CHEMISTRY

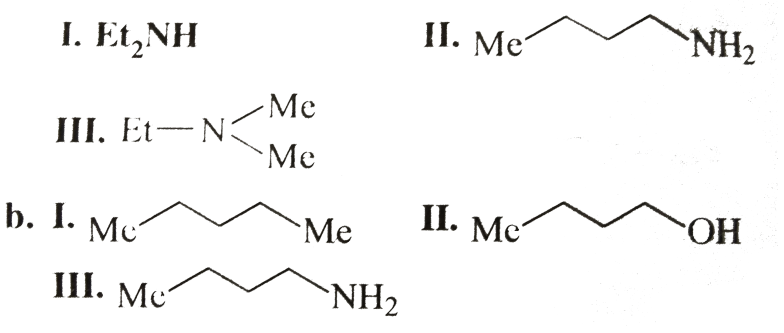
BOOKS - CENGAGE CHEMISTRY (ENGLISH)

ORGANIC COMPOUNDS WITH FUNCTIONAL GROUP

Illustration 15 1

1. Give the decresing order of boiling points for the following :

I. Et_2NH



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2. Give the decreasing orderof solubility of the following in H_2O:

(I) $PhNH_2$, $(II)Et_2NH$, $(III)EtNH_2$

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3. Why is an an amine of the type ` RR'R''N chiral and why cannot their enamtimers be separated ?

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4. Arrange the following in the decreasing order of their basic strength :

i. $PhNH_2$ ii. $EtNH_2$ iii. Et_2NH iv, NH_3

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5. Write chemical reactions for the following :

a. Reaction of ethanolic NH_3 with $EtBr$.

b. Ammonolusis of benzlbromide and reaction of amine so formed with 2 mol $MeBr$.

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6. Prepare R-NH2 by Gabriel synthesis .

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7. a. What kind of halides cannot be used to alkylate an amine :

b. Give the first amine formed from the reaction of $I. MeCl + EtNH, II, CH_2 = CHCH_2Cl + Me_2NH,$ and III. $PhCH_2Cl + EtNHMe.$

c. Identify (A) to (E).

$$PhSO_2Br + PrNH_2 \xrightarrow{-HCl} (A) \xrightarrow{KOH} (B) \xrightarrow{EtBr} (C) \xrightarrow{H_3O^{\oplus}} (D) + (E)$$

d. Complete the following reactions :

i. 

Oxirane
(A)

$$\cdot NH_3 \longrightarrow (B) \xrightarrow{(A)} (C) \xrightarrow{(A)} (D)$$

ii. 

Thiirane
(E)

$$\cdot NH_3 \longrightarrow (F) \xrightarrow{(E)} (G) \xrightarrow{(E)} (H)$$

i.

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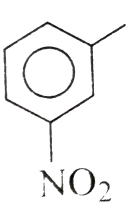
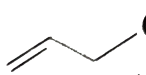
8. Complete the following :

i. 

(A)

$$\xrightarrow{NH_4SH} (B)$$

ii. 

Allylchloride

$$+ N_3^{\ominus} \longrightarrow (C) \xrightarrow{H_2/Pt} (D)$$

$$(C) \xrightarrow{LAH} (E)$$

Azide ion

i.

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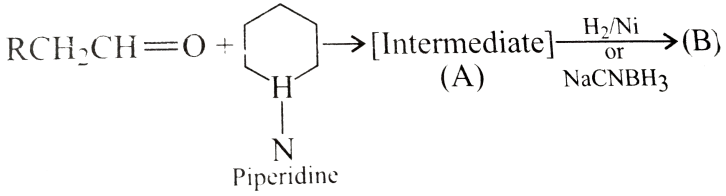
9. Complete the folllwing reactions :

a. 

a.

b. $PhCH = O + PhNH_2 \rightarrow \underset{(A)}{[\text{Intermediate}]} \xrightarrow[\text{or } NaCNBH_3]{H_2/Ni} (B)$

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10. Complete the following reactions :

a. $Et_2NH + PhSO_2Cl \rightarrow$

c. $PhCH_2NH_2 + HCOOH \xrightarrow{\Delta}$

c. $PhNH_2 + PhCHO \rightarrow$.

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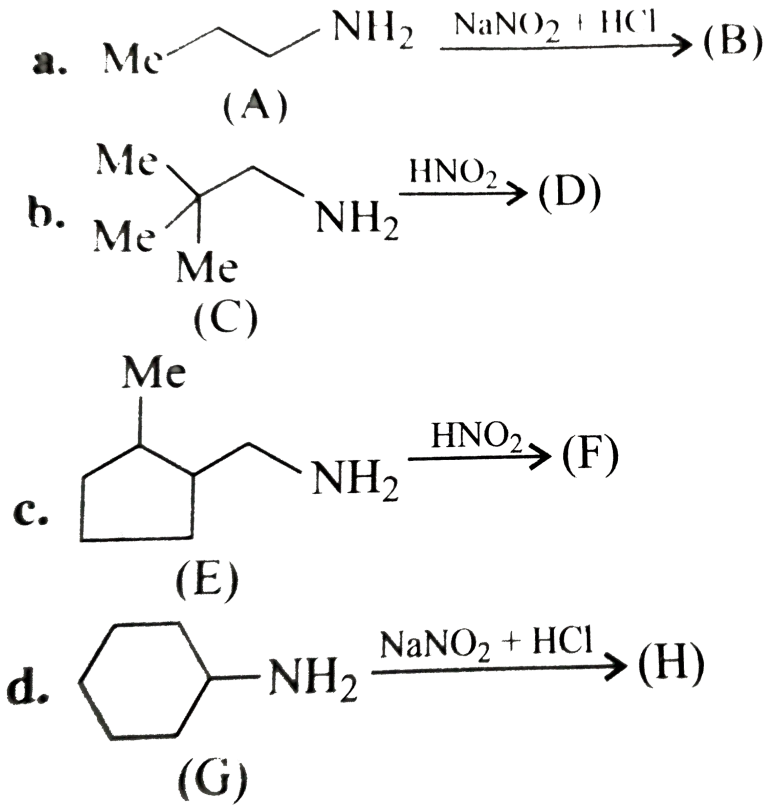
11. Identify Product (B):



a.

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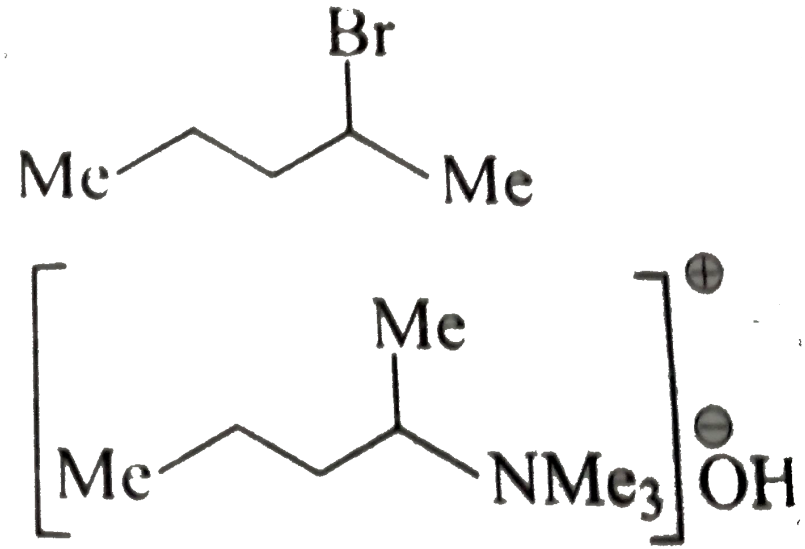
12. Explain :

I. Dehydrohalogenation of



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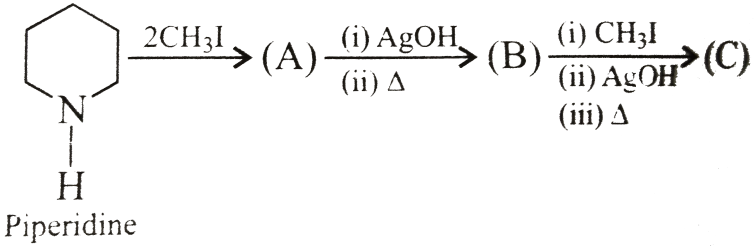
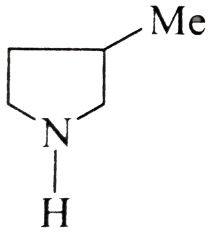
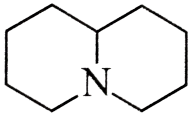
13. Complete the following :

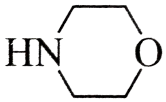
a. 

b. Give the products of the following by application of Hofmann's

exhaustive methylation and elimination :

i. 

ii. 

iii. 

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14. Give the alkene formed on heating the following (Hofmann degradation) :

i. $\left[\overset{\beta}{C}H_3\overset{\alpha}{C}H_2 - \overset{\overset{Me}{|}}{\underset{\underset{Me}{|}}{N}} - \overset{\alpha}{C}H_2 - \overset{\beta}{C}H_2 - CH_3\right]^{\oplus} \overset{\ominus}{O}H$

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15. Give the decreasing order of reactivity opf diazonium ion coupling with phenol.

I. $p - NO_2 - C_6H_4\overset{\oplus}{N}_2$ II. $p - Cl - C_6H_4\overset{\oplus}{N}_2$

III. $C_6H_5\overset{\oplus}{N}_2$ IV. $p-Me-C_6H_4\overset{\oplus}{N}_2$

V. $p-MeO-C_6H_4\overset{\oplus}{N}_2$

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16. Give the decreasing order of reactivity for the following coupling compounds with PhN_2Cl.

a. I. Aniline II. Phenol III. Toluene IV. Chlorobenzene V. Nitrobenzee

b. I. toluene II. Ethyl benzene III. Cymene IV. T-Butyl benzene V. Anisole .

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17. Explain whty 2,4-dinitrobenzen diazoninum ion couples with anisole byt $PhN_2^{\oplus}$ does not. Write the coupling reactio .

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18. Synthesise benzylamine $(PhCH_2NH_2)$ by

a. Hofman degradation

b. Reductive amination

c. Alkyl halide amination

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19. Starting from benzene or toluene or aniline and with the aid of diazonim salt synthesis the following :

a. p-Nitrobenzene

b. p-Cyano benzoic acid

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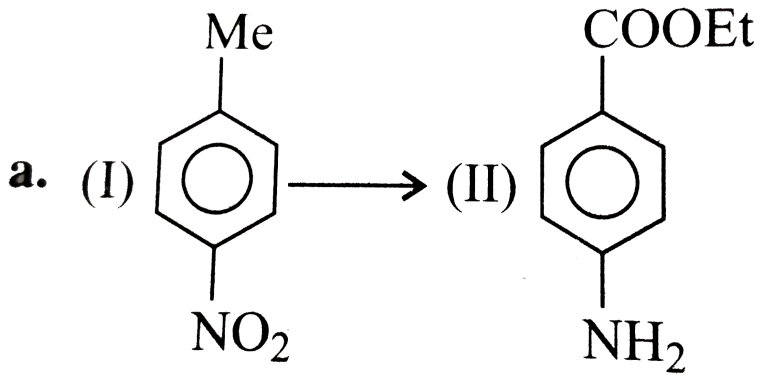
20. a.Convert the following



a.

