



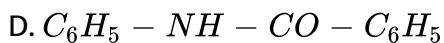
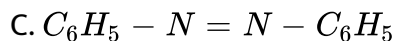
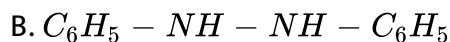
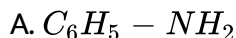
CHEMISTRY

BOOKS - MHTCET PREVIOUS YEAR PAPERS AND PRACTICE PAPERS

ORGANIC COMPOUNDS CONTAINING NITROGEN

Exercise 1 Topical Problems

1. Nitrobenzene is reduced by Zn and alcoholic potash mixture to get



Answer: B



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2. Benzene on treatment with a mixture of conc. HNO_3 and con. H_2SO_4 at 373K gives

- A. nitrobenzene
- B. m-dinitrobenzene
- C. p -dinitrobenzene
- D. o-dinitrobenzene

Answer: B



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3. Which one of the following nitro compounds when react with nitrous acid followed by treatment with alkali produces blue colour?

- A. 2-methyl-2-nitropropane

B. 2-methyl-1-nitropropane

C. 2-nitropropane

D. nitrobenzene

Answer: C

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

A. 


B. 

C. 

D. 

Answer: C

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5. In the reaction, 

X is

A. SiC

B. H_2SO_4


C. $KMnO_4$

D. Fe/HCl

Answer: D



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6. The product obtained in the following reaction is 

A. 

B. 

C. 

D. 

Answer: B

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

A. meta-chloronitrobenzene

B. para-chloronitrobenzene

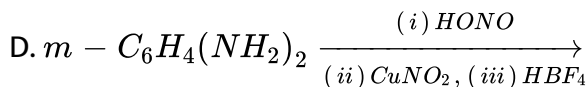
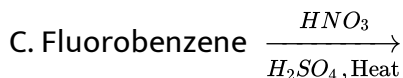
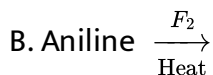
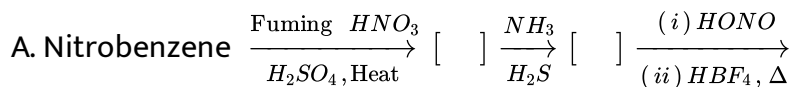
C. nitrosobenzene

D. benzene

Answer: C

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8. *m*-fluoronitrobenzene is best synthesised by using which of the following reaction?



Answer: A



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9. Secondary nitroalkanes can be converted into ketones by using Y.



Y is

A. aqueous HCl

B. aqueous NaOH

C. $KMnO_4$

D. CO

Answer: A



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

A. C_2H_5OH

B. CH_3CO_2H

C. CH_3CHO

D. $C_6H_5NO_2$

Answer: D



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11. The correct sequence of reactions to convert *p* – nitrophenol into quinol involves

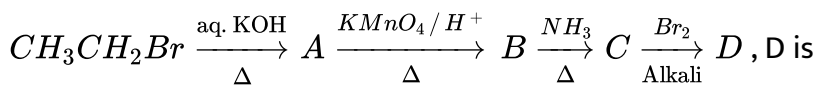
- A. reduction, diazotisation and hydrolysis
- B. hydrolysis, diazotisation and reduction
- C. hydrolysis, reduction and diazotisation
- D. diazotization, reduction and hydrolysis

Answer: A



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12. Consider the following sequence of reactions:



A. CH_3Br

B. CH_3CONH_2

C. CH_3NH_2

D. $CHBr_3$

Answer: C

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13. Choose the incorrect statement

- A. Primary amines show intermolecular hydrogen bonds.
- B. tert-butylamine is a primary amine.
- C. tertiary amines do not show intermolecular hydrogen bonds.
- D. iso -propylamine is a secondary amine.

Answer: D

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14. Why do 2° and 3° amines fails to undergo the carbylamine test?

- A. They combine with chloroform to give a stable compound
- B. They react with alcoholic KOH
- C. The nitrogen atom of the amine group does not have the required number of hydrogen atoms
- D. All the given reasons are correct

Answer: B

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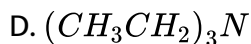
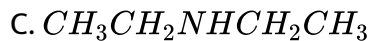
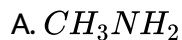
15. Choose the amide which on reduction with $LiAlH_4$ yields a secondary amine

- A. ethanamide
- B. N-methylethanamide
- C. N,N-dimethylethanamide
- D. phenylmethanamide

Answer: B

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16. An organic amino compound reacts with aqueous nitrous acid at low temperature to produce an oily nitrosoamine. The compound is



Answer: C

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17. Reaction of aniline with benzaldehyde is

A. substitution

B. addition

C. condensation

D. polymerisation

Answer: C

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18. Reaction of aniline with acetyl chloride in the presence of $NaOH$ gives .

A. aniline hydrochloride

B. acetanilide

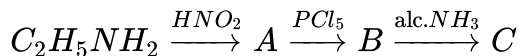
C. p-chloroaniline

D. a red dye

Answer: B

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



- A. propane nitrile
- B. methyl amine
- C. ethylamine
- D. acetamide

Answer: C

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

- A. p-aminophenol

B. azoxybenzene

C. azobenzene

D. aniline

Answer: A

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21. The correct order of increasing boiling points for the bases, CH_3NH_2 , $(CH_3)_2NH$, $(CH_3)_3N$ is

A. $CH_3NH_2 < (CH_3)_2NH < (CH_3)_3N$

B. $CH_3NH_2 < (CH_3)_3N < (CH_3)_2NH$

C. $(CH_3)_3N < (CH_3)_2NH < CH_3NH_2$

D. $(CH_3)_3N < CH_3NH_2 < (CH_3)_2NH$

Answer: C

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22. Select the weakest Bronstad base from the following bases

A. 

B. 

C. 

D. CH_3NH_2

Answer: A



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23. Amongst the following the most basic compound is :

A. benzylamine

B. aniline

C. acetanllide

D. p-nitroanillne

Answer: A

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24. Write down the IUPAC name of 

A. N-methyl-N-benzyl methanamine

B. dimethyl phenyl amine

C. N-phenyl-N-methyl methanamine

D. N, N-dimethylbenzenamine

Answer: D

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25. The source of nitrogen in Gabriel synthesis of amine is..

