CHEMISTRY

FOR IIT JEE ASPIRANTS OF CLASS 12 FOR CHEMISTRY

ORGANIC COMPOUNDS CONTAINING NITROGEN

Example

1. Write chemical equations for the following reactions:

(i) Reaction of ethanolic NH_3 with C_2H_5Cl.

(ii) Ammonolysis of benzyl chloride and reaction of amine so formed with two moles of CH_3Cl.

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2. Write chemical equations for the following conversions :

$CH_3 - CH_2 - Cl$ into

$CH_3 - CH_2 - CH_2 - NH_2$

$C_6H_5 - CH_2 - Cl$ into

$C_6H_5 - CH_2 - CH_2 - NH_2$

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3. Write structures and IUPAC names of

(i) the amide which gives propanamine by Hoffmann bromamide reaction.

(ii) the amine produced by the Hoffmann degradation of benzamide.

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4. What is carbyl amine reaction ?

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5. What happen when n-ethyl formamide heated in presenc of $POCl_3$

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6. Arrange the given species in the increasing order of basicity.

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7. Use simple chemical tests to distinguish Anilie from N-methylaniline.

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8. What is diazotisation

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9. What is the reaction between Aniline & Bromine.

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Evaluate Yourself 1

1. Gabriel phthalimide synthesis is used in the preparation of

A. Primary amine

B. Secondary amine

C. Tertiary amine

D. All of these

Answer: A

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2. The compound having the molecular formula C_3H_9N can represent

A. Trimethylamine

B. n-propylamine

C. Isopropylamine

D. All of three

Answer: D

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3. Which of the following compounds is expected to be most basic :

A. Aniline

B. Ethylamine

C. Hydroxylamine

D. Methylamine

Answer: B

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4. The reaction,

$CH_3CN + 4H \xrightarrow{Na/C_2H_5OH} CH_3CH_2NH_2$ is called

A. Hofmann's bromamide reaction

B. Mendius reaction

C. Sabatier reaction

D. None of these

Answer: B

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Evaluate Yourself 2

1. 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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2. Nitroalkane is acidic only towards :

A. Na_2CO_3

B. NaOH

C. Alcohol

D. Liquid NH_3

Answer: B

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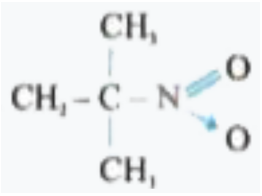
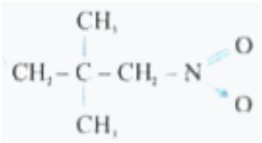
3. Which of the following is tertiary nitroalkane ?

A. $CH_3 - \underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}} - CH_2 - O - N = O$

B. 

C. $CH_3 - \underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}} - O - N = O$

D. 

Answer: B

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4. Which is more basic

A. Benzylamine

B. Aniline

C. Acetamide

D. o-methyl aniline

Answer: A

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5. Amongst the following, the strongest base in aqueous medium is

A. CH_3NH_2

B. $(CH_3)_2N$

C. $(CH_3)_2NH$

D. $C_6H_5NHCH_3$

Answer: C

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Evaluate Yourself 3

1. Benzenediazonium chloride is reduced to benzene by

A. Phosphorus acid

B. Hypophosphorus acid

C. Hypophosphoric acid

D. Phosphine

Answer: B

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2. The strongest base among the following is

A. 

B. 

C. 

D. 

Answer: C

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3. Aniline when diazotised in cold and then treated with dimethyl aniline gives a coloured product . Its structure would be :

A. 

B. 

C. 

D. 

Answer: C

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4. When acetamide is treated with Br_2 and caustic soda, then we get

A. Bromoacetic acid

B. Acetic acid

C. Methylamine

D. Ethane

Answer: C

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5. $-CONH_2 \xrightarrow{\text{Reduction}} -CH_2NH_2$

In above reaction hybridisation state of carbon changes from

A. $sp \rightarrow sp^2$

B. $sp \rightarrow sp^3$

C. $sp^2 \rightarrow sp^3$

D. $sp^2 \rightarrow sp$

Answer: C

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Cuq Iupac Naming Of Amines

1. Which of the following systematic name & names are correct for

4-Bromo-2-Ethyl aniline

4-Bromo-2 Ethyl Benzenamine

4-Bromo-2-Ethyl Amino benzene

3-Bromo-1-Ethyl benzanamine

A. only D

B. A and B only

C. A,B, C only

D. A, B, C, D

Answer: C

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2. IUPAC name of $H_2N - CH_2 - \underset{\underset{NH_2}{|}}{C}H - CH_3$

A. 1,2-Propane diamine

B. Propanamine 1,2

C. Dipropane 1,2-amine

D. Diamino 1,2-Propane

Answer: A

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3. The structural formula of N-methyl Aminomethane is

A. $(CH_3)_2CHNH_2$

B. $(CH_3)_3N$

C. $(CH_3)_2NH$

D. CH_3NH_2

Answer: C

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4. IUPAC name of $CH_3(CH_2)_2NH_2$ is

A. 1-Propanamine

B. 2-Methyl ethanamine

C. Iso-Propylamine

D. 2°-Propylamine

Answer: A

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5. IUPAC name of $C_6H_5 - CH_2 - CH_2 - NH_2$

A. 2-phenyl ethanamide

B. 2-phenyl ethanamine

C. 2-phenyl ethylamine

D. 3-phenyl ehtanamine

Answer: B

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6. The total number of structural isomers possible for an amine with molecular formula $C_4H_{11}N$ is

A. 6

B. 5

C. 7

D. 8

Answer: D

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7. Which one of the following is not a primary amine ?