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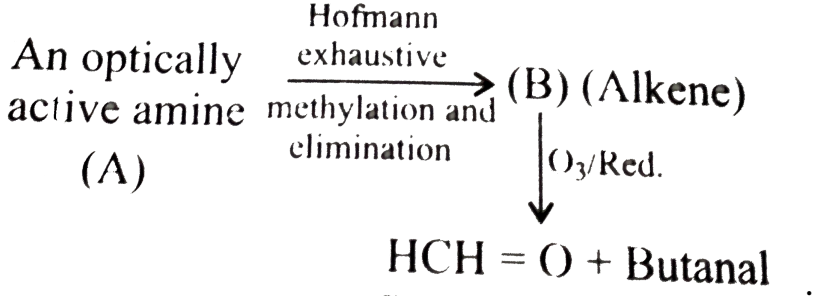
21. Identify (A) and (B).



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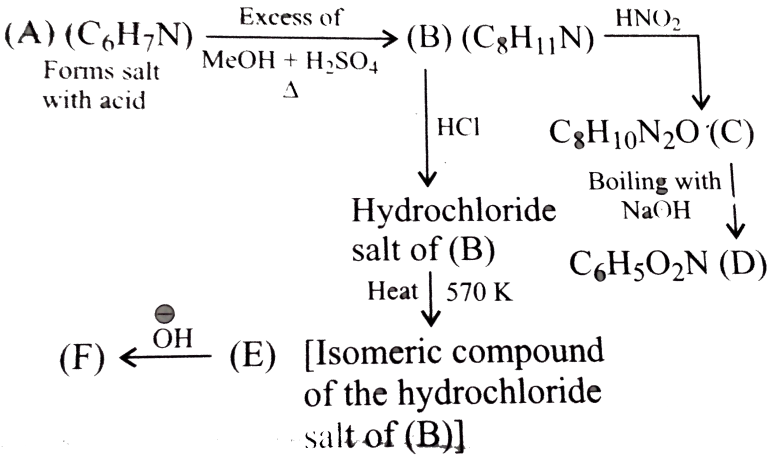
22. Identify (A) to (E) and write chemical equations for the vairous reactions involed .



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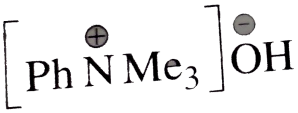
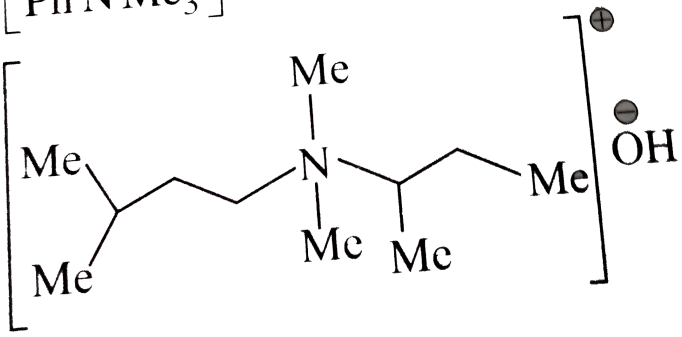
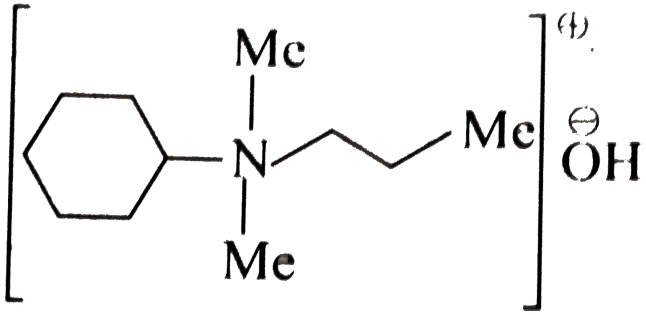
23. Give the major alkene resulting from the thermal decomposition of hydroxide salt of the following:

$$\left[PhN\overset{\oplus}{}Me_3\right]\overset{\ominus}{O}H$$

a. 

b. 

b. .

c. 

c. .

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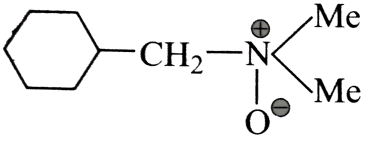
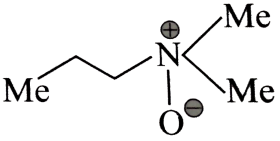
24. Give the product obtained on heating the following :

a. 

b. 

a. .

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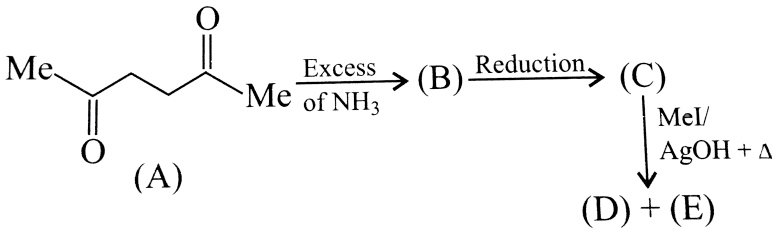
25. Complete the following :



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Solved Examples

1. Mention the main compounds which constitute Portland cement.

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2. Complete the following reactions.

a. $PhNO_2 \xrightarrow{Zn + aq.NH_4CI} (I)$

b. $p - Me - C_6H_4NO_2 \xrightarrow{As_2O_3 / Aq.NaOH} (II)$

c. $m - Me - C_6H_4NO_2 \xrightarrow{LAH} (III)$

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3. Give two uses of (i) caustic soda (ii) quick lime

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4. Why is beryllium carbonate unusually unstable thermally as compared to the other carbonates of this group?

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5. Explain the formation of the mixture $PhCH_2CHO(I)$ and $PhCOMe(II)$ when $PhCH(OH)CH_2NH_2(A)$ is treated with HNO_2

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6. What are the limitations of Hinsberg reagent?

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7. Why are lithium compounds soluble in organic solvents?

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8. Why metals like potassium and sodium can not be extracted by reduction of their oxides by carbon?

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9. The negative electron gain enthalpy of fluorine is less than that of chlorine.

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10. Write chemical name & formulae of a) Chile saltpetre b) Indian saltpetre

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11. At what concentration ozone is harmful?

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12. A mixture of two organic compound is added to cold water. After filtration, water-insoluble compound (A) burns with a smoky flame

and it does not respond to Lassaigne's and Beilsteins test. When a small amount of this is added to $NaHCO_3$ solution, a colourless gas is evolved with effervescene. when this comopound is heated with CH_3OH in acidic medium, it gives the characteristic smell of oil of wintergreen. compound (B), which is water soluble, burns with a non-smoky flame and its sodium extract is prepared with cane sugar. It gives the Prussian blue colour with freshly prepared solutions of $FeSO_4 + 2 - 3$ drops $NaOH$ and with few drops of H_2SO_4. when a small amount of this compound is heated in a dry test tube, a colourless gas is evolved that turns moist red litmus paper blue and a white residue is left. this white residue is dissolved in water and a drop of $CuSO_4$ is added in the basic medium -a violet colour is obtained. identify the compounds (A) and (B) with the help of the reactions involved.

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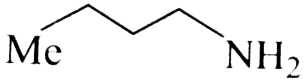
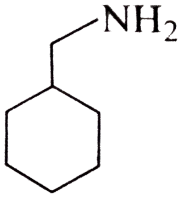
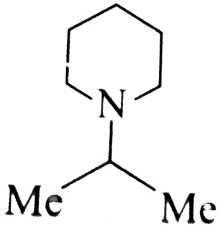
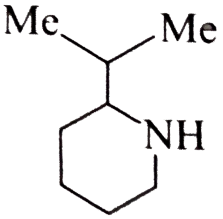
Exercises Subjective

1. Give the reactants of the following amines obtained by reduction with LAH.

i. 

ii. 

iii. 

iv. 

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2. Convert CH_3COOH into $(CH_3)_2NH$.

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3. How can photochemical smog be controlled?

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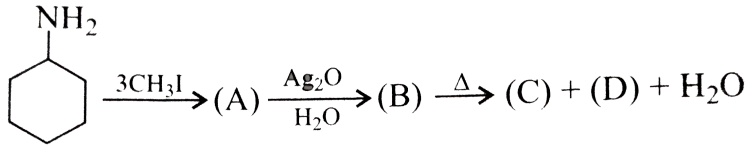
4. 

4.

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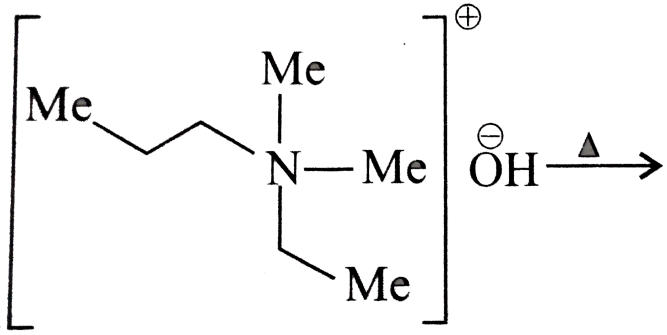
5. 

5.

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6. What are the diseases caused by sulphur dioxide?

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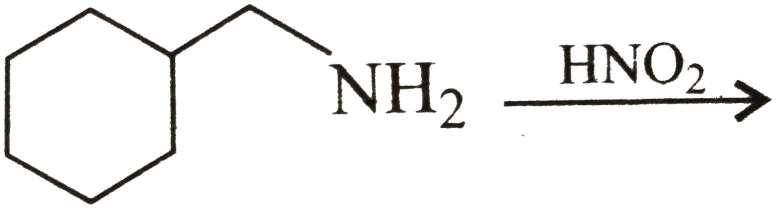

7. ` What are the possible products.

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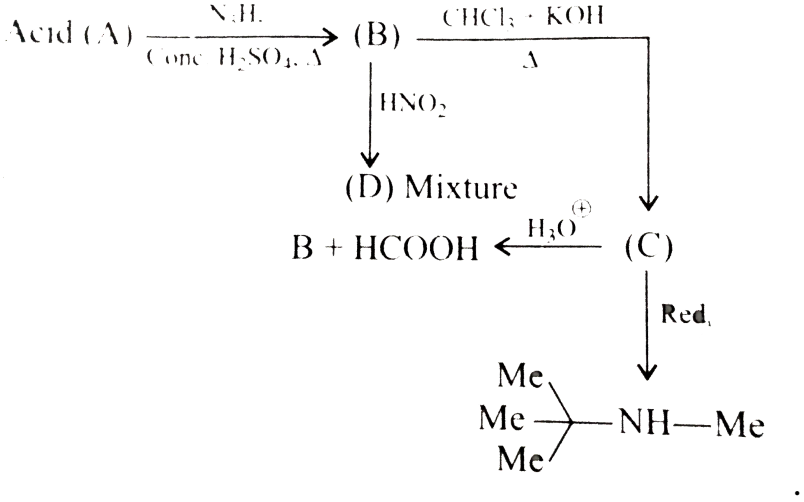
8. Identify (A),(B),(C) and (D).