A. potassium phthalimide $C_6H_4(CO)_2N^- K^+$

B. potassium cyanide , KCN

C. sodium azide , NaN_3

D. sodium nitrite , $NaNO_3$

Answer: A

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26. Hinsberg's reagent is:

A. $C_6H_5CH_2Cl$

B. $C_6H_5SO_2Cl$

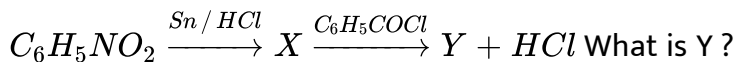
C. CH_3COCl

D. C_6H_5COCl

Answer: B

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27. Consider the following reaction



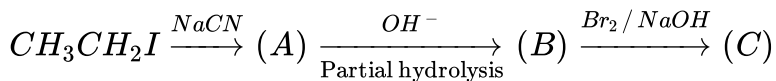
- A. Acetanilide
- B. Benzanilide
- C. Azobenzene
- D. Hydrazobenzene

Answer: B

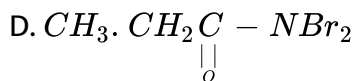


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28. In the following sequence of reaction, the major product (C)



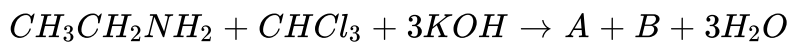
- A. $CH_3CH_2NH_2$
- B. $CH_3 \cdot CH_2 \overset{\overset{O}{||}}{C} - NHBr$
- C. $CH_3 \cdot CH_2 - COONH_4$



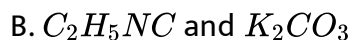
Answer: A

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29. In the chemical reaction,



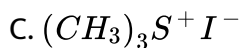
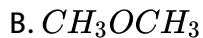
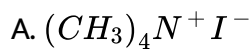
The compounds A and B respectively are



Answer: C

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



Answer: A



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31. Aniline on heating with fuming sulphuric acid gives.

A. benzene sulphonic acid

B. anthranilic acid

C. aniline

D. sulphanilic acid

Answer: D

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32. Reaction of nitrous acid with aliphatic primary amine in the cold gives

A. a diazonium salt

B. an alcohol

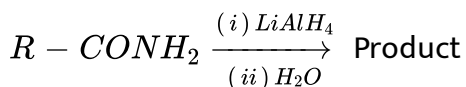
C. a nitrite

D. a dye

Answer: B

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33. The product formed in the given reaction is?



A. RNH_2

B. RCH_2NH_2

C. $RCH_2CH_2NH_2$

D. R CN

Answer: B

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34. Which of the following statement(s) is/are incorrect?

A. Aromatic amines with nitrous acid to form diazonium salts

B. Formation of diazonium salts occur at high temperature


C. Side products formed during the formation of benzenediazonium chloride are NaCl and H_2O molecules

D. Diazonium salts which being unstable, liberate nitrogen gas.

Answer: B



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35. In the given reaction,  What would be the final product formed?

A. 

B. 


C. 

D. 

Answer: C



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

A. II < III < I

B. III < I < II

C. III It II It I

D. II It I It III

Answer: D



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

A. mustard oil reaction

B. carbylamine reaction

C. exhaustive alkylation

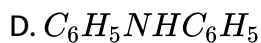
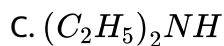
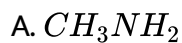
D. HNO_2 treatment

Answer: D



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

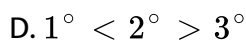
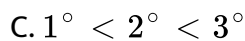
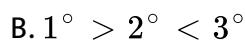
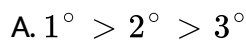


Answer: A



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39. The correct order for boiling point of isomeric alkyl amines is

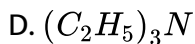
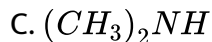
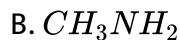
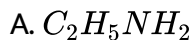


Answer: A



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40. From the following compounds which does not react with $C_6H_5SO_2Cl$?

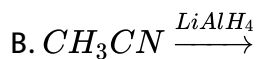


Answer: D



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41. Which of the following reaction will not give primary amine ?



Answer: C

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42. In ammonolysis, primary amine is obtained as a major product by taking

A. large excess of alkyl halide

B. large excess of ammonia

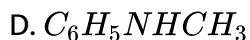
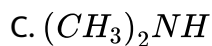
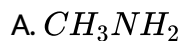
C. Both a and b

D. None of the above

Answer: B

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



Answer: C

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44. Acetamide and ethyl amine can be distinguished by reacting with .

A. aqueous HCl and heat

B. aqueous NaOH and heat

C. acidified $KMnO_4$

D. bromine water

Answer: B

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45. Liebermann's nitroso reaction is used for testing

A. primary amines

B. secondary amines

C. tertiary amines

D. All of these

Answer: B

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46. Final product of hydrolysed alkyl cyanide is

A. $R\text{ COOH}$

B. $R\text{ CONH}_2$

C. $R - \underset{\text{OH}}{\text{C}} = \text{NH}$

D. $R - \text{C} \equiv \overset{\oplus}{\text{N}}\text{H}$

Answer: A

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47. Reduction of alkyl nitriles, produces

A. secondary amine

B. primary amine

C. tertiary amine

D. amide

Answer: B

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48. Which one of the following forms propanenitrile as the major product

?