A. tert-Butylamine

B. Dimethylamine

C. sec-Butylamine

D. iso-Butylamine

Answer: B

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8. Which of the following is a secondary amine ?

A. 2-Butananmine

B. N-Methylpiperidine

C. N-Methyl-2-pentanamine

D. p-Anisidine

Answer: C

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9. Carbylamine reaction is given by

A. aliphatic 1° amines only

B. aromatic 1° amines only

C. both aliphatic and aromatic primary amines

D. all secondary amines and diazonium salt

Answer: C

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

A. 1

B. 2

C. 3

D. 4

Answer: D

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11. Which of the following should be most valatile ?

$CH_3CH_2CH_2NH_2$

$(CH_3)_3N$

$C_2H_5 - NH - CH_3$

$CH_3CH_2CH_3$

A. II

B. IV

C. I

D. III

Answer: B

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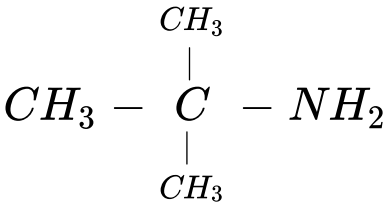
12. The structure given below represents



A. Quartermary ammonium salt

B. Primary amine

C. Secondary amine

D. Tertiary amine

Answer: B

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13. The product of the chemical reaction,

$$CH_3 - \overset{\overset{O}{||}}{C} - NH_2 + Br + 4NaOH \rightarrow$$ will be

A. CH_4

B. CH_3Br

C. CH_3OBr

D. CH_3NH_2

Answer: D

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14. Gabriel phthalimide synthesis is used in the preparation of

A. secondary amines

B. amides

C. primary amines

D. tertiary amines

Answer: C

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15. Which of the following reactions does not yield an amine ?

A. $R - X + NH_3 \xrightarrow{373}$

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

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

D. $R - CONH_2 + 4[H] \xrightarrow{LiAlH_4}$

Answer: C

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16. In the given set of reactions :

$$2-\text{Bromopropane} \xrightarrow[\Delta]{\text{alc.AgCN}} 'X' \xrightarrow{LiAlH_4} 'Y'$$

The IUPAC name of product 'Y' is :

A. N-isopropymethanamine

B. N-methylpropan-2-amine

C. N-methylpropanamine

D. butan-2-amine

Answer: B

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17. The major product formed when alkyl iodides is treated with excess of ammonia

A. priamry amine

B. Secondary amine

C. Tertiary amine

D. quatermary ammonium salt

Answer: D

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

A. Phosphorus pentoxide

B. Lithium aliminium hydride

C. Potassium cyanide

D. Bromine and sodium hydroxide

Answer: B

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19. Aniline is more basic than

A. NH_3

B. CH_3NH_2

C. N methyl aniline

D. P-nitroaniline

Answer: D

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20. Which of the following is the strongest base ?

A. Aniline

B. N-methyl aniline

C. O-methyl aniline

D. Benzylamine

Answer: D

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21. In the reaction of $C_6H_5OH \xrightarrow[ZnCl_2]{NH_2} X$, $'X'$ may be

A. $C_6H_5NH_2$

B. C_6H_5Cl

C. C_6H_5CHO

D. C_6H_5COOH

Answer: A

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22. During the nitration of aniline, the amino group is protected by

A. converting it to NO_2 group

B. converting it to Carboxylic group

C. Acylation

D. Benzoylation

Answer: C

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23. Aniline when treated with benzoyl chloride, gives benzanilide the reaction is known as

A. Perkin

B. Hofmann

C. Schotten baumann

D. Benzoin

Answer: C

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24. In phenyl isocyanide the carbons are _____hybridised.

A. sp^2, sp^2

B. sp^3

C. sp^2, sp

D. sp^3

Answer: C

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25. Schiffs base is used as a

A. oxidant

B. Hydrolysing agent

C. antichlor

D. antioxidant

Answer: D

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Exercise 1 C W Iupac Naming

1. Systematic name of 

A. 4-amino benzene carbaldehyde

B. P-amino benzaldehyde

C. 3-amino benzaldehyde

D. 4-formylamine

Answer: A

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2. The IUPAC name of CH_3NH_2 is

A. methylamine

B. amino ethane

C. methanamine

D. Ethylamine

Answer: C

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3. Aniline can be industrially prepared from nitro benzene by using

A. $LiAIH_4$

B. amino ethane

C. methanamine

D. Ethylamine

Answer: D

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Exercise 1 C W Classification And Prepration Of Amine

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

A. 1

B. 2

C. 3

D. 4

Answer: D

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2. The number of structure isomers possible from the molecular formula C_3H_9N is:

A. 5

B. 2

C. 3

D. 4

Answer: D

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3. The product of the chemical reaction,

$$CH_3 - \overset{\overset{O}{||}}{C} - NH_2 + Br_2 + 4NaOH \rightarrow$$? Will be

A. CH_4

B. CH_3NBr

C. CH_3Obr

D. CH_3NH_2

Answer: D

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4. Gabriel phthalimide synthesis is used in the preparation of

A. secondary amines

B. amides

C. primary amines

D. tertiary amines

Answer: C

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5. Which of the following reactions does not yield an amine ?

A. $CH_3 - CH_2 - Cl + NH_3 \xrightarrow{373K}$

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

C. $R - \overset{\overset{O}{||}}{C} - NH_2 \xrightarrow{H_2 \frac{\emptyset}{H^+}}$

D. $R - CONH_2 + 4[H] \xrightarrow{LiAlH_4}$

Answer: C

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6. Which of the following amides will not undergo Hofmann bromamide reaction?

