative

Answer: A

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43. N-butylamine (I), diethylamine (II) and N,N-dimethyl ethylamine(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. $II < I < III$

Answer: A

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44. The correct increasing order of basic strength in,

$CH_3CH_2CN, CH_3CH_2NH_2, CH_3N = CHCH_3$ is

A. $CH_3N = CHCH_3, CH_3CH_2NH_2, CH_3CH_2CN$

B. $CH_3CH_2NH_2, CH_3N = CHCH_3, CH_3CH_2CN$

C. $CH_3CH_2CN, CH_3N = CHCH_3, CHCH_2NH_2$

D. $CH_3CH_2CN, CH_3CH_2NH_2, CH_3N = CHCH_3$

Answer: C

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45. The reagent that is used to distinguish between secondary amine and teritary amine is:

A. p-touene sulphonyl chloride

B. $CHCl_3$ and alc. KOH

C. Lucas reagent

D. Bromine water

Answer: A

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46. The boiling points of amines and their correspondings alcohols and acids vary in the order.

A. $RCH_2NH_2 > RCOOH > RCH_2OH$

B. $RCH_2NH_2 > RCH_2OH > RCOOH$

C. $RCH_2NH_2 < RCOOH < RCH_2OH$

D. $RCH_2NH_2 < RCH_2OH < RCOOH$

Answer: D

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47. Reduction of nitroalkanes in netural medius $(e.g. Zn + NH_3Cl)$ forms mainly:

A. $R - NH_2$

B. $R - NHOH$

C. $R - N = N - Cl$

D. all of these

Answer: B

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

A. Methyl cyanide

B. Nitroethane

C. Methyl isocyanide

D. Acetamide

Answer: C

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49. A primary nitroalkane is treated with nitrous acid,which of the following will be the main product?

A. Pseudonitrol

B. Nitrolic acid

C. A primary amine

D. A primary alcohol

Answer: B

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50. A nitrogenous compound is treated with HNO_2 and the product so formed is further treated with NaOH solutoin which produces blue colouration. The nitrogenous compound is:

A. $CH_3CH_2NH_2$

B. $CH_3CH_2NO_2$

C. CH_3CHONO

D. $\underset{\underset{CH_3}{|}}{CH_3CH}NO_2$

Answer: D

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51. Which one of the following amines forms a non-acidcic and alkali insoluble product with p-toluenece sulphonyl chloride?

A. Isobutylamine

B. Tertiarybutylamine

C. Diethylamine

D. N-N-Dimethyl ethylamine

Answer: C

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52. By distilling glucine with braium hydroxide, it gives:

A. ethylamine

B. methylamine

C. amino acid

D. acetic acid

Answer: B

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53. Ethylamine is obtained by the action of sodium hypobromite on the following amide:

A. formamide

B. acetamide

C. propanamide

D. butanamide

Answer: C

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54. Primary amines on oxidation with acidified $KMnO_4$, followed by hydrolysis gives:

A. aldehydes only

B. ketones only

C. aldehydes or ketones

D. carboxylic acids

Answer: C

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55. Secondary amines on oxidation with $KMnO_4$ gives:

A. dialkyl hydroxylamine

B. tetralkyl hydrazine

C. ketones

D. amine oxide

Answer: B

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56. Secondary amines on oxidation with Caro's acid gives:

A. dialkyl hydroxylamine

B. tetraalkyl hydrazine

C. ketones

D. amine oxide

Answer: A

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57. Carboylamine reaction is shown by:

A. Quatenary salt

B. 3° amine

C. 2° amine

D. 1° amine

Answer: D

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

A. Alkyl cyanide

B. Nitroalkanes

C. Acid amide

D. Dimethyl formamide

Answer: D

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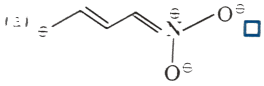
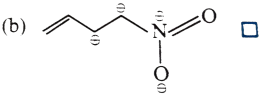
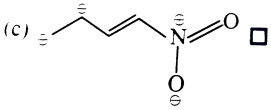
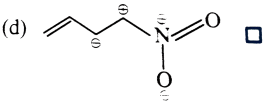
59. Among the following, the least stable resonance structure is :

A. 

B. 

C. 

D. 

Answer: D

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60. How many primary amines are possible for the formula $C_4H_{11}N$

A. 5

B. 6

C. 3

D. 4

Answer: D

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61. Primary, secondary and tertiary amines can be distinguished by

A. Schiff's test

B. Fehling's teast

C. Hinsberg test

D. Tollens' test

Answer: C

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62. A positive carbylamine test is given by:

A. N,N-dimethylaniline

B. N,methylaniline

C. triethylamine

D. p-methylbenzylamine

Answer: D

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63. By passing the mixture of the vapours of alcohol and excess of ammonia over heated alumina at 623K, the main product obtained is:

A. primary amine

B. secondary amine

C. tertiary amine

D. a mixture of pri-, sec - and tert-amines

Answer: A

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64. What is the decreasing order of basicity of $1^\circ 2^\circ$ and 3° ethy1 amines and ammonia ?

A. $NH_3 > C_2H_5NH_2 > (C_2H_5)NH > (C_2H_5)_3N$

B. $(C_2H_5)_3N > (C_2H_5)_2NH > C_2H_5NH_2 > NH_3$

C. $(C_2H_5)_3NH > C_2H_5NH_2 > (C_2H_5)_3N > NH_3$

D. $(C_2H_5)_3NH > C_2H_5NH_2 > NH_3 > (C_2H_5)_3N$

Answer: D

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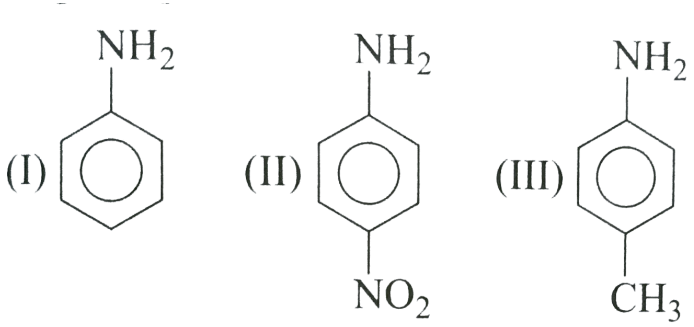

65.

The correct increasing order of basic strength for the following compounds is :

A. $III < I < II$

B. $III < II < I$

C. $II < I < III$

D. $II < III < I$

Answer: C

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66. Secondary amine forms yellow oily liquid with nitrous acid. which on warming with phenol and conc. H_2SO_4 given a brown or red colour and which at once change into blue-green. This reaction is called as:

A. Carbylamine reaction

B. Labriel phlhalimide reaction

C. Gabriel phthalmide reaction

D. Hofmann's mustard oil reaction

Answer: B

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67. Tertiary amines dissolve in cold nitrous acid to form salt which on warming decomposes to give:

A. $R_3N.HNO_2$

B. $R_2N.NO$

C. ROH

D. $R_2N.NO + ROH$

Answer: D

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68. Acctamide reacts with $NaOBr$ in alkaline medium to form:

A. NH_3

B. CH_3NH_2

C. CH_3CN

D. $CH_3CH_2NH_2$

Answer: B

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69. The product oblaincd in the following reaction is:

A. $CH_3CH_2CH_2COOH$

B. $CH_3CH_2CH_2 - \overset{OH}{\underset{|}{C}} = NH$

C. $CH_3CH_2CH_2 - CN$

D. none of the above

Answer: C

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70. Treatment of ammonia with excess of ethyl chloride will yield

A. diethylamine

B. methylamine

C. tetraethyl ammonium chloride

D. ethane

Answer: C

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71. By heating ammonium chloride with two equivalents of formaldehyde it forms:

A. dimethylamine

B. ethylamine

C. mthyalamine

D. ammonium formate

Answer: C

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72. Comparing basic strength of NH_3, CH_3NH_2 and $C_6H_5NH_2$ it may be concluded that:

A. basic strength remains unaffected

B. basic strength of NH_3 is highest

C. basic strength of alkylamine is lowest

D. basic strength of arylamine is lowest

Answer: D

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73. Which of the following reactions is appropriate for converting acetamide to methamine?

A. Hofmann's hypobromamide reaction

B. Stephen's reaction

C. Gabriel phthalmide synthesis

D. Carbylamine reaction

Answer: A

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74. Which of the following is called a carbylamine?

A. R-NC

B. $RCONH_2$

C. $R - CN$

D. $RCH = NH$

Answer: A

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75. Which is most basic?

A. Aniline

B. p-nitroaniline

C. Benylamine

D. m-nitroaniline

Answer: C

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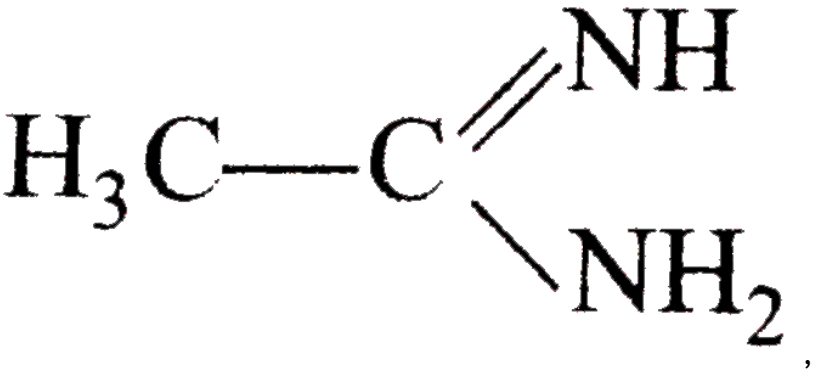
76. The correct order of basicities of the following compounds is



$CH_3CH_2NH_2$ (2)

$(CH_3)_2NH$ (3) CH_3CONH_2 (4)

A. $2 > 1 > 3 > 4$

B. $1 > 3 > 2 > 4$

C. $3 > 1 > 2 > 4$

D. $1 > 2 > 3 > 4$

Answer: B

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77. The compound that will react most readily with $NaOH$ to from methanol is

A. $(CH_3)_4\overset{+}{N}I^-$

B. CH_3OCH_3

C. $(CH_3)_3\overset{+}{S}^-$

D. $(CH_3)_3CCl$

Answer: A

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78. $CH_3CH_2Cl \xrightarrow{NaCN} X \xrightarrow{Ni/H_2} Y \xrightarrow[\text{anhydride}]{Acetic} Z$

Z in the above reaction sequence is .

A. $CH_3CH_2CH_2NHCOCH_3$

B. $CH_3CH_2CH_2NH_3$

C. $CH_3CH_2CONH_3$

D. $CH_3CH_2CH_2CONHCOCH_3$

Answer: A

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79. Which is most basic?

A. $C_6H_5NH_2$

B. $(C_6H_5)_2NH$

C. $C_2H_5NH_2$

D. $(C_2H_5)_2NH$

Answer: D

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80. An organic compound (C_3H_9N) (A) when treated with nitrous acid , gave an alcohol and N_2 gas was evolved. (A) on warming with $CHCl_3$ and caustiv potash gave (C) which on reduction gave isopropylmethylamine. Predict the structure of (A).

A. $CH_3CH_2CH_2NH_2$

B. $CH_3CH_2NHCH_3$

C. $CH_3 - \underset{\underset{CH_3}{|}}{CH} - NH_2$

D. $CH_3 - \underset{\underset{CH_3}{|}}{N} - CH_2$

Answer: C

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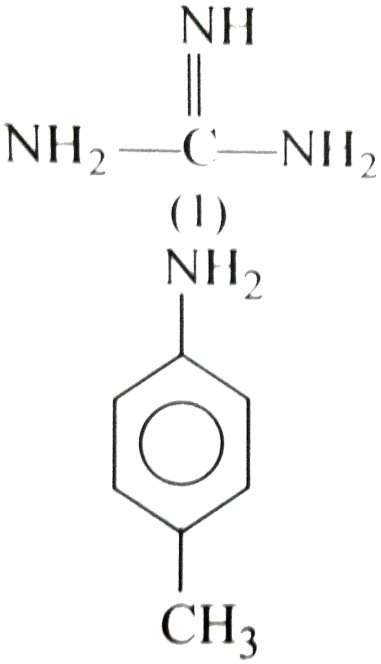
81. The correct order of basic strength of following compound is



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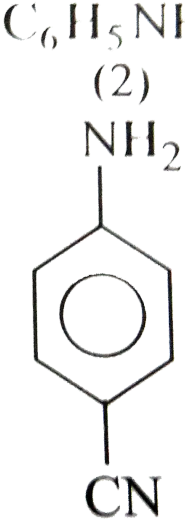

(2)

(4)

A. $4 > 2 > 3 > 1$

B. $4 > 2 > 1 > 3$

C. $1 > 3 > 2 > 4$

D. $1 > 3 > 4 > 2$

Answer: C

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82. Ethyl isocyanide on hydrolysis in acidic medium generates:

A. ethanoic acid and ammonium salt

B. propanoic acid and ammonium salt

C. ethylamine salt and methanoic acid

D. methylamine salt and ethanoic acid

Answer: C

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83. In the reaction

$CH_3CN + 2H \xrightarrow[HCI]{SnCI_2} X \xrightarrow[H_2O]{\text{Boiling}} Y$ the term Y is .

A. acetaldehyde

B. ethylamine

C. acetone

D. dimethylamine

Answer: A

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84. Which one of the following amines cannot be prepared by Gabriel phtahlimide synthesis?

A. Ethylamethylamine

B. Isopropylamine

C. n-propylamine

D. Ethylamine

Answer: A

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85. Name the following reaction.

$$C_6H_5 - C \equiv N \xrightarrow{SnCl_2 + HCl} C_6H_5 - CH = N^{\oplus}H_2\Big]Cl^{\Theta} \xrightarrow{H_2O} C_6H_5CHO +$$

A. Mendius reaction

B. Schmidt reaction

C. Roasemmund reaction

D. Stephen's reaction

Answer: D

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86. Which one of the following amines can not be prepared by Gabriel synthesis?

A. Butylamine

B. Isobutylamine

C. 2-Phenylethylamine

D. N-methylbenzylamine

Answer: D

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87. Among Me_3N, C_2H_5N and $MeCN(\text{Me}=\text{Methyl group})$ the electronegativity of N is in the order.

A. $MeCN > C_5H_5N > Me_3N$

B. $C_5H_5N > MeCN > Me_3N$

C. $Me_3N > MeCN > C_5H_5N$

D. electronegatavitivity is same in all

Answer: A

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88. Which of the following compounds is most basic?

A. Aniline

B. o-Toluidine

C. Cyclohexylamine

D. 0-Nitroaniline

Answer: C

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89. An isonitrile on reduction gives:

A. 3° amine

B. 2° amine

C. 1° amine

D. quaternary ammonium salts.

Answer: B

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90. Which one of the following methods is neither meant for the synthesis nor for separation of amines?

A. Hinsberg reagent

B. Hofmann's method

C. Wurtz reaction

D. Curtius reaction

Answer: C

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91. Reaction of cyclohexanone with dimethylamine in the presence of catalytic amount of an acid forms a compound if water during the

reaction is continously removed. The compound formed is generally known as

A. a Schiff's base

B. an enamine

C. an imine

D. an amine

Answer: B

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92. Which of the following chemicals are used to manufacture methy1 isocyanate that caused Bhopal Tragedy ?

Methylamine

(ii) Phosgene

(iii) Phosphine (iv) Dimethylamine .

A. I and ii

B. iii and iv

C. I and iii

D. ii and iv

Answer: A

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93. In the following sequence of reaction, the major product (C)

$$CH_3CH_2I \xrightarrow{NaCN} (A) \xrightarrow[\text{Partial hydrolysis}]{OH^-} (B) \xrightarrow{Br_2/NaOH} (C)$$

A. $CH_3CH_2NH_2$

B. $CH_3CH_2-\overset{\overset{O}{||}}{C}-NHBr$

C. $CH_3CH_2COONH_4$

D. $CH_3CH_2-\overset{\overset{O}{||}}{C}-NBr_2$

Answer: A

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94. Ethyl chloride on heating with AgCN forms a compound (X). The functional isomer of (X) is:

A. C_2H_5NC

B. $C_2H_5NH_2$

C. C_2H_5CN

D. none of these

Answer: C

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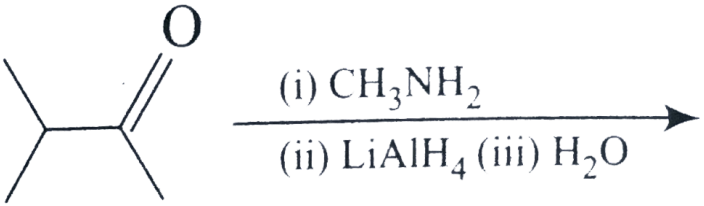
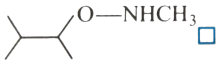
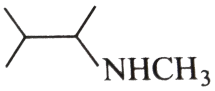
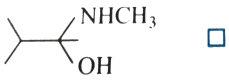
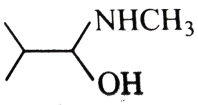
95. The major organic product formed in the following reaction is



A. (a) 

B. (b) 

C. (c) 

D. (d) 

Answer: B

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96. Which one of the following statements about CH_3CN is not true?