- A. Ethyl bromide + alcoholic KCN
- B. Propyl bromide + alcoholic KCN
- C. Propyl bromide + alcoholic AgCN
- D. Ethyl bromide + alcoholic AgCN

Answer: A



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49. Isocyanide can treatment with be prepared by alkyl halide on

- A. AgCN
- B. AgNC
- C. KCN

D. None of these

Answer: A

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50. Ethyl isocyanide on hydrolysis in acidic medium generates:

- A. ethylamine salt and methanoic acid
- B. propanoic acid and ammonium salt
- C. ethanoic acid and ammonium salt
- D. methylamine salt and ethanoic acid

Answer: A

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

A. amide

B. imide

C. secondary amine

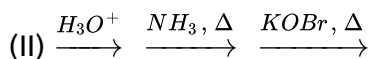
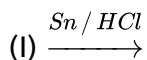
D. imine

Answer: A



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52. Ethylcyanide can be converted into ethylamine by



A. Only I

B. Only II

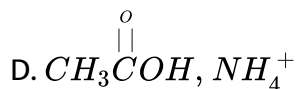
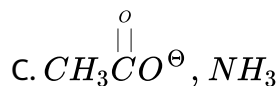
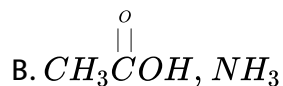
C. Both (a) and (b)

D. None of these

Answer: B

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53. Basic hydrolysis of CH_3CN forms



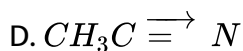
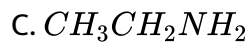
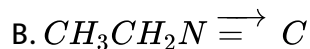
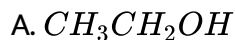
Answer: C

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54. An organic compound A with molecular formula C_2H_7N produces a compound B which on reaction with HNO_2 gives ethyl alcohol and when

warmed with $CHCl_3$ and alcoholic KOH, an offensive smelling compound

C is produced. C is



Answer: B



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55. Which compound is known as alkyl carbylamine?



Answer: B

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56. In the reaction, $R - C \equiv N + 4[H] \xrightarrow{X} RCH_2NH_2$ X can be

A. $LiAlH_4$

B. H_2SO_4

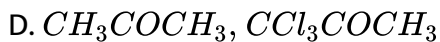
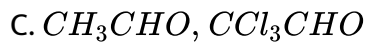
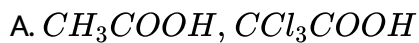
C. Ni

D. 2KBr

Answer: A

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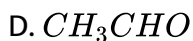
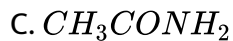
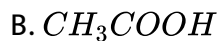
57. $CH_3CN + H_2O \xrightarrow{H^+} A \xrightarrow[RedP]{ExcessCl_2} B$. In the above reaction A and B are respectively



Answer: A


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58. Hydrolysis of acetonitrile in acidic medium gives



Answer: B


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59. In the given reaction,  What is the product formed in the above reaction ?

- A. Benzylamine
- B. Benzaldehyde
- C. Benzoic acid
- D. Benzonitrile

Answer: A

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60. The product obtained from Hofmann elimination of 

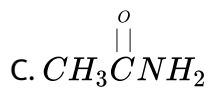
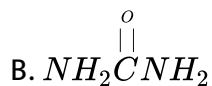
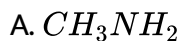
- A. 
- B. 
- C. 

D. 

Answer: C

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61. Which of the following compound is decomposed by the action of HNO_2

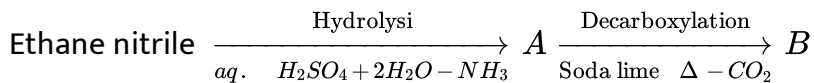


D. All of these

Answer: A

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62. Identify A and B in the reaction given below

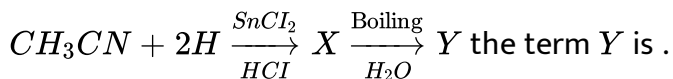


- A. acetic acid, methanol
- B. acetone, methane
- C. ethanoic acid, ethane
- D. ethanoic acid, methane

Answer: D

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63. In the reaction



- A. acetone
- B. ethanamine
- C. acetaldehyde

D. dimethyl amine

Answer: C

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64. Identify Z in the sequence, $CH_3COONH_4 \xrightarrow{\Delta} X \xrightarrow[\Delta]{P_2O_5} Y \xrightarrow{H_2O/H^+} Z$.

A. $CH_3CH_2CONH_2$

B. CH_3CN

C. CH_3COOH

D. $(CH_3CO)_2O$

Answer: C

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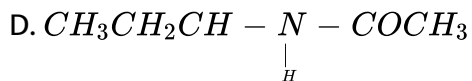
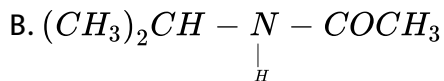
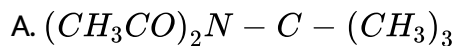
65. The formation of aldehyde from alkyl cyanide is related with the name

- A. Stephen
- B. Rosenmund
- C. Wurtz
- D. HVZ reaction

Answer: A

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66. Isopropylamine with excess of acetyl chloride will give?



Answer: C

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67. $LiAlH_4$ / ether reduces methyl cyanide into

- A. methylamine
- B. ethylamine
- C. methylimine
- D. ethylimine

Answer: B



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68. Hydrolysis of phenylisocyanide forms

- A. benzoic acid
- B. formic acid
- C. acetic acid

D. None of the above

Answer: B

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69. In the chemical reaction



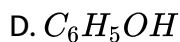
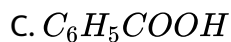
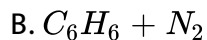
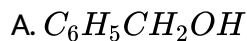
Compounds A and B respectively are

- A. fluorobenzene and phenol
- B. benzene diazonium chloride and benzonitrile
- C. nitrobenzene and chlorobenzene
- D. phenol and bromobenzene

Answer: B

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



Answer: D



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71. Benzenediazonium chloride on reaction with aniline in weakly basic medium gives

A. diphenyl ether

B. p-hydroxyazobenzene

C. chlorobenzene

D. benzene

Answer: B



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72. The reaction of o-chloroaniline with a mixture of HCl and $NaNO_2$ followed by cuprous bromide will give

A. 

B. 

C. 

D. 

Answer: C



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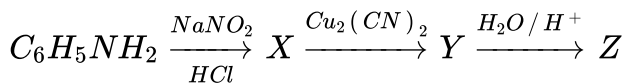
73. Aniline on treatment with sodium nitrite and HCl at $0^{\circ}C$ produces which of the following compound?

- A. Diazonium salt
- B. Hydrazo compound
- C. Phenol and N_2
- D. Nitroaniline

Answer: A

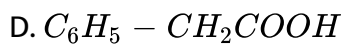
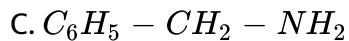
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74. Consider the following sequence of reaction.



