



CHEMISTRY

JEE (MAIN AND ADVANCED) CHEMISTRY

AMINES AND AZO COMPOUNDS

Level I Exercise I Nitrobenzene

1. Steam distillation method is useful for the purification of

- A. Nitrobenzene
- B. Benzene
- C. Aniline
- D. Both Nitrobenzene and Aniline

Answer: D



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2. Nitrobenzene is reduced with $LiAlH_4$, The product is

- A. Azobenzene
- B. Hydrazobenzene
- C. N-Phenyl hydroxylamine
- D. Aniline

Answer: A



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3. Among the following which is less reactive towards electrophilic substitution reactions

- A. Benzene
- B. Nitrobenzene

C. Aniline

D. Toluene

Answer: B



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4. The following is used in the preparation of floor polishes

A. Nitrobenzene

B. Aniline

C. Benzene diazonium chloride

D. Phenyl hydroxyl amine

Answer: A



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5. Nitrobenzene is used as a solvent in

- A. Wurtz's reaction
- B. The preparation of Grignard reagent
- C. Friedel-Craft's reaction
- D. Diazotisation reaction

Answer: C



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6. Which is used as a cheap perfume

- A. Aniline
- B. Ethyl alcohol
- C. Acetone
- D. Nitrobenzene

Answer: D



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Level I Exercise I Amines General

1. IUPAC name of $(CH_3)_3C.NH_2$ is

- A. trimethyl amine
- B. 2-methyl butanamine-1
- C. 2-methyl propanamine-2
- D. 2-methyl propanamine-1

Answer: C



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2. Which one of the following is a tertiary amine?

- A. triethylamine
- B. trimethylamine
- C. 2-methyl propanamine-2
- D. N-ethyl-N-methyl propanamine-1

Answer: C



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3. Which of the following shows optical activity ?

- A. butanamine-1
- B. butanamine-2
- C. isopropyl amine
- D. ethyl methyl amine

Answer: B



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4. IUPAC name of $(C_2H_5)_3C - NH_2$ is

- A. 3-ethyl propanamine-1
- B. 3-ethyl pentanamine-2
- C. 3-ethyl pentanamine-3
- D. 2-ethyl pentanamine-3

Answer: C



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5. Number of saturated isomeric primary amines possible for the molecular formula C_3H_5N is

- A. zero
- B. 3
- C. 2

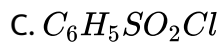
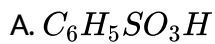
D. 4

Answer: D



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6. Chemical formula of Hinsberg's reagent is



Answer: C



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7. For carbylamine reaction, we need alcoholic KOH and

- A. any primary amine and chloroform
- B. aromatic primary amine and chloroform
- C. aliphatic primary amine and chloroform
- D. any amine and chloroform

Answer: A



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8. Aniline on acetylation gives

- A. phenol
- B. acetamide
- C. acetanilide
- D. benzene

Answer: C



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9. Treatment of ammonia with excess alkyl halide gives

- A. triethyl amine
- B. quaternary ammonium salt
- C. diethyl amine
- D. ethyl amine

Answer: B



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10. Aniline or reaction with con. H_2SO_4 gives X. If X is heated, the product is

- A. sulphanilic acid
- B. sulphonamide
- C. benzene sulphonyl chloride

D. m-amino benzene sulphonic acid

Answer: A



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11. Incorrect statement among the following is

A. methanamine is more basic than ammonia

B. ammonia forms H-bonds

C. boiling point of ethyl amine is higher than propane

D. dimethyl amine is less basic than aniline

Answer: D



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12. A primary amine on reaction with alc. KOH and chloroform yields

A. isocyanide

B. aldehyde

C. cyanide

D. alcohol

Answer: A



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13. Primary amines have lower boiling points than

A. corresponding alkanes

B. corresponding 2^o and 3^o amines

C. corresponding esters

D. corresponding alcohols

Answer: D



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14. Molecular association is highest in

- A. n-propyl amine
- B. trimethyl amine
- C. ethyl methyl amine
- D. equal in all

Answer: A



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15. Among isomeric amines possible for molecular formula C_3H_9N , correct order of basic strength is given by

- I) propanamine-1
- II) N-methyl ethanamine
- III) N,N-dimethyl methanamine

A. $III > I > II$

B. $I > II > III$

C. $II > III > I$

D. $II > I > IV$

Answer: C



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Level I Exercise I Aniline

1. Aniline is less basic than

A. NH_3

B. CH_3NH_2

C. N-methyl Aniline

D. All the above

Answer: D



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2. Which of the following is a 1° amine

A. Tert. Butylamine

B. dimethyl amine

C. N-methylaniline

D. N, N-dimethyl aniline

Answer: A



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3. Which functional group responds to carbylamine test

A. $-NH_2$

B. NH

C. $-CONH_2$

D. $-\text{N}$

Answer: A



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4. Among the following which is more basic

A. n - butyl amine

B. isobutylamine

C. Sec. butyamine

D. diethylamine

Answer: D



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5. Impure Aniline is purified by

- A. decantation
- B. steam distillation
- C. distillation under reduced pressure
- D. fractional crystallisation

Answer: B



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6. Towards litmus, Aniline is

- A. Acidic
- B. Basic
- C. Neutral
- D. Bleaching agent

Answer: C



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7. Which of the following can react with an alkyl halide

A. 1° amine

B. 2° amine

C. 3° amine

D. All the above

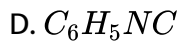
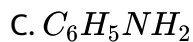
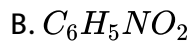
Answer: D



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8. The substance with offensive odour

A. C_6H_5CN

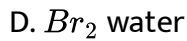
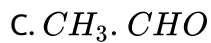
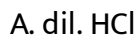


Answer: D



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9. Aniline doesn't react with



Answer: B



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10. Nitrobenzene on reduction with Hydrogen in presence of Nickel gives

- A. Azobenzene
- B. Hydrazobenzene
- C. Phenyl hydroxyl amine
- D. Aniline

Answer: D



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11. Aniline is soluble in

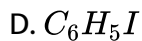
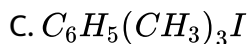
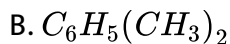
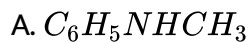
- A. dil.HCl
- B. dil.NaOH
- C. Water
- D. Na_2CO_3 solution

Answer: A



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12. Aniline is treated with excess of CH_3I . The final product is



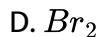
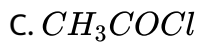
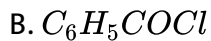
Answer: C



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13. The reagent which reacts with benzene nucleus in aniline is





Answer: D



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14. Which of the following is not a property of aniline

A. It is basic in nature

B. It gives carbylamine test

C. It can react with 3 moles of alkylhalide

D. It turns blue litmus red

Answer: D



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15. Which of the following is a mixed 2° amine

- A. Toludine
- B. N-Methylaniline
- C. Dimethylamine
- D. Methyldiethyl amine

Answer: B



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16. The general formula of aliphatic amines is

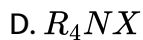
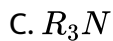
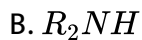
- A. $C_nH_{2n+1}N$
- B. $C_nH_{2n+2}N$
- C. $C_nH_{2n+3}N$
- D. $C_nH_{2n}N$

Answer: C



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17. The general formula of quaternary ammonium salt is



Answer: D



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18. Which of the following contains imino group $\left[\text{>NH} \right]$

A. Aniline

B. O-Toludine

C. Benzylamine

D. N-methyl aniline

Answer: D



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19. The number of hydrogen atoms required to convert 1 mole of nitrobenzene to hydrazobenzene is

A. 5

B. 10

C. 4

D. 8

Answer: A



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20. Freshly prepared aniline is ?

- A. Colourless
- B. Brown
- C. Yellow
- D. Pale Yellow

Answer: A



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21. Which of the following is true

- A. aniline forms salts with aqueous alkali
- B. aniline is more basic than ammonia
- C. aniline forms benzene diazonium chloride with nitric acid
- D. aniline is less basic than ammonia

Answer: D



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22. Bromination of aniline with bromine water mainly gives

- A. Red precipitate of 2, 4, 6 - tribromo aniline
- B. o-and p-Bromom aniline
- C. 2, 4-Dibromo aniline
- D. White precipitate of 2, 4, 6-tribromo aniline

Answer: D



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23. Aniline forms anilinium salt when it reacts with

- A. An alkyl halide'

- B. Acetyl chloride
- C. Sulphuric acid
- D. Benzoyl chloride

Answer: A



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24. The amine that does not form hydrogen bonds is

- A. Isopropyl amine
- B. Neopentyl amine
- C. Tertiary butyl amine
- D. N, N-Dimethylaminoethane

Answer: D



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25. The number of primary, secondary and tertiary amine isomers possible for the compound with formula $C_4H_{11}N$ are

A. 4, 3, 1

B. 4, 3, 2

C. 3, 2, 1

D. 4, 2, 1

Answer: A



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26. In the diazotisation of aniline, the reagent or reagents used

A. HNO_3 , HCl

B. $NaNO_2$, HCl at $0 - 5^\circ C$

C. $NaNO_2$, HNO_2 at $0 - 5^\circ C$

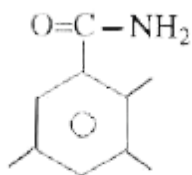
D. HNO_3 only

Answer: B

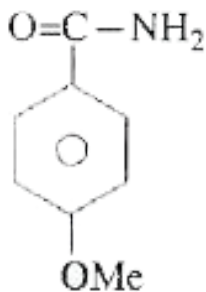


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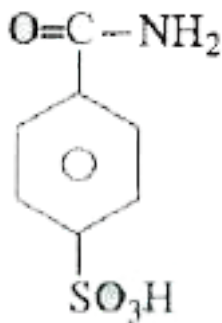
27. In which case rate of Hoffmann degradation will be maximum



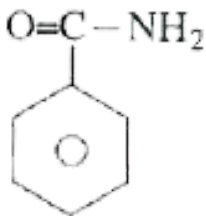
A.



B.



C.



D.

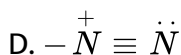
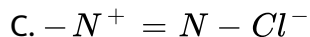
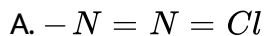
Answer: B



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Level I Exercise I Diazonium Salts Introduction Preparation Methods

1. In benzene diazonium chloride, the functional group is



Answer: D



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2. Diazonium salts are formed by

- A. aliphatic primary amines
- B. aromatic primary amines
- C. alicyclic primary amines
- D. heterocycli aromatic nitrogen compounds

Answer: B



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3. Diazotisation means the conversion of

- A. any primary amine into diazonium salt using $NaNO_2 + HCl$ at ice cold temperature

- B. aromatic primary amine into diazonium salt using $NaNO_2 + HCl$ at $60 - 70^{\circ}C$
- C. aromatic primary amine into diazonium salt using $NaNO_2 + HCl$ at ice cold temperature
- D. any primary amine into diazonium saltt using $NaNO_3 + HCl$ at ice cold temperature

Answer: C



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4. Aniline can be converted into Benzene by

- A. diazotization
- B. diazotization followed by treating with H_3PO_2
- C. treating with H_3PO_2
- D. diazotization followed by treating with steam

Answer: B



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5. Which of the following does not give diazonium salt with nitrous acid at 273K ?

- A. Benzenamine
- B. Benzyl amine
- C. p-hydroxy aniline
- D. o-hydroxy aniline

Answer: B



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1. Which diazonium salt is stable at room temperature

- A. Benzene diazonium chloride
- B. Benzene diazonium fluoroborate
- C. Benzene diazonium nitrate
- D. Benzene diazonium bromide

Answer: B



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2. Conversion of benzen diazonium salt into chlorobenzene in presence of

Cu_2Cl_2 is called

- A. Azocoupling reaction
- B. Sandmeyer reaction
- C. Gattermann reaction
- D. Shiemann reaction

Answer: B



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3. Action of HCl on Benzene diazonium chloride in the presence of copper powder gives

- A. p-chloro benzene diazonium chloride
- B. o-chloro benzene diazonium chloride
- C. Chloro benzene
- D. O-dichloro benzene

Answer: C



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4. One mole benzene diazonium chloride is treated with HBr(excess) in the presence of CuBr. Now, volume of N_2 liberated at STP weighs

- A. 11.2 lit.
- B. 22.4 lit.
- C. 5.6 lit.
- D. 44.8 lit.

Answer: B



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5. Action of KI on Benzene diazonium chloride yields

- A. sym triiodobenzene
- B. p-diiodobenzene
- C. o-di iodobenzene
- D. iodobenzene

Answer: D



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6. Benzene diazonium fluoro borate on heating to dryness yields

A. Fluorobenzene

B. Benzene

C. Aniline

D. o-fluoroaniline

Answer: A



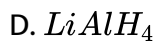
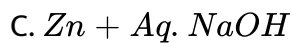
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Level I Exercise II

1. Nitrobenzene $\rightarrow$ Hydrazobenzene. Here the reagent is

A. $Sn + HCl$

B. $Zn + NH_4Cl$

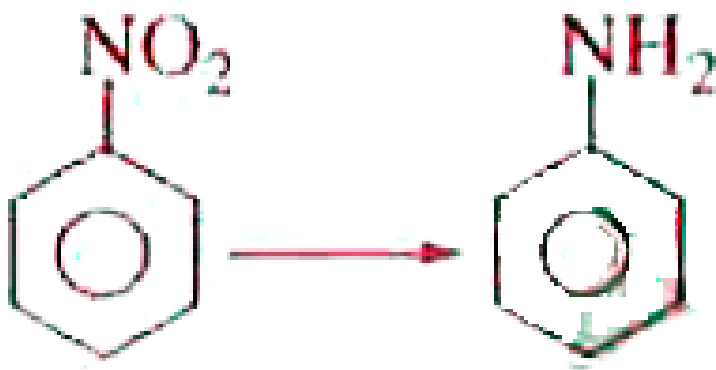


Answer: C



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2. In the reaction



The equivalent weight of Nitrobenzene is

A. M

B. $\frac{M}{2}$

C. $\frac{M}{4}$

D. $\frac{M}{6}$

Answer: D



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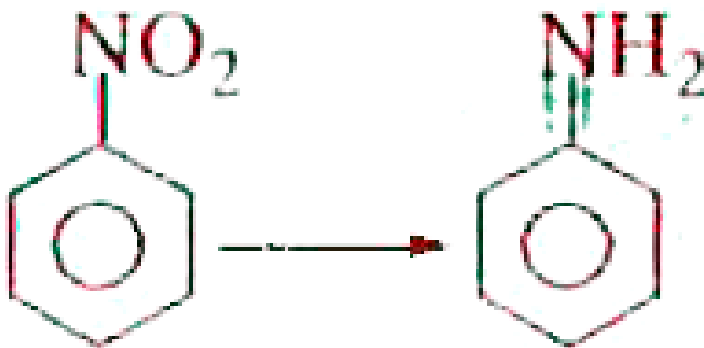
3. $R - \overset{\overset{O}{||}}{N} \rightarrow O$ and $R - O - N = O$ are a pair of

- A. Chain isomers
- B. Metamers
- C. Functional isomers
- D. Tautomers

Answer: C

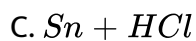
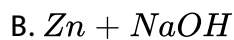
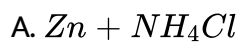


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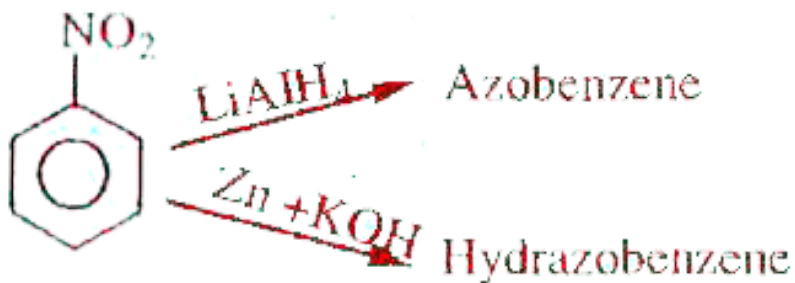
Here the reagent is



Answer: C



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5.

The ratio of the number of hydrogen atoms required to get 1 mole of azobenzene and 1 mole of hydrazobenzene

A. 4:5

B. 5:4

C. 1:1

D. 2:3

Answer: A



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the main product of the reaction

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

Answer: C



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7. Which of the following statements is wrong

- i) Shape of aliphatic amines is pyramidal
- ii) All amines are Brønsted bases

iii) All primary amines exhibit functional isomerism

iv) All tertiary amines shows functional isomerism

A. i, ii, iii, iv

B. i & ii

C. i only

D. iii only

Answer: D



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Level I Exercise II Amines General

1. N,N-dimethyl butanamine-2 contains

A. six sp^3 hybridised carbon atoms

B. seven sp^3 hybridised atoms

C. two sp^3 hybridised nitrogen atoms

D. 1 and 2 are correct

Answer: A



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2. Primary amino group is absent in

A. p-amino phenol

B. o-amino phenol

C. N-methyl ethanamine

D. phenyl amine

Answer: C



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3. N, N-dimethyl butanamine -2 is the functional isomer of

- A. N-butanamine -2
- B. N-methyl-2-ethyl butanamine-2
- C. trimethyl amine
- D. triethyl amine

Answer: D



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4. n-butyl amine and isobutyl amine are --- isomers

- A. optical
- B. functional
- C. chain
- D. positional

Answer: C



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5. How many primary amine structural isomers are possible with the molecular formula $C_4H_{11}N$.

A. 1

B. 2

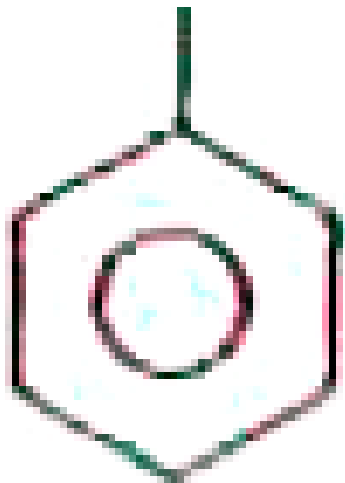
C. 3

D. 4

Answer: D



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1.
can react with a maximum of moles of CH_3I

A. 4

B. 3

C. 2

D. 1

Answer: C



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2. In the nitration of aniline the amino group is protected by conversion into

A. Tribromo derivative

B. Isocyanide

C. Diazonium salt

D. Acetyl derivative

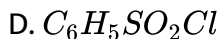
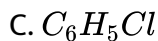
Answer: D



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3. In the preparation of N-phenyl benzene sulphonamide from aniline, the reagent used is

A. H_2SO_4

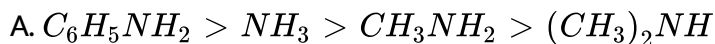


Answer: D



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4. Which of the following is correct with respect to the order of basic natures of different amines given below ?