A. Its IUPAC name is ethanenitrile

B. The bond between C and N is a triple bond

C. The C-C-N bond angle is 180°

D. The carbon-carbon bond is longer than the carbon- nitrogen bond

Answer: C

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97. In the following reaction, the product (A) is:

$$CH_3 - C \equiv N + C_2H_5OH \xrightarrow[(ii)\, H_2O,\, \Delta]{(i)\, HCl} (A)$$

A. $C_2H_5COOCH_3$

B. $CH_3COOC_2H_5$

C. CH_3CONH_2

D. $CH_3CH_2NH_2$

Answer: B

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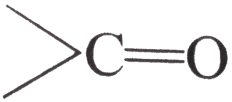
98. Which of following is not usual method for preparation of primary amine?

A. Curtius method

B. Gabriel phthalamide reaction

C. Hofmann's method

D. Reductive amination of 

Answer: C

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99. Choose the correct order for the boiling points of amines

A. (a) $CH_3\ddot{N}H_2 > (CH_3)_2\ddot{N}H > (CH_3)_3\ddot{N}$

B. (b) $(CH_3)_2\ddot{N}H > (CH_3)_3\ddot{N} > CH_3\ddot{N}H_2$

C. (c) $(CH_3)_3\ddot{N} < CH_3\ddot{N}H_2 < (CH_3)_2\ddot{N}H$

D. (d) $CH_3\ddot{N}H_2 < (CH_3)_2\ddot{N}H < (CH_3)_3\ddot{N}$

Answer: A

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100. State the product available by the following reaction:

$$CH_3CH_2CN + \text{ethanol} + H_2O \xrightarrow[\Delta]{\text{conc.}H_2SO_4}$$

A. ethyl formate$+ NH_3$

B. ethyl propanoate$+ NH_3$

C. ethyl butanate$+ NH_3$

D. ethyl acetate$+ NH_3$

Answer: B

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101. Which of the following reacts with Hinsberg's reagent (Benzene sulphonyl chloride) to form the product solub KOH?

A. Primary amine

B. Secondary amine

C. Tertiary amine

D. Quaternary amine

Answer: A

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102. Potassium phthalimide reacts with 'A' which on hydrolysis gives isopentylamine, what is 'A'?

A. $CH_3 - \overset{CH_3}{\overset{|}{C}}H - CH_2CH_2Br$

B. $CH_3 - \overset{\overset{CH_3Br}{|}}{CH} - CH_2CH_3$

C. $CH_3 - \overset{\overset{CH_3}{|}}{CH} - \underset{\underset{Br}{|}}{CHCH_3}$

D. $CH_3 - \underset{\underset{Br}{|}}{\overset{\overset{CH_3}{|}}{CH}} - CH_2CH_3$

Answer: A

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103. Which has the highest pK_b value?

A. $R_3C - NH_2$

B. R_2NH

C. RNH_2

D. NH_3

Answer: D

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104. Aniline can not be prepared by Gabriel phthalimide synthesis due to-

A. benzylamine

B. aniline

C. methyl amine

D. iso-butyl amine

Answer: B

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105. $CH_3NH_2 + CHCl_3 + KOH \rightarrow$ Nitrogen containing compound $+ KCl + H_2O.$

A. $CH_3 - C \equiv N$

B. $CH_3 - NH - CH_3$

C. $CH_3\overset{-}{N} \equiv \overset{+}{C}$

D. $CH_3\overset{+}{N} \equiv \overset{-}{C}$

Answer: D

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106. Secondary amines could be prepared by

A. reduction of nitriles

B. reduction of amides

C. reduction of nitro compounds

D. reduction of isonitriles

Answer: D

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107. The correct order of basic nature is aqueous solution is:

A. $C_6H_5NH_2 > NH_3 > CH_3NH_2 > (CH_3)_2NH$

B. $NH_3 > C_6H_5NH_2 > CH_3NH_2 > (CH_3)_2NH$

C. $(CH_3)_2NH > CH_3NH_2 > NH_3 > C_6H_5NH_2$

D. $CH_3NH_2 > (CH_3)_2NH > NH_3 > C_6H_5NH_2$

Answer: C

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108. Which one of the following is most basic?

A. FCH_2NH_2

B. $FCH_2CH_2NH_2$

C. $C_6H_5NH_2$

D. $C_6H_5CH_2NH_2$

Answer: D

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109. Isopropylamine with excess of acetyl chloride will give?

A. $(CH_3CO)_2N-CH-(CH_3)_2$

B. $(CH_3)_2-CH-\underset{\underset{H}{|}}{N}-COCH_3$

C. $(CH_3)_2CHN(COCH_3)_2$

D. $CH_3CH_2CH_2-\underset{\underset{H}{|}}{N}-COCH_3$

Answer: C

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110. Reduction of alkyl produces:

A. Secondary amine

B. primary amine

C. tertiary amine

D. amide

Answer: B

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111. Which one of the following amines can be directly oxidised to the corresponding nitro compound by potassium permanganate?

A. CH_3NH_2

B. $(CH_3)_2CH - NH_2$

C. $(CH_3)_2NH$

D. $C_6H_5NH_2$

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112. Primary amine reacts with carbon disulphide and $HgCl_2$ to produce alkyl isothiocyanate. This reaction is

A. Hofmann's reaction

B. Hofmann's rearrangement

C. Hofmann's mustard oil reaction

D. Hofmann's bromamide degradion reaction

Answer: C

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113. In order to distinguish between $C_2H_5NH_2$ and $C_6H_5NH_2$, Which of the following reagents(s) is useful?

A. Hinsberg reagent

B. $\beta - \text{napthol}$

C. $CHCl_3 / KOH$

D. NaOH

Answer: B

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114. An organic compound 'A' containing nitrogen, on acid catalysed hydrolysis produces a water soluble organic compound 'B' and a gaseous compound 'C'. When methyl magnesium bromide is slowly addd to 'A' in 1:1 ratio and hydrolysed, it produces a compound which can be obtained by dry distillation of calcium salt of 'B'. The compound 'A' is:

A. N-methyl methabnamide

B. N-ethyl methanamide

C. N-N-dimethyl methanamide

D. accetonitrile

Answer: D

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115. A compound with molecular mass 180 is acylated with CH_3COCI to get a compound with molecule of the fomer compound is .

A. 6

B. 2

C. 5

D. 4

Answer: C

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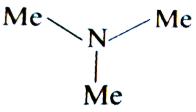
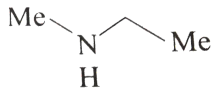
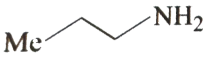
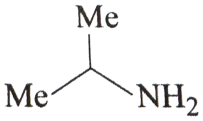
116. Compound A (C_3H_9N) reacts with benzene sulphonyl chloride to form a solid insoluble in alkali. The structure of compound A is

A. (a) 

B. (b) 

C. (c) 

D. (d) 

Answer: B

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117. $\xrightarrow[(ii)\,H_3O^+]{(i)\,CH_3MgBr} (R) \xrightarrow[(ii)\,\Delta]{\text{dil.}NaOH}$

A. proppane nitrile

B. ethane nitrile

C. nitromethane

D. methyl isocyanate

Answer: C

View Text Solution

118. In the following sequences of reactions.

$'A' \xrightarrow{\text{Reaction}} 'B' \xrightarrow{HNO_2} CH_3CH_2OH$

The compound 'A' is:

A. propane nitrile

B. ethane nitrile

C. nitromethane

D. methyl isocyanate

Answer: B

View Text Solution

119. Aniline or treatment with nirtous acid $(NaNO_2 + HCl)$ at 273K

A. phenol

B. nitrobenzene

C. nitrosobenzene

D. benzene diazonium chloride

Answer: B

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120. Aniline on treatment with excess of bromine water gives

A. 2,4,6-tribromoaniline

B. o-bromoaniline

C. 2,4-dibromoaniline

D. p-bromoaniline

Answer: A

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121. When aniline is treated with fuming sulphuric acid at 475 K, it gives

A. aniline sulphate

B. sulphanilic acid

C. aniline 2,4-disulphonic acid

D. nitrobenzene

Answer: B

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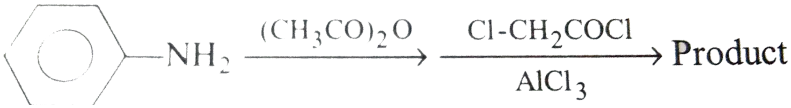
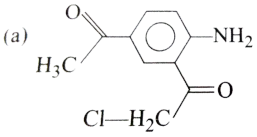
122. The product formed in the following reactions is



A.



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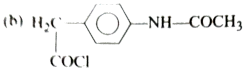
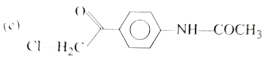
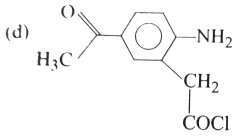


C. 

D. 

Answer: C

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123. Aniline when treated acetyl chlroide in presence of alkali, the product formed is:

A. acetanilide

B. benzoyl chloride

C. acetophenone

D. aniline hydrochloride

Answer: A

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124. In the diazotisation of aryl amine, the use of nitrous acid is:

A. it suppresses hydrolysis of phenol

B. it is a source of electrophilic nitrosonium ion

C. it neutralizes the base librated

D. all of the above

Answer: B

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125. In the reaction,

$$C_6H_5NH_2 \xrightarrow[0-5^\circ C]{NaNO_2+HCl} (A) \xrightarrow[KCN]{CuCN} (B) \xrightarrow{H^+/H_2O} (C)$$

the product (C) is

A. $C_6H_5CH_2NH_2$

B. C_6H_5COOH

C. C_6H_5OH

D. none of these

Answer: B

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126. Benzene diazonium chloride on hydrolysis gives

A. benzene

B. benzyl alcohol

C. phenol

D. chlorobenzene

Answer: C

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127. Chlorobenzene can be prepared by reacting aniline with

A. HCl and Cu_2Cl_2

B. Chlorine in presence of U.V light

C. Chlorine in presence of anhyd. $AlCl_3$

D. nitrous acid followed by heating with Cu_2Cl_3

Answer: D

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128. The product of reaction between anilne and acetic andyide is:

A. o-amino acetophenone

B. m-amino acetophenone

C. p-amino acetophenone

D. acetanilide

Answer: D

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129. Benzylamine is a stronger base than aniline because

A. the lone pair of electrons on the nitrogen atom in benzylamine is delocalised

B. the lone pair of electrons one the nitrogen atom in aniline is delocalised.

C. is not involved in resonance

D. benzylamine has a higher molecular mass than

Answer: B

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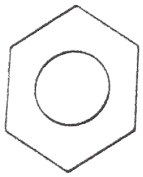
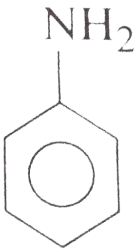
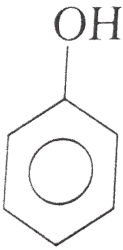
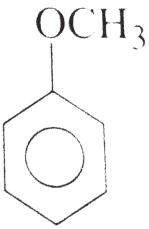
130. Friedel-Crafts reaction is not given by:

A. (a) 

B. (b) 

C. (c) 

D. (d) 

Answer: B

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131. When benzene diazonium chloride is treated with cuprous chloride in HCl. Chlorobenzene is formed . This reaction is called :

A. Perkin's reaction

B. Etard's reaction

C. Gattermann reaction

D. Sandmeyer's reaction

Answer: D

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132. The nitration (using nitration mixture) of aniline gives:

A. p-nitroaniline

B. o-nitroaniline

C. m-nitroaniline

D. all of these

Answer: D

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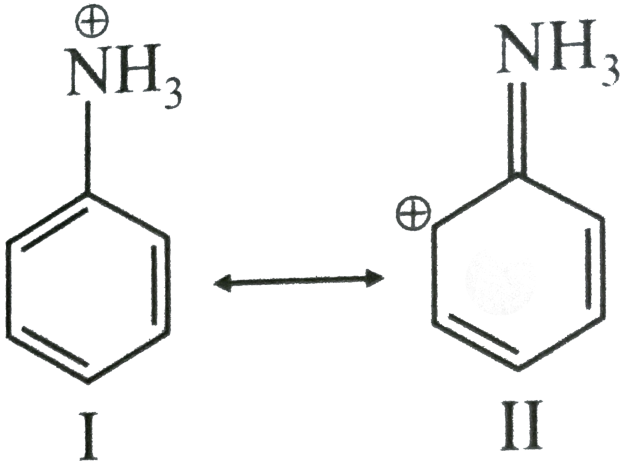
133.



I II

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

A. II is not an acceptable canonical structure because carbocation ions are less stable than ammonium ions

B. II is not an accepted canonical structure because it is non-aromatic

C. II is not an acceptable canonical structure because the nitrogen has 10 valence electrons

D. II is an acceptable canonical structure

Answer: C

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134. Which of the following would not react with benzene sulphonyl chloride in aqueous NaOH?

A. Aniline

B. Methylamine

C. N,N-Dimethylaniline

D. N-Methylaniline

Answer: C

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135. Which of the following would not react with HNO_2?

A. N,N-Dimethylaniline

B. p-Toluidine

C. Sulphanilic acid

D. Ethylamine

Answer: A

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136. Which of the following is least basic?

A. Aniline

B. p-Methylaniline

C. Diphenylamine

D. Triphenylamine

Answer: D

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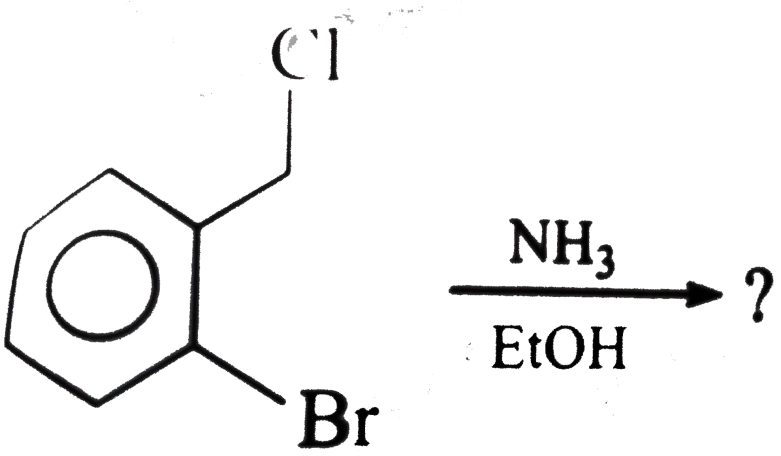
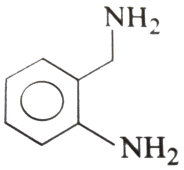


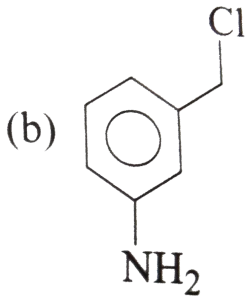
137.

The product of the above reactions is:

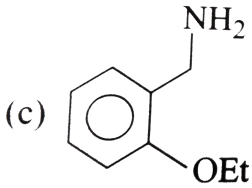
A. (a)



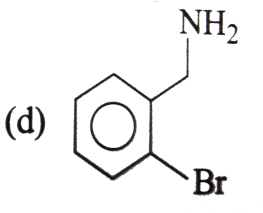
B.



C.



D.



Answer: D

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138. Dyes are formed when benzene diazonium salts are coupled with:

A. phenol

B. aniline

C. N-N,dimethyl aniline

D. all of these

Answer: B

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139. An aromatic amine (X) was treated with alcoholic potash and another compound (Y) when foul smelling gas was formed C_6H_5NC. The compound (Y) was formed by reacting a compound (Z) with Cl_2 in the presence of slaked lime. The compound (Z) is:

A. $CHCl_3$

B. CH_3COCH_3

C. CH_3OH

D. $C_6H_5NH_2$

Answer: B

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140. Aniline when acetylated, the product on nitration followed by alkaline hydrolysis give:

A. acetanilide

B. o-nitroacetanilide

C. p-nitroaniline

D. m-nitroaniline

Answer: C

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141. Method by which Aniline can t be prepared is .