Z is identified as

- A. $C_6H_5 - NH - CH_3$
- B. $C_6H_5 - COOH$



Answer: B

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75. Consider the following reaction, 

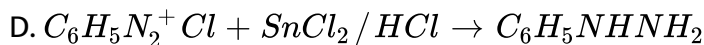
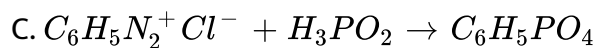
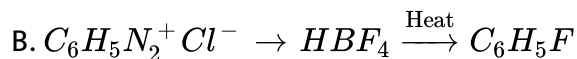
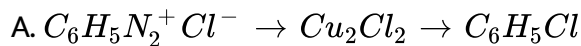
The above reaction is called

- A. Carbylamine reaction
- B. Gattermann synthesis
- C. Sandmeyer's reaction
- D. Balz-Schiemann reaction

Answer: B

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76. which of the following is not the correct reaction of aryl diazonium salts?



Answer: C



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77. Hydroazobenzene on treatment with H_2SO_4 forms

A. azobenzene

B. azobenzene sulphonic acid

C. benzidine

D. None of the above

Answer: C

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78. The diazonium salts have the general formula _____

Select an appropriate statement in order to complete the above statement.

A. $RN_2^+ X^-$, where, R stands for an aryl group and X^- ion may be

Cl^- , Br^- , HSO_4^- , BF_4^- etc.

B. $R_2N^+ X^-$, where, R stands for an aryl group and X^- ion may be

Cl^- , Br^- , HSO_4^- , BF_4^- etc.

C. $RN_2^+ X^-$, where, R stands for an alkyl group and X^- ion may be

Cl^- , Br^- , HSO_4^- , BF_4^- etc.

D. None of the above

Answer: A

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79. When p-toluidine reacts with sodium nitrite and hydrochloric acid at 274 K, a crystalline precipitate is formed, which is boiled with water. The resulting compound obtained is

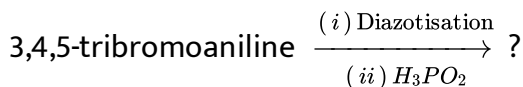
- A. p-cresol
- B. p-nitrotoluene
- C. phenol
- D. toluic acid

Answer: A



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80. Identify the product in the following reaction.



- A. 3,4,5-tribromobenzene

B. 1,2,3-tribromobenzene

C. 2,4,6-tribromobenzene

D. 3,4,5-tribromonitrobenzene

Answer: B



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81. Aniline in a set of reactions yielded a product D.



The structure of the product D would be

A. $C_6H_5CH_2NH_2$

B. $C_6H_5NHCH_2CH_3$

C. C_6H_5NHOH

D. $C_6H_5CH_2OH$

Answer: D



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



A. IV It II It III It I

B. IV gt III It II It I

C. II It IV It I It III

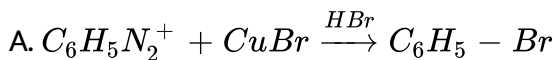
D. I It II It III It IV

Answer: A

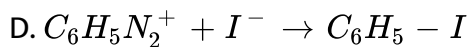
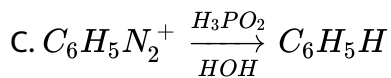


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83. Which of the following reaction will not occur?



B. 



Answer: B

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84. 

In the above sequence , B is

A. 

B. 

C. 

D. 

Answer: A

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85. Which one of the following compounds yield phenylhydrazine hydrochloride?

A. 

B. 

C. 

D. HN_2NH_2 and HCl

Answer: B



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Exercise 2 Miscellaneous Problems

1. Which of the following compounds reacts slower than benzene in electrophilic substitution ?

A. 

B. 

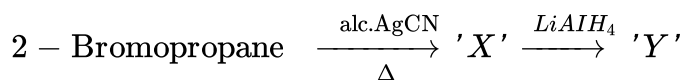
C. 

D. 

Answer: C

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2. In the given set of reactions :



The IUPAC name of product 'Y' is :

A. N-methylpropanamine

B. N-isopropylmethanamine

C. Butan-2-amine

D. N-methylpropan-2-amine

Answer: D



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3. Aromatic primary amines can be distinguished from aliphatic primary amines by

- A. Tollen's test
- B. action on red litmus paper
- C. azo dye test
- D. action with dil. HCl

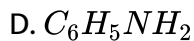
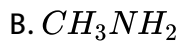
Answer: C



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4. Considering the basic strength of amines in aqueous solution which one has the smallest pK_b value?

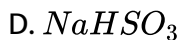
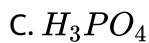
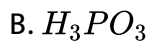
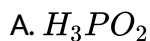
- A. $(CH_3)_2NH$



Answer: A

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5. The reagent with which the following reaction is best accomplished is



Answer: A

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6. 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 caustic potash gave (C) which on reduction gave isopropylmethylamine. Predict the structure of (A).

A. 

B. $CH_3CH_2 - NH - CH_2$

C. $CH_3 - \underset{\substack{| \\ CH_3}}{N} - CH_2$

D. $CH_3CH_2CH_2 - NH_2$

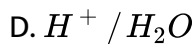
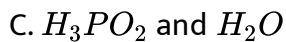
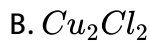
Answer: A



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7. In the reaction, 

A. $HgSO_4 / H_2SO_4$



Answer: C

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8.



Reaction is said

A. Hofmann bromamide reaction

B. Schmidt reaction

C. Curtius reaction

D. Beckmann reaction

Answer: A



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

A. 

B. 

C. 

D. 

Answer: B



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10. Match the reactant in Column I with the reaction in Column II



A. A-1, B-2 , C-3, D-4

B. A-3, B-4, C-2 , D-1

C. A-3, B-4 , C-1 , D-2

D. A-4, B-3, C - 2, D - 1

Answer: C



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11. Consider the following reaction



The compound B is

A. 

B. 

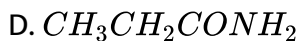
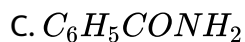
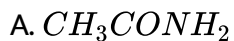
C. 

D. 

Answer: A

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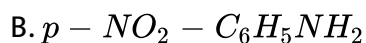
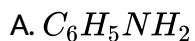
12. Which of the following amides will not undergo Hofmann bromamide reaction?