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9. What happenes when the follwing react with HNO_2 ?

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

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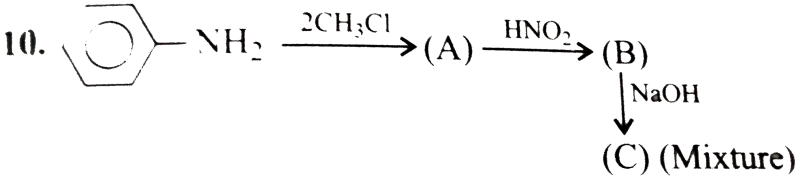
10. 

10. `

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11. C_3H_6N racts with Hinsberg reagent and the product formed is insoluble in alkali but soluble in ether . What is C_3H_9N?

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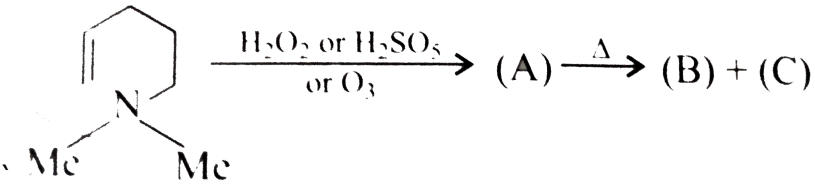
12. 

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13. a. Convert cyclohexyl amine into cyclopentyl amine .

b. Convert cyclohexene oxide into aminocyclohexamol.

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14. Arrange in the decreasing order of basic nature,

i. Pyrrole ii. Pyridine ii. Aniline

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15. Complete the folowing :

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16. When tetramethyl ammonium hydroxide is heated strongly, it yields methanol and trimethylamine . How is methanol formed : To what general class of reaction does this belong ?

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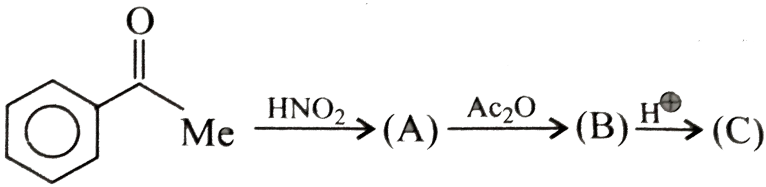
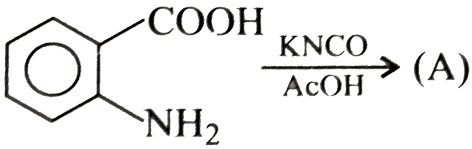
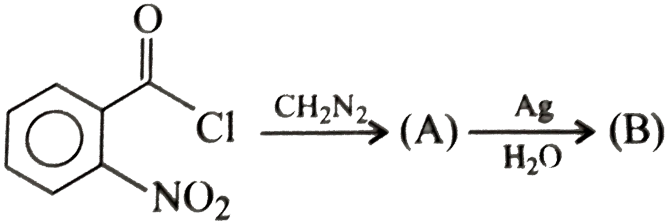
17. Complete the following :

a. 

b. 

c. 

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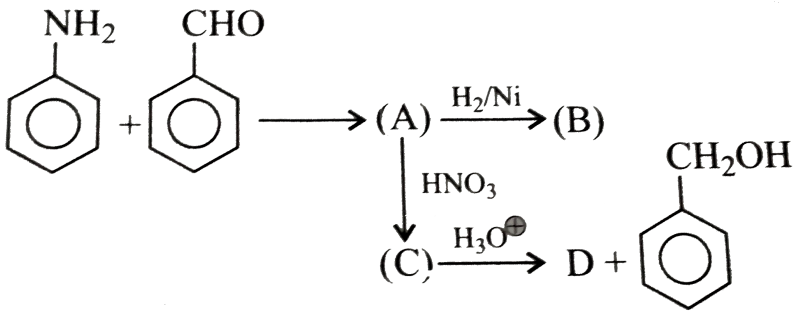
18. Complete the following :



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19. Which gas is produced when less reactive metals like Mg and Fe react with steam?

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20. How would you know whether a redox reaction is taking place in an acidic / alkaline or neutral medium?

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21. PH3 is a weaker base than NH3

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Exercises Concept Application

1. Write IUPAC names of the following compounds and classify them into primary, secondary and tertiary amines.

$(i)(CH_3)_2CHNH_2$ $(ii)CH_3(CH_2)_2NH_2$ $(iii)CH_3NHCH(CH_3)_2$

$(iv)(CH_3)_3CNH_2$ $(v)C_6H_5NHCH_3$ $(vi)(CH_3CH_2)_2NCH_3$

$(vii)m-BrC_6H_4NH_2$

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2. Give one chemical test to distinguish between the following pairs of compounds .

Secondary and tertiary amines

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3. Give a test to detect the presence of SO2 gas?

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4. Convert :

i. Ethanoic acid into methanamine

ii. Hexanenitrile into 1-aminopentane

iii. Methanol to ethanoic acid

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5. Describe a method for the identification of primary, secondary and tertiary amines. Also wirte chemical equations of the reaction involved.

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6. Diazotisation is used for the conversion of ____ to _____

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7. Accomplish the following conversions :

Chlorobenzene to p-bromoaniline

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8. Give the strutures of (A), (B) and (C) in the following reactions :

$$C_6H_5NO_2 \xrightarrow{Fe\,/\,HCI} (A) \xrightarrow[273K]{HNO_2} (B) \xrightarrow{C_6H_5OH} (C)$$

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9. An aromatic compound 'A' on treatment with aqueous ammonia and heating forms compound 'B' which on heating with Br_2 and KOH forms a compound 'C' of molecular formula C_6H_7N. Write the structures and IUPAC names of compounds A, B and C.

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10. Comlete the following reactions :

i.$C_2H_5NH_2 + CHCl_3 + Alc.\ KOH \rightarrow$

ii. $C_6H_5N_2Cl + H_3H_3PO_2 + H_2O \rightarrow$

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11. Why cannot be aromatic primary amines prepared by Gabriel phalimide synthesis ?

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12. Write the reactions of (i) aromatic and (ii) aliphatic primary amines with nitrous acid.

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13. Give plausible explanation for each of the following:

(i) Why are amines less acidic than alcohols of comparable molecular masses?

(ii) Why do primary amines have higher boiling point than tertiary amines?

(iii) Why are aliphatic amines stronger bases than aromatic amines?

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Concept Application 4

1. Arrange the following :

i. In the decreasing order of the pK_b values:

In the increasing order of solubility in water.

Aniline, $(C_2H_5)_2NH$, and $C_2H_5NH_2$

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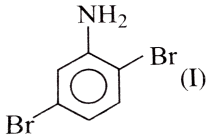
Exercises Linked Comprehension

i. Organic compound (A) (Molar mass = 251) (Contains 63.7% of Br) $\xrightarrow[\text{(ii) } Na_2SnO_2]{\text{(i) Diazotisation}}$ Solid (B) (Contains 67.8% of Br) $\xrightarrow{\text{Nitration}}$ One mono nitro compound

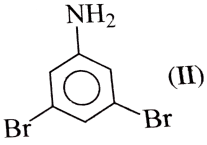
ii. Compound (C) [Isomer of (A)] $\xrightarrow[\text{(ii) CuBr}]{\text{(i) Diazotisation}}$ Compound (D) (Contains 76.4% of Br) $\xrightarrow{\text{Nitration}}$ One mono nitro compound

1. (i)

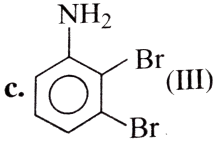
Compound (A) is:

A. **a.** 

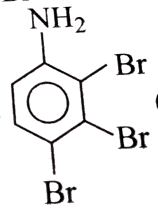
(I)

B. **b.** 

(II)

C. **c.** 

(III)

D. **d.** 

(IV)

Answer:

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i. Organic compound (A) (Molar mass = 251) (Contains 63.7% of Br) $\xrightarrow[\text{(ii) } Na_2SnO_2]{\text{(i) Diazotisation}}$ Solid (B) (Contains 67.8% of Br) $\xrightarrow{\text{Nitration}}$ One mono nitro compound

ii. Compound (C) [Isomer of (A)] $\xrightarrow[\text{(ii) CuBr}]{\text{(i) Diazotisation}}$ Compound (D) (Contains 76.4% of Br) $\xrightarrow{\text{Nitration}}$ One mono nitro compound

2. (i)

(ii)

Compound (C) is:

A. (I)

B. (II)

C. (III)

D. (IV)

Answer:

View Text Solution

i. Organic compound (A) (Molar mass = 251) (Contains 63.7% of Br) $\xrightarrow[\text{(ii) } Na_2SnO_2]{\text{(i) Diazotisation}}$ Solid (B) (Contains 67.8% of Br) $\xrightarrow{\text{Nitration}}$ One mono nitro compound

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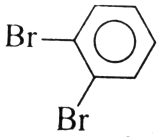
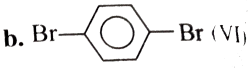
3. (i)

(ii)

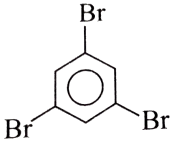
Compound (B) is:

A. **a.** 

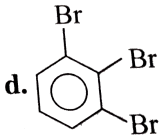
(V)

B. **b.** 

(VI)

C. **c.** 

(VII)

D. d. 

(VIII)

Answer:

View Text Solution

i. Organic compound (A) (Molar mass = 251) (Contains 63.7% of Br) $\xrightarrow[\text{(ii) } Na_2SnO_2]{\text{(i) Diazotisation}}$ Solid (B) (Contains 67.8% of Br) $\xrightarrow{\text{Nitration}}$ One mono nitro compound

ii. Compound (C) [Isomer of (A)] $\xrightarrow[\text{(ii) CuBr}]{\text{(i) Diazotisation}}$ Compound (D) (Contains 76.4% of Br) $\xrightarrow{\text{Nitration}}$ One mono nitro compound

4. (i)

(ii)

Compound (D) is:

A. (V)

B. (VI)

C. (VII)

D. (VIII)

Answer:

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5. Hydrogen peroxide stored in wax-lined glass or plastic vessels in dark.