A. hydrolysis of phenol isocyanide with acidic solution

B. potassium salt of phthalimide treated with chloroebenezene followed by hydrolysis with aquesous NaOH solution

C. reduction of nitrobenzene with H_2 / Pd in ethanol

D. degradation of benzamide with bromine in alkaline solution

Answer: B

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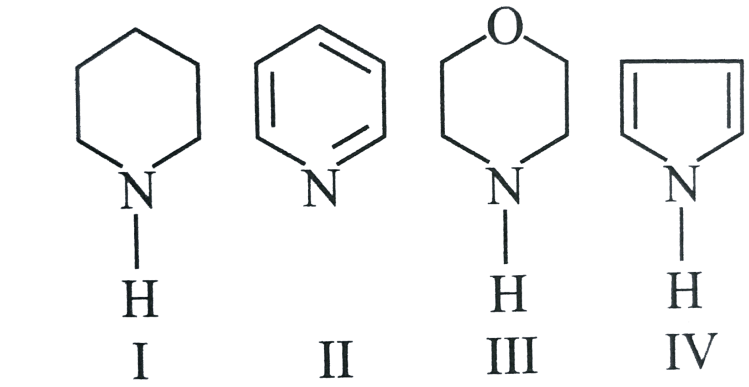

142.

In the following compounds The order of basicity is

A. $IV > I > III > II$

B. $III > I > IV > II$

C. $II > I > III > IV$

D. $II > III > II > IV$

Answer: D

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143. In the reaction of p-chlorotoluene with KNH_2 is liguid NH_3 the major product is .

A. o-toluidine

B. m-toluidine

C. p-toluidine

D. p-chloroaniline

Answer: B

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144. $p-$ chloroaniline and anilinium hydrogen chloride can be distinguished by

A. Sandmeyer's reaction

B. $NaHCO_3$

C. $AgNO_3$

D. Carbylamine test

Answer: C

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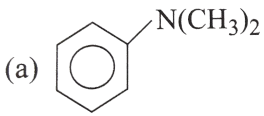
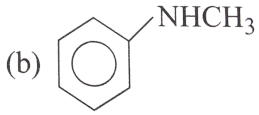
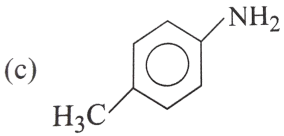
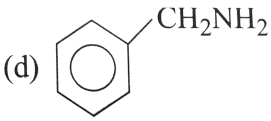
145. Amongst the compounds gives, the one that would form a brilliant colored dye on treatment with $NaNO_2$ in dil. HCl followed by addition to an alkaline solution of $\beta-$ naphthol is

A. (a) 

B. (b) 

C. (c) 

D. (d) 

Answer: C

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146. A positive carbylamine test is given by:

A. N.N-dimethylaniline

B. 2,4-dimethylaniline

C. N-methyl-o-methylaniline

D. p-methylbenzylamine

Answer: B

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147. In the reaction

$C_6H_5CHO + C_6H_5NH_2 \rightarrow C_6H_5N = CHC_6H_5 + H_2O.$

The compound $C_6H_5N = CHC_6H_5$ is known as

A. Aldol

B. Schiff base

C. Schiff reagent

D. Benedict's reagent

Answer: B

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148. In the reaction

$$C_6H_5NH_2 \xrightarrow[273k]{NaNO_2/HBF_4} (A) \xrightarrow{\Delta H} C_6H_5F$$

A. m-nitro flurorbenzene

B. a mixture of fluoroanilines

C. benezene diazonium fluoride

D. benzene diazonium tetraflurorborate

Answer: D

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149. Among the following the strongest base is

A. $C_6H_5NH_2$

B. $p-NO_2-C_6H_4NH_2$

C. $p-CH_3-C_6H_4NH_2$

D. $C_6H_5CH_2NH_2$

Answer: D

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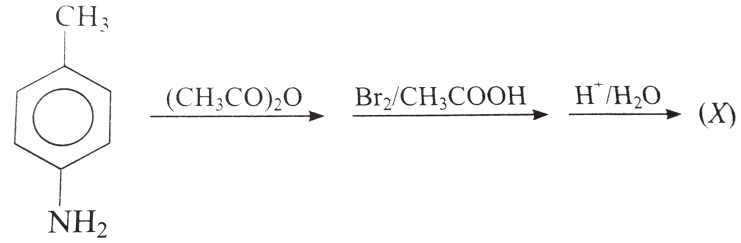
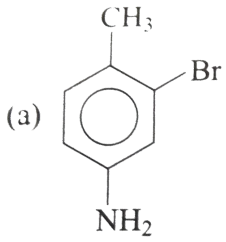


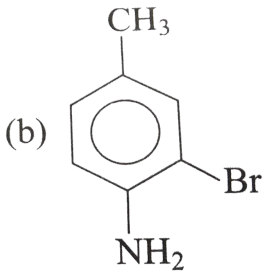
What is X ?

150. what is X?

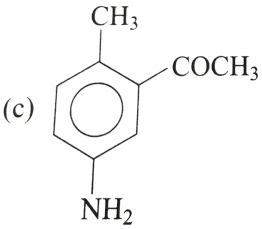


A.

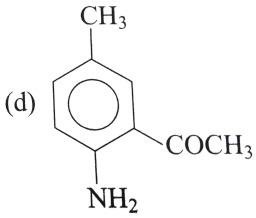
B.



C.



D.



Answer: B

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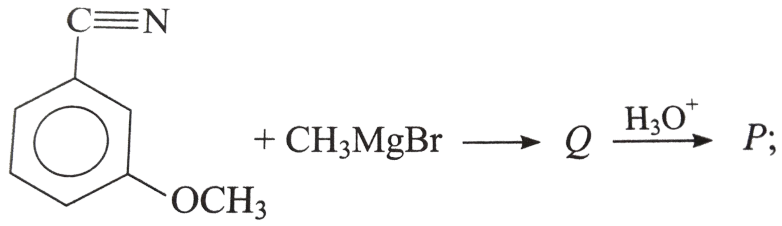
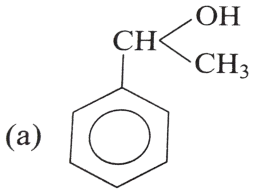
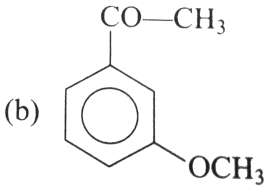
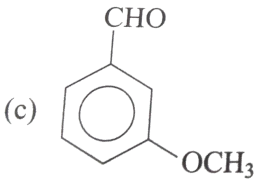
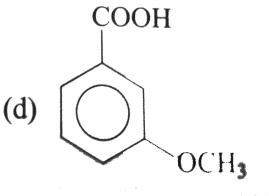
151. 

The product 'P' in the above reaction is:

A. 

B. 

C. 

D. 

Answer: B

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152. Benzmide on reaction with $POCl_3$ gives.

A. aniline

B. chlrobezene

C. benzylamine

D. benzonitrile

Answer: D

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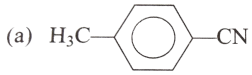
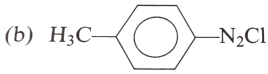
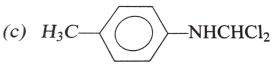
153. The reaction of chloroform with alcoholic KOH and p- toluidine forms

A. 

B. 

C. 

D. 

Answer: D

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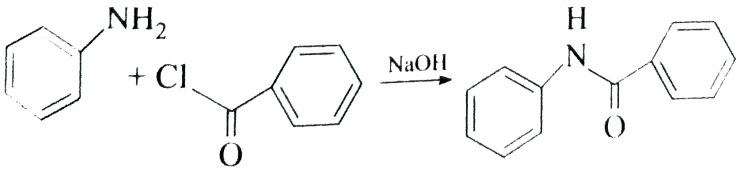
154. 

The following reaction is known by the name:

A. Schotten-Baumann reaction

B. Perkin's reaction

C. Friedel-Crafts reaction

D. Acetylation reaction

Answer: A

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155. Assertion(A) : Aniline hydrogen sulphate on heating froms a mixture of o- and p-amineo- sulphonic acid .

Reason (R) : The suphonic acid is `overline e withdrawing .

A. benzene sulphonic acid

B. anthranilic acid

C. aniline

D. m-amino benzene sulphuric acid

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156. In the following reaction,

$$X \xrightarrow{\text{Bromination}} Y \xrightarrow[HCl]{NaNO_2} Z \xrightarrow[C_2H_5OH]{\text{Boiling}} \text{Tribromobenzene, } X\text{is}$$

A. benzoic acid

B. salicylic acid

C. phenol

D. aniline

Answer: D

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157. In order to distinguish between $C_2H_5NH_2$ and $C_6H_5NH_2$, Which of the following reagents(s) is useful?

A. Hinsberg reagent

B. $\beta - \text{napthol}$

C. CH_3Cl_3 / KOH

D. NaOH

Answer: B

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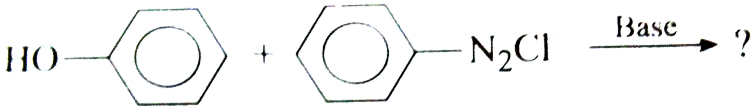
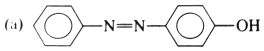
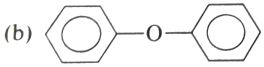
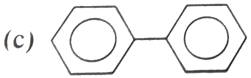
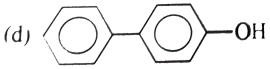
158. Complete the following reaction



A. 

B. 

C. 

D. 

Answer: A

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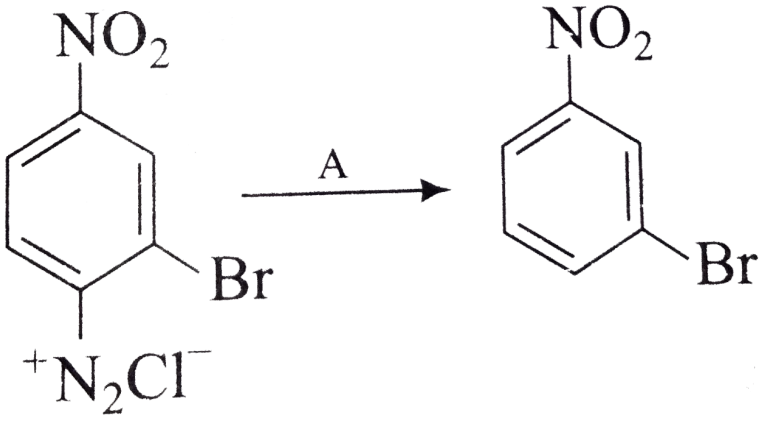
159. In the reaction A is



A. H_3PO_2 and H_2O

B. Cu_2Cl_2

C. $HgSO_3 / H_2SO_4$

D. H^+ / H_2O

Answer: A

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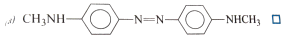
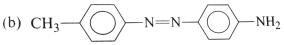
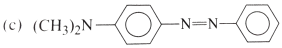
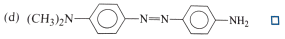
160. Aniline when diazotiesd in cold and then treated with dimethy1 aniline gives a coloured product Its structure would be .

A. 

B. 

C. 

D. 

Answer: C

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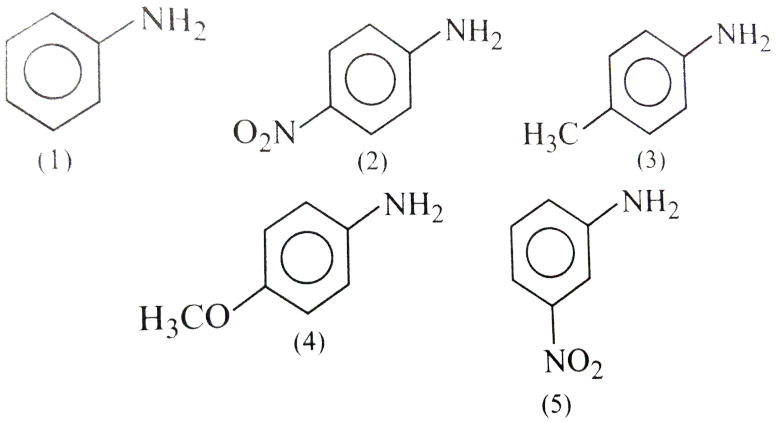
161. The correct order of increasing basic nature of the following bases is:



A. $2 < 2 < 1 < 3 < 4$

B. $2 < 5 < 1 < 4 < 3$

C. $5 < 2 < 1 < 4 < 3$

D. $2 < 5 < 4 < 3 < 1$

Answer: A

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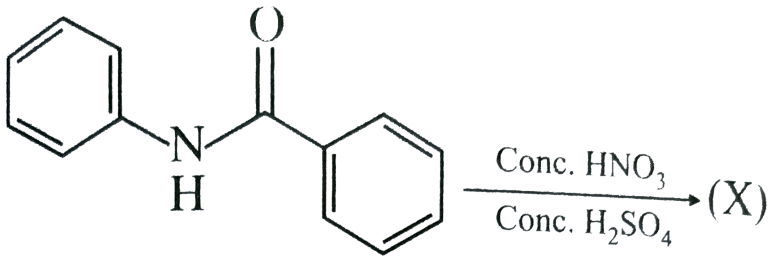
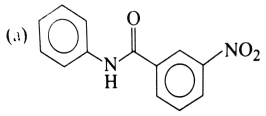


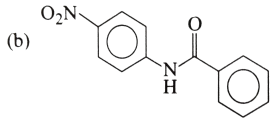
162.

In the following reaction, the structure of the major product (X) is:

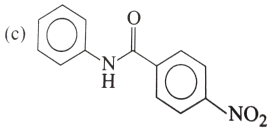
A.



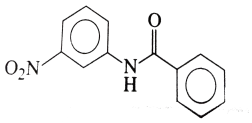
B.



C.



D.



Answer: B

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163. In which of the following compounds, does the substituent not exert its resonance effect?

A. C_6H_5OH

B. C_6H_5Cl

C. $C_6H_5NH_2$

D. $C_6H_5\overset{+}{N}H_3$

Answer: D

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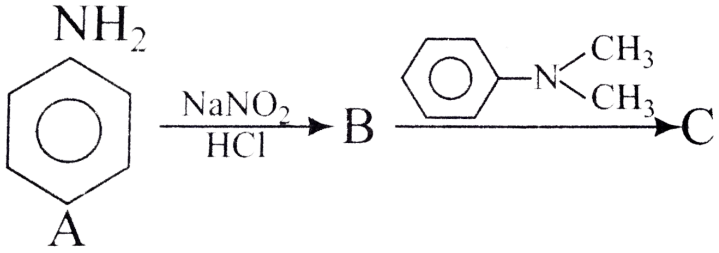
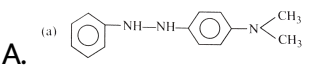
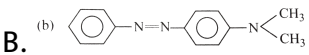
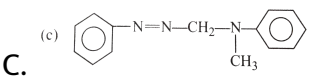
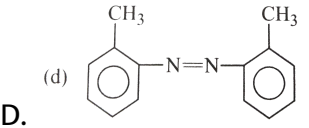
164. In a reactione a coloured product C was obtained The structure of C would be



A. 

B. 

C. 

D. 

Answer: B

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165. The aniline reaction 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, benzalide

Answer: B

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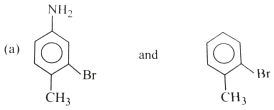
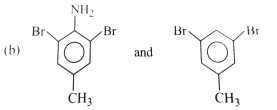
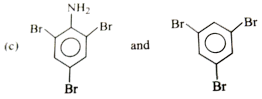
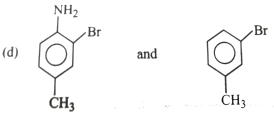
166. In the following reactions sequences,

The compounds (X) and (Y) are resepctively are:

A. 

B. 

C. 

D. 

Answer: B

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167. which 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. $C_6H_5N_2^+Cl^- + SnCl_2/HCl \rightarrow C_6H_5NHNH_2$

Answer: C

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168. Amino group, $-NH_2$ is ortho, para-directing group in case of aromatic electrophilic substitution but nitration of aniline produce a good amount of m-nitroaniline. This is because

A. in nitration mixture, ortho-para-activity of -NH_2 group is completely lost

B. $-NH_2$ becomes $-NH_3^+$, which is m-directing

C. $-NH_2$ becomes $-NH^+SO_4^-$, which is m-directing

D. $-NH_2$ becomes $-NH^-NO_2^+$, which is m-directing

Answer: B

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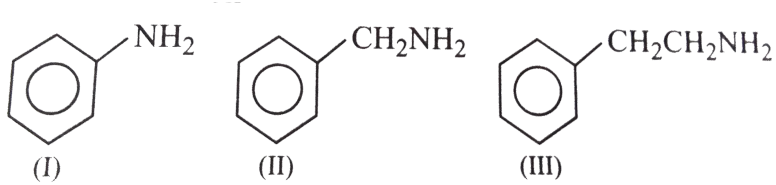
169. Consider the following compounds.