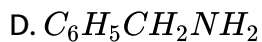
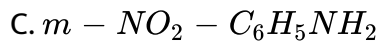


Answer: B

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13. Which of the following is the strongest base:





Answer: D

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



Answer: C

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15. Which compound exhibits maximum dipole moment among the following ?

A. 

B. 

C. 

D. 

Answer: C



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16. Aniline is treated with bromine water to give an organic compound X which when treated with $NaNO_2$ and HCl at $0^\circ C$ gives a water soluble compound Y. Compound Y on treatment with Cu_2Cl_2 and HCl gives compound Z. Compound Z is

A. o-bromochlorobenzene

B. p-bromochlorobenzene

C. 2,4,6-tribromophenol

D. 2,4,6-tribromochlorobenzene

Answer: D

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17. Which of the following compounds does liberate CO_2 from $NaHCO_3$

?

A. CH_3OH

B. CH_3NH_2

C. $(CH_3)_4N^+ OH^-$

D. $CH_3NH_3^+ Cl^-$

Answer: D

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18. 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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19. Match the amines given in Column I with their classification in the Column II and choose the correct option from the codes given below.



A. A-1, B-2, C-3

B. A-1,B-3, C-2

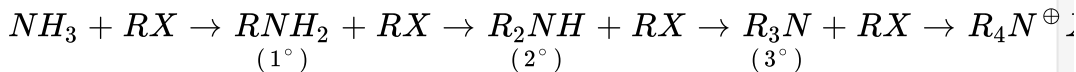
C. A-2,B-1, C-3

D. A-2, B-3, C-1

Answer: B

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20. In the given reaction,



Select an appropriate statement(s) about the reaction.

A. In this reaction NH_3 is the nucleophile

B. In this reaction RX is the nucleophile

C. $R_4N^\oplus X^-$ is called as quaternary ammonium salt

D. Both (a) and (c)

Answer: D

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

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

(iii) phenol (iv) m-chlorophenol

A. III lt II lt I lt IV

B. II lt IV lt III lt I


C. II lt III lt IV lt I

D. II lt III lt I lt IV

Answer: C

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22. Which of the following reaction/statement is incorrect?

- A. Benzenediazonium chloride is prepared by the reaction of aniline with nitrous acid at 273 - 278 K
- B. 
- C. The conversion of primary aromatic amines into diazonium salts is known as diazotisation
- D. Diazonium salt is not generally stored, used immediately after its preparation

Answer: B

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23. In the following reaction, 

What is X and Y in the above reaction?

A. 

B. 

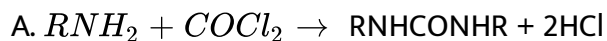
C. 

D. 

Answer: A

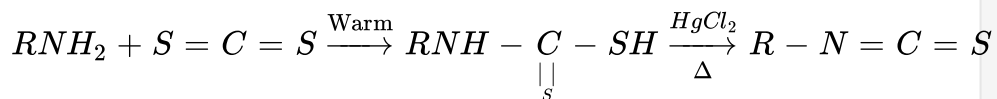
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24. The correct reaction for Hofmann mustard oil reaction is



B. 

C.



D. None of the above

Answer: C

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25. Identify A and Bin the following reaction.



A. 

B. 

C. 

D. 

Answer: A



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26. The best reagent for converting 2-phenylpropanamide into 2-phenylpropanamine is....

A. excess H_2

B. Br_2 in aqueous NaOH

C. iodine in the presence of phosphorus

D. $LiAlH_4$ in ether

Answer: D

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27. What are the constituent amines formed when the mixture of (1) and (2) undergoes Hofmann bromamide degradation?



A.

B.

C.

D.

Answer: B

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28. Consider the following reaction sequence . The final product of this reaction sequence is



A.

B.

C.

D.

Answer: C



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29. Primary amine is not formed in the reaction of

I. hydrolysis of RCN

II. reduction of $RCH = NOH$

III. hydrolysis of RNC

IV. hydrolysis of $RCONH_2$

The correct answer is

A. I, II and IV

B. I and IV

C. II and III

D. I, II and III

Answer: B

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30. Arrange the following in the decreasing order of pK_b values

I. $C_2H_5NH_2$, II. $C_6H_5NHCH_3$, III. $(C_2H_5)_2NH$, IV. $C_6H_5NH_2$

A. $IV > II > I > III$


B. $IV > II > III < I$

C. $I > III > IV > II$

D. $I > III > II > IV$

Answer: A

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31. The end-product of the following reaction is 

A. 


B. 

C. 

D. 

Answer: C

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32. In the chemical reactions,  the compounds 'A' and 'B' respectively are

A. nitrobenzene and fluorobenzene

B. phenol and benzene

C. benzene diazonium chloride and fluorobenzene

D. nitrobenzene and chlorobenzene

Answer: C



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33. Identify the product of the following reaction.



A. 

B. 

C. NH_2Br

D. 

Answer: D



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34. Benzaldehyde reacts with CH_3NH_2 forming

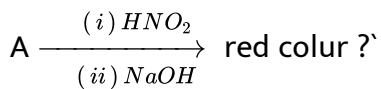
- A. Schiff's base
- B. Hofmann base
- C. Saytzeff base
- D. None of these

Answer: A



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35. Which A gives red colour in the reaction



- A. $CH_3CH_2NO_2$
- B. $(CH_3)_2CHNO_2$
- C. $(CH_3)_3CH_2$

D. 

Answer: A



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36. 

A. 

B. 


C. 

D. 

Answer: D



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37. CH_3NH_2 reacts with α, β -unsaturated ketone as shown 

Select correct statements out of I, II and III

I. Product is by conjugate addition

II. It is called Michael reaction

III. Intermediate is Zwitter ion which tautomerises after the proton transfer

A. I,II

B. I,III

C. II,III

D. I,II,III

Answer: D



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38. When aniline reacts with oil of bitter almonds (C_6H_5CHO) condensation takes place and benzal derivative is formed This is known

as .

- A. Millon's base
- B. Schiff's reagent
- C. Benedict reagent
- D. Schiff's base

Answer: D

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39. The main product of the reaction of CH_3CONH_2 with Br_2 in aqueous potassium hydroxide medium is

- A. $CH_3 - CH_2 - NH_2$
- B. CH_3Br
- C. $CH_3CONHBr$
- D. CH_3NH_2

Answer: D



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40. Nitrobenzene on reaction with conc. $\frac{HNO_3}{H_2SO_4}$ at $80 - 100^\circ C$ forms which one of the following products?