True/False

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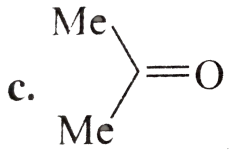
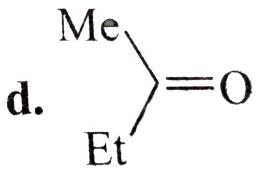
6. What is water – gas shift reaction?

A. CH_3CHO

B. CH_3CH_2CHO

C. 

D. 

Answer:

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7. Hard water does not produce lather with soap. True/False

A. $pH = 7.0$

B. $pH = 8.0$

C. $pH = 6.0$

D. $pH = 9.0$

Answer:

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8. T strength in volumes of a solution containing 30.36 g/l of H2O2 will be 5 volumes. True/False

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9. Explain why cation are smaller and anions larger in radii than their parent atoms?

A. $CH_3 - \underset{\underset{CH_3}{|}}{\overset{\overset{OCH_3}{|}}{C}} - CH_2CH_2NH_2$

B. $CH_3 - \underset{\underset{CH_3}{|}}{CH} - \underset{\underset{OCH_3}{|}}{CH} - CH_2Br$

C. $CH_3 - \underset{\underset{CH_3}{|}}{CH} - CH_2 - \underset{\underset{OCH_3}{|}}{CH} - NH_2$

D. $CH_2 - \underset{CH_3}{\overset{OCH_3}{C}} - \underset{NH_2}{CH} - CH_3$

Answer:

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10. Is it possible to acidify borax solution?

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11. Write balanced equations to show hydrolysis reactions of CO_3^2 ^ $-$ and $HCO3-$.

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12. Boric acid is a strong acid. True/False

Watch Video Solution

13. Write reaction when B(OH)3 is heated.

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14. $[A]$, $[B]$, $[C]$, $[D]$, $[E]$, $[F]$,and $[G]$ are amines,each of which forms a hydrochloride containing $32.42\,\%$ chloride.$[A]$, $[B]$, $[C]$and,$[D]$evoleN_2 on reaction with HNO_2but $[E]$, $[F]$,and$[G]$donot.

Which of the following are2°amines?

A. (A), (B), (C), (D)

B. (E),(F)and(G)

C. All

D. None

Answer:

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15. $[A]$, $[B]$, $[C]$, $[D]$, $[E]$, $[F]$,and $[G]$ are amines,each of which forms a hydrochloride containing $32.42\,\%$ chloride.$[A]$, $[B]$, $[C]$and,$[D]$evoleN_2 on reaction with HNO_2but $[E]$, $[F]$,and$[G]$donot.

If all the amines aree represented by the formula $R-NH_2$, the value of R in all the amines is:

A. C_3H_7-

B. C_4H_9-

C. $C_5H_{11}-$

D. C_2H_5-

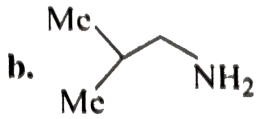
Answer:

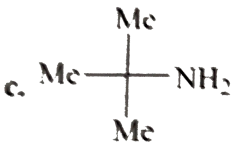
View Text Solution

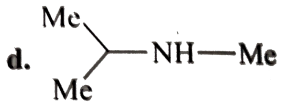
16. $[A]$, $[B]$, $[C]$, $[D]$, $[E]$, $[F]$,and $[G]$ are amines,each of which forms a hydrochloride containing $32.42\,\%$ chloride.$[A]$, $[B]$, $[C]$and,$[D]$evoleN_2 on reaction with HNO_2but $[E]$, $[F]$,and$[G]$donot.

Which of the following does not represent the structure of (A),(B),(C), and (D)?

A. 

B. 

C. 

D. 

Answer:

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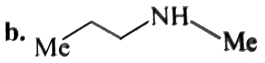
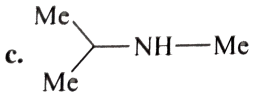
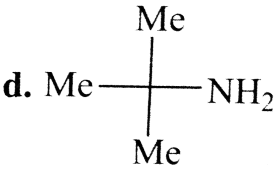
17. $[A]$, $[b]$, $[C]$, $[D]$, $[E]$, $[F]$,and[G] are amines,each of which forms a hydrochloride containing $32.42\,\%$ chloride.$[A]$, $[B]$, $[C]$and,[D]evoleN_2 on reaction with HNO_2but [E],[F],and[G]`do not.

Which of the following does not represent the structure of (E),)F), and (G)?

A. 

B. 

C. 

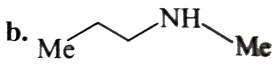
D. 

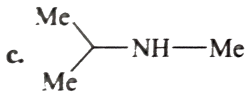
Answer:

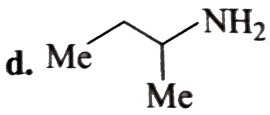
View Text Solution

18. $[A]$, $[b]$, $[C]$, $[D]$, $[E]$, $[F]$,and[G] are amines,each of which forms a hydrochloride containing $32.42\,\%$ chloride.$[A]$, $[B]$, $[C]$and,[D]evoleN_2 on reaction with HNO_2but [E],[F],and[G] $do\neg.\,Whichofthefollow\in ggivesalcohol$ and $evolves$N_(2)` gas?

A. 

B. 

C. 

D. 

Answer:

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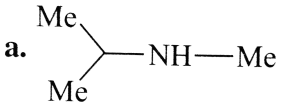
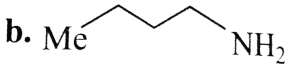
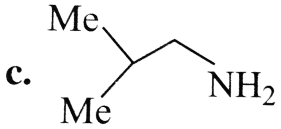
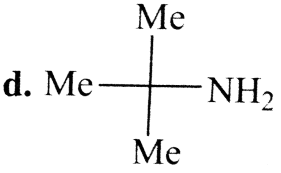
19. $[A]$, $[b]$, $[C]$, $[D]$, $[E]$, $[F]$,and[G] are amines,each of which forms a hydrochloride containing $32.42\,\%$ chloride.$[A]$, $[B]$, $[C]$and,[D]evoleN_2

on reaction with HNO_2but [E],[F],and[G]`donot.

A. 

B. 

C. 

D. 

Answer:

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20. A substance(X) contains $41.37\,\%\,C, 6.89\,\%\,H.0.166gm$ of (X) gaveNH_3 which was absorbed in$50ml$ of $N/10H_2SO_4$.The excess of acid required $30ml$of $N/10NaOH$ for neutralisation.(X)on treatment

with HNO_2 gave succinc acid (X) on heating lost NH_3 to give(A).(A) reacts with Br_2 and $NAOH$ to give(B) containing $41.02\,\%\,C$, $5.88\,\%\,H$, and $11.96\,\%\,N$. (B) on further treatment with Br_2 and $NaOH$ gives (C) (3-amino propanoic acid).(C)reats with NHO_2 to give β-hydroxy-propanoic acid.

Percentage of N is (X) is:

A. $34.38\,\%$

B. $24.38\,\%$

C. $14.38\,\%$

D. $44.48\,\%$

Answer:

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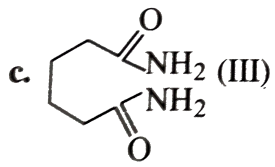
21. A substance (X) contains $41.37\,\%\,C$, $6.89\,\%\,H$. $0.166gm$ of (X) gave NH_3 which was absorbed in $50ml$ of $N/10 H_2SO_4$. The excess of

acid required $30ml$of $N/10NaOH$ for neutralisation.(X)on treatment withHNO_2gave succinc acid (X)on heating lostNH_3 to give(A).(A) reacts with$Br_2$and $NAOH$ to give(B) containing $41.02\,\%\,C$, $5.88\,\%\,H$, and $11.96\,\%\,N$. (B)on further treatment with$Br_2$and $NaOH$gives (C)(3-amino propanoic acid).(C)reats withNHO_2 to give β-hydroxy-propanoic acid.

Compound (X) is:

A. `(##KSV_CHM_ORG_P2_C15_E01_056_O01.png" width="30%">

B. `(##KSV_CHM_ORG_P2_C15_E01_056_O02.png" width="30%">

C. 

D. `(##KSV_CHM_ORG_P2_C15_E01_056_O04.png" width="30%">

Answer:

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22. A substance(X) contains $41.37\,\%\,C, 6.89\,\%\,H.0.166gm$ of (X) gaveNH_3 which was absorbed in$50ml$ of $N/10H_2SO_4$.The excess of acid required $30ml$of $N/10NaOH$ for neutralisation.(X)on treatment withHNO_2gave succinc acid (X)on heating lostNH_3 to give(A).(A) reacts with$Br_2$and $NAOH$ to give(B) containing $41.02\,\%\,C, 5.88\,\%\,H,$ and $11.96\,\%\,N.$ (B)on further treatment with$Br_2$and $NaOH$gives (C)(3-amino propanoic acid).(C)reats withNHO_2 to give β-hydroxy-propanoic acid.

Compound (A) is:

A. (I)

B. (II)

C. (III)

D. (IV)

Answer:

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23. A substance(X) contains $41.37\,\%\,C, 6.89\,\%\,H.0.166gm$ of (X) gaveNH_3 which was absorbed in$50ml$ of $N/10H_2SO_4$.The excess of acid required $30ml$of $N/10NaOH$ for neutralisation.(X)on treatment withHNO_2gave succinc acid (X)on heating lostNH_3 to give(A).(A) reacts with$Br_2$and $NAOH$ to give(B) containing $41.02\,\%\,C, 5.88\,\%\,H,$ and $11.96\,\%\,N.$ (B)on further treatment with$Br_2$and $NaOH$gives (C)(3-amino propanoic acid).(C)reats withNHO_2 to give β-hydroxy-propanoic acid.

Compound (B) is:

A. `(##KSV_CHM_ORG_P2_C15_E01_058_O01.png" width="30%">

B. `(##KSV_CHM_ORG_P2_C15_E01_058_O01.png" width="30%">

C. `(##KSV_CHM_ORG_P2_C15_E01_058_O03.png" width="30%">

D. `(##KSV_CHM_ORG_P2_C15_E01_058_O04.png" width="30%">

Answer:

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24. A substance(X) contains $41.37\,\%\,C$, $6.89\,\%\,H$.$0.166gm$ of (X) gaveNH_3 which was absorbed in$50ml$ of $N/10H_2SO_4$.The excess of acid required $30ml$of $N/10NaOH$ for neutralisation.(X)on treatment withHNO_2gave succinc acid (X)on heating lostNH_3 to give(A).(A) reacts with$Br_2$and $NAOH$ to give(B) containing $41.02\,\%\,C$, $5.88\,\%\,H$, and $11.96\,\%\,N$. (B)on further treatment with$Br_2$and $NaOH$gives (C)(3-amino propanoic acid).(C)reats withNHO_2 to give β-hydroxy-propanoic acid.