(I) (II) (III)

The compound A and B respectively are:

A. $I > II > III$

B. $III > I > II$

C. $III > II > I$

D. $I > III > II$

Answer: C

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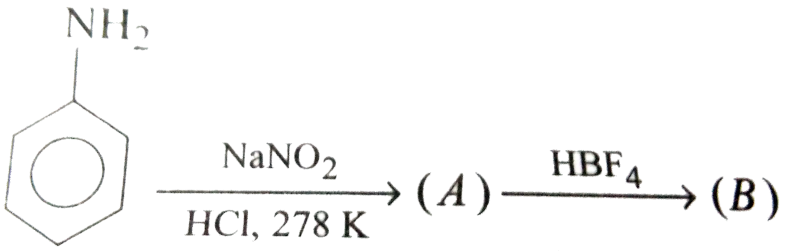
170. In the chemical reaction,



The compound A and B respectively are:

A. nitrobenzene and chlorobenzene

B. nitrobenzene and flurobenzene

C. benzene diazonium chloride and flurobenzene

D. phenol and benzene

Answer: C

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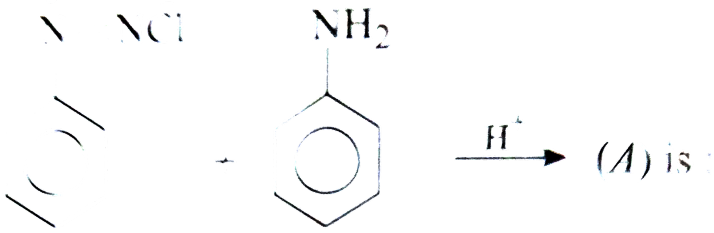
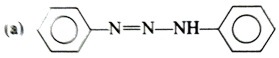
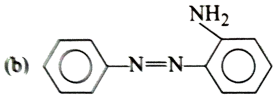
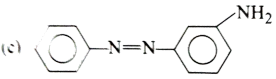
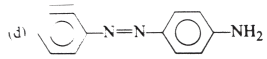
171. In the following reaction, the product (A)



A. 

B. 

C. 

D. 

Answer: D

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

.

A. $CH_3N_2^+X^-$

B. $C_6H_5N_2^+X^-$

C. $CH_3CH_2N_2^+X^-$

D. $C_6H_5CH_2N_2^+X^-$

Answer: B

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173. Nitrobenzene when reacted with tin and hydrochloric acid, i.e., in acidic medium, the product formed is:

A. aniline sulphate

B. benzene

C. phenylhydrazine

D. nitrobenzene

Answer: A

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174. Reduction of nitrobenzene with zinc dust and aqueous ammonium chloride yields

A. $C_6H_5NH_2$

B. C_6H_5NO

C. $C_6H_5N=NC_6H_5$

D. C_6H_5NHOH

Answer: D

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175. Nitrobenzene on electrolysis reduction is strong sulphyric acid solution gives:

A. aniline

B. azoxybenezene

C. p-aminophenol

D. azobenzene

Answer: C

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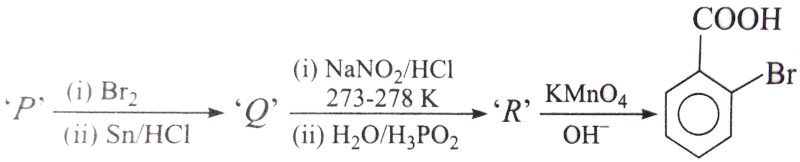
176. In the sequence of the following reactions:



The starting compound 'P' is:

A. p-nitrotoluene

B. m-nitrotoluene

C. o-nitoluene

D. o-Bromotoluene

Answer: A

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177. Which one of the following is an-expolsive?

A. Nitrobenzene

B. Nitrophenol

C. Nitromethane

D. Trinitrobenzene

Answer: D

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178. Which of the following compounds will not undergo Friedel — Crafts reaction easily ?

A. Nitrobenzene

B. Toluene

C. Cumene

D. Xylene

Answer: A

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179. The position least nitrated when m-bromochlorobenzene is nitrated is :

A. position ortho to bromine

B. position ortho to chlorine

C. position ortho to bromine and chlorine

D. position meta to chlorine

Answer: D

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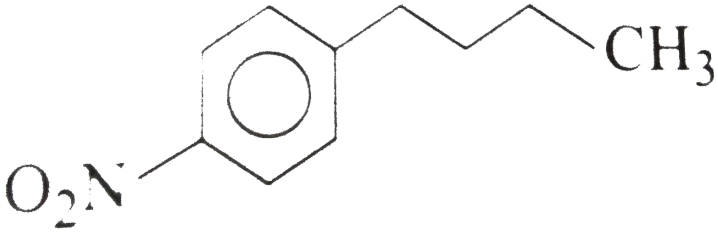
180. Idendify the correct method for the synthesis of the compound shown below from the following alternatives ?



A. (a) $\xrightarrow[AlCl_3]{CH_3CH_2CH_2COCl} \xrightarrow[HCl/\Delta]{Zn/Hg} \xrightarrow[H_2SO_4]{HNO_3}$

B. (b) $\xrightarrow[AlCl_3]{CH_3CH_2CH_2COCl} \xrightarrow[H_2SO_4]{HNO_3} \xrightarrow[HCl/\Delta]{Zn/Hg}$

C. (c) $\xrightarrow[AlCl_3]{CH_3CH_2CH_2COCl} \xrightarrow[OH]{KMnO_4} \xrightarrow[H_2SO_4]{HNO_3}$

D. (d) $\xrightarrow[AlCl_3]{CH_3CH_2CH_2CH_2Cl} \xrightarrow[H_2SO_4]{HNO_3}$

Answer: A

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181. Nitrobenzene on reaction with conc HNO_3 / H_2SO_4 at $80 - 100^\circ C$ forms which one of the following products .

A. 1,2-Dinitrobenzene

B. 1,3-Dinitrobenzene

C. 1,4-Dinitrobenzene

D. 1,2,4-Trinitrobenzene

Answer: B

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182. An organic compounds 'X' having molecular formula $C_6H_5O_2N$ has 6 carbon atoms in a ring system, two double bonds and also a nitro group as substituent, 'X' is

A. homocyclic but h not armotic

B. aromatic but not homocyclic

C. homocyclic and aromatic

D. heterocyclic

Answer: A

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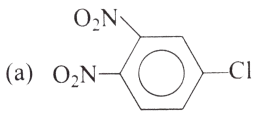
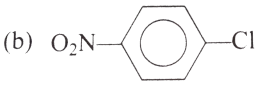
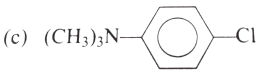
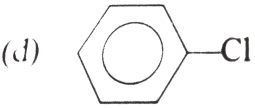
183. which chloroderivative of benzene among the following would undergo hydrolysis most readily with aqueous NaOH to furnish the corresponding hydroxy compound?

A. 

B. 

C. 

D. 

Answer: A

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184. When nitrobenzene is reduced with zinc and methanolic NaOH the product obtained is .

A. aniline

B. phenyl hydroxylamine

C. p-aminophenol

D. arobenezene

Answer: D

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185. What is obtained when nitrobenzene is treated sequesntially with (i) NH_4Cl / Zn dust and (ii) $H_2SO_4 / Na_2Cr_2O_7$?

A. Benzene

B. Nitrosobenezene

C. m-chlorobenzene

D. p-chloronitrobenzene

Answer: B

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186. The replacement of chlorine of chlorobenzene to give phenol requires drastic conditions, but the chlorine of 2,4-dinitrochlorobenzene is readily replaced since

A. nitro group makes the aromatic ring electron rich at ortho/para-position

B. nitro group withdraw electrons from the meta-position of the aromatic ring

C. nitro group withdraws electrons from ortho/para-positions of the armatic ring.

D. m-nitrochlorobenzene is formed in excess

Answer: D

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187. An equimolar mixture of toluene and chlorobenzene is treated with a mixture of conc. H_2SO_4 and conc. HNO_3 Indicate the correct statement from the following :

A. p-nitrotoluene is formed is excess

B. equimolar amount of p-nitrotolence and p-nitrochoro-benzene are formed

C. p-nitrochlorobenzene is formed in excess

D. m-nitrochlorobenzene is formed in excess

Answer: A

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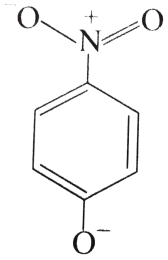
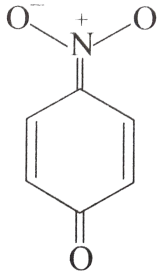
188. The most unlikely representation of resonance structures of p-nitrophenoxide ion is:

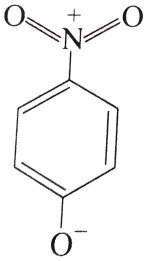
A. (a)

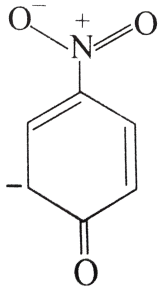


B. (b)



C. (c)



D. (d) 

Answer: C

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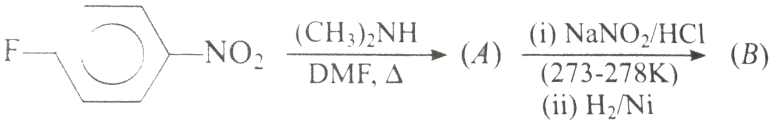
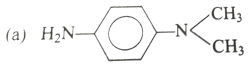
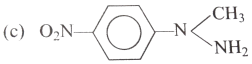
189.

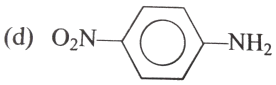


B is:

A. (a) 

B. (b) 

C. (c) 

D. (d) 

Answer: A

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190. Which give only monosubstituted product?

A. o-Dinitrobenzene

B. m-Dinitrobenezene

C. p-Dinitrobenzene

D. nitrobenzene

Answer: B

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191. 2,4,6-Trinitrochlorobenzene on warming with water produces:

A. chlorobenzene

B. phenol

C. picric acid

D. no compound since C-Cl bond is stable

Answer: C

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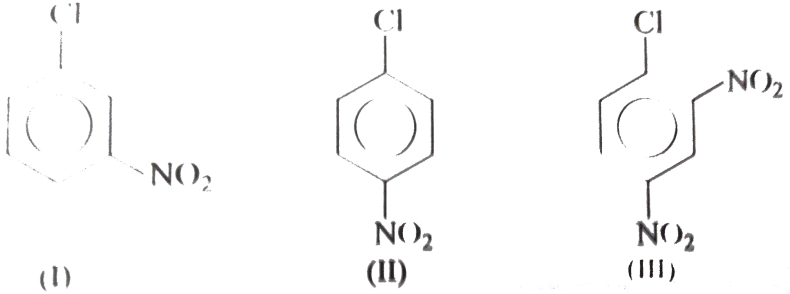
192. Reactivity order of the following towards $NaOEt, EtOH$



A. $III > II > I$

B. $II > I > III$

C. $I > II > III$

D. $III > I > II$

Answer: C

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193. Presence of a nitro group in a benzene ring:

A. deactivites the ring towards electrophlic substitution

B. activities the ring towards electrophilic subtitution

C. renders the ring basic

D. deactivities the ring towards nucleophilic substitution

Answer: A

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194. The conversion of m-nitrophenol to resorcinol inivolves respectively:

A. hydrolysis, diazotisation and reduction

B. hydrolysis, and reduction diazotisation

C. reduction diazotisation and hydrolysis,

D. diazotisation,reduction and hydrolysis,

Answer: C

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195. Toluene is nitrated and the resulting product is reduct is reduced with tin and hydrochloric acid. The product so obtained is diazotised and then with cuprous bromide. The reaction mixture so formed contains

A. mixture of o- and m-bromotoluenes

B. mixture of o- and m-bromotoulences

C. mixture of o- and m-dibromobenzenes

D. mixture of o- and p-bromoanilines

Answer: B

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196. Arrange the following compounds in increasing order of their acidic strength:

(i) m-nitrophenol (ii) m-cresol

(iii) phenol (iv) m-chlorophenol

A. $ii < iii < iv < i$

B. $iii < ii < I < iv$

C. $ii < iv < iii < i$

D. $ii < iii < I < iv$

Answer: A

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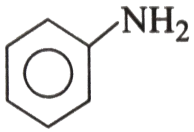
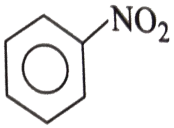
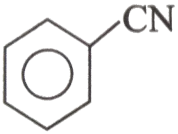
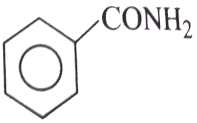
197. A given nitrogen-containing compound A reacts with Sn/HCI followed by HNO_2 to give an unstable compund B. B on treatment with pheno1 forms a beautiful coloured compound C with the molecular formula $C_{12}H_{10}N_2O$ The structure of compound A is .

A. (a) 

B. (b) 

C. (c) 

D. (d) 

Answer: B

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198. The correct sequence of reactions to be performed to convert benzene into m-bromoaniline is :

A. nitration, reduction,bromomination

B. bromination, nitration, reduction

C. nitration, bromination,reduction

D. reduction,nitration,bromination

Answer: C

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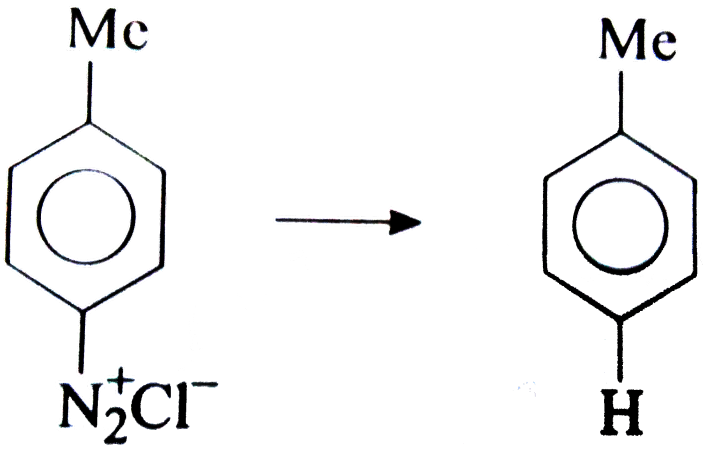
199. The reagent with which of the following reaction is best accomplised by:



A. H_3PO_2

B. H_3PO_3

C. H_3PO_4

D. $NaHSO_3$

Answer: A

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200. Phenyl isocynaide is prepared from aniline by:

A. Rosenmud's reaction

B. Reimer-Tiemann reaction

C. Kolbe's reaction

D. Wurtz reaction

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201. An aromatic compound 'A' (C_7H_9N) on reacting with $NaNO_2/HCl$ at $0^\circ C$ forms benzyl alcohol and nitrogen gas. The number of isomer possible for the compound 'A' is

A. 3

B. 5

C. 6

D. 7

Answer: B

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202. The the identification of β-napthol using dye test, it is necessary to use:

A. dichloromethane solution of $\beta - \text{napthanol}$

B. acidic solution of $\beta - \text{napthanol}$

C. neutral solution of $\beta - \text{napthanol}$

D. alkaline solution of $\beta - \text{napthanol}$

Answer: D

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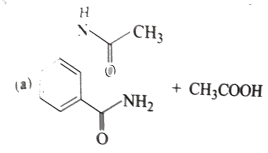
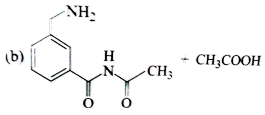
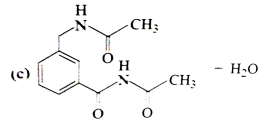
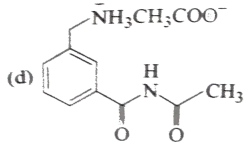
203. In the reaction shown below the major product (s) formed is/are .

A. 

B. 

C. 

D. 

Answer: A

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204. An organic compound 'A' on reduction give compound 'B' which on reaction with trichloromethane and caustic potash foms 'C'. The compound 'C' on catalytic reduction give N-methyl benzenamine, the compound 'A' is:

A. nitrobenzene

B. nitromethane

C. methanamine

D. benzenamine

Answer: A

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205. Which one of the following -compounds does not react with nitrous acid ? .

A. $CH_3CH_2CH_2NO_2$

B. $(CH_3)_2CHCH_2NO_2$

C. $(CH_3)_2C-NO_2$

D. $CH_3-\underset{\underset{O}{||}}{C}-\underset{\underset{CH_3}{|}}{C}H-NO_2$

Answer: C

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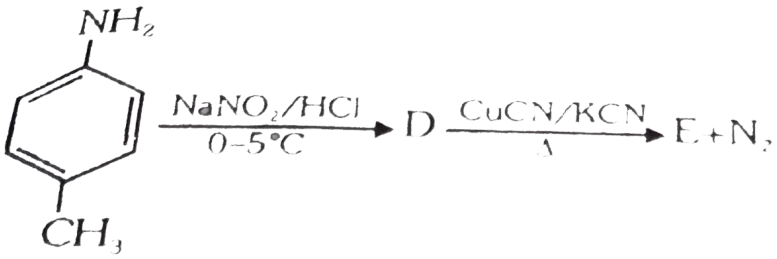
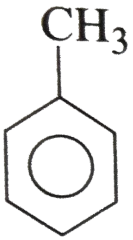
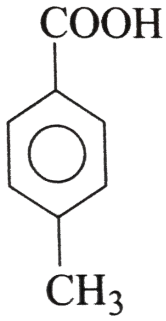
206. In the reaction



the product E is :-

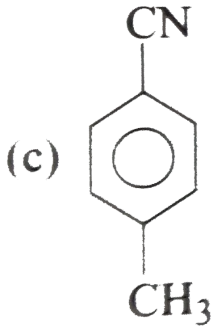
(a) 

A.