A. $CH_3CONHCH_3$

B. $CH_3CH_2CONH_2$

C. CH_2CONH_2

D. $C_6H_5CONH_2$

Answer: A

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7. In the given set of reactions :

$$2-\text{Bromopropane} \xrightarrow[\Delta]{\text{alc.AgCN}} 'X' \xrightarrow{LiAlH_4} 'Y'$$

The IUPAC name of product 'Y' is :

A. N-isopropylmethanamine

B. N-methylpropan-2-amine

C. N-methylpropanamine

D. butan-2-amine

Answer: B

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8. The major product formed when alkyl iodides is treated with ammonia

A. primary amine

B. secondary amine

C. tertiary amine

D. quatermary ammonium salt

Answer: A

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9. Which is most acidic in nature?

A. 

B. 

C. $C_2H_5\overset{+}{N}H_3$

D. 

Answer: A

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10. Identify the product C in the series.

$$C_6H_5NO_2 \xrightarrow{FeHCl} A \xrightarrow[273K]{NaNO_2+HCl} B \xrightarrow[283]{H_2O} C$$

A. C_6H_5OH

B. $C_6H_5CH_2OH$

C. C_6H_5CHO

D. $C_6H_5NH_2$

Answer: A

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11. In Gabriel synthesis, halide may be

A. Benzyl halide

B. Allyl halide

C. both

D. 3° alkyl halide

Answer: C

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12. Which of the following reagents would not be a good choice for reducing an aryl nitro compound to an amine?

A. $H_2(\text{excess}) / Pt$

B. $LiAIH_4$ in ether

C. Fe and HCl

D. Sn and HCl

Answer: B

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Exercise 1 C W Basicity

1. Arrange the following in the correct order of their basic character in gaseous phase

$I) NH_3 (II) RNH_2 (III) R_2NH (IV) R_3N$

A. $IV > III > II > I$

B. $III > IV > II > I$

C. $III > II > IV > I$

D. $I > II > III > IV$

Answer: A

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2. Out of the following compounds, which is the most basic in aqueous medium?

A. CH_3NH_2

B. $(CH_3)_2NH$

C. $(CH_3)_3N$

D. $C_6H_5NH_2$

Answer: B

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Exercise 1 C W Benzene Diazonium Salt

1. Benzene diazonium chloride is the product when aniline is treated with

A. $NaNO_2$ and HCl at $0 - 5^\circ$ C

B. HNO_3 and HCl at 4° C

C. $C_6H_5NO_2$ at $4^\circ C$

D. $NaNO_2$ at $4^\circ C$

Answer: A

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2. Aniline is treated with Br_2 water at room temperature to give the following product

A. 

B. 

C. 

D. 

Answer: D

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3. For the conversion of Aniline to N-Methyle aniline, the reagent used is

A. CH_3I

B. C_6H_5Cl

C. CH_4

D. CH_3NH_2

Answer: A

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4. Activation of benzene by $-NH_2$ group can be reduced by treating the compound with

A. acetic acid

B. acetyl chloride

C. dilute HCl

D. Methyl alcohol

Answer: B

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5. Aniline when treated with chloroform in presence of basic medium, gives following compound

A. 

B. 

C. 

D. 

Answer: A

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6. 2,4,6-tibromo aniline is a product of

A. electrophilic addition on $C_6H_5NH_2$

B. electrophilic substitution $C_6H_5NH_2$

C. nucleophilic addition on $C_6H_5NH_2$

D. nucleophilic substitution on $C_6H_5NH_2$

Answer: B

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Exercise 1 C W Other Compounds Of Nitrogen

1. Aniline undergoes condensation to form Schiff's base on reacting with

A. acetyl chloride

B. ammonia

C. Acetone

D. Benzaldehyde

Answer: D

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2. Primary amines can be distiguished from other amines by the following test

A. Tollen's

B. Schiff's

C. Carbyl amine

D. Fehling

Answer: C

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

A. CHO

B. CN

C. $COCH_2$

D. Br

Answer: B

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Exercise 1 H W Iupac Naming

1. IUPAC name of aniline

A. Phenyl amine

B. Amino benzene

C. Benzyl amine

D. Benzenamine

Answer: D

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2. The reducing agent used for preparing aniline from nitro benzene in the laboratory is

A. $LiAlH_4$

B. Na/C_2H_5OH

C. Sn/HCl

D. Fe-steam and HCl

Answer: C

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3. Primary, secondary and tertiary amines are

A. Metamer

B. Position isomers

C. Functional isomer

D. Tautomer

Answer: C

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Exercise 1 H W Classification And Prepration Of Anine

1. Which of the following pair is correctly matched

A. Curtius reaction,carboxylic acid

B. Hoffmann rearrangement hydrazoic acid

C. Schmidt reaction-carboxylic acid

D. Lossen rearrangement acid chloride

Answer: C

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2. Based on which method amines are prepared ?

A. Reduction of nitro compounds

B. Ammonolysis of alkyl halides

C. Reduction of nitriles and amides

D. All of the above

Answer: D

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

A. Phosphorus pentoxide

B. Lithium aliminium hydride

C. Potassium cyanide

D. Bromine and sodium hydroxide

Answer: D

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4. Which of the following will not give a primary amine ?