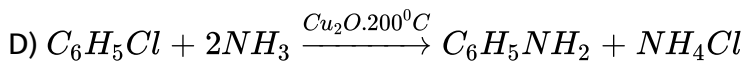
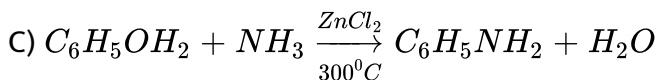
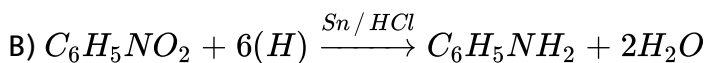
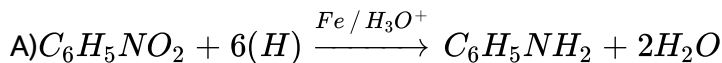


Answer: D



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5. Which of the following methods is used to prepare aniline on large scale ?



A. A only

B. B or C

C. C only

D. A or D

Answer: A



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1. Benzene diazonium chloride on reaction with KCN in the presence of CuCN yields X. X on hydrolysis yields Y. Y can also be obtained from

- A. Toluene by the action of $Cl_2 / FeCl_3$
- B. Toluene by oxidation by $KMnO_4$
- C. Toluene by nitration
- D. Toluene by sulphonation

Answer: B



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2. $Ar.N_2Cl \xrightarrow{dil. H_2SO_4} X + N_2 + HCl$ where regarding X, correct statement is

- A. dissolves in NaOH solution
- B. it liberates H_2 with Na
- C. it is stronger acid than acetic acid

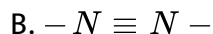
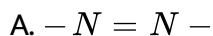
D. 1 and 2

Answer: D



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3. During diazo coupling, the following group is retained



Answer: A



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4. Which of the following is an example of electrophilic substitution?

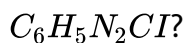
- A. diazotisation
- B. Sandmayer reaction
- C. diazo coupling
- D. action of KCN on ArN_2Cl

Answer: C



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5. Which of the following is the correct order of ease of coupling with



- A) Benzene
- B) Nitro benzene
- C) Phenol D) Chloro benzene

A. $A > D > B > C$

B. $C > A > B > D$

C. $C > A > D > B$

D. $B > D > A > C$

Answer: C



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6. Benzenediazonium salt on reaction with phenol gives

- A. p-hydroxyazobenzene
- B. o-hydroxyazobenzene
- C. m-hydroxyazobenzene
- D. p-aminoazobenzene

Answer: A



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7. N,N-dimethyl aniline on coupling with $C_6H_5N_2Cl$ yields

- A. 4-(N,N-dimethyl) amino azo benzene
- B. 4-(N,N-dimethyl) nitroso benzene
- C. 4-(N,N-dimethyl) amino azoxy benzene
- D. 4-(N,N-dimethyl) amino hydrazo benzene

Answer: A



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Level II Lecture Sheet Exercise I Nitrocompounds Preparation

1. The compound which on reaction with aqueous nitrous acid at low temperature produces an oil nitrosoamine is

- A. Methylamine
- B. Ethylamine
- C. Diethylamine
- D. Triethylamine

Answer: C



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2. $\text{CCl}_3 - \text{NO}_2$ can be obtained by

A. $\text{CH}_3 - \text{NO}_2$ reaction with PCl_5

B. $\text{CH}_3 - \text{NO}_2$ reaction with Cl_2 in presence of NaOH

C. CHCl_3 reaction with HNO_3

D. CH_3COOH reacts with HNO_3

Answer: B::C



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3. The compounds (s) that can be obtained by vapour phase nitration of propane is

A. 2-Nitropropane

B. 1-Nitropropane

C. Nitroethane

D. Nitromethane

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



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Level II Lecture Sheet Exercise I Nitrocompounds Properties

1. Which of the following compounds cannot be used as solvent in Friedel-Crafts reaction ?

A. Nitrobenzene

B. o - dinitrobenzene

C. Cyanobenzene

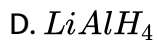
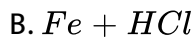
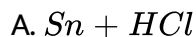
D. Toluene

Answer: D



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2. Azobenzene can be obtained by reducing nitrobenzene with

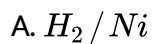


Answer: D



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3. Which of the following give (s) aniline by reduction of nitrobenzene?



B. Sn/HCl

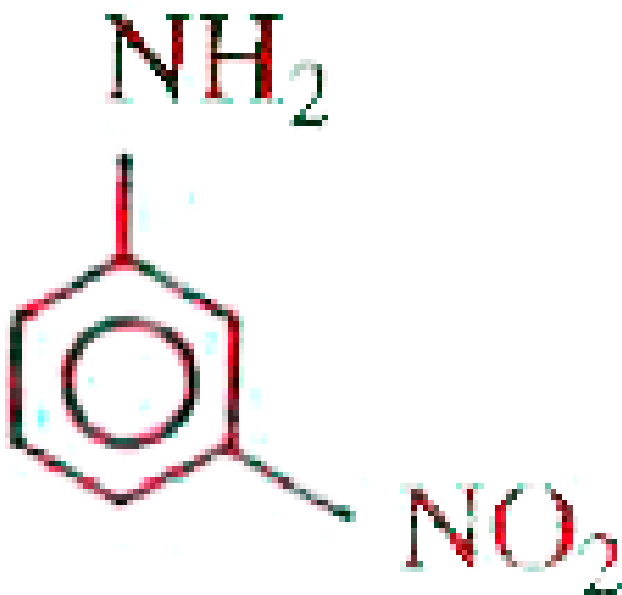
C. $\text{Zn \& NaOH}$

D. LiAlH_4

Answer: A::B



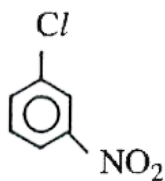
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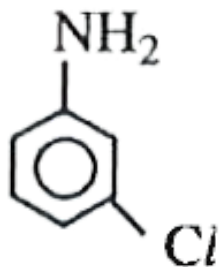
4.

$\xrightarrow{\text{Sn-HCl}}$ A $\xrightarrow[0-5^\circ\text{C}]{\text{NaNO}_2-\text{HCl}}$ B $\xrightarrow{\text{Cu}_2\text{Cl}_2/\text{KCl}}$ C The compound 'C' in the above

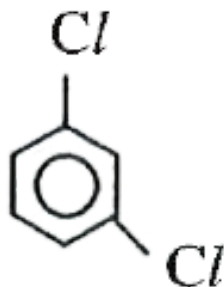
sequence is



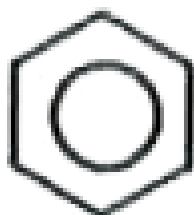
A.



B.



C.

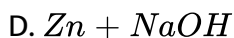
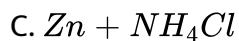


D.

Answer: C

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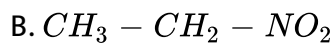
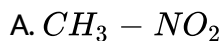
5. Hydrazobenzene can be obtained by reducing nitrobenzene with

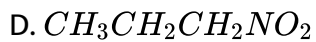
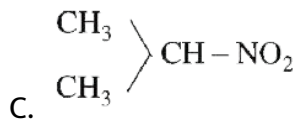


Answer: D

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6. Which of the following give (s) chloropicrin on chlorination?

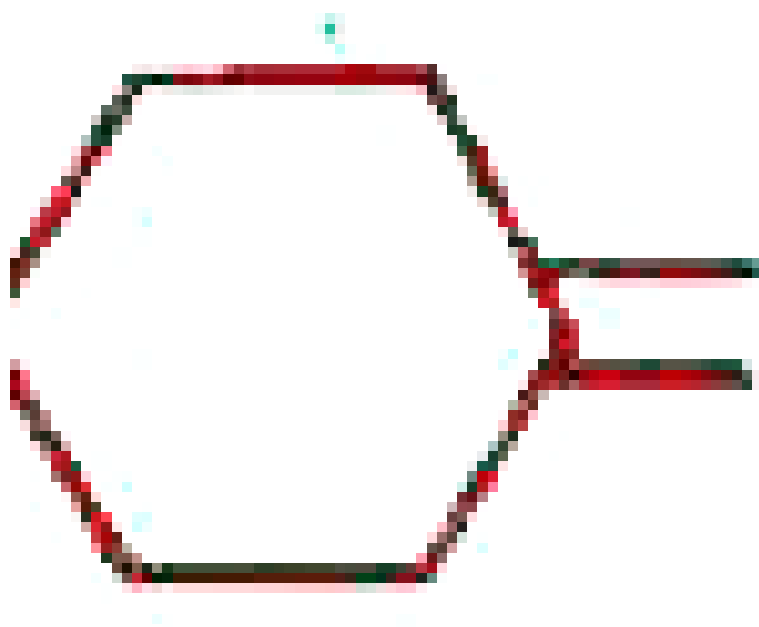




Answer: A

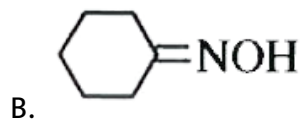
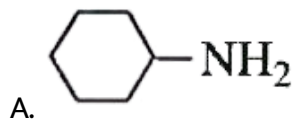


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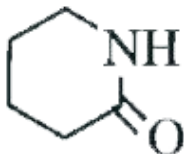


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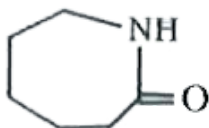
$O + H_2NOH \rightarrow A \xrightarrow{H^+} B$ The compound 'B' is



C.



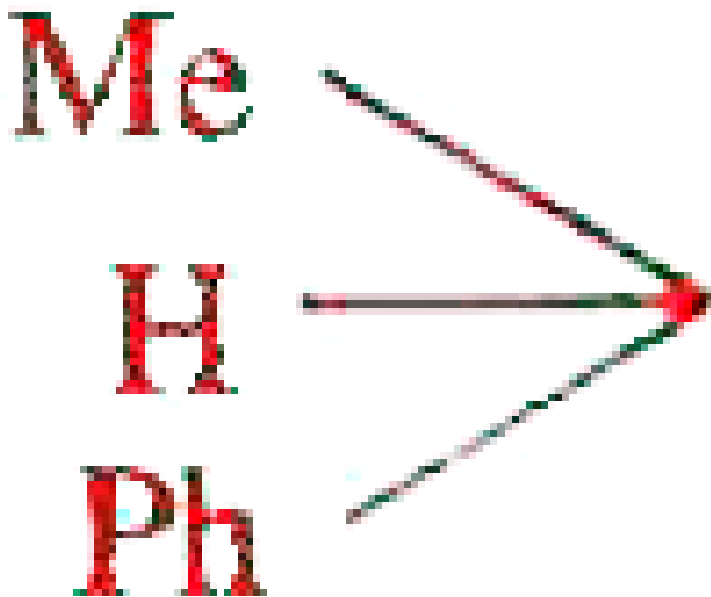
D.



Answer: D

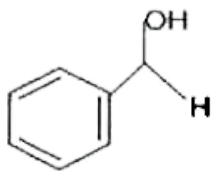


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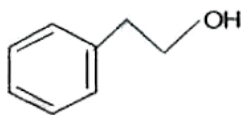


8.

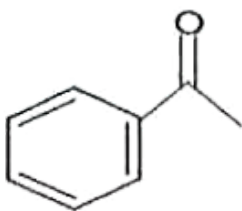
$C - COOH \xrightarrow{NH_3 \cdot Heat} A \xrightarrow{Br_2 + KOH} B \xrightarrow{HONO} C$. The compound 'C' is



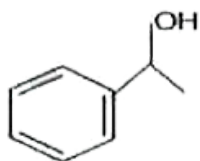
A.



B.



C.



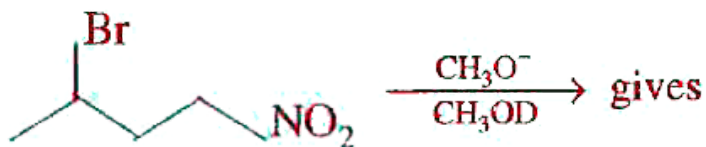
D.

Answer: D



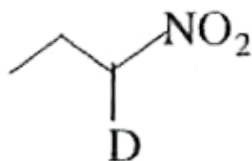
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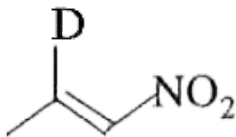
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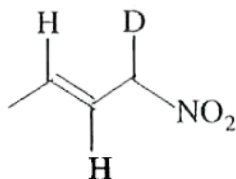
gives

A.

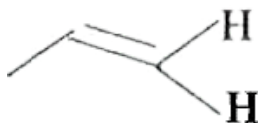




B.



C.



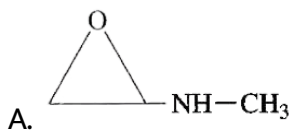
D.

Answer: C

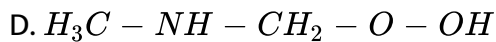
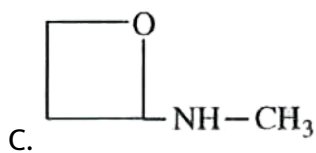


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10. $H_3CNH_2 \xrightarrow{(CH_2)_2O} (A)$. What is (A)



B. $H_3C - NH - CH_2 - CH_2 - OH$

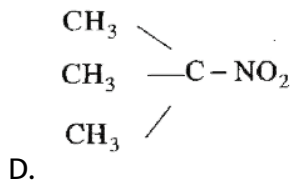
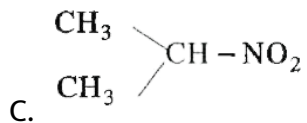
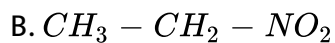


Answer: B

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11. Which of the following is soluble in NaOH?

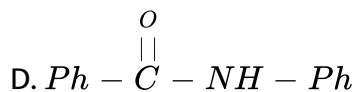
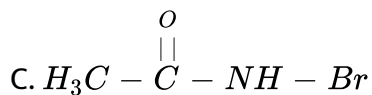
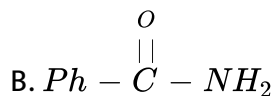
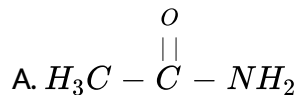
A. Aniline



Answer: B::C

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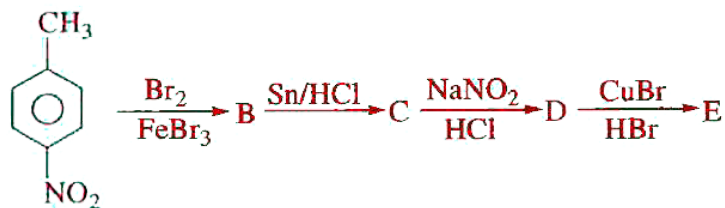
12. Which of the following will not give Hoffmann bromamide reaction



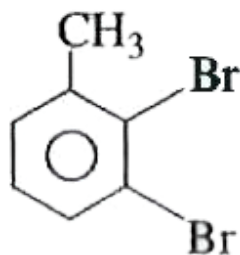
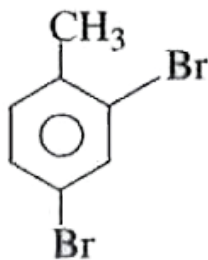
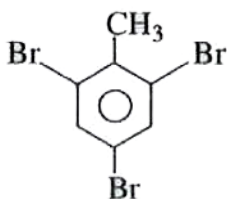
Answer: D

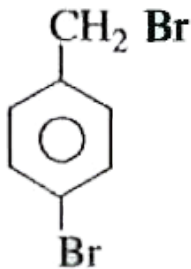
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13. In a set of reactions p- nitrotoluene yielded a produce E



The product E would be





D.

Answer: B



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Level II Lecture Sheet Exercise I Amines Preparation

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

A. PCl_5

B. Sodalime

C. $NaOH + Br_2$

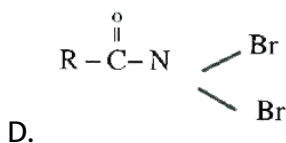
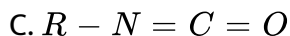
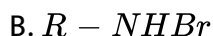
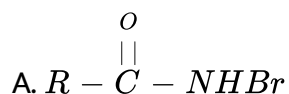
D. hot concentrated H_2SO_4

Answer: C



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2. Reaction of $RCONH_2$ with a mixture of Br_2 and KOH gives RNH_2 as the main product. The intermediates involved in the reaction are

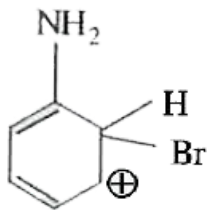


Answer: A::C

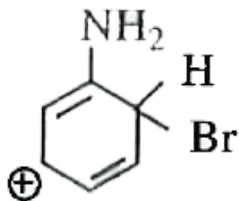


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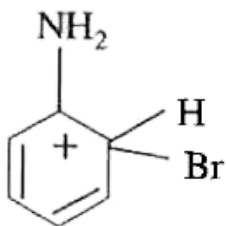
3. Arenium ion involved in the bromination of aniline is /are



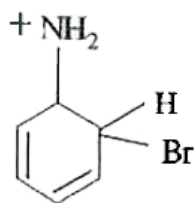
A.



B.



C.



D.

Answer: A::B::C



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1. Amongst the following, the most basic compound is

A. Benzylamine

B. Aniline

C. Acetanilide

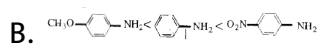
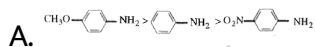
D. p-Nitroaniline

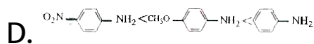
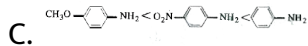
Answer: A



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2. Which of the following order is correct regarding the relative basicity of amines?