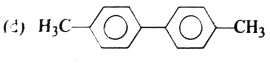
(b) 

B.

C.



D.



Answer: D

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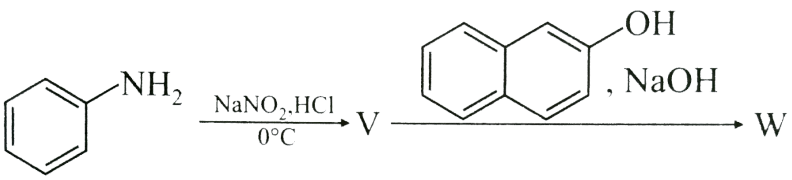
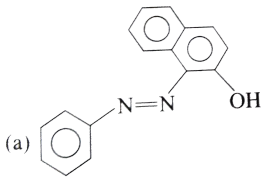
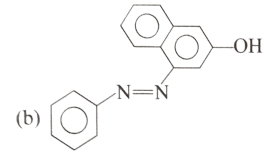
207.

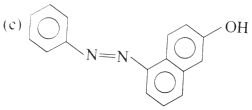


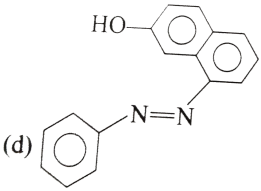
In the following reactions, the major product W is:

A.



B. 

C. 

D. 

Answer: A

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208. Which one of the following can be prepared by Gabriel phtahlimide synthesis?

A. Aniline

B. o-Toluidine

C. benzylamine

D. N-Methylethanamine

Answer: C

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209. In the hofmann-bromamide degradation reaction, the number of moles of NaOH and Br_2 used per mole of amine produced are

A. one mole of NaOH and one mole of Br_2

B. one mole of NaOH and two mole of Br_2

C. one mole of NaOH and two mole of Br_2

D. four mole of NaOH and one mole of Br_2

Answer: D

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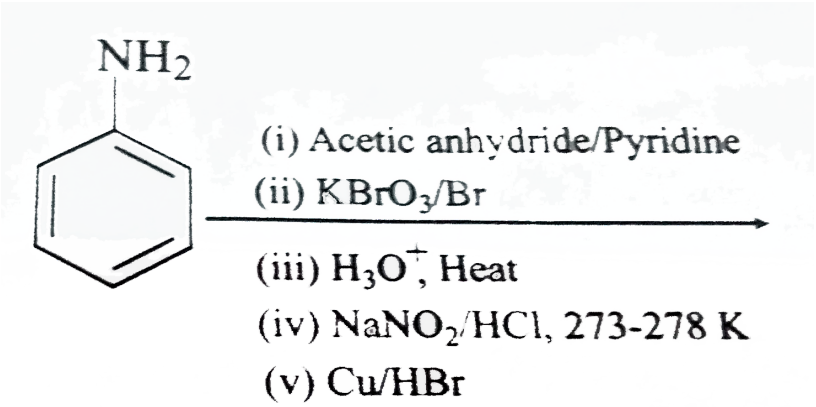
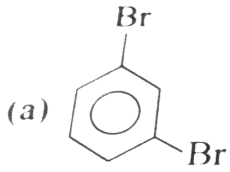
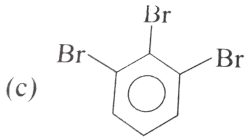
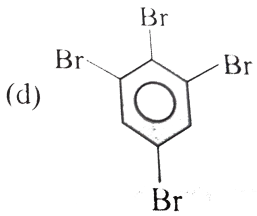
210. The product (s) of the following reaction sequence is (are)



A. 

B.

C. 

D. 

Answer: B

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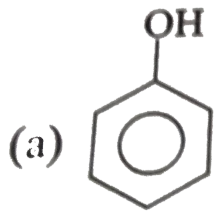
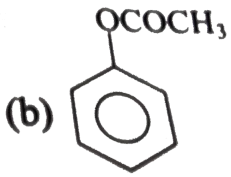
211. Which of the following compounds will give significant amount of meta- product during mononitration reaction?

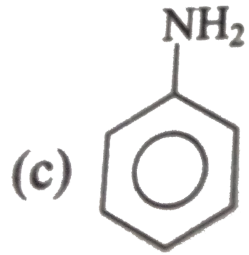
A.



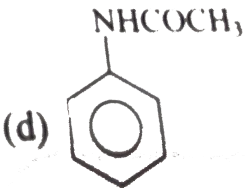
B.



C.



D.



Answer: C

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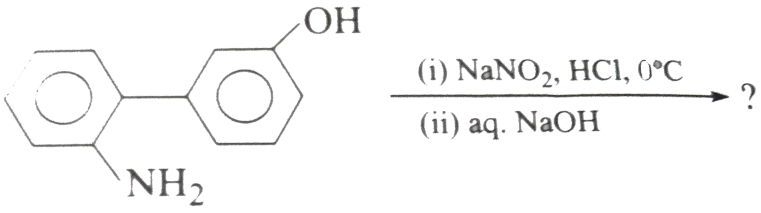
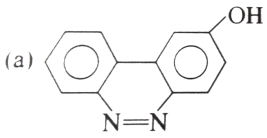
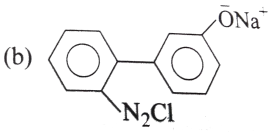
212. The major product of the following reaction is:



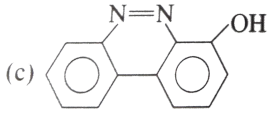
A.



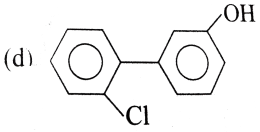
B.



C.



D.



Answer: A

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213. The order of basicity among the the following compounds is

A. $II > I > IV > III$

B. $IV > II > III > I$

C. $I > IV > III > II$

D. $IV > I > I > III$

Answer: D

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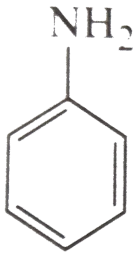
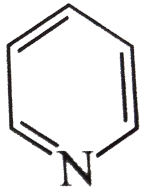
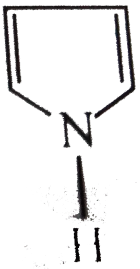
STEP I:

1. Which of the following is most basic?

A. (a) 

B. (b) 

C. (c) 

(d) 

D.

Answer: C

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2. Which of the following is the correct of basic character?

I. 1-Aminopropane

II. Ethanamide

III. Guanidine $\left[HN = C(NH_2)_2\right]$

IV. Aniline

A. $I > II > III > IV$

B. $III > I > IV > II$

C. $IV > III > I > II$

D. $III > II > I > IV$

Answer: B

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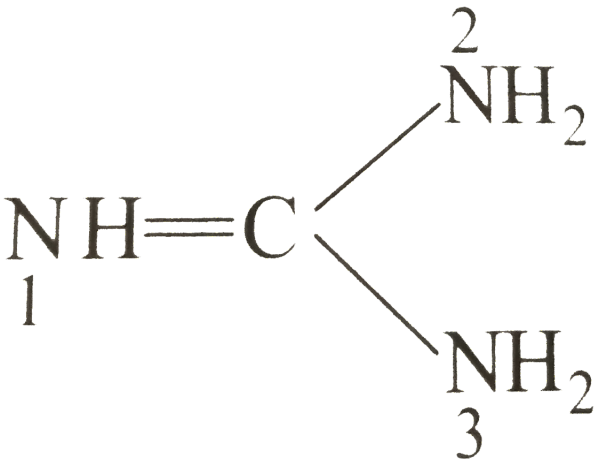
3. Which nitrogen is protonated readily in the guanidine?



A. 1

B. 2

C. 3

D. all of these

Answer: A

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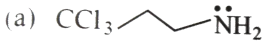
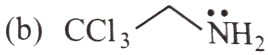
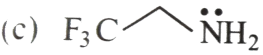
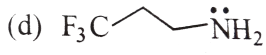
4. Which of the following has the highest pK_b value?

A. 

B. 

C. 

D. 

Answer: A

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5. Which of the following is insoluble in dil.HCl

A. Aniline

B. Triphenylamine

C. ethylamine

D. Dimethylamine

Answer: B

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6. Which of the following may be prepared by Galbriel phthalimide synthesis?

A. Aliphatic amines

B. Aromatic amines

C. Aliphatic amides

D. Aromatic amides

Answer: A

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7. When an organic compound was treated with sodium nitrite and hydrochloric acid in the ice cold, nitrogen gas was evolved vihorously. The compound is

A. a nitro compound

B. a primary amine

C. a secondary amine

D. a tertiary amine

Answer: B

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8. In carbylamine reaction:

A. the nucleophilic is RNH_2 and electrophilie is CCl_2

B. the nucleophilic is primary amine and electrophile is CCl_3^-

C. the nucleophilic is CCl_3^- and the electrophile is primary amine

D. the attracting reagent is electrophile

Answer: A

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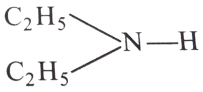
9. Which one of the following will not react with the Grignard reagent (C_2H_5MgBr)

A. $C_2H_5 - NH_2$

B. (b) 

C. $C_2H_5 - \overset{C_2H_5}{\underset{C_2H_5}{\overset{|}{\underset{|}{N}}}}$

D. $CH_3 - \overset{O}{\overset{||}{C}} - NH_2$

Answer: C

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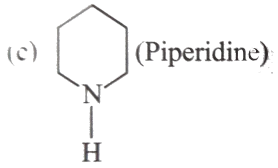
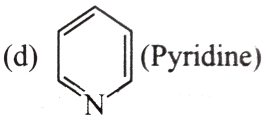
10. One mole of an amine (A) consumes two moles of methyl bromide to give a quaternary ammonoium salt. The amine (A) is:

A. $(CH_3)_3CCH_2NH_2$

B. $(CH_3)_2NCH_2CH_3$

C. 

D. 

Answer: C

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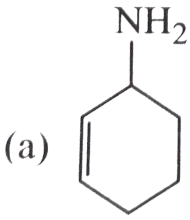
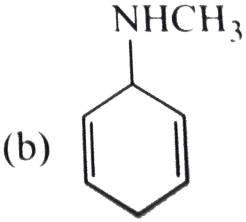
11. An optically active compound (A) decolourises Br_2/CCl_4 and releases N_2 with nitrous acid. The compound A is:

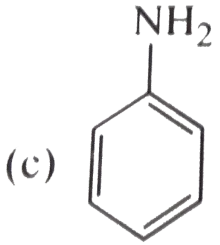
A.



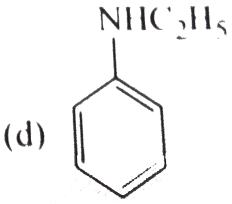
B.



C.



D.



Answer: A

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12. $(A) \xrightarrow{H_2/Pt} 1^\circ \text{ Amine}$

$(B) \xrightarrow{H_2/Pt} 2^\circ \text{ Amine}$

A and B respectively are:

A. RNC, RNC

B. RCN,RCN

C. RCN,RNC

D. RNC,RCN

Answer: C

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13. How many products will be obtained when propane is subjected to vapour phase nitration?

A. 2

B. 3

C. 4

D. 5

Answer: C

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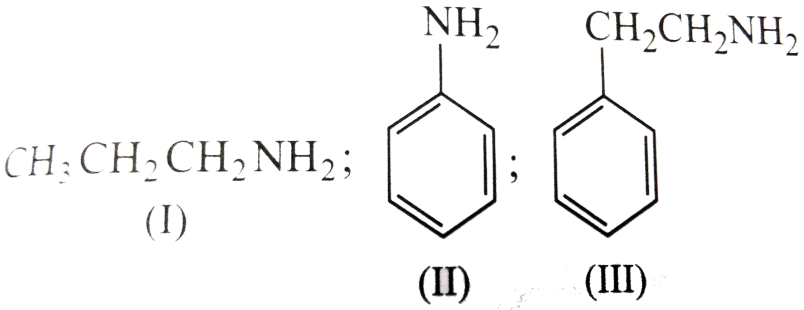
14. Arrange following amines in the decresing order of their basicity:



A. $I > III > II$

B. $I > II > III$

C. $III > II > I$

D. $II > III > I$

Answer: A

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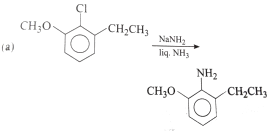
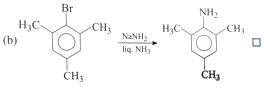
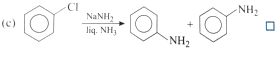
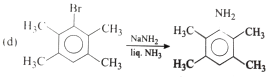
15. Which of the following reactions is feasible?

A. 

B. 

C. 

D. 

Answer: C

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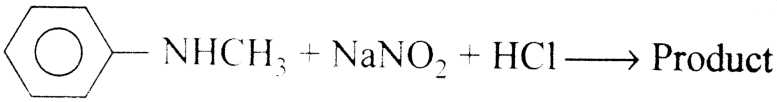
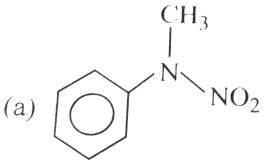
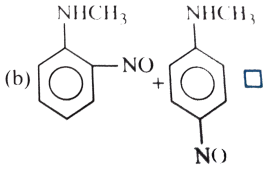
16. Predict the product



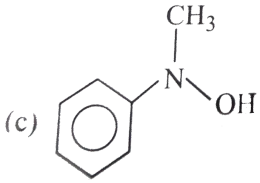
A.



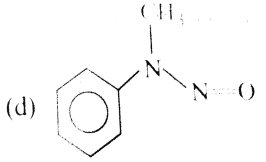
B.



C.



D.



Answer: D

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17. In gattermann reaction a diazonium group is replaced by X using Y. What are X and Y?

X	Y
$(a) Cl^-$	Cu / HCl
$(b) Cl^+$	$CuCl_2 / HCl$
$(C) Cl^-$	$CuCl_2 / HCl$
$(d) Cl_2$	Cu_2O / HCl

A.

B.

C.

D.

Answer: A

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18. An orange dye p-hydroxy azobenzene can be synthesized from benzene diazonium chloride by:

A. Sandmeyer reaction

B. Gomberg reaction

C. Coupling reaction

D. Gattermann reaction

Answer: C

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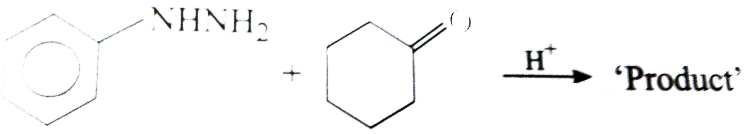
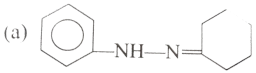
19. Identify the product in the following reaction:



A.



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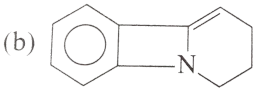
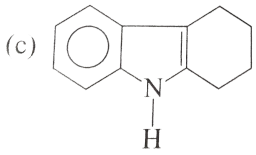
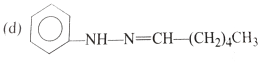


C. 

D. 

Answer: C

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20. The most basic amine among the following is:

A. p-toludine

B. o-nitroaniline

C. p-nitroaniline

D. 2,4-dinitroaniline

Answer: A

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21. Consider the nitratio of benzene using mixed conc. H_2SO_4 and HNO_3. If a large amount of $KHSO_4$ is added to the mixture, the rate of nitration will be :

A. uncharged

B. doubled

C. faster

D. slower

Answer: D

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22. The correct statement regarding the basicity of arylamines is .