A. $CH_3CN \xrightarrow{LiAIH_4}$

B. $CH_3N'C \xrightarrow{LiAIH_4}$

C. $CH_3CONH_2 \rightarrow$

D. $CH_3CONH_2 \xrightarrow{Br_4 . NaOH}$

Answer: B

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5. $PhCH_2Cl \xrightarrow{\text{aq. NaCN}} \xrightarrow{\text{Catalytic hydrogenation}} (\cup)$

The final product $(\cup)$ is :

A. $C_6H_5CH_2NH_2$

B. $C_6H_5CH_2CONH_2$

C. $C_6H_5CH_2NH_2$

D. $C_6H_5CH_2NHCH_3$

Answer: A

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Exercise 1 H W Chemical Properties Benzene Diazonium

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

A. 

B. 

C. 

D. 

Answer: C

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2. In the reaction ,

reagents R and R_1 are

A. ethyl amine, ethanol

B. ethyl amine, sodium borohydride

C. ethyl amine, hydrogen peroxide

D. ethyl alcohol, sodium metal

Answer: A

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3.

$$CH_3CH_2Br \xrightarrow[\Delta]{Aq.KOH} A \xrightarrow[\Delta]{KMnO_4/H^+} B \xrightarrow[\Delta]{NH_3} C \xrightarrow[\text{Alkali}]{Br_2} D$$

, D is

A. CH_3Br

B. CH_3CONH_2

C. CH_3NH_2

D. $CHBr_3$

Answer: C

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4. Among the following which one does not act as an intermediate in hofmann rearrangement

A. RNCO

B. RCON

C. RCONHBr

D. RNC

Answer: D

5. A secondary amine could be prepared readily from the starting material

A. alkyl isocyanide

B. alkyl cyanide

C. alkanamide

D. phthalimide and alkyl halide

Answer: A

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6. Match ther compounds given in List I with their characteristic reactions given in List II.Select the correct option .

A. a-ii, b-I, c-iv, d-iii

B. a-iii, b-ii, c-I, d-iv

C. a-ii, b-iii, c-I, d-iv

D. a-iv, b-ii, c-iii, d-i

Answer: C

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Exercise 1 H W Basicity

1. Arrange the following in the correct order of their basic character

(I)NH_3 (II) CH_3NH_2 (III) $C_6H_5NH_2$

A. $III > II > I$

B. $II > III > I$

C. $II > I > III$

D. I=II=III

Answer: C

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2. When aniline is heated with chloroform and caustic potash solution, we get

A. Phenyl iso cyanide

B. o-Chloro aniline

C. Benzoic acid

D. Phenol

Answer: A

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3. Aniline dissolves in HCl due to the formation of

A. Anilinium chloride

B. o-chloro Anilin

C. Azodye

D. diazonium chloride

Answer: A

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4. Acetanilide can be obtained by the following

A. Benzoylation of aniline

B. Alkylaion of nitro benzene

C. Acetylation of aniline

D. reaction between acetaldehyde and aniline

Answer: C

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Exercise 1 H W Test Other Reactions

1. Aniline reacts with excess of alkyl halide to give

A. amino compound

B. tertiary compound

C. azonmethane

D. quatermary ammonium compound

Answer: D

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2. Which of the following compounds will dissolve in an alkali solution after it has undergone reaction with Hinsberg reagent?

A. $(C_2H_5)NH$

B. $(CH_3)_3N$

C. CH_3NH_2

D. $C_6H_5NHC_6H_5$

Answer: C

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3. Aniline on heating with fuming sulphuric acid gives.

A. Aniline disulphate

B. Sulphanilic acid

C. Aniline sulphate

D. Aniline-2-, 4-disulphonic acid

Answer: B

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4. Bromine water reacts with aniline to give

A. o-bromoaniline

B. p-bromoaniline

C. m-bromoaniline

D. symmetric tribromoaniline

Answer: D

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5. N-alkyl aniline is the product of following

A. Nitration of benzene

B. Alkylation of aniline

C. Acylation of aniline

D. Benzoylation of aniline

Answer: B

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

A. Ethyl amine

B. Propyl amine

C. Dimethylamine

D. Ethyl methyl amine

Answer: D

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7. Cyanide is an:

A. Zwitter ion

B. Cation

C. Ambident nucleophile

D. Electrophile

Answer: C

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Exercise 2 C W

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

A. $C_6H_5OH + NH_2 \xrightarrow[300^\circ C]{ZmCl_2}$

B. $C_6H_5NO_2 + Zn\text{Power} \xrightarrow{\text{alcoholoc}KOH}$

C. $C_6H_5Cl + NH_3 \xrightarrow[Cu_2O]{200^\circ C}$

D. $C_6H_5NO_2 + Fe + H_2O \xrightarrow{HCl}$

Answer: B

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

A. Benzylamine

B. Aniline

C. Ethylamine

D. Methalylamine

Answer: B

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3. In the Hoffmann Bromamide rearrangement, intermediate species are

A. R-CO-NHBr

B. $\left[R - C\overset{\ominus}{O}N - Br\right] Na^{+}$

C. R-N=C=O

D. All

Answer: C

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

A. PCl_5

B. Sodalime

C. $NaOH + Br_2$

D. Hot conc. H_2SO_4

Answer: C

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5. Among the following the strongest base is

A. $C_6H_5NH_2$

B. $p - NO_2 - C_6H_4NH_2$

C. $m - NO_2 - C_6H_4NH_2$

D. $C_6H_5CH_2NH_2$

Answer: D

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6. Aniline (1 mole) react with bromine to give symmetrical tribromoaniline. The amount of bromine required is

A. 3.0 moles

B. 1.5 moles

C. 4.5 moles

D. 6.0 moles

Answer: A

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7.

$$C_6H_5Cl \xrightarrow[Cu_2O, 200^\circ C]{NH_3} X, X \xrightarrow[0-5^\circ C]{HNO_3} Z, X + Z \rightarrow A,$$

the σ and π bonds in 'A' are

A. $25\sigma, 6\pi$

B. $25\sigma, 7\pi$

C. $27\sigma, 7\pi$

D. $27\sigma, 6\pi$

Answer: C

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8. Aniline reacts with HCl and forms 'X' the type of bonds in X are

A. ionic, covalent

B. ionic, covalent, dative

C. only covalent

D. only ionic

Answer: B

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9. Which of the following is the strongest base ?