Answer: A



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3. Activation of benzene ring by NH_2 in aniline can be decreased by treating with

- A. Dilute HCl
- B. Ethyl alcohol
- C. Acetic acid
- D. Acetyl chloride

Answer: D



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4. Which of the following orders is correct regarding the basic strength of substituted aniline ?

A. p-nitroaniline > p-aminobenzaldehyde > p-bromoaniline

B. p-nitroaniline < p-bromoaniline < p-aminobenzaldehyde

C. p-Nitroaniline < p-aminobenzaldehyde < p-bromoaniline

D. p-Nitroaniline > p-aminobenzaldehyde > p-bromoaniline

Answer: C



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5. Which of the following orders regarding the basic strength of substituted aniline is correct ?

A. p-methylaniline > p-chloroaniline > p-aminoacetophenone

B. p-methylaniline p-aminoacetophenone > p-chloroaniline

C. p-aminoacetophenone > p-methylaniline > p-chloroaniline

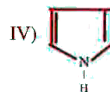
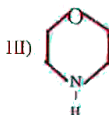
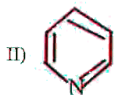
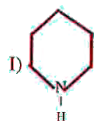
D. p-aminoacetophenone > p-chloroaniline > p-methylaniline

Answer: A



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6. In the following compounds



the order of

basicity is

A. $IV > I > II > III$

B. $III > I > IV > II$

C. $II > I > III > IV$

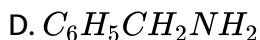
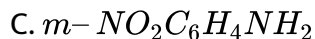
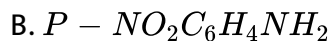
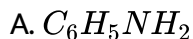
D. $I > III > II > IV$

Answer: D



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7. Among the following, the strongest base is



Answer: D



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Level II Lecture Sheet Exercise I Amines Properties

1. Carbylamine test is performed in alcoholic KOH by heating a mixture of

A. Chloroform and silver powder

B. Trichloro methane and a primary amine

C. An alkyl halide and a primary amine.

D. An alkyl cyanide and a primary amine.

Answer: B



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2. Chlorobenzene can be prepared by reacting aniline with

A. Hydrochloric acid

B. Cuprous chloride

C. Chlorine in the presence of anhydrous aluminium chloride

D. Nitrous acid followed by heating with cuprous chloride.

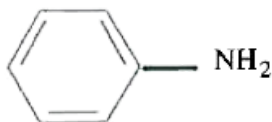
Answer: D



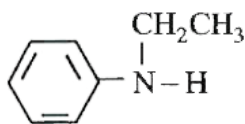
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3. Which of following amines form N-nitroso derivative when treated with NaNO_2 and HCl .

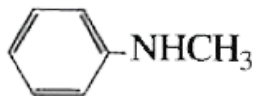
A. CH_3NH_2



B.



C.



D.

Answer: C::D



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4. Hinsberg's reagent is

A. Phenylisocyanide

B. Benzenesulphonyl chloride

C. p-toluenesulphonic acid

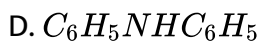
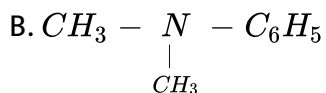
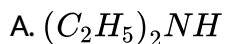
D. o-dichlorobenzene

Answer: B



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



Answer: C



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6. The bromination of aniline produces

- A. 2- bromoaniline
- B. 4-bromoaniline
- C. 2, 4, 6-tribromoaniline
- D. 2, 6-dibromoaniline

Answer: C



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7. Primary, secondary and tertiary amines can be separated by using

- A. Diethyl ether
- B. Hinsberg's reagent
- C. Hofmann method

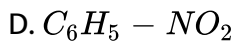
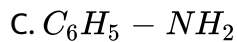
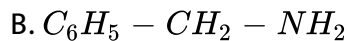
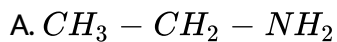
D. Filterpaper

Answer: B::C



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8. Which of the following give (s) Schiff's base with aldehydes ?

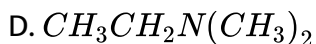
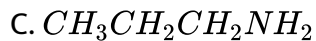
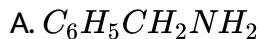


Answer: A::B::C



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9. Which of the following compounds give alcohol on reaction with NaNO_2 and HCl



Answer: A::C



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10. p- chloroaniline and aniline hydrochloride can be distinguished by using

A. Carbylamine reaction

B. silver nitrate solution

C. Barium chloride solution

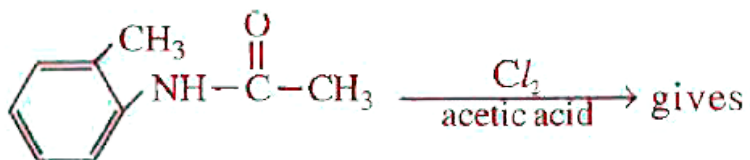
D. Any of the above

Answer: B



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11. Complete the following reaction



A. 4-chloro - 2 - methylacetanilide

B. 3-chloro-2-methylacetanilide

C. 2-methylacetanilide

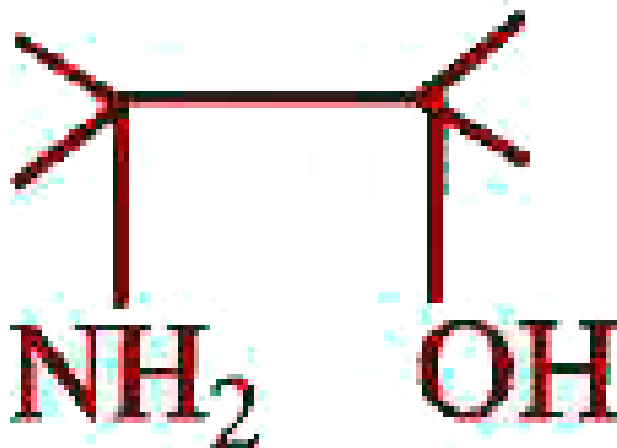
D. none of these

Answer: A

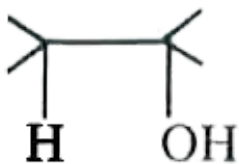


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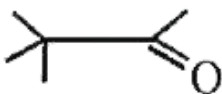
12. The major product of the reaction



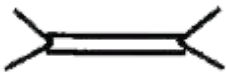
$\xrightarrow{\text{NaNO}_2 / \text{H}_2\text{SO}_4}$ is



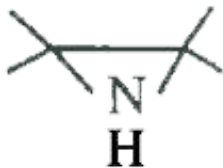
A.



B.



C.



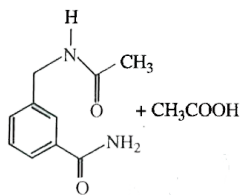
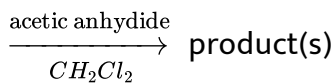
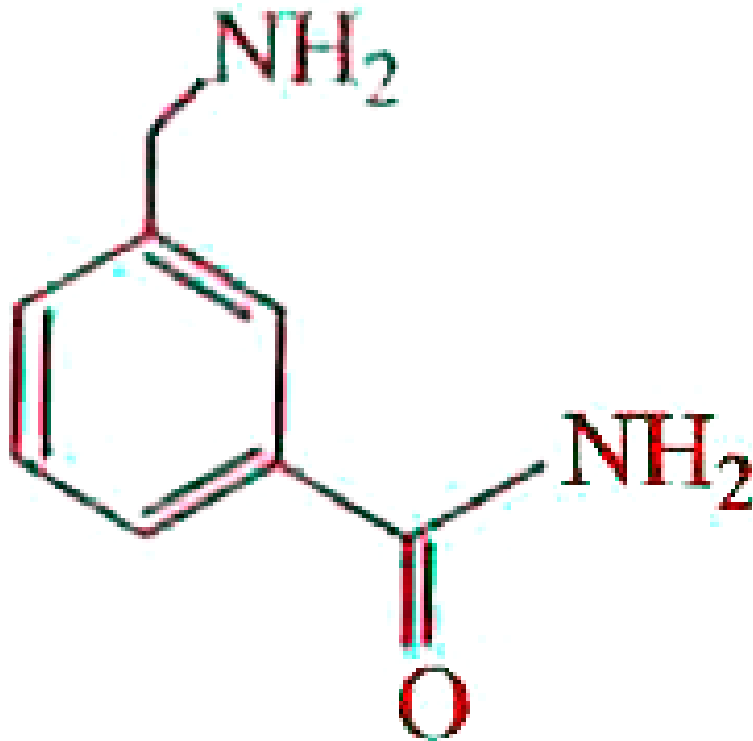
D.

Answer: B

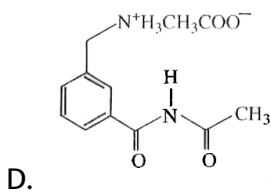
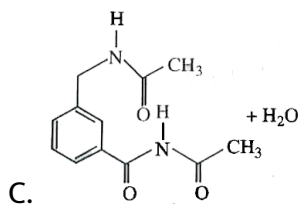
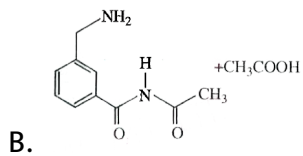


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13. In the reaction shown below the major product(s) formed is/are



A.



Answer: A



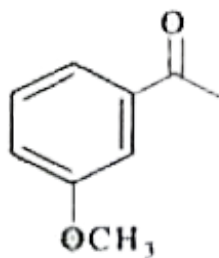
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Level II Lecture Sheet Exercise I Cyanides And Isocyanides

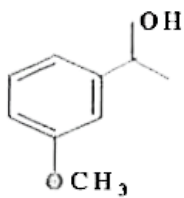


1.

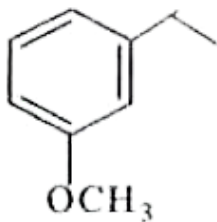
$\xrightarrow{\text{CH}_3\text{MgBr}}$ A $\xrightarrow{\text{H}_3\text{O}^+}$ B. The compound 'B' is



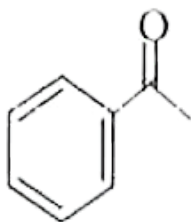
A.



B.



C.



D.

Answer: A



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1. On warming an aqueous solution of benzenediazonium chloride, the product obtained is

- A. Benzene
- B. Aniline
- C. Phenol
- D. amide

Answer: C



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2. Benzenediazonium chloride on reaction with phenol in weakly basic medium gives

- A. Diphenyl ether
- B. p- hydroxyazobenzene
- C. Chlorobenzene

D. Benzene

Answer: B



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3. Compounds which do not give coupling reaction with benzenediazonium chloride in acidic medium is/are

A. Phenol

B. Aniline

C. Nitrobenzene

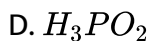
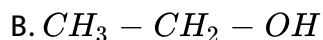
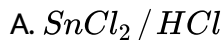
D. Chlorobenzene

Answer: C



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4. Which of the following reagents can be used to convert benzenediazonium chloride to benzene ?

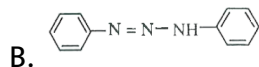
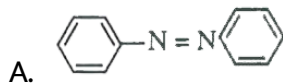


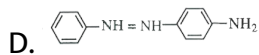
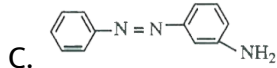
Answer: B



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5. When aniline is treated with benzene diazonium chloride at low temperature in weakly acidic medium the final product is





Answer: A

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6. The compounds soluble in water

A. Methyl amine

B. Acetone

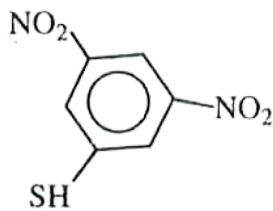
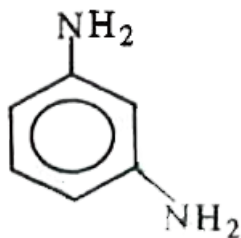
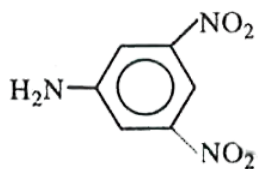
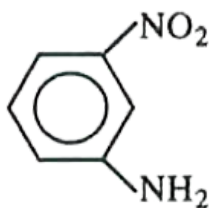
C. Formic acid

D. 1-pentanol

Answer: A::B::C

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7. Reaction of m-dinitro benzene with $(NH_4)_2S_x$ gives



Answer: A



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8. Which of the following compounds will dissolve in alkali solution after its reaction with Hinsberg reagent?

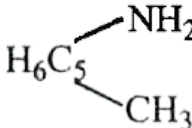
- A. N - Methylethanamine
- B. Diethylamine
- C. N, N - Dimethyl aniline
- D. Isopropylamine

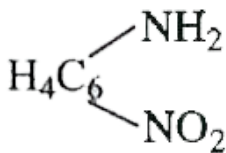
Answer: D



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9. Which compound/s does not give stable diazotisation product

- A. $C_6H_5NH_2$
- B. $C_6H_5CH_2NH_2$
- C. 



D.

Answer: B



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10. The amine which liberate nitrogen on reaction with nitrous acid is

A. Isopropyl amine

B. N - Methyl aniline

C. Isobutyl amine

D. tert-butylamine

Answer: A::C::D



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11. A) $\xrightarrow[\text{[H]}]{\text{Reduction}}$ Primary amine. The compound A) may be

A. Alkyl isocyanide

B. Alkyl cyanide

C. Acid amide

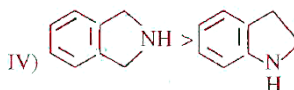
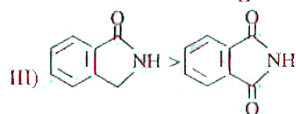
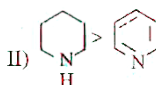
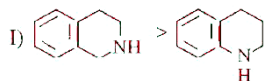
D. 1°-nitroalkane

Answer: B::C::D



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12. Consider the following comparisons of basic nature of different compound Identify correct comparison



A. I

B. II

C. III

D. IV

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



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13. Which of the following aryl amines will not form a diazonium salt on reaction with sodium nitrite in hydrochloric acid?

A. N, N-Dimethylaniline

B. p-Amino acetophenone

C. 4-Chloro-N-methyl aniline

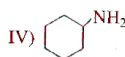
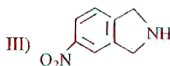
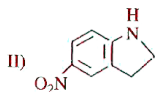
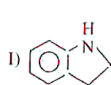
D. N-Ethyl-2-methyl aniline

Answer: A::C::D



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14. For following given compounds identify correct statement(s)



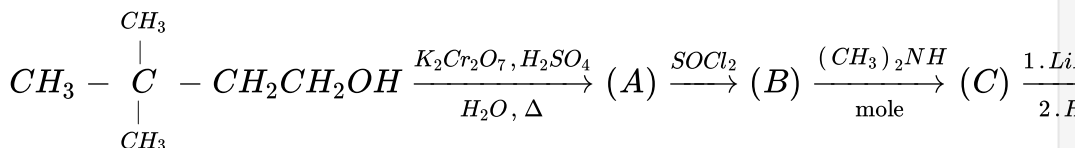
- A. All are basic
- B. III is more basic than II
- C. IV is the most basic of all
- D. II is the least basic of all

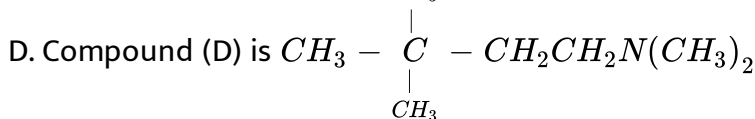
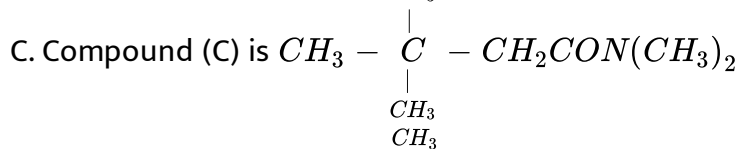
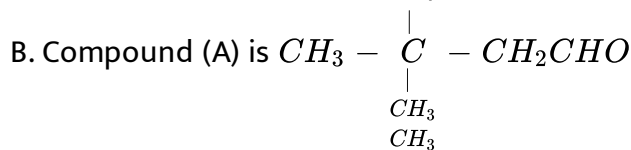
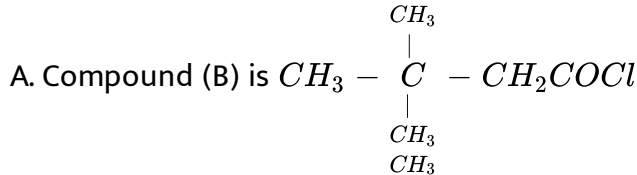
Answer: A::B::C::D



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15. In the given reaction sequence,

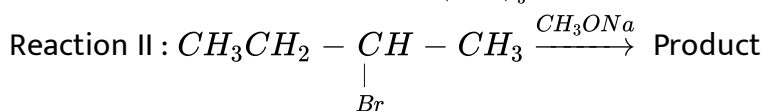
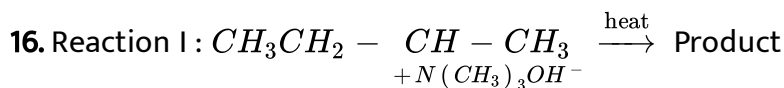




Answer: A::C::D



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Products are $CH_3 - CH = CH - CH_3 (X)$

$CH_3CH_2CH = CH_2 (Y)$

A. The major product in reaction 1 is (X)

B. The major product in reaction 1 is (Y)

C. The major product in reaction 2 is (X)

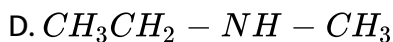
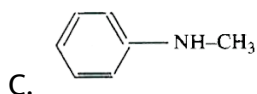
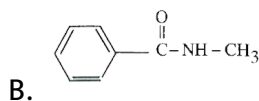
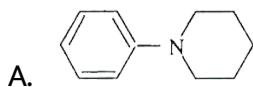
D. The major product in reaction 2 is (Y)

Answer: B::C



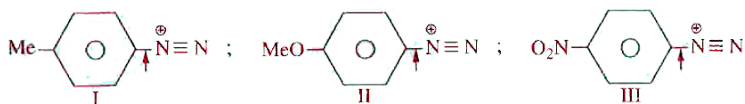
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17. Which compound yields an N-nitroso amine after treatment with nitrous acid ($NaNO_2 + HCl$)?