Compound (C) is:

A. (V)

B. (VI)

C. (VII)

D. (VIII)

Answer:

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25. A substance(X) contains $41.37\,\%\,C, 6.89\,\%\,H.0.166gm$ of (X) gaveNH_3 which was absorbed in$50ml$ of $N/10H_2SO_4$.The excess of acid required $30ml$of $N/10NaOH$ for neutralisation.(X)on treatment withHNO_2gave succinc acid (X)on heating lostNH_3 to give(A).(A) reacts with$Br_2$and $NAOH$ to give(B) containing $41.02\,\%\,C, 5.88\,\%\,H,$ and $11.96\,\%\,N.$ (B)on further treatment with$Br_2$and $NaOH$gives (C)(3-amino propanoic acid).(C)reats withNHO_2 to give β-hydroxy-propanoic acid.

The conversion of (B) to (C) is called:

A. Hofmann ammonolysis

B. Hofmann bromanid degradation

C. Lassen rearrangement

D. Curtius rearrangement

Answer:

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Exercises Multiple Correct

1. Which statements are correct ?

A. Phenol and aniline give coupling reaction with diazonium salt.

B. Phenol couples with diazonium salt in mild basic conditions $(pH = 8 - 10)$.

C. Aniline couples with diazonium salt in mild acidic condition $(pH = 4 - 6)$.

D. Both phenol and aniline couple with diazonium salt in neutral condition $(pH = 7)$.

Answer: A::B::C

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2. Carbon forms ____compounds whereas lead forms _____ compounds.

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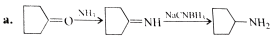
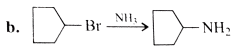
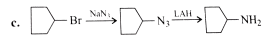
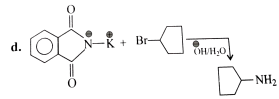
3. Which of the following statement are correct reactions?

A. 

B. 

C. 

D. 

Answer: A::B::C

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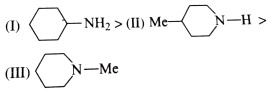
4. What of the following statements are correect?

A. The extent of H-bonding is greater in 1° than 2° and 3° amines.

B. The boiling points of isomeric amines are in the order:

$$1^\circ > 2^\circ > 3^\circ.$$

C. The boiling points of



D. The boiling points of

$$(I)C_4H_9NH_2 > (II)Me_2N - Et > (III)(C_2H_5)_2NH.$$

Answer: C::D

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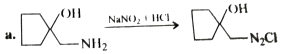
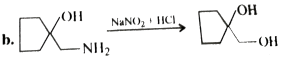
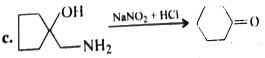
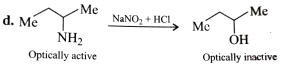
5. Which of the following reaction are correct?

A. 

B. 

C. 

D. 

Answer: A::C::D

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6. Which of the following statement are correct?

A. In gas phase, the basic character of amine is $3^\circ > 2^\circ > 1^\circ$, Due to the $+I$ effect $(R-)$, the availability of $LP\bar{e}'s$ pm N increases.

B. In aqueous medium, the basic characterof amines is $Me_2NH > ME_3N > MeNH_2 > NH_3$.

C. In aqueoys medium, the addition of protons increases of crowding and thus strains setup, which being the highest in 3° amine decreases its basic character.

D. In aqueous medium, the ammonium ions in solution are stabilised not only by alkyl groups but also by H-bond donation to the solvent.

Answer: A::C::D

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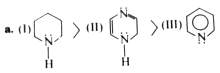
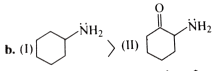
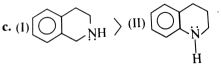
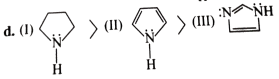
7. Which of the following are the correct orders of basic character?

A. 

B. 

C. 

D. 

Answer: A::B::C

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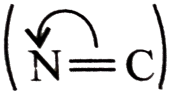
8. Which statements are correct about MIC (methyl isocyanate, $Me - N = C = O$).

A. MIC is prepared byt the reaction of $MeNH_2$ and $COCl_2$ (phosgene).

B. Hydrolysis of MIC gives $\left(Me - NH - \overset{\overset{O}{||}}{C} - OH \right)$ as the intermediate, which gives $MeNH_2$ and CO_2 on further hydrolysis.

C. MIC is used to prepare insecticide, carbaryl under the commercial name Sevin.

D. **d.**  , bond takes part when 1-naphthol is reacted with MIC beacause N is more basic and nucleophilic.

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

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9. Which of the following statements are correct?

A. Aryldiazonium ions are more stable than alkyldiazonium ions.

B. Electron release from the ortho-and para-positions of the ring stabilises the aryldiazonium ion.

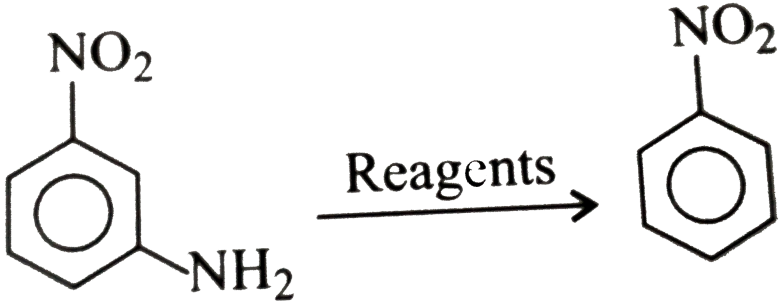
C. The increased stability of aryldiazonium is due to the great difficuly of forming $Ar^{\oplus}$ as compared to $R^{\oplus}$.

D. Alkyldiazonium is more stable than aryldiazonium ion.

Answer: A::B::C

View Text Solution

10. Which of the following reagents are correct for the given reaction?



A. (i) $NaNO_2 + HCl, 0 - 5^\circ C$, (ii) H_3PO_2

B. (i) $KNO_2 + HBr, 0 - 5^\circ C$, (ii) $Na_2SnO(2)$

C. (i) HNO_2, (ii) C_2H_5OH and heat

D. (i) $KNO_2 + HCl$, (ii) H_2O (Steam)

Answer: A::B::C

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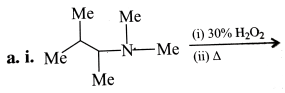
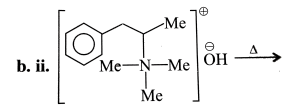
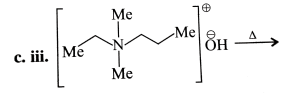
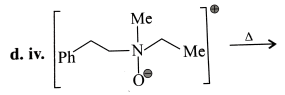
11. Which of the following would give Hofmann alkene?

A. 

B. 

C. 

D. 

Answer: A::C

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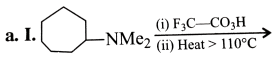
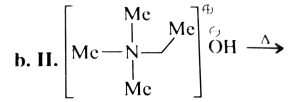
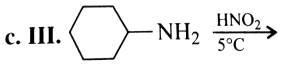
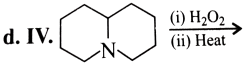
12. Which of the following are Cope reactions?

A. 

B. 

C. 

D. 

Answer: A::D

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13. Which of the following statements are correct?

A. $CH_3\overset{\oplus}{N} \equiv \overset{\ominus}{C}$ on partial hydrolysis gives N-methyl methanamide.

B. $CH_3\overset{\oplus}{N} \equiv \overset{\ominus}{C}$ on partial hydrolysis gives CH_3NH_2 and $HCOOH$.

C. In an isocyanide, first an electrophile and then a nucleoplile add at the same C atom bearing negative charge.

D. In an isocyanide, first a nucleophile and then an electrophile add at the same C atom bearing negative charge.

Answer: A::B::C

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14. Which of the following statements are correct?

A. Ethanenitrile on partial hydrolysis gives acetamide.

B. Ethanenitrile on complete hydrolysis gives acetic acid and NH_3.

C. Cyanides are hydrolysed with aqueous mineral acids or alkali.

D. Isocyanides are hydrolysed with dilute acids and not by alkali.

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

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15. By which of the following reactions can MIC (methyl isocyante) be obtained? C H 3 − ⊕ N ≡ ⊖ C + H g O ⟶ B C H 3 − ⊕ N ≡ ⊖ C + O 3 ⟶

C C H 3 − ⊕ N ≡ ⊖ C + S ⟶ D C H 3 − ⊕ N ≡ ⊖ C + D M S O

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16. Which of the following statements are correct?

A. 1°, 2°, and 3° nitro compounds can be distinguished by HNO_2.

B. 1° nitro compound with $HNO(2)$ gives nitrolic acid, which gives blood-red colour with base.

C. 2° nitro compound with HNO_2 gives pseudo nitrole, which gives blue colour with base.

D. 3° nitro compound does not react with HNO_2.

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

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17. The smell of perfume spreads over the room due to the property called.....

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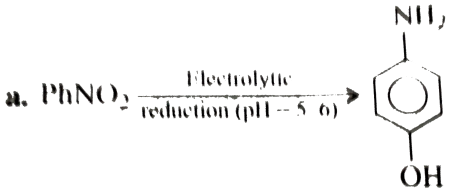
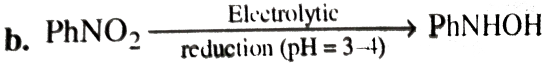
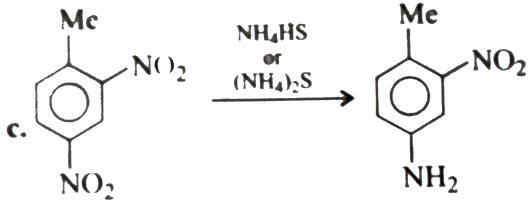
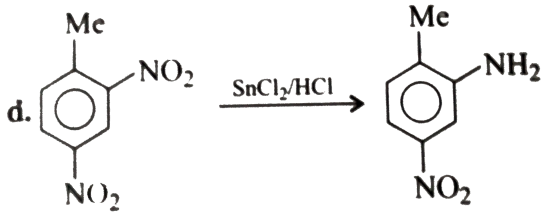
18. Which of the following reaction are wrong?

A. 

B. 

C. 

D. 

Answer: A::B

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Exercises Single Correct

1. Which of the following substaces on treatment with P_2O_5 gives ethanenitrile?

A. Propanamide

B. Enthanamide

C. Ethanoic acid

D. N-Methylethyl amine

Answer: B

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2. Methyl cyanide on treatment with methyl magnesium bromide followed by of subsequent hydrolysis gives:

A. Propanone

B. Ethanone

C. Ethanal

D. Propanal

Answer: A

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3. The product formed by the treatment of ethanol and ethane nitrile in the presence of sulphuric acid is:

A. Ethyl acetate

B. Diethyl ether

C. Ethyl methyl ketone

D. Butanal

Answer: A

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4. Which of the following reagents on treatment with benzenamine in basic medium produces phynyl isocyanide?

A. CCl_4

B. Trichloromethane

C. Methylene dichloride

D. Hexachloroethane

Answer: B

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5. Which can not acting as an ambident nucleophile ?