A. 

B. 

C. 

D. 

Answer: D

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10. Which of the following statement is incorrect ?

a)Oxide of aluminium (Al_2O_3) and arsenic (As_2O_3) are amphoteric. b)Oxide of chlorine (Cl_2O_7) is less acidic than oxide of nitrogen (N_2O_5). c)Oxide of carbon (CO_2) is more acidic than oxide of silica (SiO_2). d)The correct increasing order of basic character of various oxides is $H_2O < CuO < MgO < CaO$.

A. $C_6H_5N_2Cl$ is soluble in water

B. $C_6H_5N_2BF_4$ is water insoluble

C. $C_6H_5N_2Cl$ is stable at room temperature

D. $C_6H_5N_2Cl$ is stable at $0^\circ C$

Answer: C

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11. A positive carbylamine test is given by:

A. N.N-dimethyl aniline

B. isopropyl amine

C. diethyl amine

D. trimethyl amine

Answer: B

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12. 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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13. Acetaldoxime reacts with phosphorus pentoxide to give:

A. Methyl cyanide

B. Methyl cyanate

C. Ethyl cyanide

D. Ethyl isocyanide

Answer: A

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

A. $CH_3N = CCl_2$

B. $CH_3NCl - CCl_2$

C. $ClCH_2NC$

D. Cl_2CHNC

Answer: A

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15. Which of the following amides will not undergo Hofmann bromamide reaction?

A. CH_3CONH_2

B. $CH_3CH_2CONH_2$

C. $C_6H_5CONH_2$

D. $CH_3CONHCH_3$

Answer: D

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16. Amongst the given set of reactants, the most appropriate for preparing 2° amine is..

A. $2^{\circ} R - Br + NH_3$

B. $2^{\circ} R - Br + NaCN$ followed by H_2 / Pt

C. $1^{\circ} R - NH + RCHO$ followed by H_2 / Pt

D. $1^{\circ} RBr$(2 mol)+Potassium phthalimide followed by H_2O^+/heat

Answer: C

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17. Zwitter ion is formed by

A. Acetanilide

B. Benzanilide

C. Sulphanilic acid

D. Benzene sulphonamide

Answer: C

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18. Aniline doesn't react with

A. dil HCl

B. dil NaOH

C. CH_3COCl

D. Br_2 water

Answer: B

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19. In the following reaction 'C' is

A. 

B. 

C. 

D. 

Answer: B

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20. The compound $C_5H_{13}N$ is optically active and reacts with HONO to give $C_5H_{11}OH$. The compound is

A. N-methylbutanamine

B. 2-Aminpentane

C. 1-Aminopentane

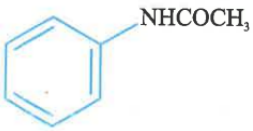
D. N,N-Dimethylpropanamine

Answer: B

21. Which one of the following has the most nucleophilic nitrogen ?

A. 

B. 

C. 

D. 

Answer: A

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22. Predict the product

A. 

B. 

C. 

D. 

Answer: D

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23. Identify the final product

A. 

B. 

C. 

D. 

Answer: D

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24. 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. 

B. 

C. 

D. 

Answer: B

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Exercise 2 H W

1. What is the end product in the following sequence of operations?

$$C_2H_5NH_2 \xrightarrow{HNO_2} A \xrightarrow{PCl_5} B \xrightarrow{\text{alc.}NH_3} C$$

A. ethyl cyanide

B. Methyl amine

C. ethyl amine

D. Acetamide

Answer: C

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2. Which of the following shows optical activity?

A. butanamine-1

B. butanamine-2

C. isoprpylamine

D. etylmethyl amine

Answer: B

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3. 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. all the above

Answer: B

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4. Which of the following can distinguish the three amines, viz..., primary , secondary and tertiary?

A. Azo-dye test

B. Hinsberg reagent

C. Carbyl amine reaction

D. Solubility test

Answer: B

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5. Aniline and diphenylamine may be distinguished by

A. Lassaigne's test

B. Schiff's test

C. Carbyl amine reaction

D. Solibility test

Answer: C

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6. Match the compounds given in List I with their characteristic reactions given in List II. Select the correct option

A. a-(ii), b-(i), c-(iv), d-(iii)

B. a-(iii), b-(ii), c-(i), d-(iv)

C. a-(ii), b-(iii), c-(i), d-(iv)

D. a-(iv), b-(ii), c-(iii), d-(i)

Answer: C

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

A. methyl amine

B. ethyl amine

C. diethyl amine

D. triethyl amine

Answer: C

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8. The only stable organic functional group in which carbon is divalent is

A. : CCl_2

B. : CH_2

C. : CBr_2

D. $R - Nc$

Answer: D

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9. Electrophilic and Nucleophilic reagents give addition on the same atom of the molecule in

A. Cyanide

B. Isocyanide

C. Aldehyde

D. Ketone

Answer: B

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10. In the following reaction, the product (A) is

A. 

B. 

C. 

D. 