Answer: C::D

18.



Among these cations, the correct order of the indicated C-N bond strength is

A. $III > I > II$

B. $II > III > I$

C. $I > II > III$

D. $II > I > III$

Answer: D

19. $\text{PhCOCH}_2\text{CH}_2\text{NH}_2$ and $\text{PhNHCH}_2\text{COCH}_3$ can be distinguished by

A. Carbylamine test

B. Tollen's test

C. Hinsberg's test

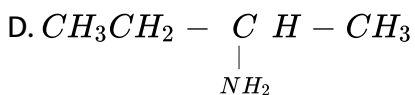
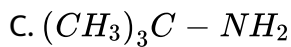
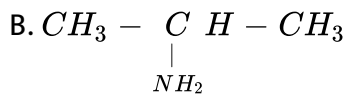
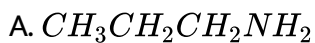
D. Iodoform test

Answer: A::C::D



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20. Which of the following is a primary amine



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



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21. The type of hybridisation of nitrogen in aliphatic amines is

- A. sp^3
- B. sp^2
- C. sp
- D. Unhybridised

Answer: A



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22. The correct IUPAC name of $C_2H_5 - \underset{\underset{CH_3}{|}}{N} - CH_2CH_2CH_3$ is

- A. N, N - diethyl butylamine
- B. N - Ethyl - N - methyl butylamine
- C. N - Ethyl - N - methyl butanamine

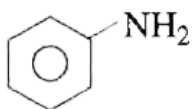
D. N - Ethyl - N - methyl propan - 1 - amine

Answer: D

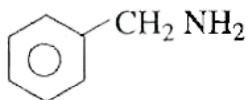


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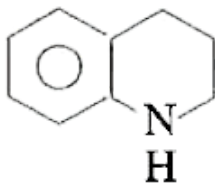
23. Which of the following is an arylamine



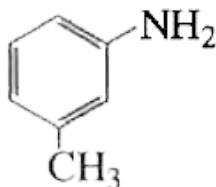
A.



B.



C.



D.

Answer: A::C::D



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24. Which sequence of reactions is best suitable method for preparation of *m*-chloroaniline from benzene

A. (i) nitration (ii) $Cl_2 / FeCl_3$ (iii) $Sn + HCl$

B. (ii) $Cl_2 / FeCl_3$ (ii) nitration (iii) $Sn + HCl$

C. (ii) $Cl_2 / FeCl_2$ (ii) NH_3 & $ZnCl_2$

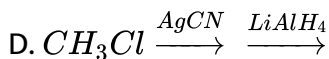
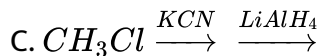
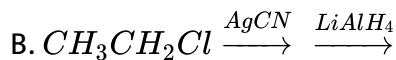
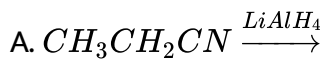
D. (ii) Nitration (ii) $Cl_2, h\nu$ (iii) $Sn + HCl$

Answer: A



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25. Which sequence of reactions is useful to prepare 1 – propanamine

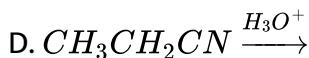
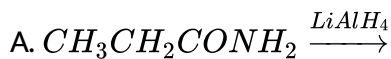


Answer: A



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26. Which of the following reaction give primary amine



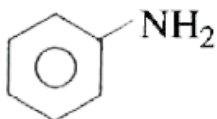
Answer: A



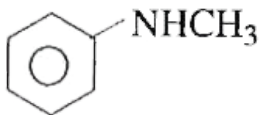
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Level II Lecture Sheet Exercise II

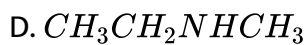
1. Gabriel-Phthalimide reaction is useful for preparation of



A.



B.



Answer: C



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2. Which of the following species is not formed in Hofmann bromamide reaction

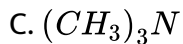
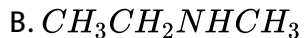
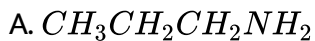


Answer: D



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3. Which of the following isomeric amines is likely to have higher boiling point



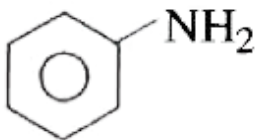
D. All have same B.P. as they are isomers

Answer: A

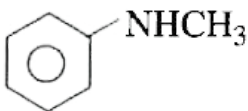


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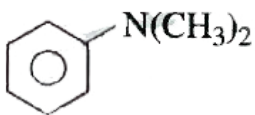
4. In which of the following amines, intermolecular hydrogen bond does not exist



A.



B.



C.

D. $\text{CH}_3\text{CH}_2\text{CH}_2 - \text{NH}_2$

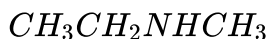
Answer: C



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5. Which of the following statements is correct

A. $CH_3CH_2CH_2NH_2$ is more soluble in water than



B. $(CH_3)_3N$ is more soluble in water than $CH_3CH_2CH_2NH_2$

C. $(CH_3)_3N$ and $CH_3CH_2NHCH_3$ both enter into hydrogen bond with water

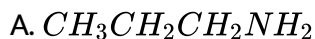
D. $(CH_3)_3N$ possess more B.P. than $CH_3CH_2NHCH_3$

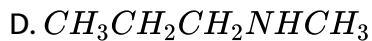
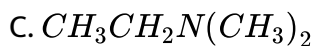
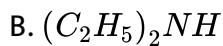
Answer: A::C



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6. Which of the following is likely to have higher boiling point



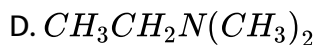
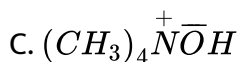
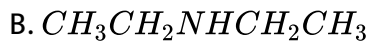


Answer: A



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7. Which of the following is highly basic in aqueous solution



Answer: C



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8. Aniline on reaction with acetic anhydride to give

- A. Acetanilide
- B. N-phenylmethanamide
- C. Phenyl acetamide
- D. Methylacetamide

Answer: A::C



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9. Which of the following amines react with $NaNO_2 + HCl$ to give yellow oily liquid product(s)

- A. $C_6H_5NHCH_3$
- B. $CH_3CH_2NHCH_2CH_3$
- C. $C_6H_5N(CH_3)_2$
- D. $C_6H_5NH_2$

Answer: A::B



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10. In Gattermann reaction for preparation of chlorobenzene from diazonium salt, the catalyst used is

A. $CuCl_2$

B. Cu

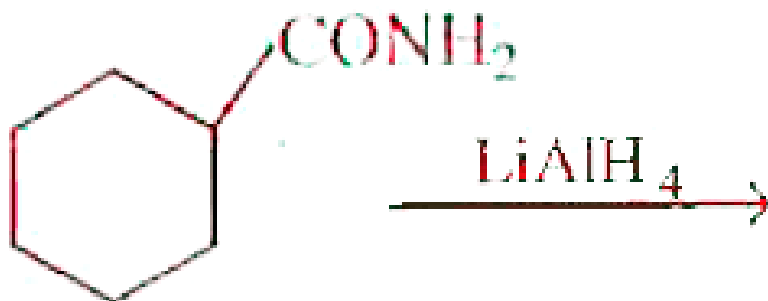
C. Cu_2O

D. $CuSO_4$

Answer: B

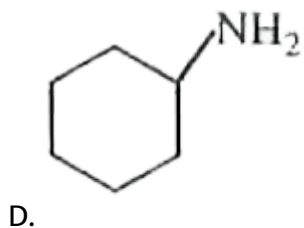
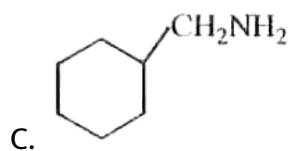
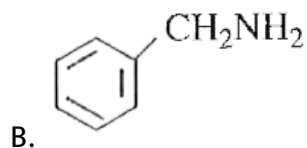
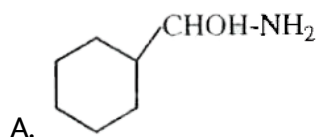


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11.

The product of the reaction is



Answer: C



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12. Complete reduction of benzene-diazonium chloride with Zn/HCl gives :

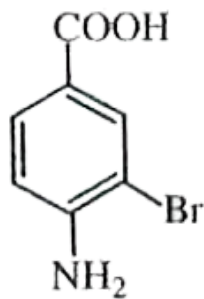
- A. Aniline
- B. Phenylhydrazine
- C. Azobenzene
- D. Hydrazobenzene

Answer: A

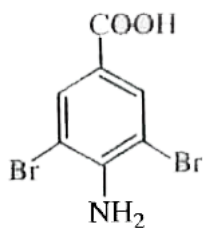


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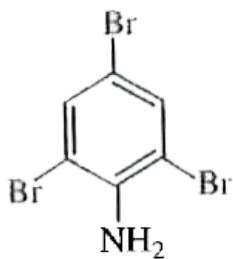
13. p-aminobenzoic acid reacts with bromine and H_2O to give



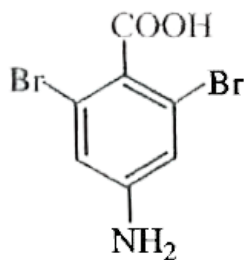
A.



B.



C.



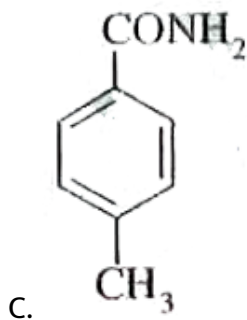
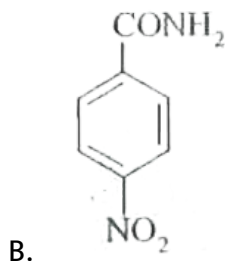
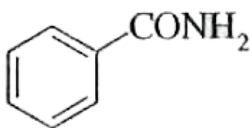
D.

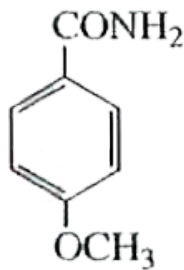
Answer: C



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14. Hofmann bromamide reaction involves the conversion of amides into amines. Which of the following undergo at fastest rate under identical conditions





D.

Answer: D



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15. In which of the following reactions 1-bromopentane is converted into 1-aminopentane only

A. Treatment with ammonia followed by NaOH

B. Treatment with potassium phthalimide followed by hydrolysis

C. Reaction with KCN followed by reduction with $LiAlH_4$

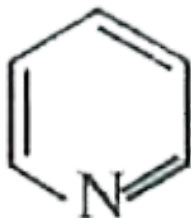
D. Reaction with acetylchloride followed by reduction with $LiAlH_4$

Answer: B

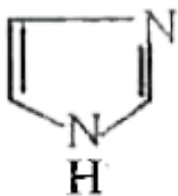


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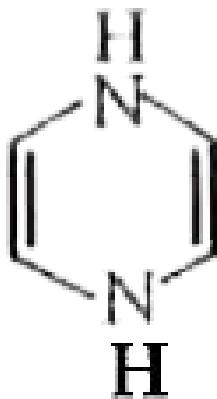
16. Which of the following is aromatic



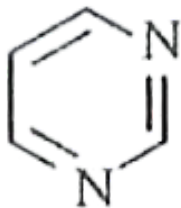
A.



B.



C.



D.

Answer: A::B::D

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17. Which of the statements is wrong

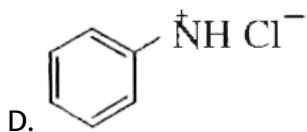
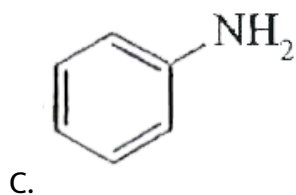
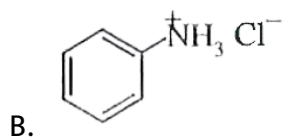
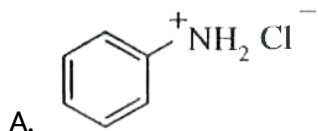
- A. All primary amines are basic
- B. Aliphatic amines are more basic than ammonia
- C. Aliphatic amines are less basic than aromatic amines
- D. All aromatic amines are basic

Answer: C

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A in the above sequence is



Answer: D



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19. Anisidines are the compounds containing benzene ring in which

- A. $-CH_3$ & $-NH_2$ are present
- B. $-CH_3$ & $-OCH_3$ are present
- C. $-OCH_3$ & NO_2 are present
- D. $-OCH_3$ & $-NH_2$ are present

Answer: D



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20. A chloroform solution of aniline is heated with KOH. Which of the following is right.

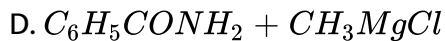
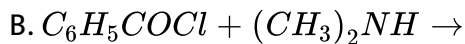
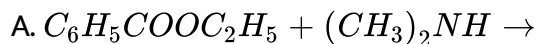
- A. Chloroform hydrolysed to give formic acid
- B. Aniline reacts with chloroform to give cyanides
- C. A secondary amine is obtained
- D. Foul smelling compound is obtained

Answer: D



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21. N, N - dimethyl benzamide cannot be prepared by



Answer: D



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22. Which of the following statements is correct

A. Methyl amine is more basic than aniline

- B. Aniline is more basic than ammonia
- C. Ammonia is more basic than aliphatic amines
- D. Aromatic amines have almost same basic nature as aliphatic amines

Answer: A



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23. Which of the following statements is wrong

- A. All amines are considered as Lewis bases
- B. All primary amines exhibit functional isomerism
- C. All secondary amines exhibit functional isomerism
- D. All tertiary amines exhibit functional isomerisms

Answer: B



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24. Which statement about the reaction of 1-bromobutane and NH_3 is correct?

- A. The reaction initially gives a primary amine
- B. The reaction specifically gives a primary amine
- C. The reaction is a nucleophilic substitution
- D. The reaction may lead to the formation of a quaternary ammonium salt.

Answer: A::C::D



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25. In which reaction is a quaternary ammonium salt is not formed?

- A. Reaction of $EtNH_2$ with excess MeI.
- B. Reaction of $EtNH_2$ with EtCl.
- C. Reaction of $EtNH_2$ with n-BuBr

D. Reaction of $EtNH_2$ with $MeCOCl$.

Answer: D



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26. Which statement is incorrect about the reaction of $EtCOCl$ (an acyl chloride) with $EtNH_2$?

- A. The product is an amide which can be reduced to a tertiary amine
- B. The product is $EtCONHEt$
- C. HCl is eliminated
- D. It is a nucleophilic displacement reaction

Answer: A



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27. Which of the following reagents would be best for converting

$C_6H_5CONH_2$ to $C_6H_5CH_2NH_2$

A. $LiAlH_4$ in ether

B. (i) P_2O_5 & heat, (ii) $LiAlH_4$ in ether

C. H_2 & Pt. catalyst

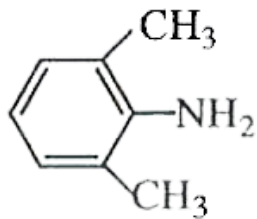
D. Aqueous NaOBr

Answer: D

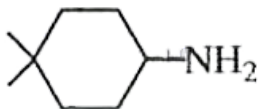


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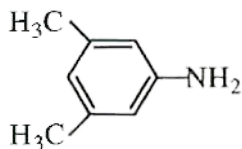
28. Which of the following is N,N-dimethylaniline?



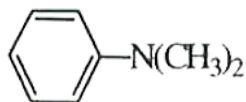
A.



B.



C.



D.

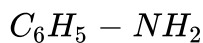
Answer: D



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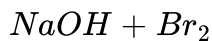
29. Which of the following statements is (are) correct

A. C - N bond length in $CH_3 - NH_2$ is more than that in



B. Cyanides on partial hydrolysis give amides

C. $\text{CH}_3\text{CH}_2\text{CONH}_2$ is converted into $\text{CH}_3\text{CH}_2\text{NH}_2$ by using



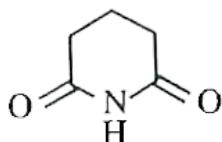
D. Alkyl isocyanides on reduction with LiAlH_4 give secondary amines

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

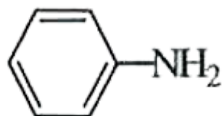


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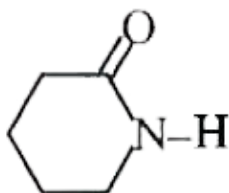
30. Which of the following is the strongest Bronsted acid ?



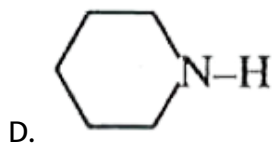
A.



B.



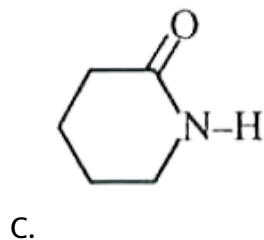
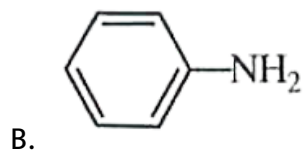
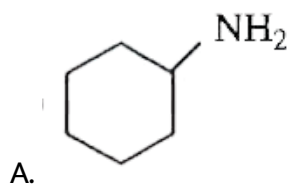
C.

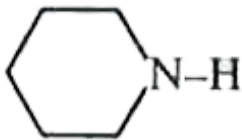


Answer: A

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31. Which of the following is the weakest Bronsted base ?





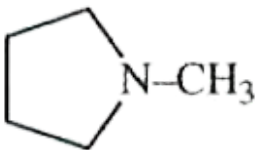
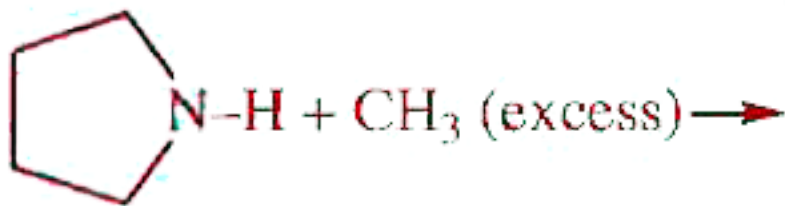
D.