- A. 1,2-dinitrobenzene
- B. 1,3-dinitrobenzene
- C. 1,4-dinitrobenzene
- D. 1,2,4-trinitrobenzene

Answer: B



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41. Nitrobenzene gives N-phenylhydroxylamine by

A. Sn/HCl

B. H_2 /Pd-C

C. Zn/NaOH

D. Zn/NH_4Cl

Answer: D

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

A. 

B. 

C. 

D. 

Answer: D

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

A. 5

B. 7

C. 3

D. 6

Answer: A



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44. Which of the following is not the property of ethanenitrile (CH_3CN)

?

A. Undergoes acidic hydrolysis to give carboxylic acid.

- B. Undergoes alkaline hydrolysis to give salt of carboxylic acid.
- C. It tautomerises to give methyl isocyanide.
- D. It gives carbylamine reaction with chloroform

Answer: D

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45. $CHCl_3$ and KOH on heating with a compound form a bad smelling product compound is

- A. C_2H_5CN
- B. C_2H_5NC
- C. C_2H_5OH
- D. $C_2H_5NH_2$

Answer: D

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



The compound X and Y are

A.

B.

C.

D.

Answer: B



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

A. IV It II It III It I

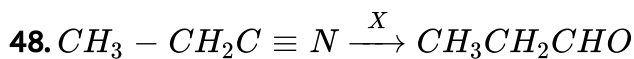
B. IV gt III It II It I

C. II It IV It I It III

D. I It II It III It IV

Answer: A

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The compound X is

A. $SnCl_2 / HCl / H_2O$, boil

B. $H_2 / Pd - BaSO_4$

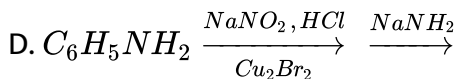
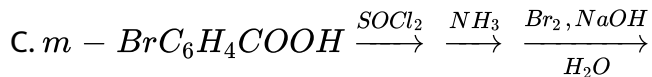
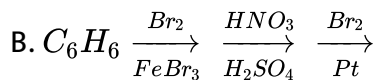
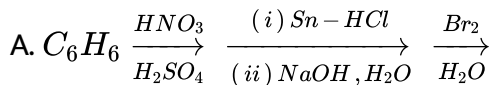
C. $LiAlH_4$ /ether

D. $NaBH_4$ /ether / H_3O^+

Answer: A

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49. m- bromoaniline can be prepared by .



Answer: C



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50. The product Y in the following reaction sequence is 

A. 

B. 

C. 

D. 

Answer: C



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51. Fluorobenzene (C_6H_5F) can be synthesized in the laboratory .

- A. from -aniline by dlazotisation followed by heating the diazonium salt with HBF_4
- B. by direct fluorination of benzene with F_2 gas
- C. by reacting bromobenzene with NaF solution
- D. by heating phenol with HF and KF

Answer: A



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52. Decomposition of benzene diazonium chloride by using Cu_2Cl/HCl to form chlorobenzene is

- A. Raschig's reaction
- B. Sandmeyer's. reaction
- C. Kolbe's reaction
- D. Cannizaro's reaction

Answer: B

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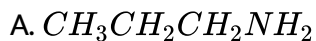
53. Amongst the given set of reactants, the most appropriate for preparing 2° amine is..

- A. $2^\circ R - Br + NH_3$
- B. $2^\circ R - Br + NaCN$ followed by H_2/Pt
- C. $1^\circ R - NH_2 + R CHO$ followed by H_2/Pt
- D. $1^\circ R-Br$ (2 mole) + potassium phthalimide followed by $H_3O^+ /heat$

Answer: C

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54. Which of the following should be most volatile?



Answer: B

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55. Which of the following is/are the incorrect representation of resonance hybrid of aniline ?



A. I and II

B. III and IV

C. V and IV

D. None of these

Answer: D



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56. 

Select the percentage in which these amine derivatives are formed in the reaction mixture and the reason behind it.

A. I \rightarrow 2% II \rightarrow 47% III \rightarrow 51%

In the acidic medium, aniline is protonated to form the anilium ion which is ortho directing

B. I \rightarrow 51% II \rightarrow 2% III \rightarrow 47%

In the acidic medium, aniline is protonated to form the anilium ion which is para directing

C. I \rightarrow 51% II \rightarrow 47% III \rightarrow 2%

In the acidic medium, aniline is protonated to form the anilium ion which is meta directing

D. I \rightarrow 50% II \rightarrow 20% III \rightarrow 20%

In the acidic medium, aniline is protonated to form the anilium ion which is ortho directing

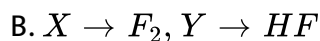
Answer: C

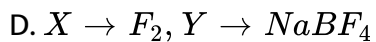
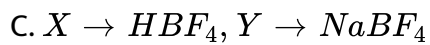
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57. Name the reagent and the by product used and formed during the given reaction



Choose the correct option.





Answer: C

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58. Which of the following reactions are correct?



A. I and II

B. I and III

C. I and IV

D. I, II and IV

Answer: B

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59. Name the product formed when aniline reacts with carbonyl chloride in the presence of pyridine.

- A. Phenylcyanate
- B. Phenylisocyanate
- C. Phenylcyanide
- D. Phenylisocyanide

Answer: B



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60. Consider the following sequence



Product of this reaction is

A. 

B. 

C. 

D. 

Answer: B

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61. The best reagent for converting, 2-phenylpropanamide into 1-phenylethanamine is....

A. excess H_2/Pt

B. $NaOH/Br_2$

C. $NaBH_4$ /methanol

D. $LiAlH_4$ / ether

Answer: B

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

A. 

B. 

C. 

D. 

Answer: D



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63. Give the structure of A in the following reaction.



A. 

B. 

C. 

D. 

Answer: B



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64. What is the end-product of the following reaction?