A. $NO_2^{\ominus}$

B. $\overset{\ominus}{O}H$

C. $CSN^{\ominus}$

D. $CN^{\ominus}$

Answer: B

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6. (A) is subjected to reduction with $Zn - (Hg/HCl)$ and the product formed is N-methylmethanamine. (A) can be.

A. Ethane nitrile

B. Nitroethane

C. Carbylaminoethane

D. carbylaminomethane

Answer: D

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7. Mendius Reaction

A. Reduction of aldehydes to give alcohols

B. Reduction of nitriles with sodium and ethanol

C. Oxidation of nitriles

D. Hydrolysis of cyanides.

Answer: B

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8. The reaction of primary amine with chloroform and ethanolic solution of KOH is called:

A. Hofmann reaction

B. Reimer-Tiemann reaction

C. Carbylamine reaction

D. Kolbe reaction

Answer: C

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9. Ethanamine is treated with nitrous acid at ordinary temperature, the products will be:

A. Ethanol only

B. ethanol acetic acid, N_2, and H_2O

C. Acetic acid, ethane, and H_2O

D. Ethanol, ethene, N_2 and H_2O

Answer: D

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10. Stephen's reduction converts nitriles into:

A. Aldehydes

B. Ketones

C. Amines

D. Carboxylic acids

Answer: A

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11. When propane is subjected to the treatment with fuming nitric acid at 673 K which of the following will not form ?

A. 1-Nitropropane

B. 2-Nitropropane

C. Nitromethane

D. Nitrohexane

Answer: D

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12. Nitrobezene of treatment with zinc dust and aqueous ammonium chloride gives

A. Benzenamine

B. Aniline

C. N-Phenylhydroxylamine

D. None of these

Answer: C

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13. 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. Primary alcohol

Answer: B

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14. Nitromethane is subjected to treatment with chlorine in the presence of sodium hydroxide, the main product is:

A. Monochloronitromethane

B. Trichloromethane

C. Chloropicrin

D. None of the above

Answer: C

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15. Which of the following nitro compounds will show tautomerism?

A. $C_6H_5NO_2$

B. $(CH_3)_3CNO_2$

C. $CH_3CH_2NO_2$

D. None of the above

Answer: C

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16. Which of the following groups will facilitate the electrophilic attackon benzene ring?

A. $-NO_2$

B. $-CHO$

C. $-Cl$

D. $-SO_3H$

Answer: C

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17. Gabriel synthesis is used for the preparation of

A. 1° amine

B. 2° amine

C. 3° amine

D. all can be prepared

Answer: A

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18. Hinsberg's reagent is:

A. C_6H_5COCl

B. CH_3COCl

C. $C_6H_5CH_2Cl$

D. $C_6H_5SO_2Cl$

Answer: D

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19. Which of the following statements is correct?

A. Methyl amine is slighty acidic.

B. Methyl amine is less basic than ammonia.

C. Methyl amine is less basic than dimethyl amine.

D. Methyl amine is less basic than aniline.

Answer: C

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20. Which of the following forms a stable diazonium salt at 273-278 K?

A. $C_2H_5NH_2$

B. $C_6H_5NH_2$

C. $C_6H_5CH_2NH_2$

D. $C_6H_5N(CH_3)_2$

Answer: B

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21. Which of fllowing is the weakest base ?

A. NH_3

B. $C_6H_5NH_2$

C. $C_6H_5CH_6NH_2$

D. CH_3NH_2

Answer: B

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22. Which of the following are not functional isomers of each other ?

A. $CH_3CH_2NO_2$ and $CH_3CH_2ON = O$

B. C_2H_5CHO and CH_3COCH_3

C. $CH_3CH_2NH_2$ and CH_3NHCH_3

D. $C_3H_7NH_2$ and $(CH_3)_2CHNH_2$

Answer: D

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23. A nitrogenous compound (X) is treated with HNO_2, and the mixture is then made alkaline with dilute NaOH to give a blue colouration. Among the following, which one can be the compound (X)?

A. $CH_3CH_2NH_2$

B. $CH_3CH_2NO_2$

C. CH_3CH_2ONO

D. $(CH_3)_2CHNO_2$

Answer: D

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24. Which of the following cannot react with HNO_2?

A. CH_3CONH_2

B. $(CH_3)_3CNO_2$

C. $(CH_3CH_2)_2NH$

D. $CH_3CH_2NH_2$

Answer: B

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25. Nitrobenzene on eelctrolutic reduction gies :.

A. Azobebzene

B. Hydrazobebzene

C. Aminophenol

D. Aniline

Answer: D

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26. An orgnic compoud with the formula C_3H_5N hydrolysis forms a acid which reduces Fehling solution . The compound can be :

A. Ethanenitrile

B. Isocyanoethane

C. Ethoxyethane

D. Propanenitrile

Answer: B

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27. In order to distinguigh between $C_2H_5NH_2$ and $C_6H_5NH_2$ which of the following reagenis is useful ?

A. Hinsberg reagent

B. p-Naphatheol

C. Benzene diazomium chloride

D. None of the above

Answer: B

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28. The compound 1- (N-ethyl-N-methyl)- propanamine forms non-superimposable mirror images . But this compound does not show optical activity because of the :

A. Absence fo a chiral (N) atom

B. Prersence of chiral (N) atom

C. Presence of lone pair on (N) atom

D. Rapid filipping of one form into the another

Answer: D

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29. Which of the following will yield phenlhydrazine hydrochloride ?

A. Benzenamine and hydrazine

B. Hydrazine and HCl

C. Benzenediazonium chlorid and $SnCl_2 / HCl$

D. Nitrobenzene and $SnCl_2 / HCl$

Answer: C

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30. An aromatic compounds $'X'$ with molecular formula C_8H_{10} produces on nitration one mononitro derivative and three dinitro

derivatives. Compound $'X'$ would be :

A. p-Xylene

B. ethyl benzene

C. o-Xylene

D. m-Xylene

Answer: A

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31. $CHCl_3 \xrightarrow{HNO_3} (X)$ In the above sequence , (X) is :

A. Nitrochloromethane

B. Chloropicrin

C. Ethanenitrile

D. None of the above

Answer: B

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32. Which of the following is formed when RNH_2 reacts with $RCHO$?

A. Hemiacetals

B. Acetals

C. Ketals

D. Imines

Answer: D

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33. Which of the following represents the poinsonous gas which caused the tragedy in Bhopal in 1984 ?

A. $CH_3C = N = S$

B. $CH_3 - N = C = O$

C. $CH_3 - N = C = S$

D. $CH_3 - O - N = C$

Answer: B

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34. The conjugate base of $(CH_3)NH_2^{\oplus}$ is :

A. $(CH_3)_3N$

B. $(CH_3)_2NH$

C. $(CH_3CH_2)_2NH_2$

D. $C_6H_5NHCH_2$

Answer: B

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35. Which of the following is the weakest base ?

A. $(CH_3)_2NH$

B. $(CH_3)_3N$

C. $C_6H_5NH_2$

D. $(CH_3)_4N^{\oplus}$

Answer: C

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36. Which of the following reaction does not yield amine?

A. $R-X+NH_3 \rightarrow$

B. $R-CH=NOH=[H] \xrightarrow[C_2H_5OH]{Na}$

C. $R-CN+H_2O \xrightarrow{H^{\oplus}}$

D. $R-CONH+4[H] \xrightarrow{LiAlH_4}$

Answer: C

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37. Primary and secondary amines are distinguished by :

A. Br_2/KOH

B. $HClO$

C. NHO_2

D. NH_3

Answer: C

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38. Indicate which nitrogen compound amongst the following would undergo Hofmann reaction ?

A. $RCONHCH_3$

B. $RCOONH_2$

C. $RCONH_2$

D. $R - CO - NHOH$

Answer: C

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39. Pick up the correct stament :

A. The boling points of alkly halides are more than those of the corresponding alkances .

B. In water , the solulity of $CH_3OH > C_2H_5OH > C_6H_5OH.$

C. $C_6H_5NH_2$ is a weaker base thann NH_3.

D. All the above statements are correct .

Answer: D

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40. The producet of the reaction of alcoholic silver nitrite with ethyl bromide is :

A. Ethane nitrile

B. Ethene

C. Nitroethane

D. Ethyl alcohol

Answer: C

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41. The electrolytic reduction of nitrobenzene in strongly acidic medium produces .

A. Phenol

B. p-Aminophenol

C. Hydroazobenzen

D. Azohebzene

Answer: B

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42. Azoxybenzene can be obtained by the treatment of mitro-benzene with :

A. O_2

B. H_2 / Pt

C. $NaAsO_3 / NaOH$

D. $Zn / NaOH$

Answer: C

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43. Tertiary nitro compounds cannot show tautomerism becauses :

A. They are very stable .

B. They isomerise to give secondary intro compounds

C. They do not have labile hydrogen atom.

D. They are highly reactive .

Answer: C

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44. Diazo coupling is useful to prepare some

A. Pesticides

B. Dyes

C. Proteins

D. Vitamins

Answer: B

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45. The following reaction constituts :

$$RNH_2 + S = C = S \xrightarrow{H_gCl_2} \underset{\text{Alkyl isothicoyanate}}{R - N = C = S} + HgS$$

A. Mustard oil reaction

B. Test for 3° amine

C. Test for 2° amine

D. Test for CS_2

Answer: A

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46. Primary , secondary , tertiary amines can be separated by the following except :

A. Fractional distillation

B. Fractional method ysubg duetgtk oxalate

C. Hinsberg' s method using $C_6H - 5SOCl$

D. Selective crtystallisation

Answer: D

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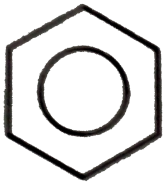
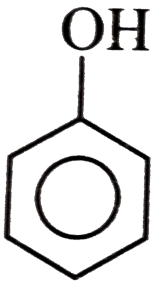
47. When $C_6H_5N_2Cl$ is reduced with Na_2SnOO_2, the product is :

A. `(##KSV_CHM_ORG_P2_C15_E01_128_O01.png" width="30%">

b. 

B.

c. 

C.

D.

Answer: B

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48. Nitrogen is likely to be evolved when $NaNO_2$ in dilute HCl warmed with :

A. $CH_3NHCH_2CH_3$

B. $(C_2H_5)_3N$

C. $C_6H_5NH_2$

D. $H_2NCH_2CH_2NH_2$

Answer: D

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49. A compound X has the molecular formula C_7H_7NO. On treatment with Br_2 and KOH. X gives an amine Y. The latter gives carbylamine test. Y upon diazotisation and coupling with phelon gives an azo dye. Thus X is

A. $PhCONH_2$

B. $PhCONHCOCH_3$

C. $PhNO_2$

D. $PhCOONH_4$

Answer: A

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50. A compound (X) has the molecular formula C_3H_7NO . With Br_2 and KOH, (X) gives (Y) . (Y) responds to mustard oil reaction . (Y) upon treatment with HNO_2 evolves N_2 and gives an alcohol (Z) which gives iodoform test , (X) is likelty to be :

A. $C_2H_5CONH_2$

B. CH_3COHH_2

C. CH_3COONH_4

D. C_2H_5CNO

Answer: A

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51. An amine on treatment with HNO_2 evolved N_2 The amine on exhaustive methylation with CH_3I formed a quatermary dalt containing $59.07\,\%$ iodine . The amine is likely to be:

A. CH_3NH_2

B. $(CH_3)_2NH$

C. $C_2H_5NH_2$

D. $(CH_3)_3N$

Answer: C

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Exercises Assertion And Reasoning

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

Reason (R) : The suphonic acid is electron withdrawing group.