Answer: C

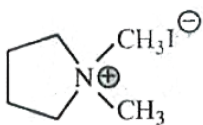


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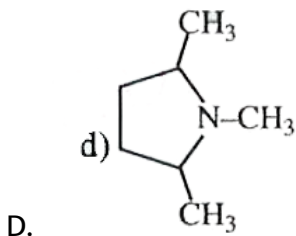
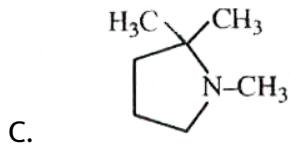
32. Which compound is the likely product from reaction of pyrrolidine with excess methyl iodide (equation below)?



A.



B.



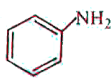
Answer: B

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33. For the following compounds, which is the strongest base and which the strongest acid ?



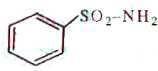
I



II



III



IV

A. II = strongest base, I = strongest acid

B. IV = strongest base, III = strongest acid

C. III = strongest base, IV = strongest acid

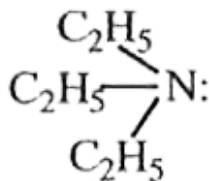
D. II = strongest base, III = strongest acid

Answer: C

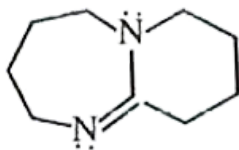


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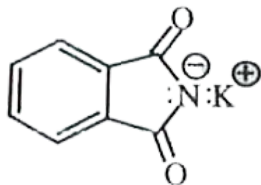
34. Which of the following is the strongest base



A.

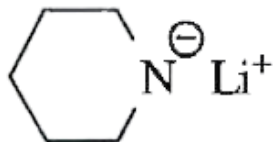


B.



C.

D.



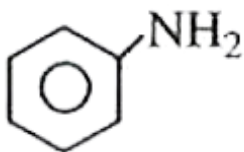
Answer: D



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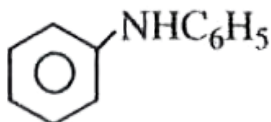
35. Which of the following does not react with Hinsberg's reagent ($\text{C}_6\text{H}_5\text{SO}_2\text{Cl}$)

A.

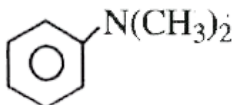


B. $\text{CH}_3\text{CH}_2\text{NHCH}_3$

C.



D.



Answer: D



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36. Which of the following amines reacts most rapidly with para-nitrophenylacetate, $p - NO_2C_6H_4OCOCH_3$?

A. para-Methoxyaniline, $p - CH_3OC_6H_4NH_2$

B. para-Nitroaniline, $p - NO_2C_6H_4NH_2$

C. Aniline, $C_6H_5NH_2$.

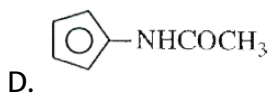
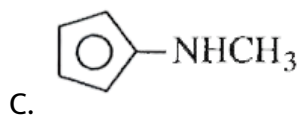
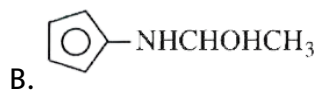
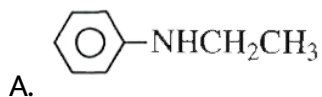
D. Cyclopentylamine, $C_5H_9NH_2$.

Answer: D



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37. Acetyl chloride reacts with aniline a product which on reduction with $LiAlH_4$ give



Answer: A



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38. Aniline reacts with benzoyl chloride to give a product. The reaction is known as

A. Schmidt reaction

B. Schotten – Baumann reaction

C. Sandmeyer reaction

D. Hofmann reaction

Answer: B



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39. $CH_3CH_2C(O)NHCH_2CH_2CH_3$ is

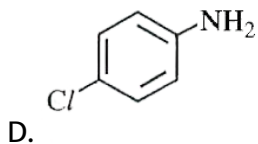
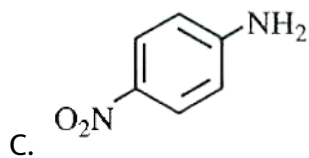
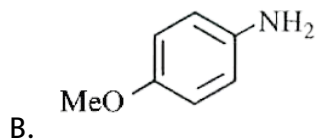
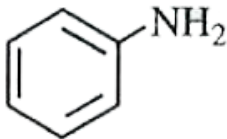
- A. N-Ethylethanamide
- B. Hexanamide
- C. N-Propylpropanamide
- D. N-Ethylhexanamide

Answer: C



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40. Which of the following amines is the strongest base ?

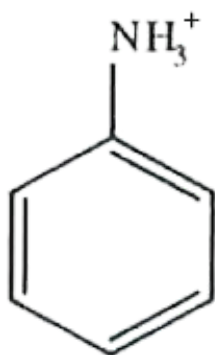


Answer: B

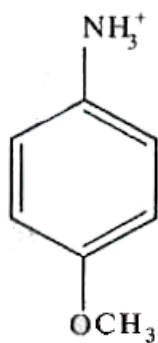


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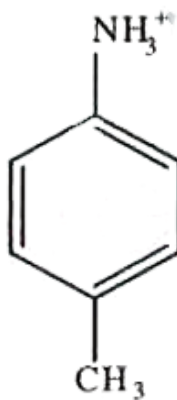
41. Which of the following compounds is the strongest acid ?



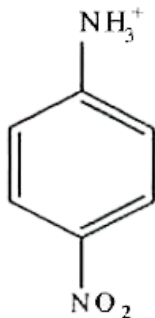
A.



B.



C.



D.

Answer: D



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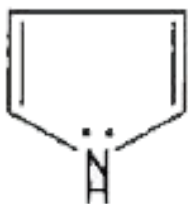
42. A $C_5H_{13}N$ compound gives a base soluble derivative on reaction with Hinsberg test. Which of the following fits these facts best?

- A. 1,1-Dimethylpropylamine
- B. Isopropyldimethylamine
- C. 2,2-Dimethylpropylamine
- D. N-Methyl-2-methylpropylamine

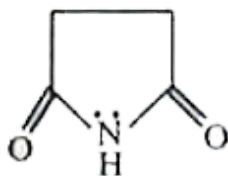
Answer: C



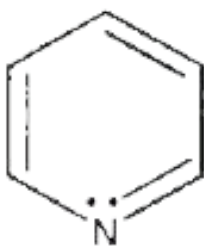
43. Which of the following contains most basic nitrogen



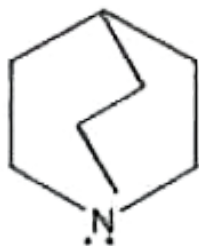
A.



B.



C.



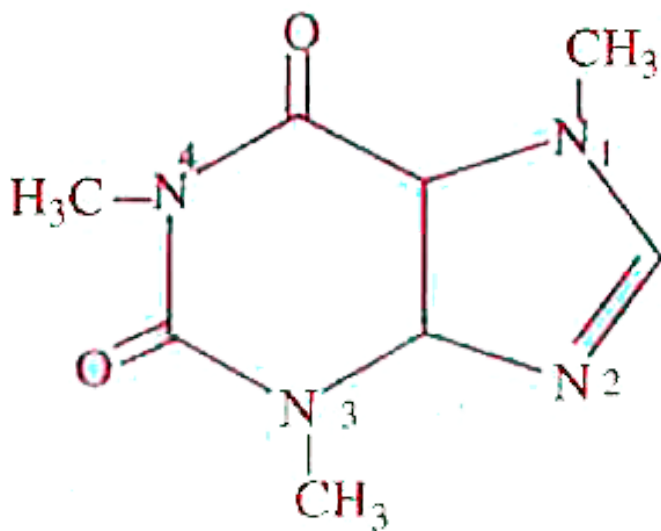
D.

Answer: D



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44. Caffeine is found in tea leaves. It contains four nitrogens. Correct sequence of basic strength of these nitrogens is :



A. $1 > 2 > 3 > 4$

B. $2 > 1 > 3 > 4$

C. $1 > 4 > 3 > 2$

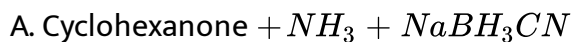
D. $1 > 3 > 4 > 2$

Answer: A



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45. Which of the following reagents and conditions would be best for the preparation of cyclohexylamine?



Answer: A

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46. Which of the following reagents would be best for converting phenylacetamide ($C_6H_5CH_2CH_2NH_2$)?

A. H_2 & Pt catalyst

B. $NaBH_3CN$

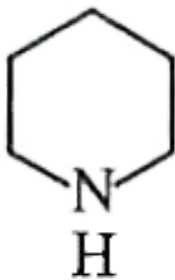
C. $LiAlH_4$ in ether

D. Aqueous NaOBr

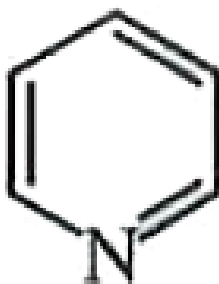
Answer: C

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47. Which of the following have highest pK_a value

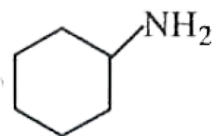


A.



B.

C. NH_3



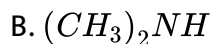
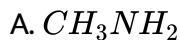
D.

Answer: A



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48. One mole of NH_3 is made to react with one mole of CH_3Cl , which of the following is/ are formed



D. All the above

Answer: D



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49. Compound having the molecular formula C_3H_9N reacts with benzene sulphonyl chloride to give product which is soluble in NaOH. The compound is

A. Primary amine

B. Secondary amine

C. Tertiary amine

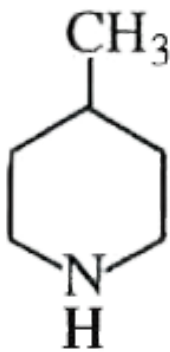
D. Quaternary salt

Answer: A



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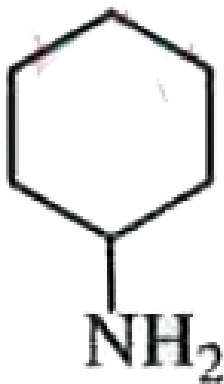
50. Which compound has highest boiling point



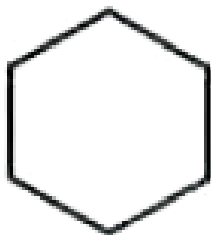
A.



B.



C.



D.

Answer: C



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51. Which compound on reduction with LiAlH_4 give n-butylamine

A. n-Butylcyanide

B. n-Propylcyanide

C. Iso-Butylcyanide

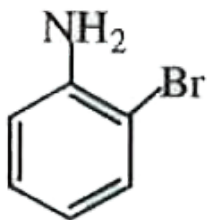
D. Vinyl-cyanide

Answer: B

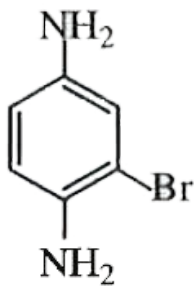


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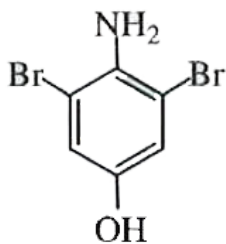
52. Aniline reacts with Br_2 in acetic acid to give



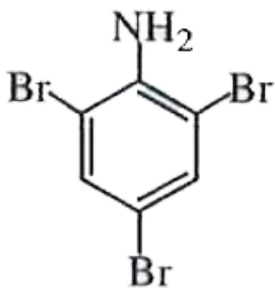
A.



B.



C.



D.

Answer: D



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53. In the reaction of p-chlorotoulene with KNH_2 in liq. NH_3 the major product is

A. o-toluidine

B. p-chloroaniline

C. m-toluidine

D. p-toluidine

Answer: C



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54. Which of the following sequence of reactions convert aniline into chlorobenzene

A. Conc. HCl under high P and high T

B. Sn – HCl, Boiling in H_2O

C. $NaNO_2$ – HCl, Cu_2Cl_2 , KCl

D. HNO_3 – H_2SO_4 , Cu_2Cl_2 , KCl, Boil in H_2O

Answer: C

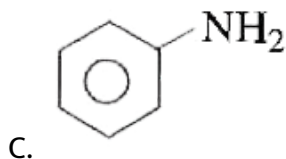
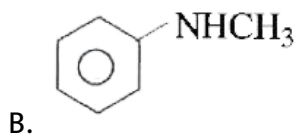
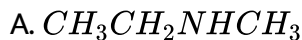


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Passage I

1. The reaction of amines with $\text{NaNO}_2 + \text{HCl}$ depends on the type of the amine and whether it is aliphatic or aromatic. The diazo group developed in aliphatic primary amines is rather highly unstable and decompose to produce mainly alcohols. Secondary amines react to give yellow oily liquids.

Which of the following amines give yellow oily liquid nitroso compounds on reaction with $\text{NaNO}_2 + \text{HCl}$.



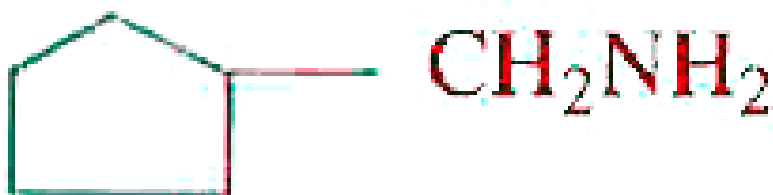
Answer: D



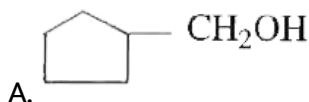
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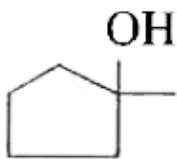
2. The reaction of amines with $\text{NaNO}_2 + \text{HCl}$ depends on the type of the amine and whether it is aliphatic or aromatic. The diazo group developed in aliphatic primary amines is rather highly unstable and decompose to produce mainly alcohols. Secondary amines react to give yellow oily liquids.

The possible alcohols produced ore

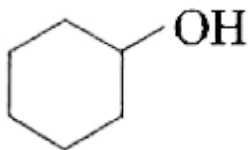


with NaNO_2/HCl is / are

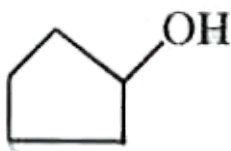




B.



C.



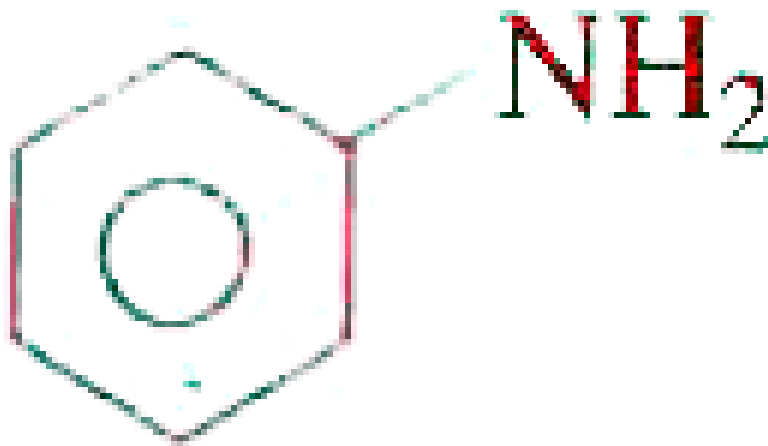
D.

Answer: A::B::C

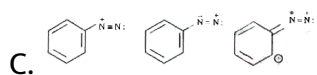
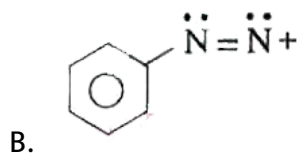
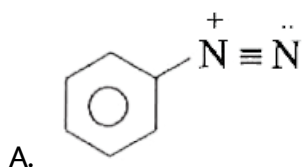


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3. The reaction of amines with $NaNO_2 + HCl$ depends on the type of the amine and whether it is aliphatic or aromatic. The diazo group developed in aliphatic primary amines is rather highly unstable and decompose to produce mainly alcohols. Secondary amines react to give yellow oily liquids.



$\xrightarrow{\text{NaNO}_2 + \text{HCl}}$ product structure is likely to be



D. All the above

Answer: D



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Passage II

1. A, B, C are with molecular formula $C_8H_{11}N$ three isomeric amines. A and B react with $CHCl_3 + KOH$ but not C. C reacts with $NaNO_2 + HCl$ to give yellow oily liquid. A and B on treatment with Br_2 and acetic acid separately produced compounds D ($C_8H_9NBr_2$) and E ($C_8H_8NBr_3$).

The name of compound B is likely to be

A. 3, 4 – dimethyl aniline

B. 3, 5 – dimethyl aniline

C. 4 – Ethyl aniline

D. 2, 6 – dimethyl aniline

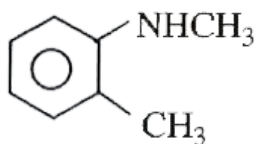
Answer: D



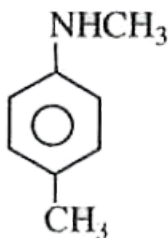
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2. A, B, C are with molecular formula $C_8H_{11}N$ three isomeric amines. A and B react with $CHCl_3 + KOH$ but not C. C reacts with $NaNO_2 + HCl$ to give yellow oily liquid. A and B on treatment with Br_2 and acetic acid separately produced compounds D ($C_8H_9NBr_2$) and $E(C_8H_8NBr_3)$.

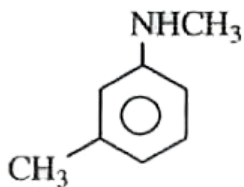
compound C may be



A.



B.



C.

D. All the above

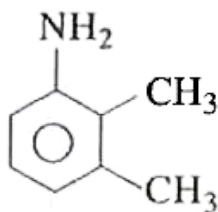
Answer: D



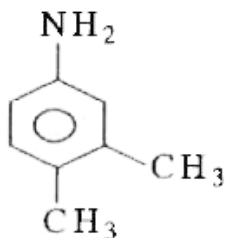
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3. A, B, C are with molecular formula $C_8H_{11}N$ three isomeric amines. A and B react with $CHCl_3 + KOH$ but not C. C reacts with $NaNO_2 + HCl$ to give yellow oily liquid. A and B on treatment with Br_2 and acetic acid separately produced compounds D ($C_8H_9NBr_2$) and $E(C_8H_8NBr_3)$.