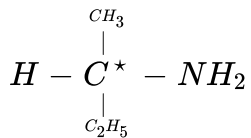
- A. 1,3,5-tribromobenzene
- B. Bromobenzene
- C. Bromophosphobenzene
- D. Bromonitrobenzene

Answer: A



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65. Following 1° amine has chiral carbon as indicated



This on reaction with ($\text{NaNO}_2 + \text{HCl}$) forms

- A. 1° alcohol with retention of configuration
- B. 2° alcohol with inverted configuration
- C. racemic mixture of 2° alcohol
- D. racemic mixture of 1° alcohol

Answer: C



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66. $\text{C}_4\text{H}_{11}\text{N}$ on reaction with HNO_2 forms tertiary alcohol . Thus ,
 $\text{C}_4\text{H}_{11}\text{N}$ is

- A. primary amine

B. secondary amine

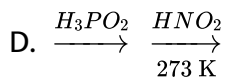
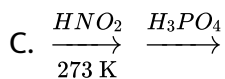
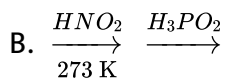
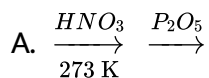
C. tertiary amine

D. quaternary ammonium salt

Answer: A

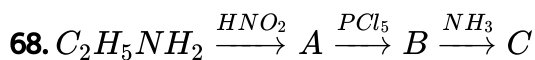
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67. Aniline can be converted to benzene by



Answer: B

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The compound C is identified as

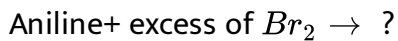
- A. acetamide
- B. ethylamine
- C. ethyl cyanide
- D. methyl amine

Answer: B



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69. The product obtained in the following reaction is



- A. Tribromo benzene
- B. m-bromo aniline
- C. 3, 4, 5-tribromo aniline

D. 2, 4, 6-tribromo aniline

Answer: D

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70. N-methyl aniline on reaction with nitrous acid gives

A. N-nitroso-N-methylaniline


B. p-nitroso-N-methylaniline

C. p-nitro-N-methylaniline

D. N-nitro-N-methylaniline

Answer: A

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

A. 

B. 

C. 

D. 

Answer: A

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72. The reaction of aniline with chloroform under alkaline conditions lead to the formation of

A. phenylcyanide

B. phenylisonitrile

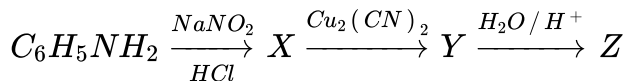
C. phenylcyanate

D. phenylisocyanate

Answer: B

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73. Consider the following sequence of reaction.



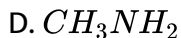
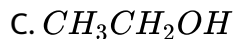
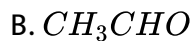
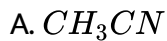
Z is identified as

- A. $C_6H_5 - NH - CH_3$
- B. $C_6H_5 - COOH$
- C. $C_6H_5 - CH_2 - NH_2$
- D. $C_6H_5 - CH_2 - COOH$

Answer: B

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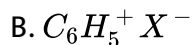
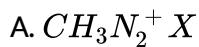
74. The product formed by the reaction of acetamide with bromine in presence of $NaOH$ is



Answer: D

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



Answer: B

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76. In the given reaction , 

The product A is

A. 

B. 

C. 

D. 

Answer: C



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77. N-butylamine (I), diethylamine (II) and N,N-dimethyl ethylamine(III) have the same molar mass. The increasing order of their boiling point is:

A. III lt II lt I

B. I lt II lt III

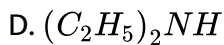
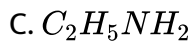
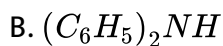
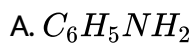
C. III It I It II

D. II It I It III

Answer: A

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78. The strongest base among the following is



Answer: D

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1. The amine 'A' when treated with nitrous acid gives yellow oily substance.

The amine A is

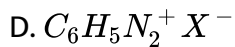
- A. triethylamine
- B. trimethylamine
- C. aniline
- D. methyphenylamine

Answer: D

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2. 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. $CH_3CH_2N_2^+ X^-$



Answer: D



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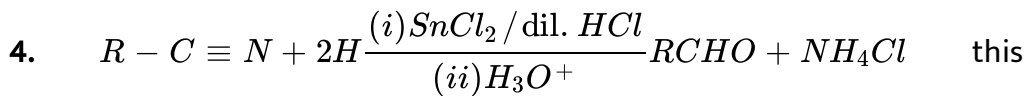
3. The replacement of diazonium group by fluorine is known as

- A. Gattermann reaction
- B. Sandmeyer reaction
- C. Balz-Schiemann reaction
- D. Etard reaction

Answer: C



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reaction is known as

- A. Etard reaction
- B. Stephen reaction
- C. Hell-Vohlard-Zelinsky reaction
- D. Balz-Schiemann reaction

Answer: B



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5. Diethyl amine when treated with nitrous acid yields

- A. diethyl ammonium nitrite
- B. ethyl alcohol
- C. N-nitroso diethyl amine

D. triethyl ammonium nitrite

Answer: C

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6. Identify the alkene that is produced in the following series of reactions.



A. 

B. 

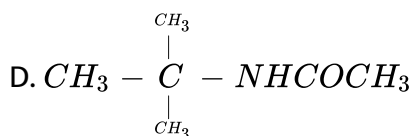
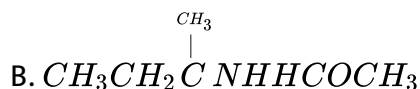
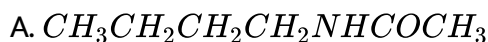
C. 

D. 

Answer: B

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7. An organic compound X having molecular formula $C_4H_{11}N$ reacts with p-toluene sulphonyl chloride to form a compound Y that is soluble in aqueous KOH. Compound X is optically active and reacts with acetyl chloride to form compound Z. Identify the compound Z.



Answer: B

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8. Nitrobenzene on reaction with conc. $\frac{HNO_3}{H_2SO_4}$ at $80 - 100^\circ C$ forms which one of the following products?

A. 1, 2-dinitrobenzene

B. 1, 3-dinitrobenzene

C. 1, 4-dinitrobenzene

D. 1, 2, 4-trinitrobenzene

Answer: B



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9. Some meta-directing substituents in aromatic substitution are given which one is the most deactivating?