Answer: D

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11. Best method to form aromatic iodide is

A. $ArN_2^+ + HI \rightarrow$

B. $RNH_2 + I_2 \rightarrow$

C. $ArN_2^+ + KI \rightarrow$

D. $ArN_2^+ + PI_3 \rightarrow$

Answer: C

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12. In the following reaction, X stands for

A. NH_2

B. NHOH

C. $N^+H_3Cl^-$

D. $N=N-C_6H_5$

Answer: B

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13. Identify the product (E) in the following sequence of reactions

A. 

B. 

C. 

D. 

Answer: B

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14. The most basic compound in the following is

A. NH_3

B. CH_3NH_2

C. $NH(CH_3)_2$

D. $N(CH_3)_2$

Answer: C

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15. Compound 'A' yield benzylamine on reaction with $LiAIH_4$ following by hydrolysis. The reaction

of 'A' with NaOH and Br_2 will yield

A. benzamine

B. aniline

C. nitrobenzene

D. N-bromoanile

Answer: B

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16. Which one of the following isomeric amines has the highest boiling point

A. $CH_3 - CH_2 - CH_2NH - CH_3$

B. $CH_3 - CH_2 - NH - CH_2 - CH_3$

C. $(CH_3)_2N - CH_2 - CH_3$

D. $(CH_3)_2CH - CH_2 - NH_2$

Answer: D

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17. In the following sequence of reaction :

$$A \xrightarrow{\text{Reduction}} B \xrightarrow{HNO_2} CH_3CH_2OH$$

The compound A is

A. propane nitrile

B. ethane nitrile

C. nitromethane

D. methyl isocyanide

Answer: B

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18. Carbylamine reaction is given by

A. primary

B. secondary

C. tertiary

D. quatermary

Answer: A

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19. A mixture of methylamine and dimethylamine is given to you. The reagents used to separate the compenents of the mixture are

A. $CHCl_3$ and HCl

B. $C_6H_5SO_2$ and KOH

C. $C_6H_5SO_2$ and HCl

D. $CHCl_3$ and KOH

Answer: B

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20. The correct order of basic strength of the following is

A. $1 > 2 > 3 > 4$

B. $4 > 2 > 3 > 1$

C. $3 > 4 > 2 > 1$

D. $3 > 2 > 4 > 1$

Answer: D

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21. A compound with nitro group was reduced by Sn/HCl, followed by treatment with $NaNO_2/HCl$ and followed by phenol. The chromophore group in the compound is

A. NO_2 group

B. NH_2 group

C. azo group

D. OH group

Answer: C

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22. Aniline is treated wi.th bromine water to give an organic compound X which when treated with $NaNO_2$ and HCI at $0^\circ C$ gives a water soluble compound Y. Compound Yon treatment with

Cu_2Cl_2 and HCI gives compound Z . Compound Z is

A. o-bromochlobenzene

B. p-bromochlorobenzene

C. 2,4,6-tribromophenol

D. 2,4,6-tribromochlorobenzene

Answer: D

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

A. hydrolysis, diazotization and reduction

B. diazotization, reduction and hydrolysis

C. hydrolysis, reduction and diazotization

D. reduction, diazotization and hydrolysis.

Answer: D

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24. Identify the product (E) in the following sequence of reactions.

A. 

B. 

C. 

D. 

Answer: B

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Exercise 3

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

A. 

B. 

C. 

D. 

Answer: C

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

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

B. arylamines are generally more basic than alkylamines, because the nitrogen atom in arylamines is sp-hybridised

C. arylamines are generally less basic than alkylamines because the nitrogen lone-pair

electrons are delocalised by interaction with the aromatic ring π-electrons system

D. arylamines are generally more basic than alkyamines because the nitrogen lone-pair electrons are not delocalised by interaction with the aromatic ring π-electron system.

Answer: C

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3. The product formed by the reaction of an aldehyde with a primary amine is:

A. carboxylic acid

B. aromatic acid

C. Schiff's base

D. ketone

Answer: C

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4. Reactivity order of following towards NaOEt, EtOH

A. $III > II > I$

B. $II > I > III$

C. $I > II > III$

D. $III > I > II$

Answer: A

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5. Electrolytic reduction of nitrobenzene in weakly acidic medium gives .

A. Aniline

B. Nitrosobenzene

C. N-phenylhydroxylamine

D. p-hydroxyaniline

Answer: A

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

A. Cutius reaction

B. Wutz reaction

C. Hofmann method

D. Hinsberg method

Answer: B

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7. Pyridine is less basic than triethylamine because

.

A. pyridine has aromatic character

B. nitrogen in pydrine is sp^2 hybridised

C. pyridine is a cyclic system.

D. in pyridine lone pair of nitrogen is delocalised.

Answer: A

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

A. Hofmann's reaction

B. Reimer-Tiemann's reaction

C. Carbylamine reaction

D. Kolbe, s reaction

Answer: C

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9. $CH_3CH_2C \equiv N \xrightarrow{X} CH_3CH_2CHO$

The compound X is

A. $SnCl_2 / HCl / H_2O$, boil

B. $H_2 / Pd - BsSO_4$

C. $LiAIH_4 / \text{ether}$

D. $NBH_4 / \text{ether} / H_2O^+$

Answer: A

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

A. Nitroethane

B. Methylisocyanide

C. Acetamide

D. Methyl cyanide

Answer: B

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11. Which of the following reaction can produce aniline as main product ?

A. $C_6H_5NO_2 + n/KOH$

B. $C_6H_5NO_2 + Zn/NH_4Cl$

C. $C_6H_5NO_2 + LiAIH_4$

D. $C_6H_5NO_2 + Zn/HCl$

Answer: D

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12. Which of the following statements about primary amines is false ? .