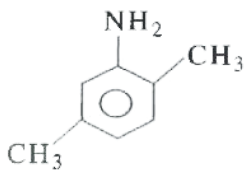
compound A is



A.



B.



C.

D. All the above

Answer: D



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Level II Lecture Sheet Exercise IV Match The Following Questions

1. Match the following

COLUMN - I

- A) Hofmann degradation
- B) Curtius rearrangement
- C) Lossen rearrangement
- D) Imine

COLUMN - II

- p) Aldehyde + 1^o amine
- q) Isocyanate
- r) Br₂ + NaOH
- s)
$$\text{R}-\overset{\text{O}}{\underset{\text{||}}{\text{C}}}-\text{N}_3$$



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2. Match the following

COLUMN - I

- A) $\text{C}_6\text{H}_5 - \text{NO}_2 \rightarrow \text{C}_6\text{H}_5 - \text{NH}_2$
- B) $\text{C}_6\text{H}_5 - \text{NO}_2 \rightarrow \text{C}_6\text{H}_5 - \text{N}=\text{N} - \text{C}_6\text{H}_5$
- C) $\text{C}_6\text{H}_5 - \text{NO}_2 \rightarrow \text{C}_6\text{H}_5 - \text{NH} - \text{NH} - \text{C}_6\text{H}_5$
- D) $\text{C}_6\text{H}_5 - \text{NO}_2 \rightarrow \text{C}_6\text{H}_5 - \text{NON} - \text{C}_6\text{H}_5$

COLUMN - II

- p) Alkaline medium
- q) Glucose in NaOH
- r) Sn/HCl in acidic medium
- s) Alkaline sodium stannite in basic medium



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3. Match the following

COLUMN - I

- A) Hofmann's reagent
- B) Hinsberg's reagent
- C) Mustard oil smell
- D) Thiourea

COLUMN - II

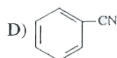
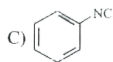
- p) Primary amines
- q) Carbondisulphide
- r) Oxalyl chloride
- s) Separation of 1° , 2° and 3° amines



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4. Match the following

COLUMN - I



COLUMN - II

p) Undergoes electrophilic substitution

q) Hydrolysis give primary amine

r) Reduction give primary amine

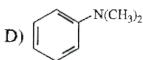
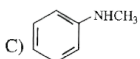
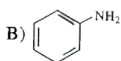
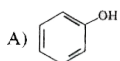
s) Hydrolysis give formic acid

t) Reduction give a secondary amine

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5. Match the following

COLUMN - I



COLUMN - II

p) Reacts with nitrous acid

q) Undergoes azo coupling reaction with diazonium salts

r) Undergoes electrophilic substitution

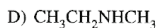
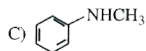
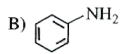
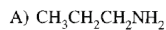
s) Reacts with hydrochloric acid to form salt

t) Gives carbylamine test with CHCl_3 & KOH

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6. Match the following

COLUMN - I



COLUMN - II

p) Exhibits isomerism

q) Reacts with HNO_2 to give yellow oily liquid compounds

r) Reacts with Hinsberg reagent to give compound soluble in NaOH

s) Least basic of all the compounds

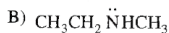
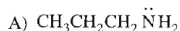
t) Reacts with CH_3I to give quaternary salt as the final product



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7. Match the following

COLUMN - I



COLUMN - II

p) Inter molecular H-bonding exists

q) Enters into H-bonding with water when dissolved in water

r) Reacts with dil. HCl to form a water soluble salt

s) Highest basic compound when dissolved in water

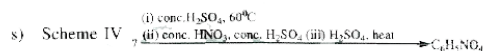
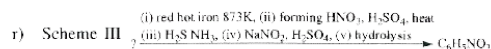
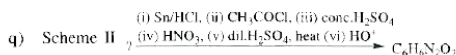
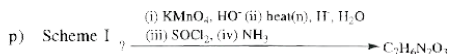
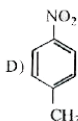
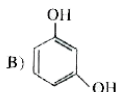
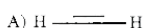


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8. Match the four starting materials (P,Q,R,S) given in List-I with the corresponding reaction schemes (I, II, III, IV) provided in List - II and select the correct answer using the code given below the lists

COLUMN - I

COLUMN - II



- A.

A	Q	R	S
1	4	2	3
- B.

A	Q	R	S
3	1	4	2
- C.

A	Q	R	S
3	4	2	1
- D.

A	Q	R	S
4	1	3	2

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



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1. The number of resonating structures of arylammonium ion is



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2. The number of resonance structures for anilinium ion is



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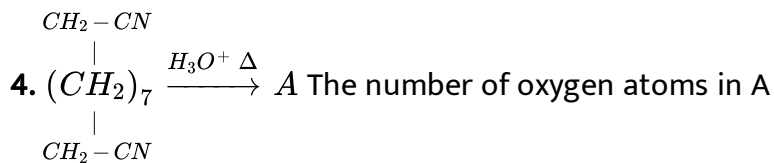
3. The number of [H] required to reduce



with Sn-HCl to give aniline.

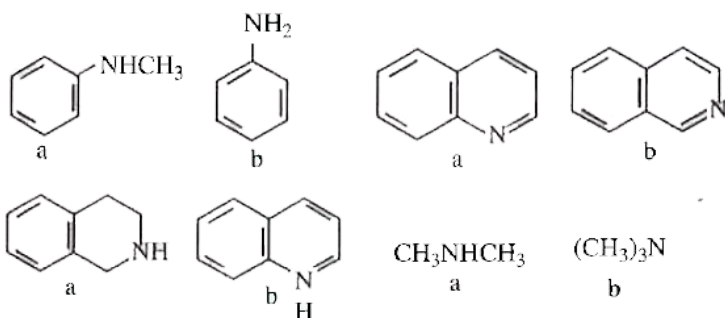


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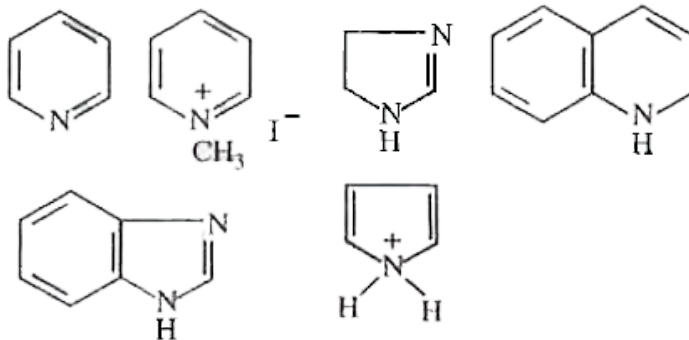
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5. From among following pairs, number of pairs in which first compound is more basic than second compound is



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6. Which of the following nitrogen containing compounds are aromatic according to Huckel rule



[▶ Watch Video Solution](#)

Practice Sheet 1 Single Answer Questions

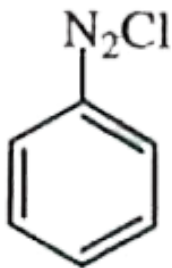
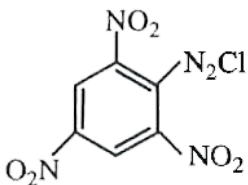
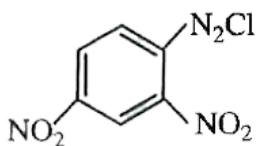
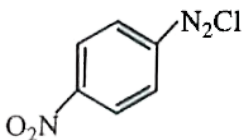
1. Which of the following is the strongest base in aqueous solution

- A. $(\text{CH}_3)_3\text{N}$
- B. $(\text{CH}_3)\text{NCH}_2\text{CH}_2\text{OH}$
- C. $\text{CH}_3\text{CH}_2\text{CH}_2\text{NHOH}$
- D. $(\text{CH}_3)_4\text{NOH}$

Answer: D

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2. Which of the following diazonium salts readily undergo diazo coupling reaction with phenol

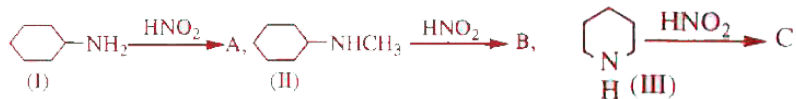


Answer: C

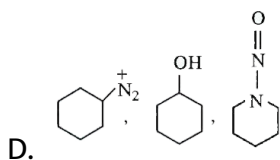
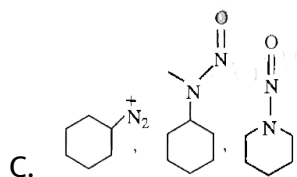
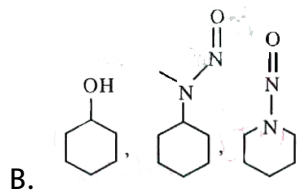
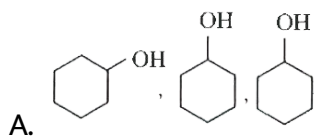


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3. Consider the reactions



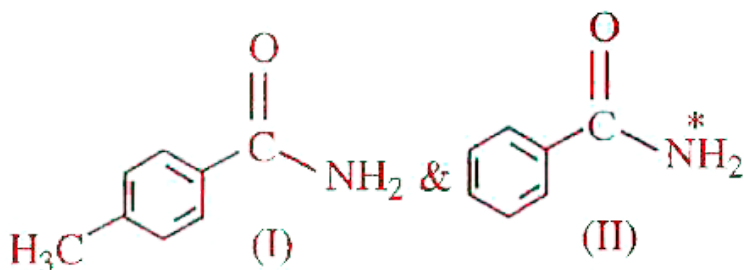
The products A, B, C respectively are



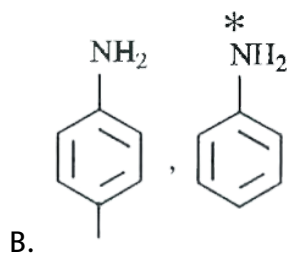
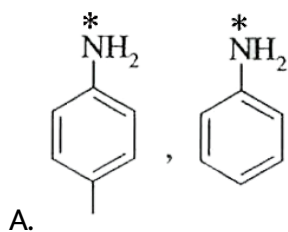
Answer: B

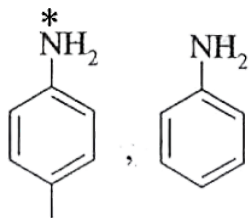
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4. Two compounds

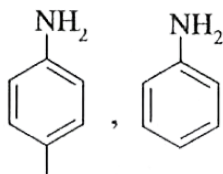


are allowed to react with Br, in presence of KOH in the same reaction medium. The products obtained are (*indicates nitrogen atom is labelled)





C.



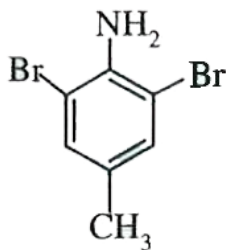
D.

Answer: B

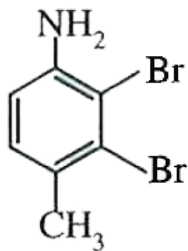


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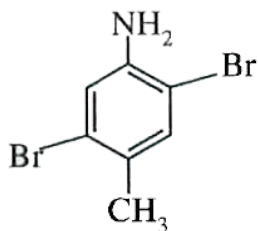
5. p-Toluidine $\xrightarrow{\text{Br}_2 - \text{H}_2\text{O}}$ A. A in the above sequence is



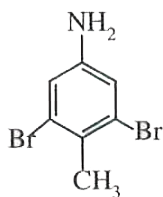
A.



B.



C.



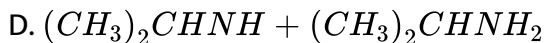
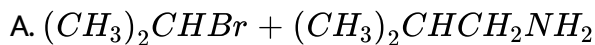
D.

Answer: A



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6. Which of the following procedures would be best for preparing isobutylisopropylamine, $(CH_3)_2CHNHCH_2CH(CH_3)_2$?

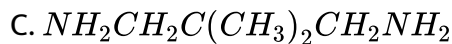
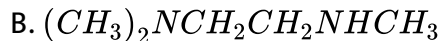
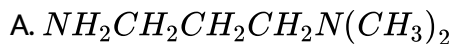


Answer: B



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7. The Hinsberg test of a $C_5H_{14}N_2$ compound produces a solid that is insoluble in 10% aq. NaOH. This solid derivative dissolves in 10% aq. sulphuric acid. Which of the following would best fit these facts ?



Answer: B



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8. How would you accomplish the following synthesis ?



A. 1. HNO_3 , H_2SO_4 2. NaOH 3. HONO , ice bath 4. Cu_2O , H_2O 5. NaH

6. MeBr 7. H_2 , catalyst

B. 1. HNO_2 , H_2SO_4 2. Fe , HCl 3. NaOH 4. HONO , ice bath 5.

Cu_2O , H_2O 6. MeONa , MeBr

C. 1. Sn , HCl 2. HNO_2 , H_2SO_4 3. HONO , ice bath 4. Cu_2O , H_2O 5.

MeONa 6. MeBr

D. 1. HONO, ice bath 2. Cu_2O , H_2O 3. NaH 4. MeBr 5. HNO_3 , H_2SO_4

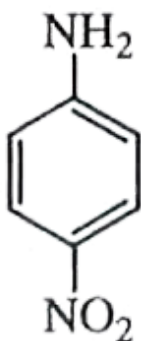
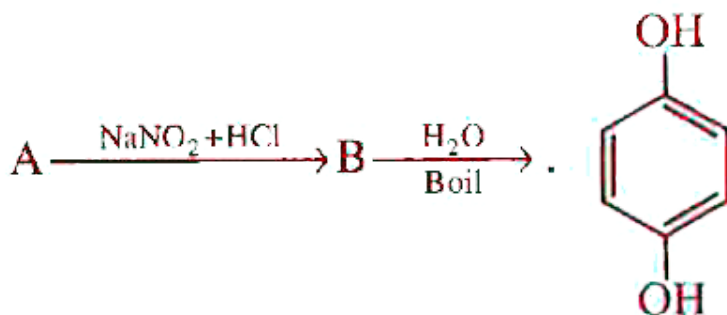
6. H_2 , catalyst

Answer: D

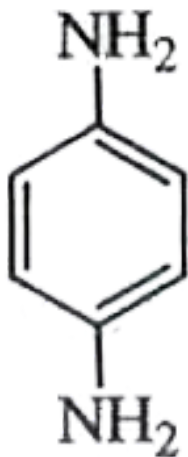


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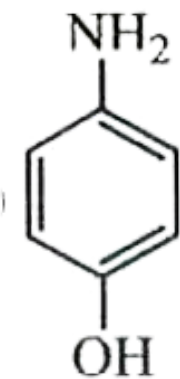
9. Complete the following reaction



A.



B.



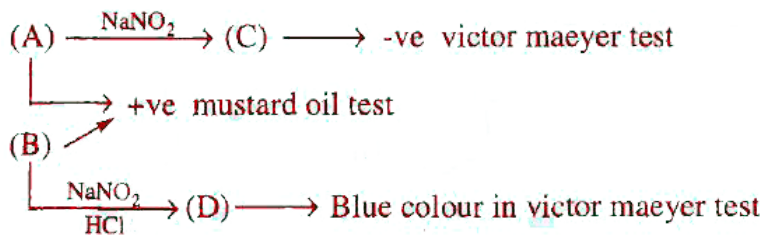
C.

D. Both b and c

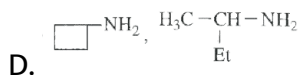
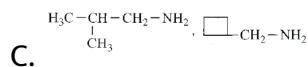
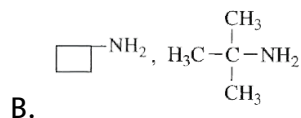
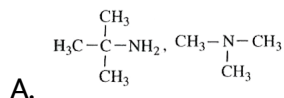
Answer: D



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10. (A) and (B) respectively



Answer: C



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11. Reduction of nitrobenzene using LiAlH_4 gives

- A. Azobenzene
- B. Hydrazobenzene
- C. Aniline
- D. Phenylhydroxylamine

Answer: A



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Practice Sheet 1 More Than One Correct Answer Questions

1. Which of the following statements is right

- A. Aliphatic amines are stronger bases than ammonia
- B. Aromatic amines are stronger bases than ammonia
- C. In aniline nitrogen atom is sp^2
- D. Both a & c

Answer: D



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2. Which of the following statements is/are correct?

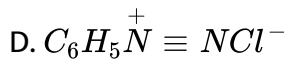
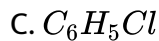
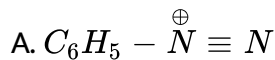
- A. Primary amines show intermolecular hydrogen bonding
- B. Secondary amines shows intermolecular hydrogen bonding
- C. Tertiary amines show intermolecular hydrogen bonding
- D. Amines have lower boiling points as compared to those of alcohols and carboxylic acids of comparable molecular mass

Answer: A::B::D



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3. Which of the following intermediates in Sandmeyer's reaction ?



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



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4. Benzylamine is more basic than

A. Aniline

B. Ammonia

C. p-nitroaniline

D. Sodium hydroxide

Answer: A::B



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5. Which statements are right

- A. All Amine are basic
- B. Amines are purified by reaction with dil HCl
- C. Amines are purified by reaction with dil. NaOH
- D. Basic nature is due to presence of lone pair of electrons on N-atom

Answer: A::B::D



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6. Conversion of benzene diazonium chloride to chloro benzene is an example of which of the following reaction?

- A. Claisen
- B. Friedel-craft
- C. Sandmeyer

Answer: C



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Practice Sheet 1 Linked Comprehension Type Questions Passage I

1. Reaction of benzene with a mixture of conc. HNO_3 and Conc H_2SO_4 at about $60^\circ C$ give nitrobenzene. Nitration of substituted benzenes depends on the nature of the group already present in the ring. Increase of temperature may result in multiple nitration.

Which of the following compounds undergo nitration at a rate faster than the other

A. Toluene

B. Phenol

C. Benzene

D. Chlorobenzene

Answer: B



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2. Reaction of benzene with a mixture of conc. HNO_3 and Conc H_2SO_4 at about $60^\circ C$ give nitrobenzene. Nitration of substituted benzenes depends on the nature of the group already present in the ring. Increase of temperature may result in multiple nitration.