A. If both (A) and (R) ar true, and (R) is the correct explanation of (A).

B. If both (A) and (R) are true , and (R) is not the correct explanation of (A).

C. If (A) is true , but (R) is false .

D. If both (A) and (R) are false .

Answer: B

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2. Assertion (A) : $Ph\overset{\oplus}{N}_2Br^{\Theta}$ couples with N, N-dimethyl aniline (I) but not with 2, 6, -dimethyl-N, N-dimethuyl aniline (II)

Reason (R): Due to steric inhibition of resonance , the p-position of (II) is not sufficiently activated fro the coupling reaction.

A. If both (A) and (R) ar true, and (R) is the correct explanation of (A).

B. If both (A) and (R) are true , and (R) is not the correct explanation of (A).

C. If (A) is true , but (R) is false .

D. If both (A) and (R) are false .

Answer: A

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3. Assertion (A) : Gabriel phthalimide reaction is used for the prepartion fo $C_2H_5NH_2$ and p-nitro aniline .

Reason (R): SN^2 reaction takes place with $1^\circ RX$ and $1^\circ ArX$ containing $\bar{e}$- withdrawing group at o-and p-positions

A. If both (A) and (R) ar true, and (R) is the correct explanation of (A).

B. If both (A) and (R) are true , and (R) is not the correct explanation of (A).

C. If (A) is true , but (R) is false .

D. If both (A) and (R) are false .

Answer: A

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

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

A. If both (A) and (R) ar true, and (R) is the correct explanation of (A).

B. If both (A) and (R) are true , and (R) is not the correct explanation of (A).

C. If (A) is true , but (R) is false .

D. If both (A) and (R) are false .

Answer: D

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5. Assertion (A) : $Ph\overset{\oplus}{N}_2Br^{\ominus}$ is more acidic than NH_4Br.

Reason (R) : $Ph\overset{\oplus}{N}H_3$ (anilinum ion) is resonance stabilinsed .

A. If both (A) and (R) ar true, and (R) is the correct explanation of (A).

B. If both (A) and (R) are true , and (R) is not the correct explanation of (A).

C. If (A) is true , but (R) is false .

D. If both (A) and (R) are false .

Answer: C

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6. Assertion (A) : Carbylamine reaction takes place between 1° amine and $CHBrCII$ in basic medium . ltbRgt Reaspm (R): The reaction takes place by the formation of bromiodo carbene (:C BrI) as intemediate .

A. If both (A) and (R) ar true, and (R) is the correct explanation of (A).

B. If both (A) and (R) are true , and (R) is not the correct explanation of (A).

C. If (A) is true , but (R) is false .

D. If both (A) and (R) are false .

Answer: C

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7. Assertion (A) : Hofmann bromamide reaction takes place btween an arthide and Br_2 in basic medium .

Reason (R). The reaction proceeds by the formation of $(R-\overline{N}:)$ nitrene intremediate.

A. If both (A) and (R) ar true, and (R) is the correct explanation of (A).

B. If both (A) and (R) are true , and (R) is not the correct explanation of (A).

C. If (A) is true , but (R) is false .

D. If both (A) and (R) are false .

Answer: C

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8. Assettio (A) : $Ph\overset{\oplus}{N}_2Br^{\Theta}$ on reaction with $NaOH$ gives bebzene diazohroxile

Reason (R) : $\overset{\Theta}{O}H$ is a strong nucleophile , attacks the terminal (N) atom , and forms a covalent bond.

A. If both (A) and (R) ar true, and (R) is the correct explanation of (A).

B. If both (A) and (R) are true , and (R) is not the correct explanation of (A).

C. If (A) is true , but (R) is false .

D. If both (A) and (R) are false .

Answer: A

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9. Assettion (A) : $Ph\overset{\oplus}{N}_2Br^{\Theta}$ pm reactopm wotj motrpnemzeme om the [resemce pf $NaOH$ gives p-nitrbiphenyl

Reason(R) : The reaction takes jplace by free radical mechanism .

A. If both (A) and (R) ar true, and (R) is the correct explanation of (A).

B. If both (A) and (R) are true , and (R) is not the correct explanation of (A).

C. If (A) is true , but (R) is false .

D. If both (A) and (R) are false .

Answer: A

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Archives Single Correct

1. The compound which on reaction with aqueous nitrous acid at low tremperature produces an oily nitrosoamine is :

A. Methylamine

B. Ethylamine

C. Diethylamine

D. Triethgylamin

Answer: C

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2. Acetamide is reated separately with the following reagents . Which one of these would give methylamine ?

A. PCl_5

B. $Soda\ \lim\ e$

C. $NaOH + Br_2$

D. $Hotconc.\ H_2SO_4$

Answer: C

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3. Carbylamine test is performed in alc . KOH by heating a mixture of :

A. Choloroform and silver powder

B. Trihalogenated methane and a primary amine

C. An alkyl halide and a primary amine

D. An alkyl cyanide and a primary amine

Answer: B

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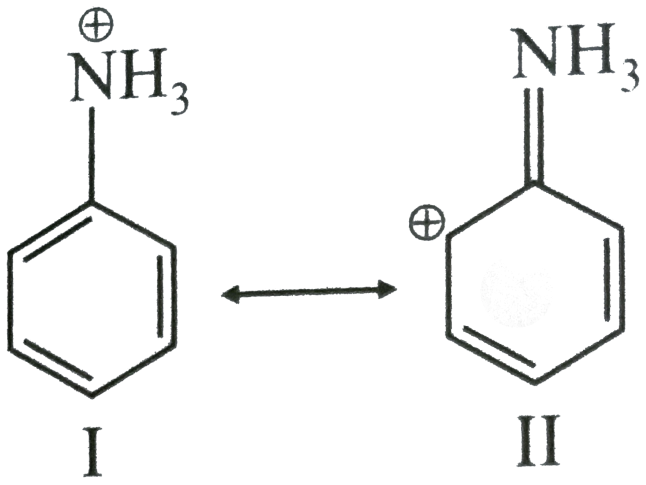

4.

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

A. (II) is not an acceptabnle canonical structure because carbionium ions are less stable than ammonium ions

B. (II) is not an acceptable canonical structure becauses it is non - aromatic .

C. (II) is not an acceptable canonical structure becauses nitrogen has 10 valence eelctrons .

D. (II) is an acceptable canonical structure.

Answer: C

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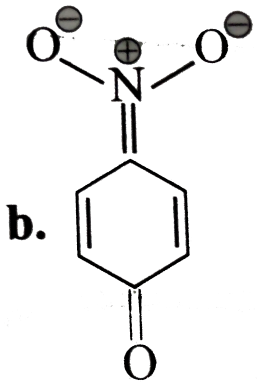
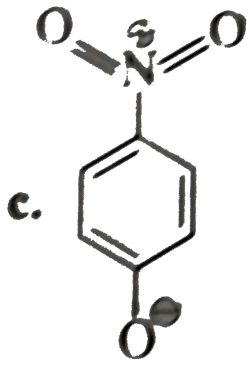
5. The most unlikely representation of resonance structures of p-nitrophenoxide ion is:

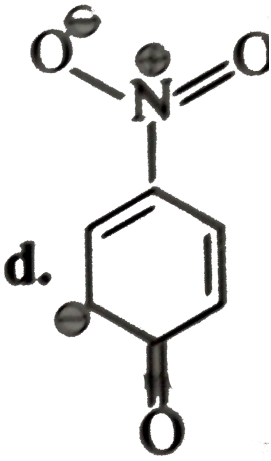
A. `(##KSV_CHM_ORG_P2_C15_E01_150_O01.png" width="30%">



B.



C.



D.

Answer: C

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6. Among the following the strongest base is

A. $C_6H_5NH_2$

B. $p-NO_2C_6H_4NH_2$

C. $m-NO_2.C_2H_4NH_2$

D. $C_6H_5CH_2NH_2$

Answer: D

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7. The correct order of basictiies of the following compounds is :

3. $(CH_3)_2NH$. 4. $CH_3-\overset{\overset{O}{||}}{C}-NH_2$

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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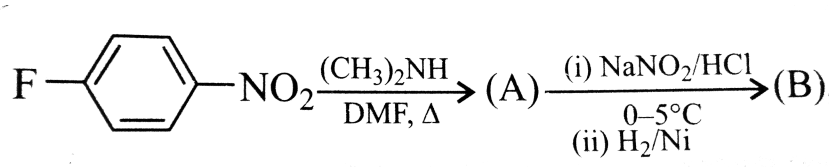
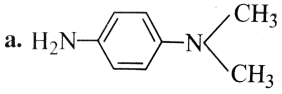


8. `

A.



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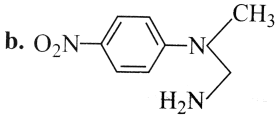
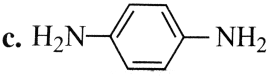
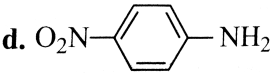


C.



D. d. 

Answer: A

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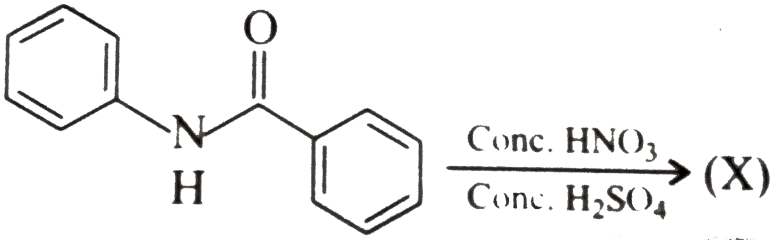
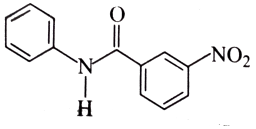
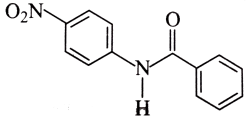
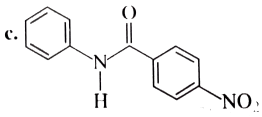
9. In the following reaction ,

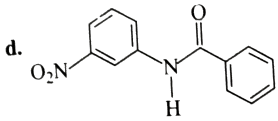


the structure of the major product (X) is :`

A. a. 

B. b. 

C. 

D. 