A. arylamines are generally less basic than alkylamines because the nitrogen lone pair of electrons are delocalised

B. arylamines are generally more basic than alkylamines because the nitrogen lone pari electron are not decalised by interaction with aromatic ring π- electron system

C. arylamines are generally more basic than alkylamines because of aryl group

D. arylamines are generally more basic than alkylamines, because the nitrogen atoms in arylamines is sp-hybridized

Answer: A

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STEP II:

1. $(A) \xrightarrow[[H]]{\text{Reduction}} \text{Primary amine}$

The compounds (A) may be:

A. alkyl isocyanide

B. Alkyl cyanide

C. acid amide

D. 1° nitroalkane

Answer: B::C::D

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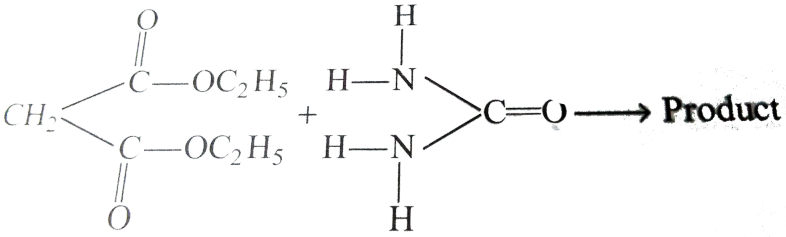
2. The produced obtained in the following reaction is:



A. hypnotic agent

B. barbituric acid

C. cyclic amide

D. cyclic ketone

Answer: A::B::C

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3. The primary, secondary and tertiary amines can be best distinguished by

A. $CS_2 / HgCl_2$

B. $NaNO_2 / HCl$

C. $CHCl_3 / KOH$

D. $X_2 / NaOH$

Answer: A::B::C

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4. Nitroalkane and alkyl nitrite can be distinguished by the action of:

A. alkali

B. nitrous acid

C. mineral acids

D. reduction of Sn/HCl

Answer: A::B::D

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5. A mixture of three amines (pri-, sec- and tert-) can be prepared by:

A. Hofmann's bromamide reaction

B. the reduction of nitroalkanes, cyanides and oximes

C. ammonolysis of alocohols

D. ammonolysis of alcohols

Answer: C::D

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6. Primary amines may be obtained by:

A. the reduction of nitroalkanes

B. the reduction of alkyl isocyanide

C. the decarboxylation of amino acids

D. the hydrolysis of alkyl isocyaide

Answer: A::C::D

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7. Tertiary amines may be obtained by:

A. Gabriel phtalmide synthesis

B. heating an alcoholic solution of ammonia with excess of RX

C. the hydrolysis of dialkyl cyanamide

D. thermal decomposition of quaternary ammonium hydroxide

Answer: B::D

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8. All the three amines (pri-, sec- and tert-) react with

A. KOH

B. RX

C. HCl

D. CH_3COCl

Answer: A::B::C

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9. A mixture of three amines can be separated into individual one by:

A. Carbylamine reaction

B. Hinsberg's method

C. Fracitonal distillation method

D. Hofmann's method

Answer: B::C::D

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10. $C_4H_{11}N(X) + HNO_2 \rightarrow C_4H_{10}O(3^\circ \text{alcohol})$ hence, (x) will give:

A. Carbylamine reaction

B. Hofmann's mustard oil reaction

C. Diazonium salt (as the intermeidat)

D. Hofmann's bromide reaction

Answer: A::B::C

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11. When methyl iodide is treated with ammonia, the product obtained is/are:

A. methylamine

B. dimethylamine

C. trimethylamine

D. quaternary ammonium salt.

Answer: A::B::C::D

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12. The name $CH_3 - C \equiv N$ is:

A. methyl cyanide

B. methyl carbylamine

C. ethaneitrile

D. acetonitrile

Answer: A::C::D

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13. The positive carbylamine test is given by

A. N,N-Dimethylaniline

B. 2,4-dimethylaniline

C. N-methyl-o-methylamine

D. p-methyl-benzylamine

Answer: B::D

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14. In the following reaction.

$2X + B_2H_6 \rightarrow [BH_2(X)_2]^{\oplus}[BH_4]^{\ominus}$

The amine $(s)x$ is /are.

A. NH_3

B. CH_3NH_2

C. $(CH_3)_2NH$

D. $(CH_3)_3N$

Answer: A::B::C

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15. Which of the following statements are correct

A. $\alpha =$ Amino acids on heating give piperazine (cyclic diamide)

B. $\beta -$ Amino acids on heating give, $\alpha, \beta =$ unsaturated acids

C. $\gamma - \text{Amino}$ acids on heating give lactum (five membered cyclic ester)

D. $\delta - \text{Amino}$ acids on heating give lactum(six-membered cyclic ester)

Answer: A::B::C::D

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16. Benzene is obtained from benzendiazonium chloride by the:

A. reduction with alkaline stannous chloride

B. reduction with acidic stannous chloride

C. action of hyposphorus acid

D. action of ethyl alcohol

Answer: A::C::D

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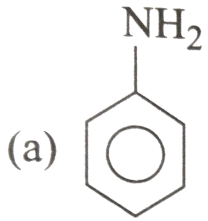
17. Oxidation (A) give para-benzoquinone (A) is:

A.



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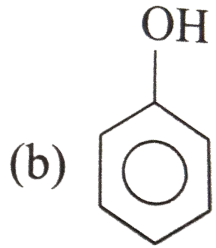

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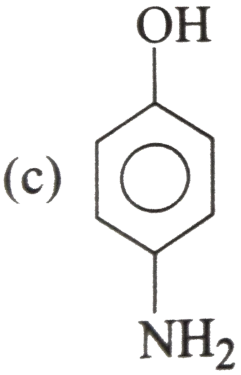
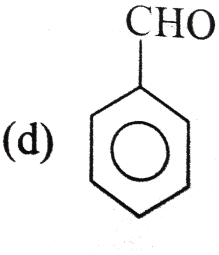


D.



Answer: A::B::C

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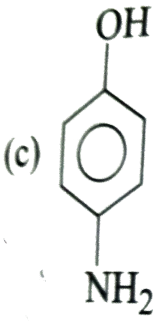
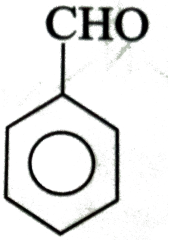
18. Among the following compounds, which will react with acetone to give

(c) 

(d) 

product

A. $C_6H_5NH_2$

B. $(CH_3)_3N$

C. $C_6H_5NHC_6H_5$

D. $C_6H_5NHNH_2$

Answer: A::D

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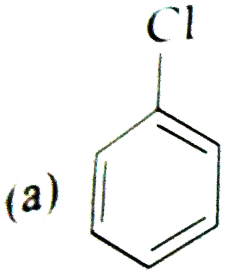
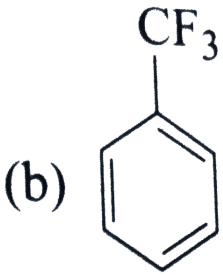
19. which of the compounds give cine substitution produced on reaction with $NaNH_2$ in liquid NH_3?

A.



B.



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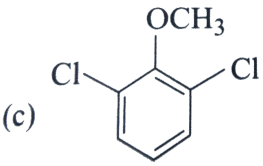

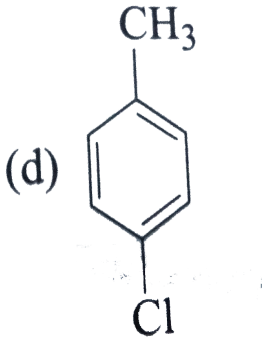

D.

Answer: A::B::D

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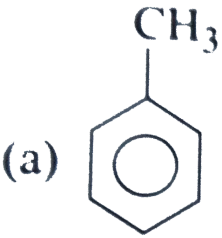
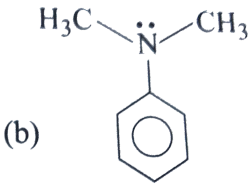
20. Which of the following compounds can give can given coulping reaction with benzene diazonium salt ?

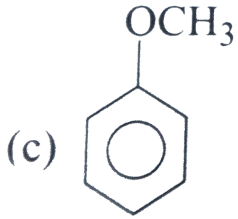


A.

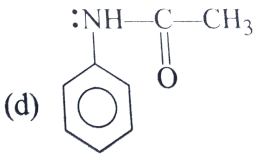
B.



C.



D.



Answer: B::C

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PASSAGE

1. (A) Ammonolysis of alkyl halides is not a suitable method for the preparation of pure primary amines.

(R) Ammonolysis of alkyl halides yields mainly secondary amines.

A. If both A and R are correct and R is the correct explanation of A.

B. If both A and R are correct and R is not the correct explanation of A.

C. If A is the correct but R is incorect.

D. If A is the incorrect but R is corect.

Answer: C

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2. (A) Carbylamine reaction involves chemical reaction between 1° amine and chloroform in basic medium.

(R) In carbylamine reaction, $-NH_2$ group changes into -NC group.

A. If both A and R are correct and R is the correct explanation of A.

B. If both A and R are correct and R is not the correct explanation of A.

C. If A is the correct but R is incorect.

D. If A is the incorrect but R is corect.

Answer: A

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3. (A) The main product of reaction of alcoholic silver nitrite and ethyl bromide is nitroethane.

(R) Silver nitrite is predominantly covalent compound.

A. If both A and R are correct and R is the correct explanation of A.

B. If both A and R are correct and R is not the correct explanation of A.

C. If A is the correct but R is incorect.

D. If A is the incorrect but R is corect.

Answer: A

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4. (A) Treatment of alkyl halide with alcoholic solution of potassium cyanide gives isocyanide.

(R) Cyanide are used for the preparation of anmines and amides.

A. If both A and R are correct and R is the correct explanation of A.

B. If both A and R are correct and R is not the correct explanation of A.

C. If A is the correct but R is incorect.

D. If A is the incorrect but R is corect.

Answer: D

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5. (A) $CuCl_2$ gives a deep blue coloured solution with ethylamine.

(R) Ethylamine molecules co-ordinate with cupric ions forming a blue coloured complex.

A. If both A and R are correct and R is the correct explanation of A.

B. If both A and R are correct and R is not the correct explanation of A.

C. If A is the correct but R is incorect.

D. If A is the incorrect but R is corect.

Answer: A

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6. (A) Amines are more basic than esters and ethers.

(R) Nitrogen is less electronegative than oxygen. It is better position to accommodate the positive charge on the proton.

A. If both A and R are correct and R is the correct explanation of A.

B. If both A and R are correct and R is not the correct explanation of A.

C. If A is the correct but R is incorect.

D. If A is the incorrect but R is corect.

Answer: A

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7. Assertion (A) : Pyridine is more basic than piperidine.

Reason (R): N atom is sp^2-hybridised in both.

A. If both A and R are correct and R is the correct explanation of A.

B. If both A and R are correct and R is not the correct explanation of A.

C. If A is the correct but R is incorect.

D. If A is the incorrect but R is corect.

Answer: C

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8. Assertion (A) : Hofmann bromamide reaction takes place btween an arthide and Br_2 in basic medium . ltbRgt Reason (R). The reaction proceeds by the formation of $\left(R-\overline{N}:\right)$ nitrene intremediate.

A. If both A and R are correct and R is the correct explanation of A.

B. If both A and R are correct and R is not the correct explanation of A.

C. If A is the correct but R is incorect.

D. If A is the incorrect but R is corect.

Answer: C

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9. (A) Nitrobenzene undergoes Friedel-Craft reaction.

(R) Friedel-Crafts reaction is an electrophilic substitution reaction.

A. If both A and R are correct and R is the correct explanation of A.

B. If both A and R are correct and R is not the correct explanation of A.

C. If A is the correct but R is incorect.

D. If A is the incorrect but R is corect.

Answer: D

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10. Statement I Benzonitrile is prepared by the reaction of chlorobenzene with potassium cyanide.

Statement II Cyanide $\left(CN^{-}\right)$ is a strong nucleoohile.

A. If both A and R are correct and R is the correct explanation of A.

B. If both A and R are correct and R is not the correct explanation of A.

C. If A is the correct but R is incorect.

D. If both A and R is incorect.

Answer: D

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11. Statement I: In strongly acidic solutions , anline becomes more reactive towards electrophilic reagents Statement II: The amino group being

completely protonated in strongly acidic solution, the lone pair of electrons on nitrogen is no longer available for resonance.

A. If both A and R are correct and R is the correct explanation of A.

B. If both A and R are correct and R is not the correct explanation of A.

C. If A is the correct but R is incorect.

D. If A is the incorrect but R is corect.

Answer: D

Watch Video Solution

12. (A) Rate of nitration of benzene and hexadeuterobenzene are different.

(R) C-H bond is stronger than C-D bond.

A. If both A and R are correct and R is the correct explanation of A.

B. If both A and R are correct and R is not the correct explanation of A.

C. If A is the correct but R is incorect.

D. If both A and R is incorect.

Answer: D

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13. (A) The presence of nitro group facilitates nucleophilic

(R) The intermediate carbanion is stabilized due to the

A. If both A and R are correct and R is the correct explanation of A.

B. If both A and R are correct and R is not the correct explanation of A.

C. If A is the correct but R is incorect.

D. If A is the incorrect but R is corect.

Answer: A

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14. (A) Nitration of aniline can be conveniently done by

(R) Acetylation increases the electron density in the benzene ring.\

A. If both A and R are correct and R is the correct explanation of A.

B. If both A and R are correct and R is not the correct explanation of A.

C. If A is the correct but R is incorect.

D. If A is the incorrect but R is corect.

Answer: C

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15. Statement I: Aniline on reaction with $NaNO_2HCl$ at $0^\circ C$ followed by coupling with β-naphthol gives a dark blue coloured precipitate.

Statement II: The colour of the compound formed in the reaction of aniline with $NaNO_2 / HCl$ at $0^\circ C$ followed by coupling with β-naphthol is due to extended conjugation.

A. If both A and R are correct and R is the correct explanation of A.

B. If both A and R are correct and R is not the correct explanation of A.

C. If A is the correct but R is incorect.

D. If A is the incorrect but R is corect.

Answer: D

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16. (a) If both the assertion and reason are true and reason is a true explanation of the assertion.

(b) If both the assertion and reason are true but the reason is not the correct explanation of assertion.

(c) If the assertion is true but reason is false.

(d) If assertion is false but reason is true.

Q. Assertion: Oxidation of 1-nitronaphthalene gives o-nitrophthalic acid whereas 1-amino naphthalene on oxidation gives phthalic acid.

Reason: An amino group attached to the benzene ring makes it resistant

to oxidation whereas nito group makes the benzene ring susceptible to oxidation.

A. If both A and R are correct and R is the correct explanation of A.

B. If both A and R are correct and R is not the correct explanation of A.

C. If A is the correct but R is incorect.

D. If A is the incorrect but R is corect.

Answer: C

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MATRIX

1. Match the following:

Column I (Reaction with)	Column II (Compounds)
(a) Acetyl chloride	(p) Primary amine
(b) Methyl iodide	(q) Secondary amine
(c) Ethyl alcohol	(r) Tertiary amine
(d) Carbon disulphide	(s) Quaternary ammonium

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2. Match the following:

Column I (Amines)	Column II (Distinguished by)
(a) $C_2H_5NH_2$ and $C_6H_5NH_2$	(p) Carbylamine test
(b) $(C_2H_5)_2NH$ and $(C_2H_5)_3N$	(q) Azo dye test
(c) $C_2H_5NH_2$ and $(C_2H_5)_3N$	(r) Hinsberg's reagent
(d) $(C_2H_5)_3N$ and $C_6H_5NH_2$	(s) Liebermann's nitroso reaction

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3. Match the following:

Column I	Column II
(a) $C_2H_5NH_2$	(p) Reaction with $NaNO_2 + HCl$
(b) $(C_2H_5)_2NH$	(q) Reaction with $CHCl_3 + KOH$
(c) $(C_2H_5)_3N$	(r) Formation of *N*-nitroso diethylamine with HNO_2
(d) $C_6H_5NH_2$	(s) Formation of triethylammonium nitroso with HNO_2

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4. Match the following:

Column I	Column II
(a) $CH_3-\underset{\displaystyle CH_3}{\underset{\vert}{CH}}-OH$	(p) **Hydrolysis gives 1° amine**
(b) $CH_3-\overset{\displaystyle O}{\overset{\Vert}{C}}-NH_2$	(q) Reduction gives 2° amine
(c) $CH_3-N=C=O$	(r) Br_2, OH^-, gives bromoform
(d) $R-\overset{+}{N}\equiv C$	(s) NaOBr gives 1° amine
	(t) Dehydration gives nitrile

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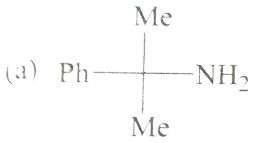
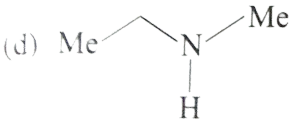
5. Match the following:

Column I (Amines)	Column II (Reaction with)
(a) 	(p) Treatment of CS_2, $HgCl_2$ gives out alkyl isothionate
(b) 	(q) Treatment of $Ph—SO_2—Cl$ produces the compound insoluble in alkali
(c) 	(r) Treatment of H_2O_2 and heating gives out alkene
(d) 	(s) Treatment of CS_2 produces dithiocarbamic acid

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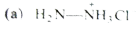
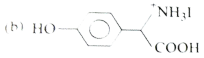
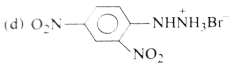
6. Match the following:

Column I (Compounds)	Column II (Tests/reactions)
(a) 	(p) Sodium fusion extract of the compound gives prussian blue colour with $FeSO_4$.
(b) 	(q) gives positive $FeCl_3$ test.
(c) 	(r) gives white precipitate with $AgNO_3$.
(d) 	(s) reacts with aldehyde to form the corresponding hydrazone derivatives.