Nitration of benzene is an

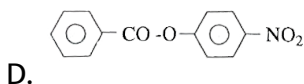
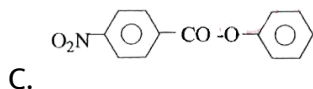
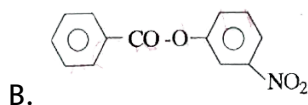
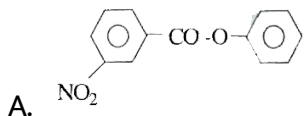
- A. Elechphilic addition
- B. Electrophilic substitution
- C. Nucleophilic substitution
- D. Nucleophilic addition

Answer: B



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3. Reaction of benzene with a mixture of conc. HNO_3 and Conc H_2SO_4 at about $60^\circ C$ give nitrobenzene. Nitration of substituted benzenes depends on the nature of the group already present in the ring. Increase of temperature may result in multiple nitration.



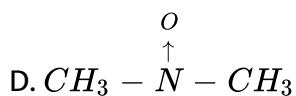
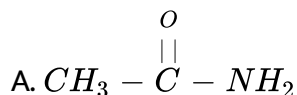
Answer: D



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1. 'A' and 'B' are two isomeric compounds of the formula C_2H_5NO . 'A' on treatment with P_2O_5 gives 'C'. Both 'A' and 'C' on alkaline hydrolysis evolve NH_3 . 'B' can be easily prepared from acetaldehyde. 'A' is amphoteric in nature and acid derivative.

The structure of 'A' is



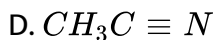
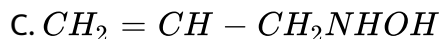
Answer: D



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2. 'A' and 'B' are two isomeric compounds of the formula C_2H_5NO . 'A' on treatment with P_2O_5 gives 'C'. Both 'A' and 'C' on alkaline hydrolysis evolve NH_3 . 'B' can be easily prepared from acetaldehyde. 'A' is amphoteric in nature and acid derivative.

'B' is



Answer: A

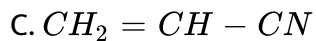
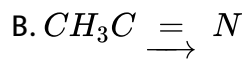
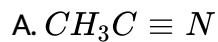


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3. 'A' and 'B' are two isomeric compounds of the formula C_2H_5NO . 'A' on treatment with P_2O_5 gives 'C'. Both 'A' and 'C' on alkaline hydrolysis evolve NH_3 . 'B' can be easily prepared from acetaldehyde. 'A' is amphoteric

inature and acid derivative.

'C' is



D. None of these

Answer: A



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Practice Sheet 1 Matching Type Questions

1. Match the following columns

COLUMN - I

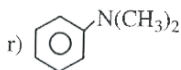
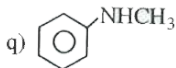
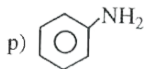
A) Carbylamine reaction

B) Mustard oil reaction

C) Hinsberg's reaction

D) Reaction with HNO_2

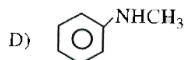
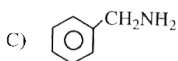
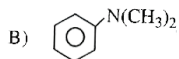
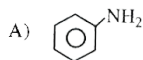
COLUMN - II



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2. Match the following columns

COLUMN - I



COLUMN - II

p) Decompose RMgX to RH

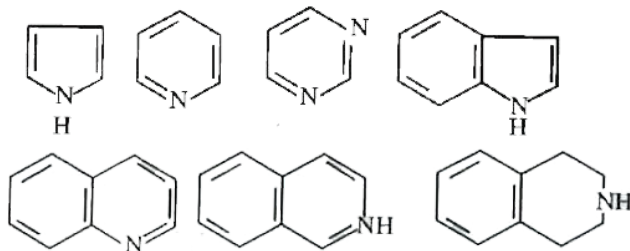
q) Intermolecular H-bonding formed

r) Undergo electrophilic substitution reaction

s) Reacts with HNO_2

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3. The number of compounds which contain at least one basic nitrogen is



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4. The number of atoms which are sp^2 hybridised in aniline is

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5. The number of primary amines possible for C_4H_9N (exclude stereoisomers)

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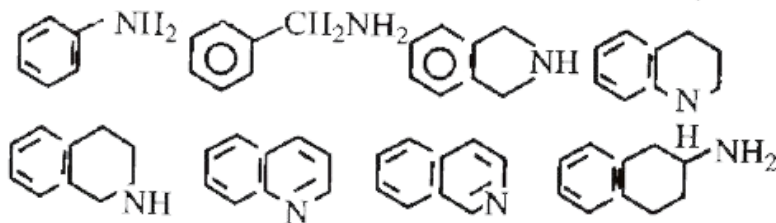
6. The number of primary amines possible for C_4H_9N (exclude stereoisomers)

 Watch Video Solution

7. The number of p-disubstituted benzene derivations of $C_9H_{13}N$ is

 Watch Video Solution

8. The number of amines which behave like atiphatc amines from the following list is

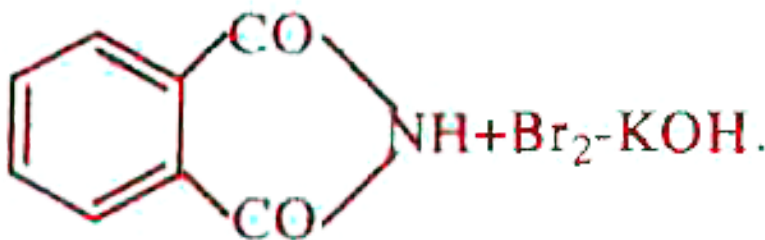


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9. Number of tertiary amines possible for C_6H_5N (excluding stereoisomers) is

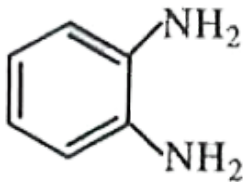
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Practice Sheet 2 Single Answer Questions

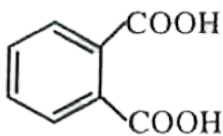


1.

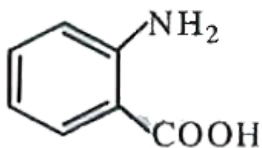
The product of the reaction is



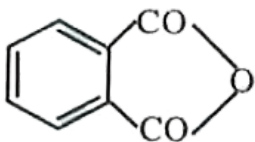
A.



B.



C.



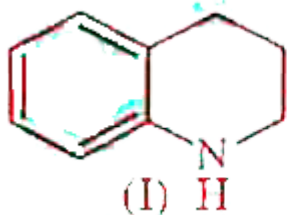
D.

Answer: C

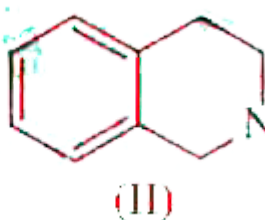


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2. Which of the following statements regarding



&



is true

is true

- A. I is more basic than II
- B. I is less basic than II
- C. I and II are equally basic
- D. I and II are not basic

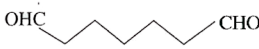
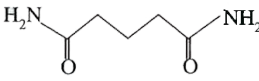
Answer: B

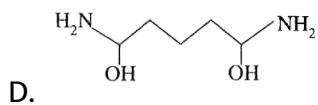
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3.



The Structure of the product is

- A. 
- B. 
- C. 

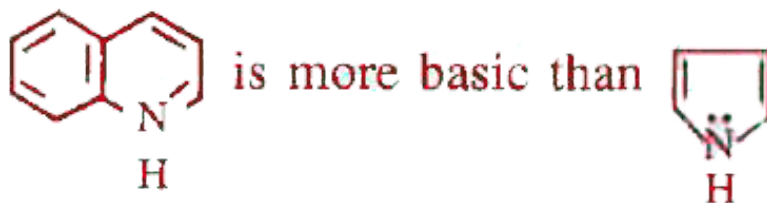


Answer: C

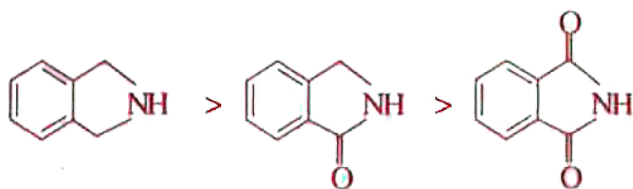


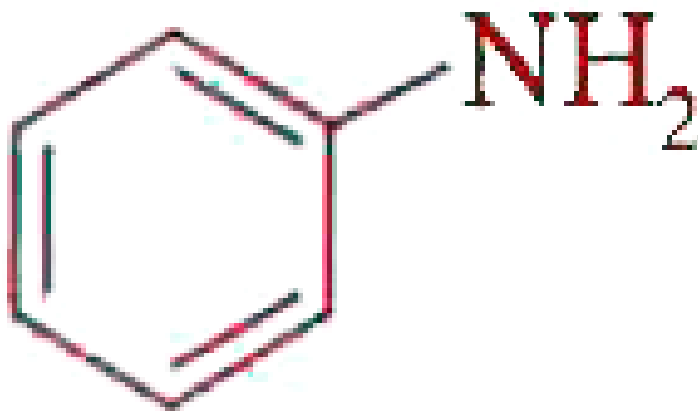
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4. Consider the following



(II) Order of Basic nature





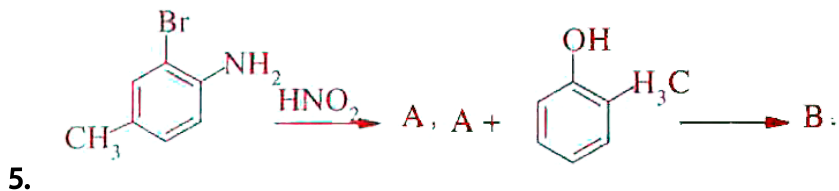
is more basic than ammonia

- A. All statements I, II, III are correct
- B. II is wrong I and III are correct statements
- C. I & III are wrong, II is correct
- D. I, II are right III is wrong

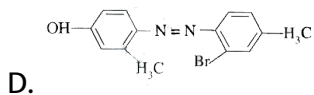
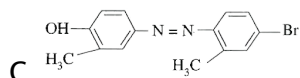
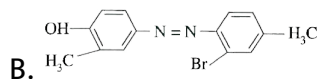
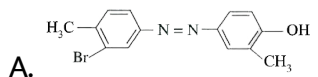
Answer: D



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The structure of the product B is



Answer: B



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6. Arrange p-methylaniline (I), m-methyl aniline (II), aniline (III), o-methyl aniline (IV), in the order of basicity.

A. $I > II > III > IV$

B. $IV > III > II > I$

C. $II > I > III > IV$

D. $I > III > II > IV$

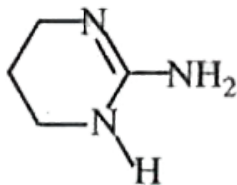
Answer: A



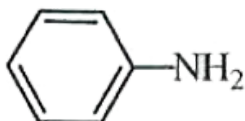
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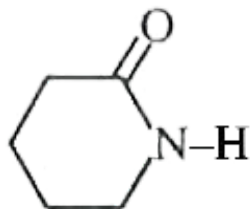
7. Which of the following is the strongest Bronsted acid ?

A.

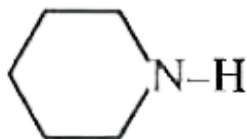


B.





C.



D.

Answer: A



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8. In which of the following reactions give only primary amine

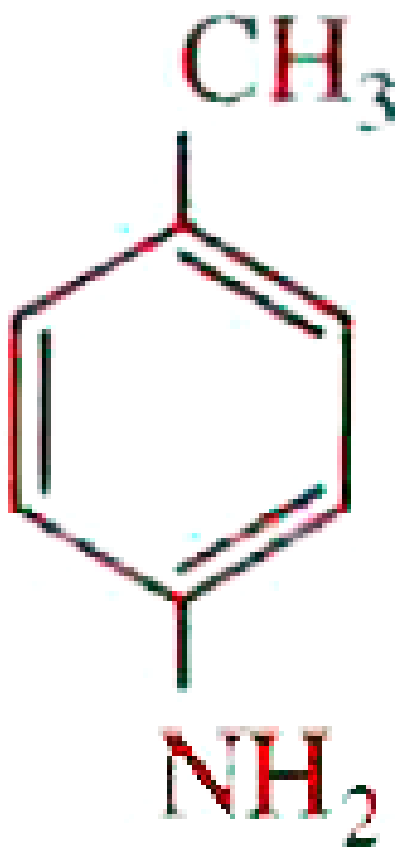


D. All the above

Answer: D



9. Which of the following sequence of reactions is useful to prepare compound A from benzene



A. CH_3Cl , AlCl_3 , HNO_3 , H_2 , SO_4 , H_2

B. CH_3Cl , AlCl_3 , HNO_3 , H_2SO_4 , Fe , HCl , NaOH

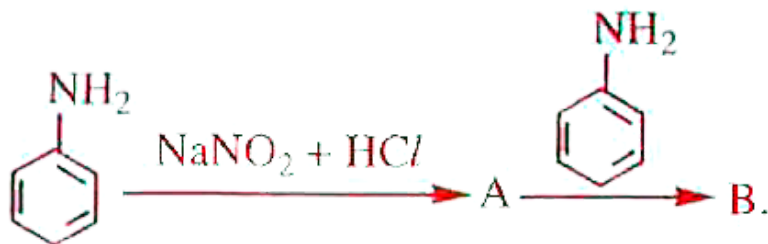
C. HNO_3 , H_2SO_4 , Fe , HCl , NaOH , CH_3Cl , AlCl_3

D. HNO_3 , H_2SO_4 , CH_3Cl , AlCl_3 , Fe , HCl , NaOH

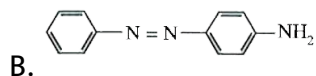
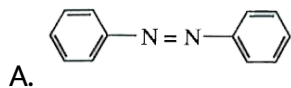
Answer: B

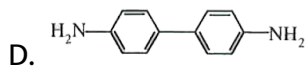
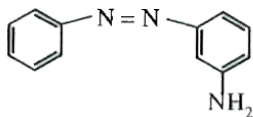


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The structure of B is





Answer: B



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Practice Sheet 2 More Than One Correct Answer Questions

1. Which of the following can be used for nitration of aromatic compound ?

A. Conc. HNO_3 + Conc. H_2SO_4

B. Nitronium tetrafluoroborate

C. Nitronium perchlorate

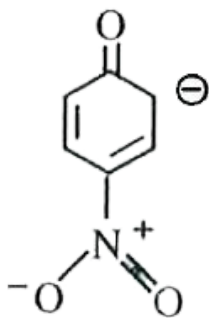
D. $NaNO_2$ & HCl

Answer: A::B::C

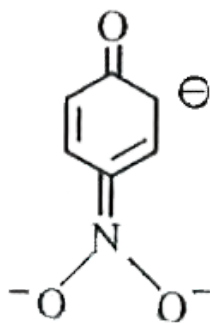


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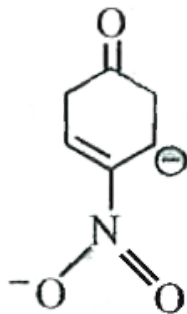
2. The correct resonance structure(s) of p - nitrophenoxide is



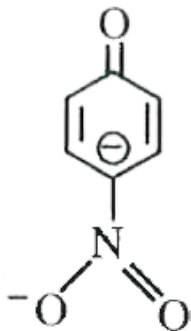
A.



B.



C.



D.

Answer: A::D



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3. Which of the following react(s) with nitrous acid ?

A. Nitroethane

B. 2-Nitropropane

C. Phenol

D. Ethylamine

Answer: C::D



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4. Carbylamine test is used for the detection of primary amine group, which of these is related with carbylamine reaction ?

A. $R - NC$

B. $CHCl_3$

C. $NaNO_2 + HCl$

D. Cl_2

Answer: A::B::D



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5. The compounds which can be purified by steam distillation.

A. Nitrobenzene

B. Aniline

C. o-nitro-phenol

D. m-nitrophenol

Answer: A::B::C



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Practice Sheet 2 Linked Comprehension Type Questions Passage I

1. A reaction of aryl diazonium salts that does not involve loss of nitrogen takes place when they react with phenol and aromatic amines. Aryl diazonium ion relatively is weak electrophile but has sufficient reactivity to attack strongly activated aromatic ring. The reaction is known as azo coupling. The coupling of diazonium ions with phenols or

other electron rich aromatic compounds is useful commercial reaction as azo compounds are highly coloured and many of them are used as dyes.

Which of the following is responsible for the colour of diazo compounds ?

- A. Benzene ring
- B. $-N=N-$ group
- C. $-OH$ group
- D. $-NH_2$ group

Answer: B



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2. A reaction of aryl diazonium salts that does not involve loss of nitrogen takes place when they react with phenol and aromatic amines. Aryl diazonium ion is relatively a weak electrophile but has sufficient reactivity to attack strongly activated aromatic ring. The reaction is known as azo coupling. The coupling of diazonium ions with phenols or

other electron rich aromatic compounds is useful commercial reaction as azo compounds are highly coloured and many of them are used as dyes. Coupling between arenediazonium cation and amines takes place most rapidly at pH

A. 10 – 14

B. 0 – 2

C. 5 – 7

D. 5 – 8

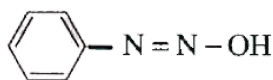
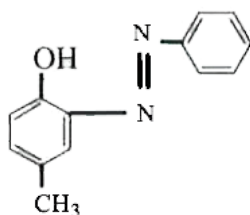
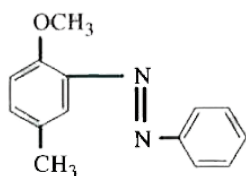
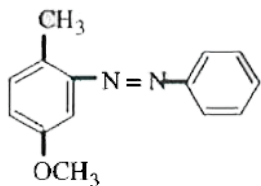
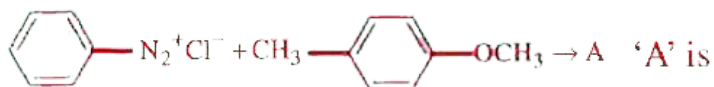
Answer: C



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3. A reaction of aryl diazonium salts that does not involve loss of nitrogen takes place when they react with phenol and aromatic amines. Aryl diazonium ion relatively is weak electrophile but has sufficient reactivity to attack strongly activated aromatic ring. The reaction is known as azo coupling. The coupling of diazonium ions with phenols or

other electron rich aromatic compounds is useful commercial reaction as azo compounds are highly coloured and many of them are used as dyes.