A. Alkyl amines stronger bases than ammonia

B. Alky amines are stronger bases than aryl ammonia

C. Aryl amines react with nitrous acid to produce aicohols.

D. Aryl amines react with nitrous acid to produce phenols.

Answer: B

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13. Acetamide is treated with the following reagents seprately.Which one of these would yield methyl amine?

A. PCl_5

B. $NaOH - Br_2$

C. Sodalime

D. Hot conc. H_2SO_4

Answer:

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

A. Schiff's test

B. Fehling's test

C. Tollen's test

D. Hinsberg's test

Answer: D

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15. N_2 gas will not be evolved upon reaction of HNO_2 with which of the following amines ?

A. 1°

B. 2°

C. 3°

D. Both (2) & (3)

Answer: D

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16. An organic compound $A(C_3H_9N)$ when treated with ntrous acid gave an alcohol and N_2 gas was evolved (A) on warming with $CHCI_3$ and caustic potash gave (C) which on reduction gave is isoproymethylamine Predict the structure of (A) .

A. 

B. 

C. 

D. 

Answer: B

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17. 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-Trimitrobenzene

Answer: B

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18. In the reaction A is

A. $HgSO_4 / H_2SO_4$

B. Cu_2Cl_2

C. H_3PO_2 and H_2O

D. H^+ / H_2O

Answer: C

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19. Which of the following compounds will not undergo Friedel – Crafts reaction easily ?

A. Cumene

B. Xylene

C. Nitrobenzene

D. Toluene

Answer: C

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20. Which of the following reagents would not be a good choice for reducing an aryl nitro compound to an amine?

A. H_2(excess)Pt

B. $LiAH_4$ in ether

C. Fe and HCl

D. Sn and HCl

Answer: B

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

A. $C_6H_5CH_2N_2^+X^-$

B. $CH_3N_2^+X^-$

C. $C_6H_5N_2^+X^-$

D. $CH_3CH_2N_2^+X^-$

Answer: C

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22. In the following reaction, the product (A) is

A. 

B. 

C. 

D. 

Answer: A

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23. The number of structure isomers possible from the molecular formula C_3H_9N is:

A. 2

B. 3

C. 4

D. 5

Answer: C

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24. The following reaction

is known by the name :

A. Acetylation reaction

B. Schotten-Baumen reaction

C. Friedel-Craft's reaction

D. Perkin's reaction

Answer: B

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25. Method by which aniline cannot be prepared is:

A. reduction of nitrobenzene with H_2 / Pd in ethanol.

B. potassium salt of phthalimide treated with chlorobenzene followed by hydrolysis with aqueous NaOH solution.

C. hydrolysis of phenylisocyanide with acidic solution.

D. degradation of benzamide with bromine in alkaline solution.

Answer: B

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

A. Azobenzene

B. Aniline

C. p-Aminophenol

D. Azoxybenzene

Answer: C

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27. Which of the following reagents cannot be used for the given conversion ?

A. Sn-HCl

B. Fe-HCl

C. $LiAIH_4$

D. Pd/C

Answer: C

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28. Which one of the following isomeric amines has the highest boiling point

A. $CH_3 - CH_2 - CH_2NH - CH_3$

B. $CH_3 - CH_2NH - CH_2 - CH_3$

C. $(CH_3)_2N - CH_2CH_3$

D. $CH_3CH_2CH_2 - NH_2$

Answer: D

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29. Which amine amongst the following will answer positively the carbylamine test ?

A. $C_6H_5 - NH - CH_3$

B. 

C. $C_6H_5 - NH - C_6H_9$

D. $C_6H_5 - N(C_2H_5)_2$

Answer: B

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30. 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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31. A mixture of methylamine and dimethylamine is given to you. The reagents used to separate the compenents of the mixture are

A. $CHCl_3$ and HCl

B. $C_6H_5SO_2$ and KOH

C. $C_6H_5SO_2Cl$ and HCl

D. $CHCl_3$ and KOH

Answer: B

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32. Which of the nitrogen atoms in $\underset{I}{H_2N} - \underset{II}{NH} - \overset{O}{\overset{||}{C}} - \underset{III}{NH_2}$ is the most nucleophilic ?

A. III

B. I

C. II

D. All three nitrogen atoms are equally strong nuclephilic centers.

Answer: B

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Exercise 4

1. The final products is the following sequenceof reaction is

A. 

B. 

C. 

D. 

Answer: C

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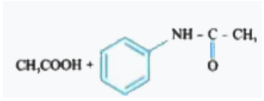
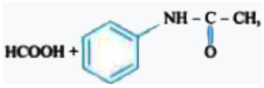
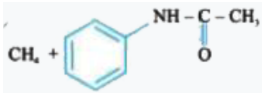
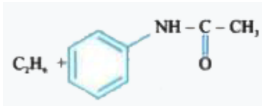
2. Aniline reacts with acetic anhydride to give

A. 

B. 

C. 

D. 

Answer: A

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3. What reagent is used In the Hinsberg's test of amines?

A. $(CH_3CO)_2O$ and pyridine

B. $C_6H_5SO_2Cl$ in aq. NaOH

C. $NaNO_2$ in aq. H_2SO_4

D. CH_3l (excess) followed by AgOH

Answer: B

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4. In order to convert aniline into chlorobenzene the reagents needed are

A. $NaNO_2 / HCl, CuCl + HCl$

B. Cl_2 / CCl_4

C. $Cl_2 / AlCl_3$

D. $CuCl_2$

Answer: A

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5. Hydrolysis of phenylisocyanide forms

A. benzonic acid

B. formic acid

C. acetic acid

D. None of these

Answer: B

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6. Hydrolysis of eyanogen gives

A. oxalic acid $+NH_3$

B. oxalic acid

C. NH_3

D. None of these

Answer: A

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7. m- bromoaniline can be prepared by .