A. $-C \equiv N$

B. $-SO_3H$

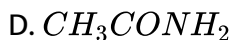
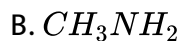
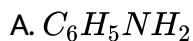
C. $-COOH$

D. $-NO_2$

Answer: D

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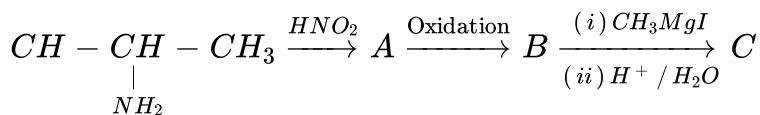
10. Which of the following is the strongest base?



Answer: B

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11. In the following sequence of reactions



The compound C formed will be



B. butanol-2

C. 2-methyl propanol-1

D. 1, 1- dimethylethanol

Answer: D

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12. In the following reaction sequence, $CH_3CHO \xrightarrow[Ca(OH)_2]{Cl_2} X \xrightarrow[Alc. KOH]{C_6H_5NH_2} Y$.

Y is

A. $CH_3CH = NHC_6H_5$

B. $C_6H_5NHCH_3$

C. C_6H_5NC

D. C_6H_5NCO

Answer: C

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13. Which of the following amines gives yellow oily liquid with HNO_2 ?

- A. Ethylmethanamine
- B. Aniline
- C. 3-methylbenzylamine
- D. Methanamine

Answer: A



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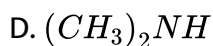
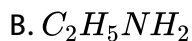
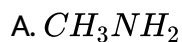
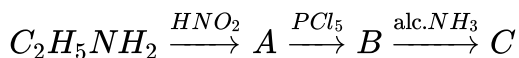
14. N-ethyl-N-methylpropan-1-amine is

- A. 1° amine
- B. 2° amine
- C. 3° amine
- D. 4° amine

Answer: C

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



Answer: B

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16. The compound that forms a yellow oily liquid with nitrous acid is

A. 2-methylaniline

B. methylamine

C. benzylamine

D. diethylamine

Answer: D



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17. Iso -propylamine is a

A. primary amine

B. secondary amine

C. tertiary amine

D. quaternary amine

Answer: A



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

- A. N-bromamide
- B. bromoacetic acid
- C. methanamine
- D. ethanamine

Answer: C



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

- A. benzylalcohol
- B. benzaldehyde
- C. benzonitrile

D. benzylisocyanide

Answer: D

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20. A mixture of ethyl amine and alcoholic KOH on heating gives

A. alkylcyanide

B. ethylcyanate

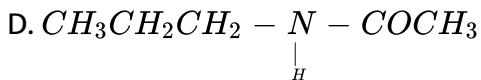
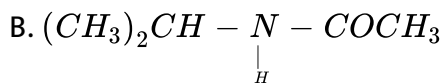
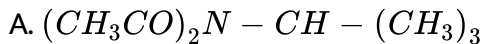
C. ethylisocyanide

D. ethylisocyanate

Answer: D

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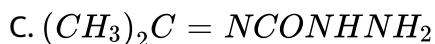
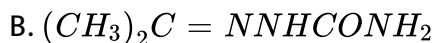
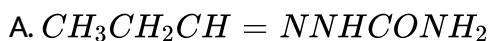
21. Isopropylamine with excess of acetyl chloride will give?

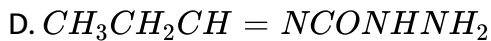


Answer: C

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

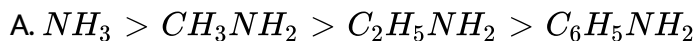




Answer: A

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23. The decreasing order of basic characters of the three amines and ammonia is

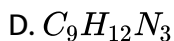
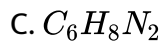
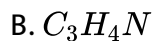
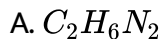


Answer: B

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24. In a compound C, H, N atoms are present in 9:1:3.5 by weight.

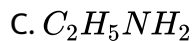
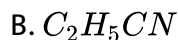
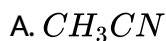
Molecular weight of compound is 108. Its molecular formula is:



Answer: C

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25. $CH_3Br + KCN(Alc \ominus) \rightarrow X \xrightarrow[Na + C_2H_5OH]{Reduction} Y$. What is Y in the series ?



D. CH_3NH_2

Answer: C



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26. Acetonitrile on reduction gives

A. propanamine

B. methanamine

C. ethanamine

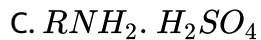
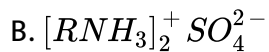
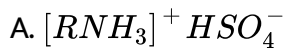
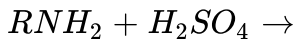
D. None of these

Answer: C



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27. Complete the following reaction.



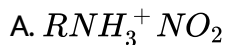
D. No reaction

Answer: B



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



B. ROH

C. R OR

D. None of these

Answer: B

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29. The IUPAC name of $CH_3 - \underset{\substack{| \\ NH_2}}{C}H - CH_3$ is

- A. dimethylamine
- B. 2-aminopropane
- C. isopropylamine
- D. 2-propanamine

Answer: D

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30. Reduction of nitrobenzene, in the presence of Zn and KOH, gives

- A. hydrazobenzene

B. nitrobenzene

C. azobenzene

D. azoxybenzene

Answer: A



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31. During acetylation of amines, what is replaced by acetyl groups?

A. Hydrogen atom attached to nitrogen atom

B. One or more hydrogen atoms attached to carbon atom

C. One or more hydrogen atoms attached to nitrogen atom

D. Hydrogen atoms attached to either carbon atom or nitrogen atom

Answer: C



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32. $CH_3 - CH_2 - Br \xrightarrow{Alc. KCN} CH_3CH_2CN \xrightarrow{HOH} X$, then X is

- A. acetic acid
- B. propionic acid
- C. butyric acid
- D. formic acid

Answer: B

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33. A compound X has 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 phenol gives an azo dye. Thus, X is

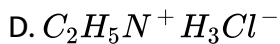
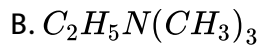
- A. $C_6H_5NO_2$
- B. $C_6H_5COONH_4$
- C. $C_6H_5CONH_2$

D. None of these

Answer: C

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34. Ethanamine with excess of acetyl chloride gives



Answer: C

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