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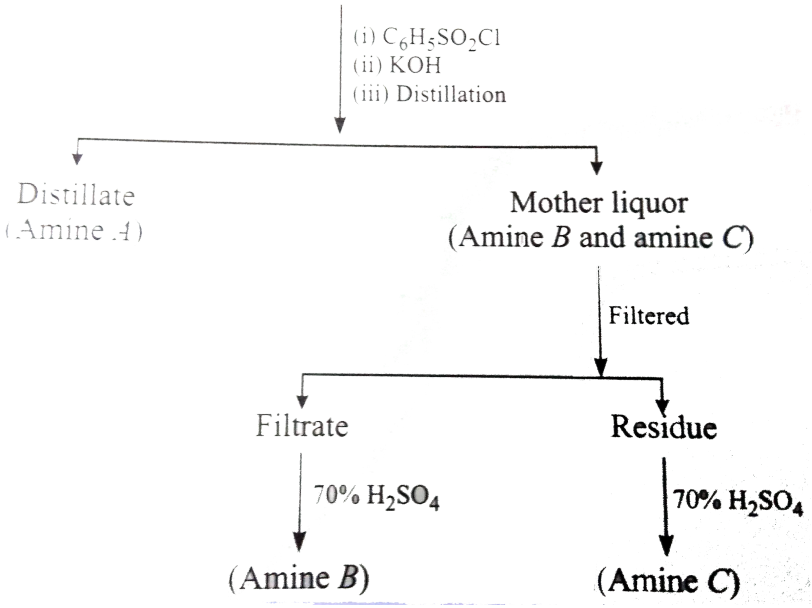
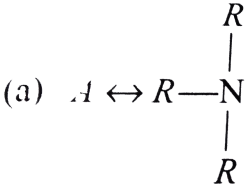
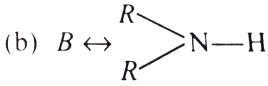
PASSAGE 1

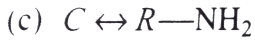
1. Benzene sulphonyl chloride $(C_6H_5SO_2Cl)$ is called Hinsberg's reagent. It is used for the distinction between primary, secondary and teriary amines. It is also used for separation of primary, secondary and teritiary amines from their mixture. $(1^\circ, 2^\circ, 3^\circ$ amines in mixture)

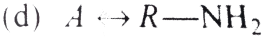


Which of the following is correctly matchd?

A. 

B. 

C. 

D. 

Answer: A

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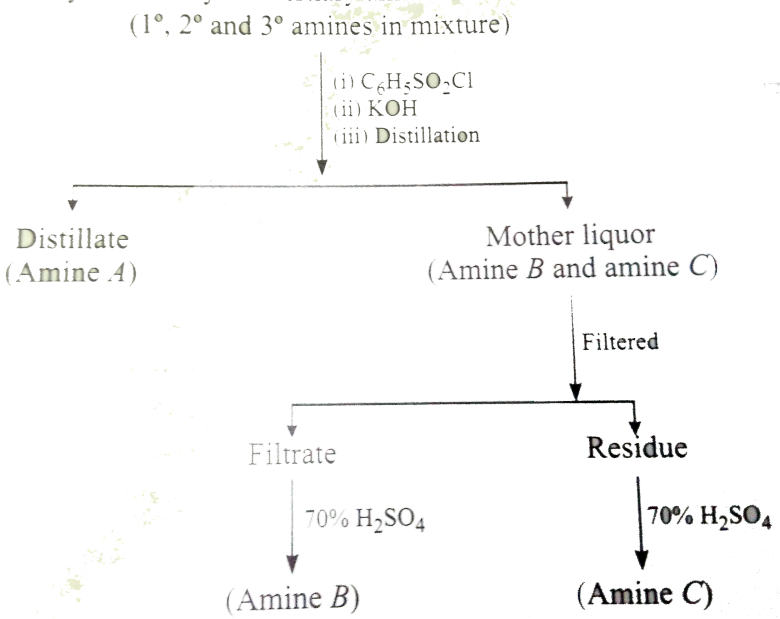
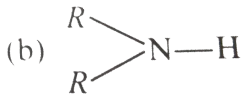
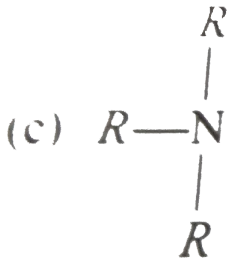
2. Benzene sulphonyl chloride $(C_6H_5SO_2Cl)$ is called Hinsberg's reagent. It is used for the distinction between primary, secondary and teriary amines. It is also used for separation of primary, secondary and teritiary amines from their mixture. $(1^\circ, 2^\circ, 3^\circ$ amines in mixture)



Which of the following amines does not react with benzene sulphonyl chloride?

A. (a) $R—NH_2$

B. (b) 

C. (c) 

D. Both a and b

Answer: C

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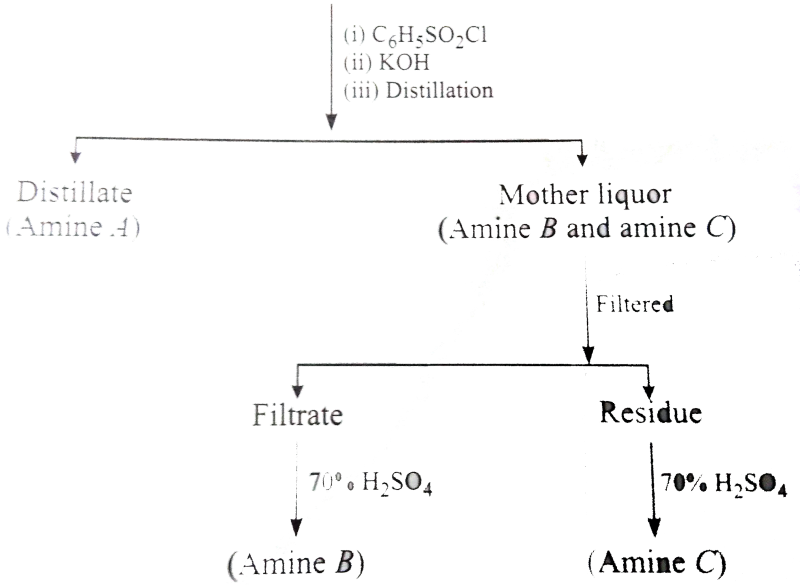
3. Benzene sulphonyl chloride $(C_6H_5SO_2Cl)$ is called Hinsberg's reagent. It is used for the distinction between primary, secondary and teriary amines. It is also used for separation of primary, secondary and teritiary amines from their mixture. $(1^\circ, 2^\circ, 3^\circ$ amines in mixture)



Which of the folloiwng is primary amine $R - NH_2$?

A. A

B. B

C. C

D. Cannot be predicted

Answer: B

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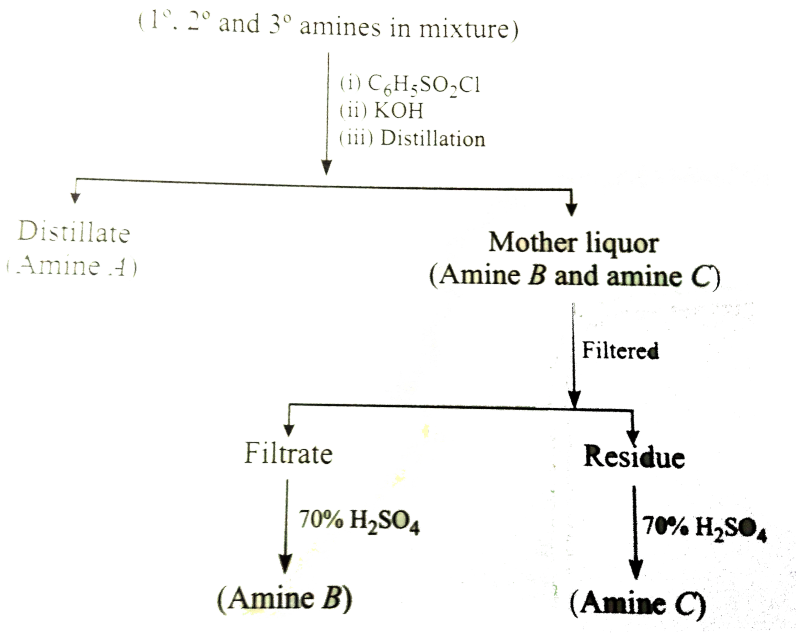
4. Benzene sulphonyl chloride $(C_6H_5SO_2Cl)$ is called Hinsberg's reagent. It is used for the distinction between primary, secondary and teriary amines. It is also used for separation of primary, secondary and teritiary amines from their mixture. $(1^\circ, 2^\circ, 3^\circ$ amines in mixture)



The resisdue insoluble in KOH obtained in the Hinsberg's test, corresponds to:

A. primary amine

B. secondary amine

C. tertiary amine

D. aromatic primary amine

Answer: B

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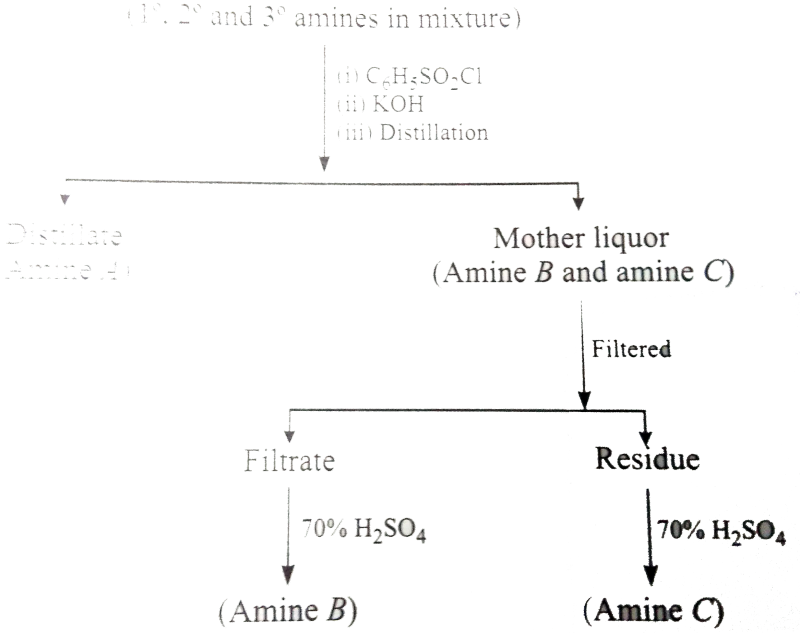
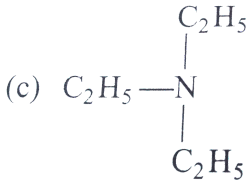
5. Benzene sulphonyl chloride $(C_6H_5SO_2Cl)$ is called Hinsberg's reagent. It is used for the distinction between primary, secondary and teriary amines. It is also used for separation of primary, secondary and teritiary amines from their mixture. $(1^\circ, 2^\circ, 3^\circ$ amines in mixture)



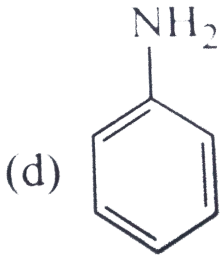
Which of the following amines represent C?

A. $C_2H_5 - NH_2$

B. (b) $(C_2H_5)_2N-H$



C.



D.

Answer: B

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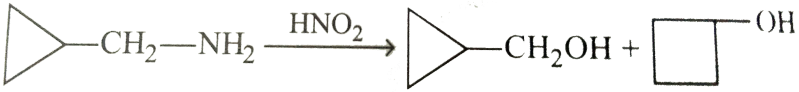
PASSAGE 2

1. Nitrous acid reacts with all classes of amines. The product obtained from these reactions depend on whether primary, secondary or tetriary and ,wheather the amine or aliphatic or aromatic.

Aliphalic primary amines react with acid $(NaNO_2 + HCl)$ to form

alcohol as major product. In , addition to alcohol, alkene and alkyl halides are also formed as minor product.

Certain cyclic primary amines can undergo either ring expansion or ring contraction reactions on treatment with acid. This reaction is called Demajanov ring expansion or contraction.



What will be the major product when 2-aminopropane is treated with nitrous acid?

A. 1-propanol

B. 2-propanol

C. Propene

D. Cyclopropane

Answer: B

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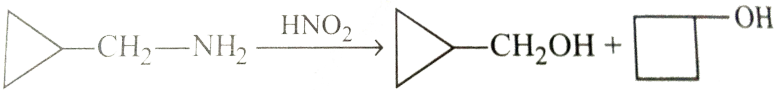
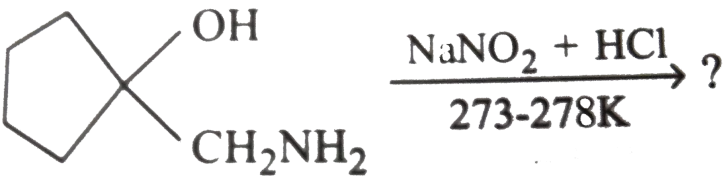
2. Nitrous acid reacts with all classes of amines. The product obtained from these reactions depend on whether primary, secondary or tetriary and ,wheather the amine or aliphatic or aromatic.

Aliphalic primary amines react with acid $(NaNO_2 + HCl)$ to form alcohol as major product. In , addition to alcohol, alkene and alkyl halides are also formed as minor product.

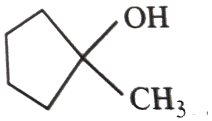
Certain cyclic primary amines can undergo either ring expansion or ring contraction reactions on treatment with acid. This reaction is called Demajanov ring expansion or contraction.

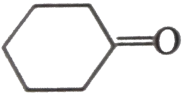


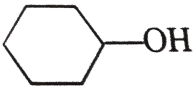
The product(s) obtained in the following reaction will be:



A.

B. (b) 

C. (c) 

D. (d) 

Answer: A::C::D

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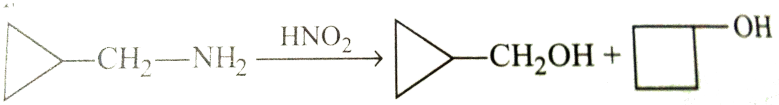
3. Nitrous acid reacts with all classes of amines. The product obtained from these reactions depend on whether primary, secondary or tetriary and ,wheather the amine or aliphatic or aromatic.

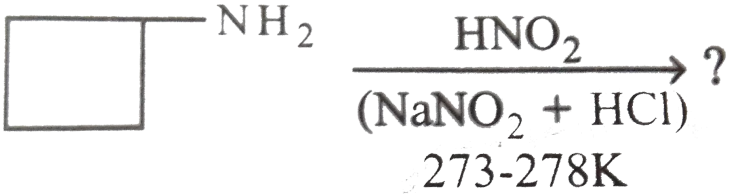
Aliphalic primary amines react with acid $(NaNO_2 + HCl)$ to form alcohol as major product. In , addition to alcohol, alkene and alkyl halides are also formed as minor product.

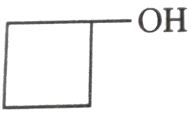
Certain cyclic primary amines can undergo either ring expansion or ring

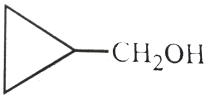
contraction reactions on treatment with acid. This reaction is called Demajanov ring expansion or contraction.

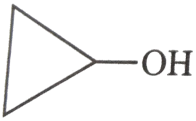


Which of the following product(s) will be obtained in the following reactions?



A. (a) 

B. (b) 

C. (c) 

D. $CH_3CH_2CH_2CH_2OH$

Answer: A::B

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4. Nitrous acid reacts with all classes of amines. The product obtained from these reactions depend on whether primary, secondary or tetriary and ,wheather the amine or aliphatic or aromatic.

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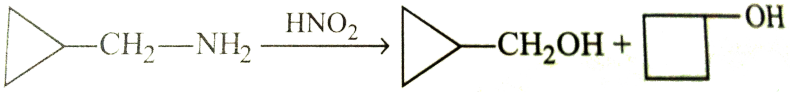

Which of the following product(s) will be obtained when isopropylamine is treated with sodium nitrite and hydrochloric acid?

A. $CH_3 - \underset{\underset{OH}{|}}{CH} - CH_3$

B. $CH_3 - CH = CH_2$

C. $CH_3 - \overset{Cl}{\overset{|}{C}}H - CH_3$

D. all of these

Answer: D

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5. Nitrous acid reacts with all classes of amines. The product obtained from these reactions depend on whether primary, secondary or tetriary and ,wheather the amine or aliphatic or aromatic.

Aliphalic primary amines react with acid $(NaNO_2 + HCl)$ to form alcohol as major product. In , addition to alcohol, alkene and alkyl halides are also formed as minor product.