Answer: B

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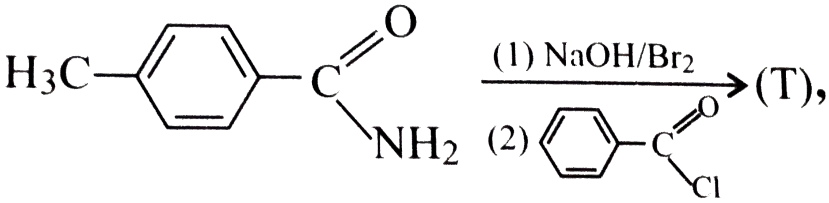
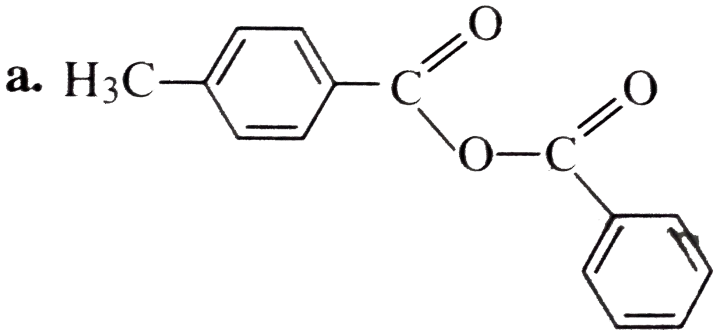
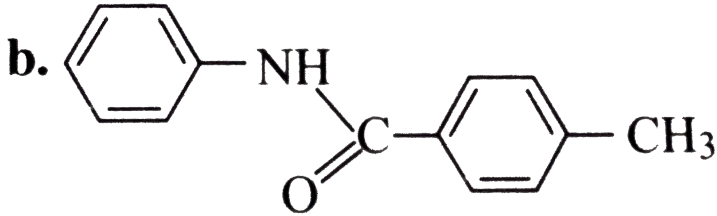
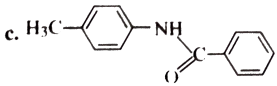
10. In the reaction

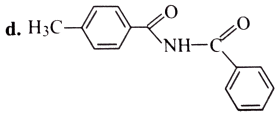


struture of the product (T) is :

A. 

B. 

C. 

D. 

Answer: C

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Archives Assertion Reasoning

1. Assertion : In strongly acidic solution, aniline becomes less reactive towards electrophilic reagents .

Reason : Due to protonation of amino group the lone pair of electrons on nitrogen is not available for donation to benzene ring by resonance .

A. Statement (I) is true : Statement (II) is true : Statement (II) is the correct esplanation of Statement (I)

B. Statement (I) is true : Statement (II) is true , Statement (II) is not the correct exphanation fo sTatement (I)

C. Statement I is True, Statament II is false

D. Statement (I) is false , Statement (II) is true .

Answer: (d)

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2. 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. Statement (I) is true : Statement (II) is true : Statement (II) is the correct esplanation of Statement (I)

B. Statement (I) is true : Statement (II) is true , Statement (II) is not the correct exphanation fo sTatement (I)

C. Statement I is True, Statament II is false

D. Statement (I) is false , Statement (II) is true .

Answer: (d)

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Archives Multiple Correct

1. When nitrobezene is treated with Br_2 in the presence of $FeBr_2$ the major product formed is m-bromonitro-benzene . Statements which are related to obtatining the m-isomer are :

A. The electron densitty on meta-carbon is more than that on ortho- and para -positons

B. The intemediate carbonium ion formed after intial attakc of $Br^{\oplus}$ at the meta-position is least destabnilise

C. Loss of aromaticity when $Br^{\oplus}$ attacks at the orth- and para - positions and not at meta-position.

D. Easier loss of $H^{\oplus}$ to regain aromaticity from the meta-position than fromm the ortho- and para-positions

Answer: (a)

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2. p-Chloroaniline and anilinium hydrochloride can be distinguished by :

A. Sandmeyer reaction

B. $NaHCO_3$

C. $AgNO_3$

D. Carbylamine test

Answer: (c)

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3. A positive carbylamine test is shown by :

A. N,N-Dimethyl aniline

B. $2, 4 -$ Dimethyl aniline

C. N-methyl -o-methyl aniline

D. p-Methyl benzylamine

Answer: (b,d)

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Archives Fill In The Blanks

1. In an acidic medium ..... behaves as the strongest base (nitrobenzen. Aniline, phenol),

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2. Fill in the blanks by choosing the appropriate word/words from those given in the brackets.

(Monohydric, dihydric, trihydric, nitration, sulfonation, resonance

stabilizaton, acidic, basic, $FeCl_3ZnCl_2$, more, less, aldehydes, ketones, Tollens' reagent, Luca's reagent, o-nitrophenol, p-nitrophenol, ethene, diethyl ether, fit, unfit, be, not be, O_2, Cl_2, alkyl halides, oxonium, hydronium, alkyl, lone pairs of electrons, ethyl iodide, ethyl hydrogen sulfate, perchlorodiethyl ether, methyl iodide, ethyl hydrogensulfate, perchlorodiethyl ether, methyl iodide, dialkyl, hydrogen bonding, violet, green)

Amongest the three isomers of nitrophenols, the one that is least soluble in water is .....

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3. The high melting point and insolubility of sulphanilic acid in organic solvents are due to its ..... structure .

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Archives Analytical And Descriptive

1. State the equations for the preparation of the following compounds . (Equations need not to be balance).

(i) Chlorobenzene from aniline (in two steps)

(ii) N-Propyl amine from ethyl chloride (in two steps)

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2. State the conditions under which the following preparation in carried out . Give the necessary equations which need not to be balance : Aniline from benzene'

Watch Video Solution

3. How would you convert ?

'Aniline to chorobenzene' .

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4. For intromethane movecule , write structures (s) (i) showing signifcant resonance stabilisation (ii) indicationg tautomerism .

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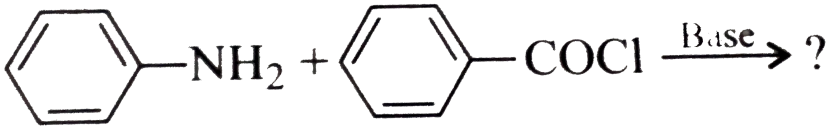
5. Complete the following with appropriate structures :



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6. Give a chemical test and the reagents used to distinguish between the following :

'Ethylamine and diethylamine'

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7. Arrange the following in increasing orde of base strength : methylamine, dimethylamine , aniline , N-methylamiline .

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8. How will you bring about the following conversion ?

$4-$ nitroaniline to $1, 2, 3$-tribromobensene

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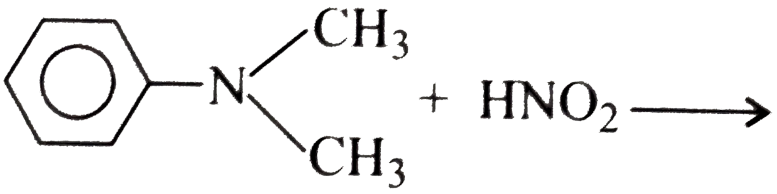
9. Write the structure of the major organci product expected from the following reaction .



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10. A basic volatile nitrogen compound give a foul smelling gas when treated with chaloroform and alcoholic potash. $A0.295gm$ sample of the substance dissolved in aqueous HCl and treated with $NaNO_2$ solution at $0^\circ C$ libreated a colourless , odorless gas whose volume corresponded to $112ml$ at STP. After the evoltion fo the gas was complte , the aqueous solution was distilled to give an orgfanic liquid which did not coniain nitrogen and wihic on watemiing with alkali and iodine gave a uellow preciptitate , Idntify the orginal substance assuming that it contains one (N) atom per molecule .

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11. Outline a synthesis of p-bromonitrobenzene from benzene in two steps .

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12. Give the structure of (A) (explanations are not required). $A(C_3H_9N)$ reacts with bezenesulphonyl chloride to give a solid insoluble in alkali'.

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13. Complete the following with appropriate structures :

$$2,3\text{-Dinitroaniline} \xrightarrow[(ii)\,Anisol]{(i)\,NaNO_2 \text{ and } HClat5^\circ c} (A)`.$$

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14. Write the structure of the foul-smelling compound obtained when aniline is treated with chloroform in the presence of KOH.

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15. Give reason for the following in one or two sectences :

'Dimethyl amine is a stronger base than trimethyl amine'

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16. Following reaction gives two products . Write the structures of the products .

$$CH_3CH_2NH_2 \xrightarrow{(CH_3CO)_2O, heat} \text{A + B}$$

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17. How would you bring about the following conversion (in three steps) ?

Aniline $\rightarrow$ Benxylamine .

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18. There is a solution of p-hydroxybenzoic acid and p-amino benzoic acid . Discuss one method by which we can separate them and also

write down the confirmatory test of the functional groups present .

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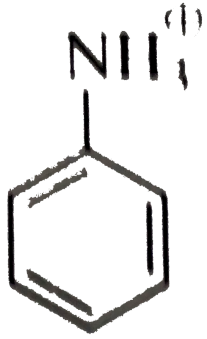
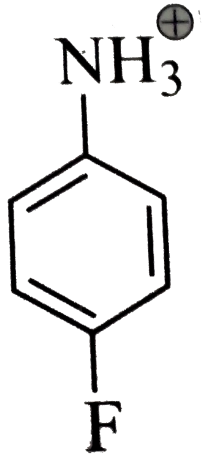
19. Which of the following is more acidic and why ?





(II)

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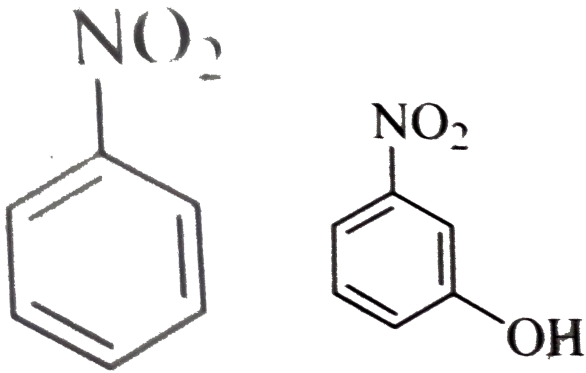
20. Convert `  in not more than four steps. Also mention the temperature and reaction conditions.

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21. $\underset{\substack{\text{Optically active} \\ (X)}}{C_5H_{13}N} \xrightarrow[N_2]{NaNO_2/HCl} (Y)\text{Tertiary alcohol} + \text{Other product}$

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

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22. A mixture of two aromatic compounds (A) and (B) separated by dissolving it in chloroform followed by extraction with aqwueous KOH solution. The organic layer containing compound (A) when heate with alcoholic solution of KOH produced a compound (C) (C_7H_5N) associated with an unpleasnt odour . The alkaline aqueous layer on the other hand , when heated with chloroform and then acidified gave a mixture of two isometic compounds (D) and (E) of molecular formula $C_7H_6O_2$. Identity the compounds (A), (B) . (C) (D), and (E) and write their structures .

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23. Convert

C6H6 into PhNH2

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24. During acylation of amines, pyridine is added. True/False

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