A. $C_6H_6 \xrightarrow[H_2SO_4]{HNO_3} \xrightarrow[2.NaOH.H_2O]{1.Sn-HCl} \xrightarrow[H_2O]{br_2}$

B. $C_6H_6 \xrightarrow[feBr_3]{Br_2} \xrightarrow[H_2SO_4]{HNO_3} \xrightarrow[Pt]{H_2}$

C.

$$m - BrC_6H_4COOH \xrightarrow{SOCl_2} \xrightarrow{NH_3} \xrightarrow[H^+]{Br_2 . NaOH}$$

D. $C_6H_5NH_2 \xrightarrow[Cu_2Br_2]{NaNO_2 . HCl} \xrightarrow{NaNH_3}$

Answer: C

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8. Nitrobenzene can be prepared from benzene by using a mixture of cone. HNO_3 and cone. H_2SO_4 In the mixture, nitric acid acts as a/an

A. reducing agent

B. acid

C. base

D. catalyst

Answer: C

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9. The product 'Y' in the following reaction sequence is

A. 

B. 

C. 

D. 

Answer: C

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10. Identify the product E) in the following sequece of reactions.

A. 

B. 

C. 

D. 

Answer: B

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11. The reaction of chloroform with alcoholic KOH and p-toluidine form-

A. 

B. 

C.

D.

Answer: D

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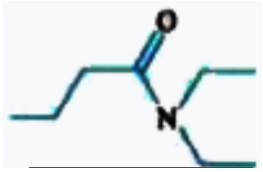
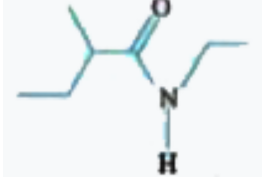
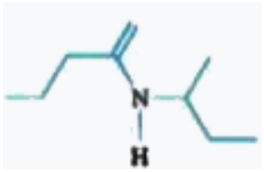
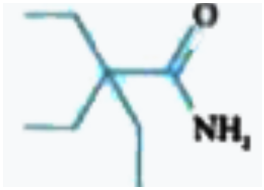
12. Which one of the following is an example of 3° amide ?

A. 

B. 

C. 

D. 

Answer: A

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13. The product of the given reaction is

A. 

B. 

C. 

D. 

Answer: C

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14. Which of the following reagents can be used to convert primary amides into primary amines containing the same number of carbon atoms ?

A. $Br_2 + NaOH$

B. $LiAIH_4$

C. $Sn + HCl$

D. $Na + C_2H_5OH$

Answer: B

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15. 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 (iii)

B. (ii) and (iv)

C. (i) and (ii)

D. (ii) and (iv)

Answer: C

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16. The major organic product formed from the following reaction

A. 

B. 

C. 

D. 

Answer: B

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17. The following reaction gives :

4-nitrotoluene $\xrightarrow[H_2S_4]{K_2Cr_2O_7}$?

A. 4-nitrobenzaldehyde

B. 4-nitrobenzyl alcohol

C. 4-aminotoluene

D. 4-nitrobenzoic acid

Answer: A

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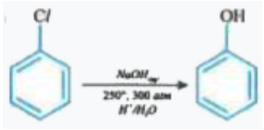
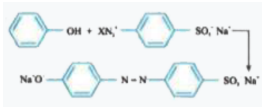
18. The example of an electrophilic substitution reaction is

A. 

B. 

C. $H_2C = CH - CH_3 \xrightarrow[\text{peroxide}]{HBr}$

$$Br_2 - CH_2 - CH_2 - CH_3$$

D. $H_2\mathbb{C}H_2 - CH_2 - \overset{O}{\overset{||}{C}} - CH_3$

Answer: B

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

A. 5

B. 7

C. 3

D. 6

Answer: A

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20. 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. 

B. $CH_3CH_2 - NH - CH_3$

C. $CH_3 - \underset{\underset{H_3C}{|}}{N} - CH_3$

D. $CH_3CH_2CH_2 - NH_2$

Answer: A

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21. Which of the following reagents could be used to distinguish aniline from methanamine ?

Bromine water

$CHCl_3$ and aqueous KOH

Dilute HCl

Nitration mixture under heated condition

A. (i) only

B. (i) and (ii)

C. (i) and (iii)

D. (i) and (iv)

Answer: D

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22. Maximum number of molecules of CH_3I that can react with a molecule of CH_3NH_2 are

A. 3

B. 4

C. 2

D. 1

Answer: A

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23. Which of the followinmg is soluble in sodium hydroxide ?

A. 

B. 

C. 

D. 

Answer: D

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24. Identify the major product for the reaction given below.

A. 

B. 

C. 

D. 

Answer: D

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25. What is the majot product of the following reaction ?

A. 

B. 

C. 

D. 

Answer: C

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26. 

the product B is

A. 

B. 

C. 

D. 

Answer: A

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

A. Tertiary butylamine

B. n-Butylamine

C. Isobutylamine

D. Diethylamine

Answer: D

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

A. p-toluenesulphonyl chlorides

B. Lucas reagent

C. $CHCl_3$ and alc. KOH

D. Borche's product.

Answer: A

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30. Predict the product

A. 

B. 

C. 

D. 

Answer: D

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