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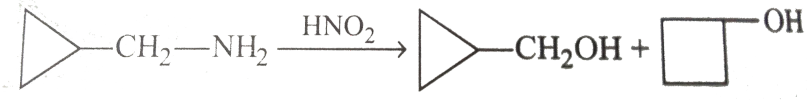

Two compounds (A) and (B) are treated with nitrous acid.

(From *A*)	(From *B*)
(a) $CH_3—CH_2—\overset{+}{C}H_2$	$CH_3—CH_2—\overset{+}{C}H_2$
(b) $CH_3—\overset{+}{C}H—CH_3$	$CH_3—CH_2—\overset{+}{C}H_2$
(c) $CH_3—\overset{+}{C}H—CH_3$	$CH_3—\overset{+}{C}H—CH_3$
(d) none of the above	

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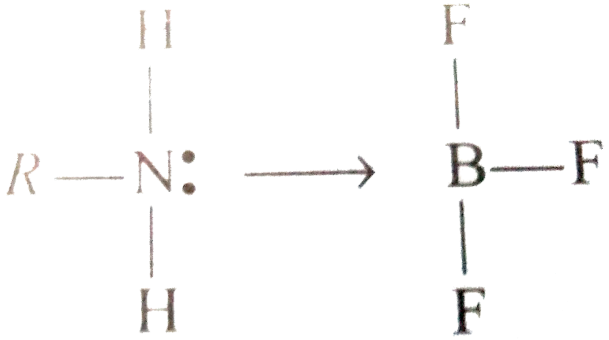
PASSAGE 3

1. Amines are basic compounds They act as Lewis base due to the presence of lone pair electrons at nitrogen



Lewis base Lewis acid

Amines also behave as base as well as Bronsted inductive effect, steric hindrance and resosnance.

$$CH_3 - NH_2 + HOH \Leftrightarrow CH_3 - NH_3^+ + OH^-$$

$$CH_3 - NH_2 + H^+Cl^- \Leftrightarrow CH_3 - NH_3^+ + Cl^-$$

Alkyl groups and electron groups hence these groups increases the electron density at nitrogen as well as the basic amines character of amines. Basic character of teritary amines is reduced due to the steric hindrance of three alkyl groups. Experimentally it is observed that stronger bases have smaller values of pK_b greater value of K_b.

Which among the following is the most basic in aqueous medium?

A. NH_3

B. $CH_3 - NH_2$

C. $(CH_3)_2NH$

D. $(CH_3)_3N$

Answer: D

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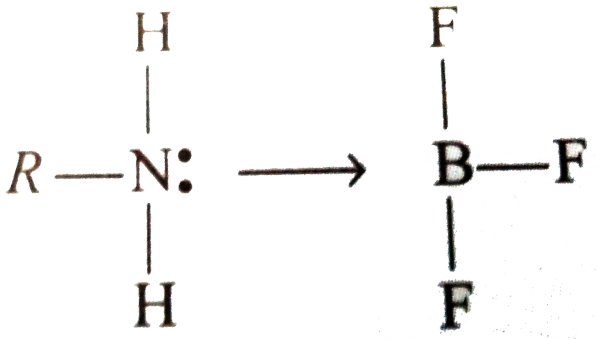
2. Amines are basic compounds They act as Lewis base due to the presence of lone pair electrons at nitrogen



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Which among hte following is the most basic in aqueous medium?

A. NH_3

B. $CH_3 - NH_2$

C. $(CH_3)_2NH$

D. $(CH_3)_3N$

Answer: C

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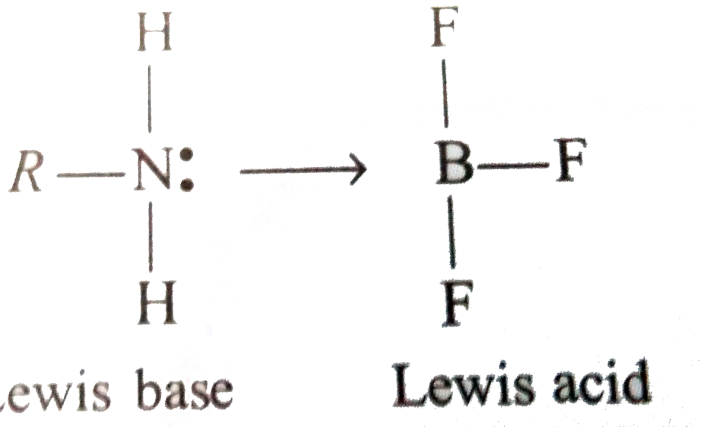
3. Amines are basic compounds They act as Lewis base due to the presence of lone pair electrons at nitrogen



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Which among the following factors in fluence the basicity of amines?

I-the inductive effect of alkyl group

II-the polar effect

III-the resonance

A. I,II

B. I,III

C. II,III

D. I,II,III

Answer: D

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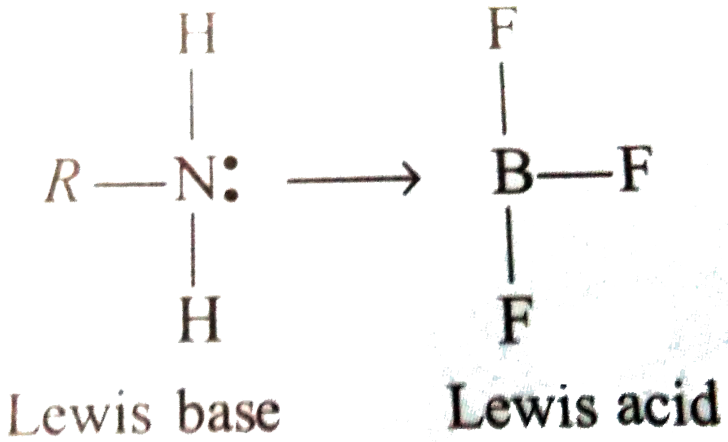
4. Amines are basic compounds They act as Lewis base due to the presence of lone pair electrons at nitrogen



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stronger bases have smaller values of pK_b greater value of K_b.

Which of the following is the most basic?

A. $CH_3 - CH_2 - NH_2$

B. $C_2H_5 - NH_2$

C. $C_3H_7 - NH_2$

D. (d) 

Answer: C

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PASSAGE 4

1. p-Amino-N,N-dimethylaniline is added to a strongly acidic solution of X.

The resulting solution is treated with a few drops of aqueous solution of

Y to yield blue colouration due to the formation of methylene blue. Treatment of aqueous solution of Y with reagent potassium hexacyanoferrate (II) leads to the formation of an intense blue precipitate. The precipitate dissolves on excess addition of the reagent. Similarly, the treatment of the solution of Y with the solution of potassium hexacyanoferrate (III) leads to a brown colouration due to the formation of Z.

Q. Compound X is

A. $NaNO_3$

B. $NaCl$

C. Na_2SO_4

D. Na_2S

Answer: D

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2. p-Amino-N,N-dimethylaniline is added to a strongly acidic solution of X. The resulting solution is treated with a few drops of aqueous solution of Y to yield blue colouration due to the formation of methylene blue. Treatment of aqueous solution of Y with reagent potassium hexacyanoferrate (II) leads to the formation of an intense blue precipitate. The precipitate dissolves on excess addition of the reagent. Similarly, the treatment of the solution of Y with the solution of potassium hexacyanoferrate (III) leads to a brown colouration due to the formation of Z.

Q. Compound Y is

A. $MgCl_2$

B. $FeCl_2$

C. $FeCl_3$

D. $ZnCl_2$

Answer: C

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3. p-Amino-N,N-dimethylaniline is added to a strongly acidic solution of X. The resulting solution is treated with a few drops of aqueous solution of Y to yield blue colouration due to the formation of methylene blue. Treatment of aqueous solution of Y with reagent potassium hexacyanoferrate (II) leads to the formation of an intense blue precipitate. The precipitate dissolves on excess addition of the reagent. Similarly, the treatment of the solution of Y with the solution of potassium hexacyanoferrate (III) leads to a brown colouration due to the formation of Z.

Q. Compound Z is

A. $Mg[Fe(CN)_6]$

B. $Fe[Fe(CN)_6]$

C. $Fe_4[Fe(CN)_6]_3$

D. $K_2Zn_3[Fe(CN)_6]_2$

Answer: B

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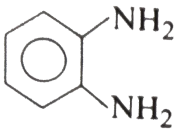
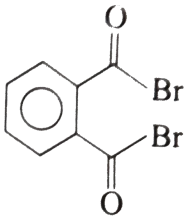
PASSAGE 5

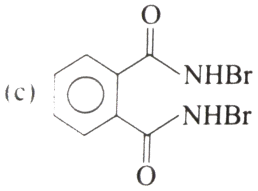
1. Treatment of compound o with $KMnO_4 / H^+$ gave P, which on heating with ammonia gave Q. The compound Q on treatment with $Br_2 / NaOH$ produced R.On strong heating ,Q gave S, which on furthur treatment with ethyl2-bromopropanate in the presence of KOH followed by acidfication , gave acidificatin , gave a compound T.4

The compound R is

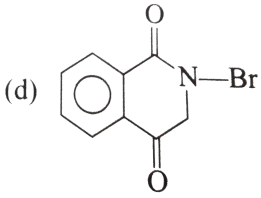
A. (a) 

B. (b) 

C.



D.



Answer: A

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2. Treatment of compound o with $KMnO_4/H^+$ gave P, which on heating with ammonia gave Q. The compound Q on treatment with $Br_2/NaOH$ produced R.On strong heating ,Q gave S, which on furthur treatment with ethyl2-bromopropanate in the presence of KOH followed by acidfication , gave acidificatin , gave a compound T.4

The compound R is

A. glycine

B. alanine

C. valanine

D. serine

Answer: B

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Single integer

1. How many isomeric amines can have the formula $C_4H_{11}N -$

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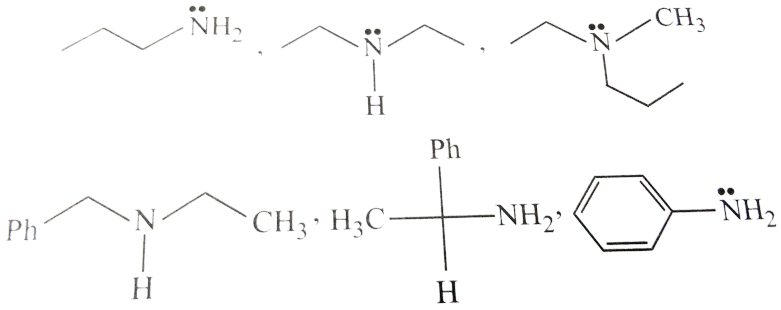
2. How many of the following amines can give carbylamine reaction



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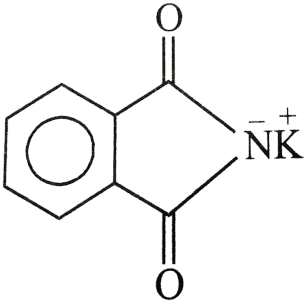
3. Of the following how many reactions are used for the preparation of amines?

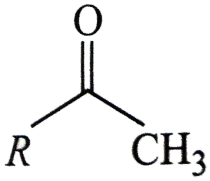
(a) $R-C\equiv N \xrightarrow{LiAlH_4}$

(b) $R-\underset{\underset{O}{\|}}{C}-NH_2 \xrightarrow{LiAlH_4}$

(c) $R-\underset{\underset{O}{\|}}{C}-NH_2 \xrightarrow{Br_2 + OH^-}$

(d) $R-\underset{\underset{O}{\|}}{C}-CH_3 + H_3C-NO_2 \xrightarrow{NaOH}$

(e)  $\xrightarrow[H^+/H_2O]{R-X}$

(f)  $\xrightarrow{N_2H_4, {}^-OH}$

(g) $R-\underset{\underset{O}{\|}}{C}-NH_2 \xrightarrow[\Delta]{P_2O_5}$

(h) $R-CH_2-NO_2 \xrightarrow{H_2, Ni}$

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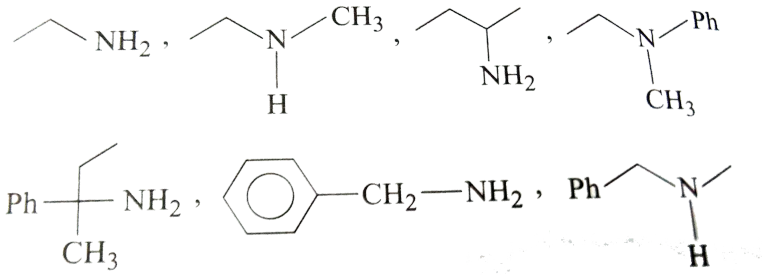
4. Of the following how many can be separated by Hofmann's mustard oil reaction?



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5. Which of the following can be prepared by Gabriel method from their corresponding halides or tosylates?

Allylamine, tert-Butylamine, Diethylamie,

Neopentylamine, o-Nitroaniline, m-Nitroaniline

p-Nitroanlamine, Vinylamine, p-toludiene, n-Butylamine

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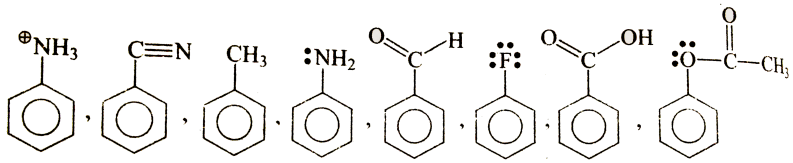
6. Examine the structural formula shown below and find out how many compounds can not give Friedel Carfts reaction .



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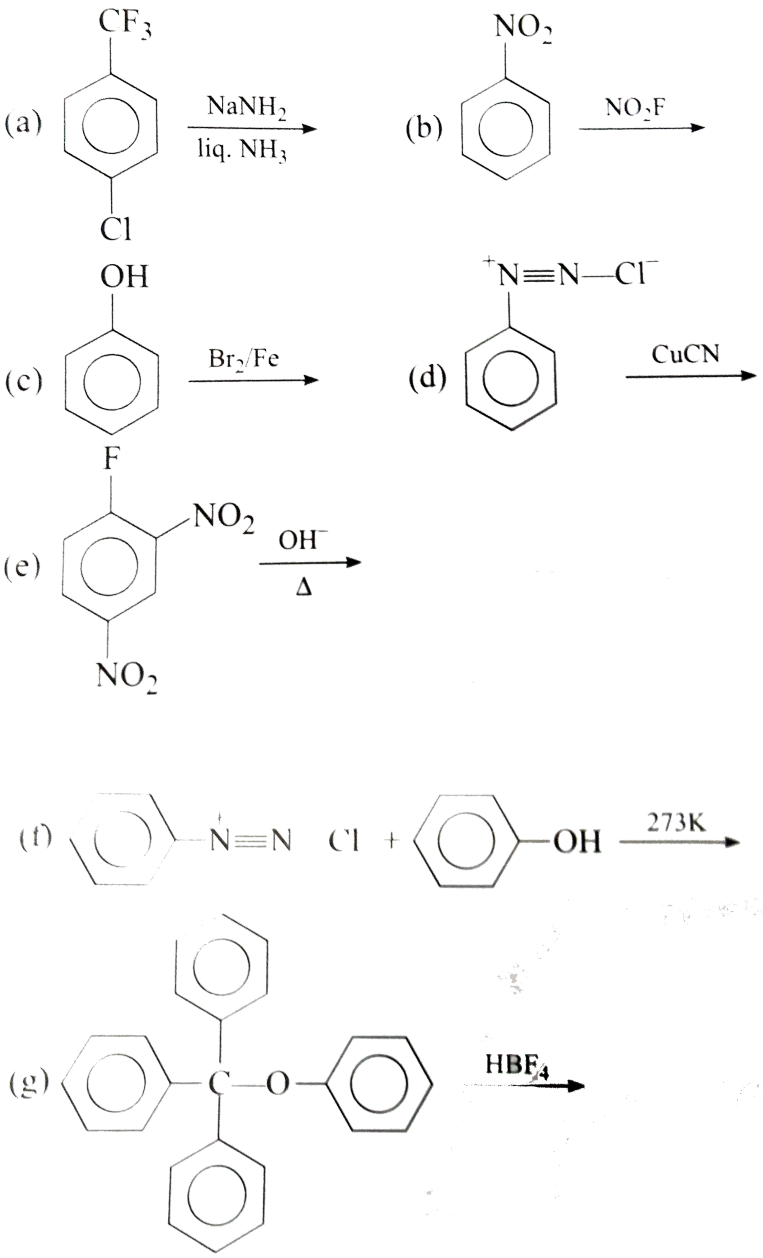
7. Find out number of reactions that are electrophilic aromatic subsitution in nature.



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8. How many of the followin amines will unergo diazotisatio?

Ethanamine, tert-butylamine, aniline, N-methylaniline,

m-chloroaniline, p-toluidine, 2-phenylethanamine,

o-anisdine, 2,4,6-tribromoaniline.

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