Answer: B



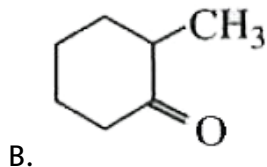
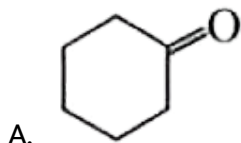
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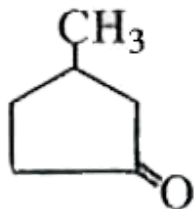
Practice Sheet 2 Linked Comprehension Type Questions Passage II

1. Compound A ($C_6H_{13}NO$) liberates hydrogen on reaction with metallic sodium. A on reaction with $NaNO_2$ and HCl was found to give three products $B(C_6H_{10}O)$, $C(C_6H_{10}O)$ and $D(C_6H_{12}O_2)$ a vicinal. Both B & C react with 2,4 - DNP to give coloured product. C reduces Fehling's solution, but not B. B on reduction with HI & Red P gave cyclohexane while C gave methylcyclopentane. D on reduction with HI & Red P also gave cyclohexane.

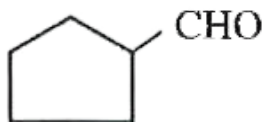
Study the reaction give above carefully and answer the following questions.

Compound 'B' is





C.



D.

Answer: A

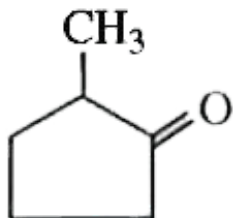


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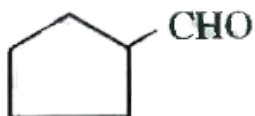
2. Compound $A(C_6H_{13}NO)$ liberates hydrogen on reaction with metallic sodium. A on reaction with $NaNO_2$ and HCl was found to give three products $B(C_6H_{10}O)$, $C(C_6H_{10}O)$ and $D(C_6H_{12}O_2)$ a vicinal. Both B & C react with 2,4 – DNP to give coloured product. C reduces Fehling's solution, but not B. B on reduction with HI & Red P gave cyclohexane while C gave methylcyclopentane. Don reduction with HI & Red P also gave cyclohexane.

Study the reaction give above carefully and answer the following questions.

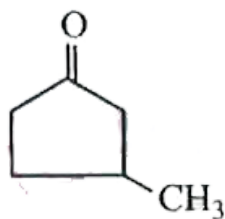
Compound 'C' is



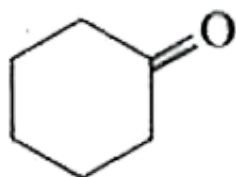
A.



B.



C.



D.

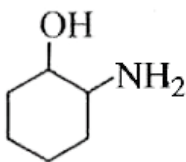
Answer: B



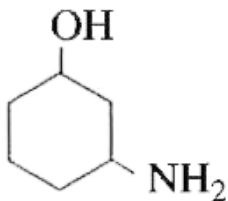
3. Compound $A(C_6H_{13}NO)$ liberates hydrogen on reaction with metallic sodium. A on reaction with $NaNO_2$ and HCl was found to give three products $B(C_6H_{10}O)$, $C(C_6H_{10}O)$ and $D(C_6H_{12}O_2)$ a vicinal. Both B & C react with 2,4 - DNP to give coloured product. C reduces Fehling's solution, but not B. B on reduction with HI & Red P gave cyclohexane while C gave methylcyclopentane. On reduction with HI & Red P also gave cyclohexane.

Study the reaction give above carefully and answer the following questions.

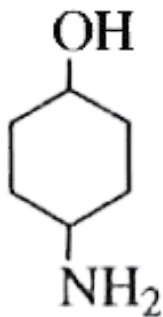
The structure of Compound 'A' is



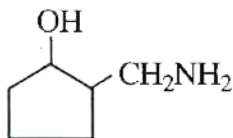
A.



B.



C.



D.

Answer: A

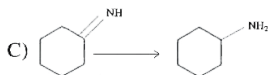
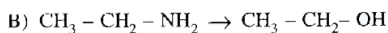
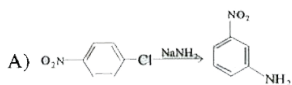


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Practice Sheet 2 Match The Following Questions

1. Match the following columns

COLUMN - I



COLUMN - II

p) Nucleophilic substitution

q) NaBH_3CN

r) SOCl_2

s) Benzyne



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2. Match the following columns

COLUMN - I

A) Nitrobenzene $\rightarrow$ Azobenzene

B) Aniline $\rightarrow$ Phenylisocyanide

C) Aniline $\rightarrow$ Chlorobenzene

D) Ethylamine $\rightarrow$ Ethanol

COLUMN - II

p) LiAlH_4

q) $\text{NaNO}_2 + \text{HCl} + \text{Cu}_2\text{Cl}_2$

r) $\text{CHCl}_3 + \text{KOH}$

s) $\text{NaNO}_2 + \text{HCl}$ (aq)



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1. The number of electrons change during the conversion of nitrobenzene to aniline is



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2. Reduction of nitrobenzene with $LiAlH_4$ gives azobenzene. The number of hydrogen atoms involved in the formation of the product is



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3. The number of resonance structures of nitrobenzene is



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4. The number of resonance structure of aniline is



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5. Aniline reacts with bromine in acetic acid to give a white solid compound. The number of bromine atoms present in compound is



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6. A primary amine reacts with benzene sulphonyl chloride to sulphonamide. The number of acidic hydrogens present in sulphonamide is



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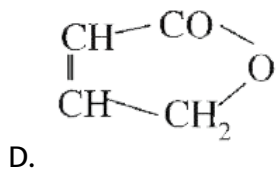
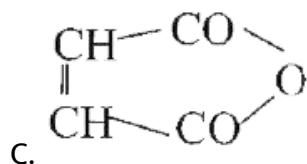
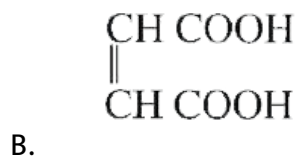
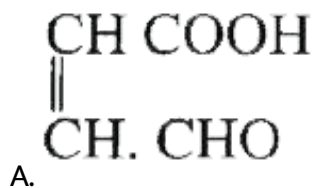
7. Total secondary amine compounds possible (benzene derivations) for $C_8H_{11}N$



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1. $C_6H_5NH_2 + A \xrightarrow{(i) \text{Ether}} C_6H_5NHCOCH = CHCOOH$. The

compound A in the above reaction is

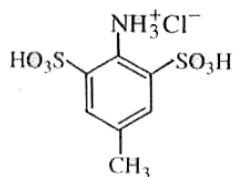
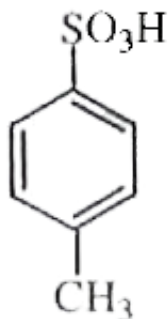
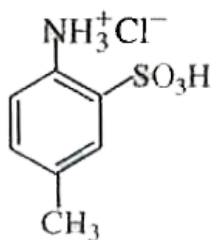
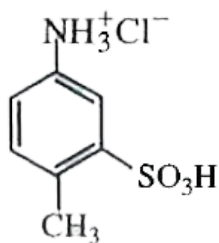
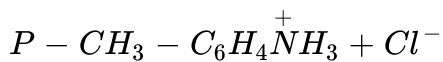


Answer: C



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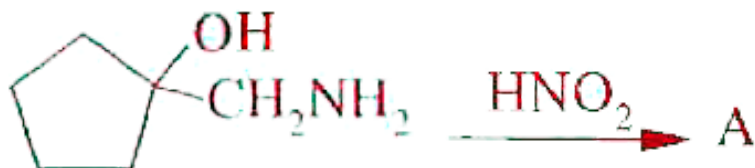
2. Which of the following is the major product obtained by sulplination of



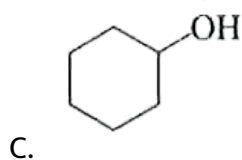
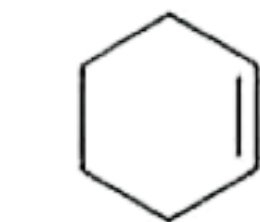
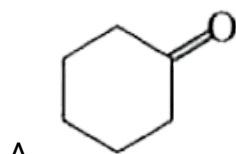
Answer: A

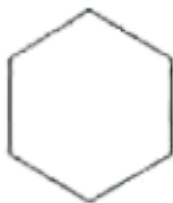


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The Structure of the product is





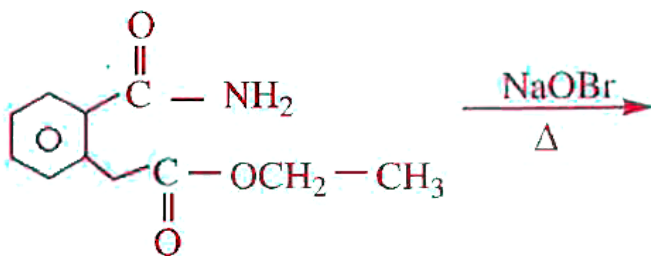
D.

Answer: A

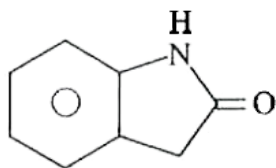


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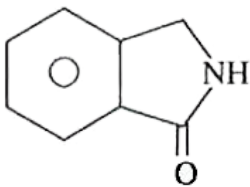
4.



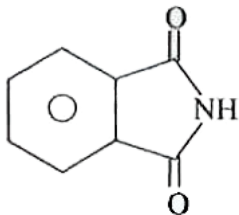
The final product of the reaction is



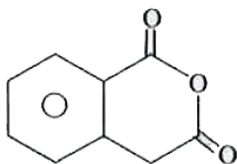
A.



B.



C.



D.

Answer: A



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5. I : Tertiary amines do not form intermolecular hydrogen bonds

II : All amines form H-bonds with water

III : Amines are higher boiling than alcohols and carboxylic acids of comparable molecularweights

A. I & II are wrong, III is right

B. I & III are right, II is wrong

C. I & II are right, III is wrong

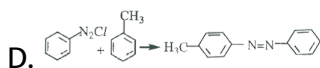
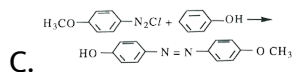
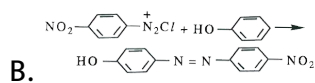
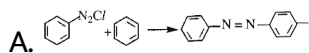
D. II is right I, III are wrong

Answer: C



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6. Which of the following coupling reactions takes place most readily than others

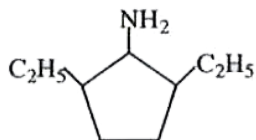


Answer: B

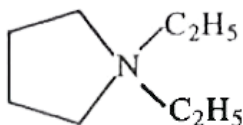


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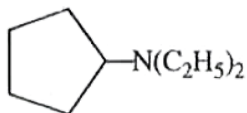
7. Which of the following compounds is cyclopentyl-diethylamine?



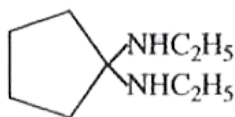
A.



B.



C.



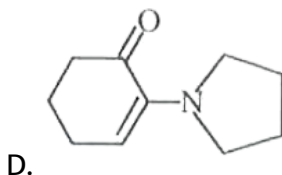
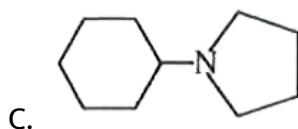
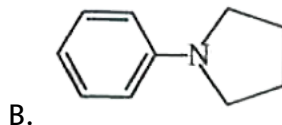
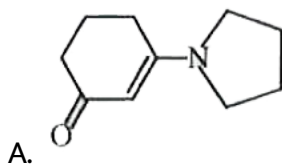
D.

Answer: C



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8. Which of the following is the weakest Bronsted base ?



Answer: A



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9. A nitrogen containing compound dissolves in 10% aq. sulfuric acid. The Hinsberg test ($C_6H_5SO_2Cl$ in base) gives a solid product that is not

soluble in 10% aq. NaOH. Which of the following would best fit these facts?

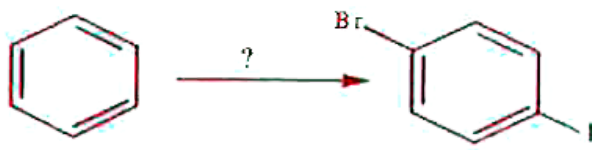
- A. N,N-Dimethylaniline, $C_6H_5N(CH_3)_2$.
- B. N-Methylbenzamide, $C_6H_5CONHCH_3$.
- C. N-Methylaniline, $C_6H_5NHCH_3$.
- D. Benzylamine, $C_6H_5CH_2NH_2$.

Answer: C



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10. How would you accomplish the following synthesis ?



- A. 1. 1 eq. Br_2 , $FeBr_3$ 2. HNO_3 , H_2SO_4 3. H_2 , catalyst 4. HONO, ice bath 5. KI

B. 1. Br_2 , FeBr 2. HNO_2 , H_2SO_4 3. Zn Hg, HCl 4. HONO, room temperature 5. CuI

C. 1. HNO_3 , H_2SO_4 2. 1eq. Br_2 , $FeBr_3$ 3. Zn, HCl 4. HONO, ice bath 5.

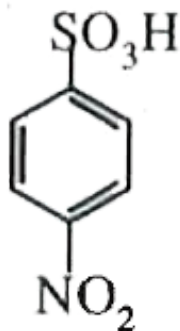


D. 1. HNO_2 , H_2SO_4 2. Fe, HCl 3. Zn Hg, HCl 4. HONO, ice bath 5. Br_2

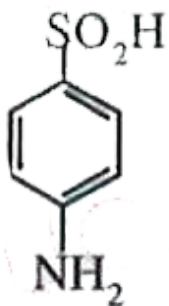
Answer: A

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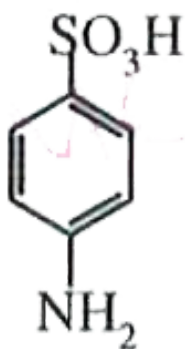
11. The formula of sulphanilic acid is



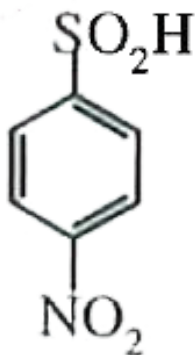
A.



B.



C.



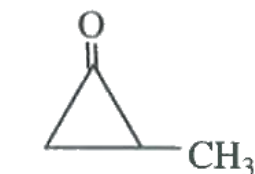
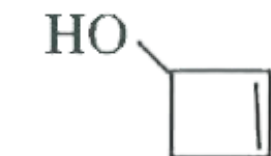
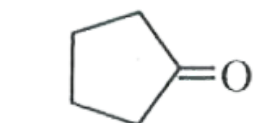
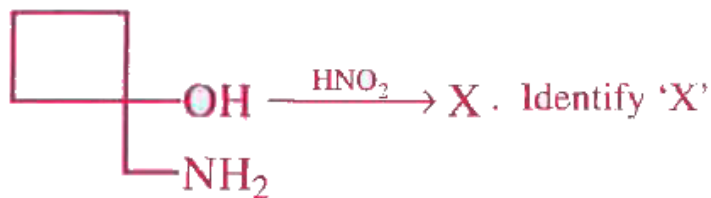
D.

Answer: C



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12. Complete the following reaction



Answer: A



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Practice Sheet 3 More Than One Correct Answer Questions

1. Which of the following is /are correct ?

A. During mono nitration of benzene with conc. H_2SO_4 and conc.

HNO_3 temperature should not be allowed to exceed $60^\circ C$

B. In nitrating mixture ($HNO_3 + H_2SO_4$), HNO_3 acts as base

C. Electrophilic substitution in aromatic compounds involves arenium ion

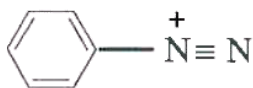
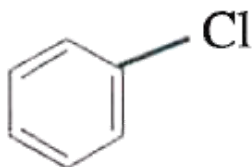
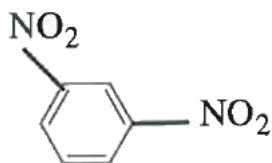
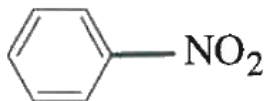
D. Nitrogen and H_2SO_4 can be used an nitrating mixture

Answer: A::B::C



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2. Which of the following compounds undergo nucleophilic substitution reaction



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



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3. Which of these is soluble in NaOH?

- A. Nitroethane
- B. 2-Nitropropane
- C. PhenylNitromethane
- D. Nitrobenzene

Answer: A::B::C



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4. A positive carbylamine test is given by

- A. N, N-dimethylaniline
- B. 2, 4-dimethylaniline
- C. N-methyl-o-methylaniline
- D. p- methylbenzylamine

Answer: B::D



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5. Which of the following is not be prepared by Sandmeyer's reaction ?

A. Chlorobenzene

B. Bromobenzene

C. Iodobenzene

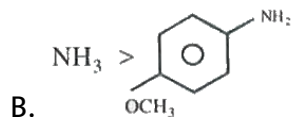
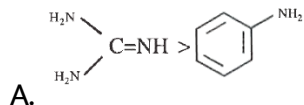
D. Fluorobenzene

Answer: C::D



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6. Which of the following regarding basic nature of amine is correct





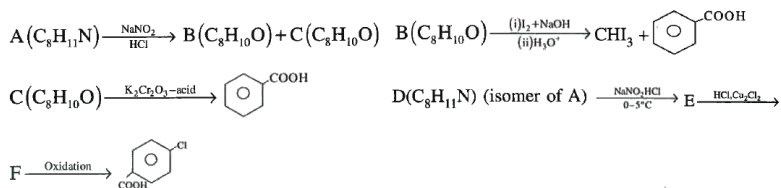
Answer: A::B::C::D



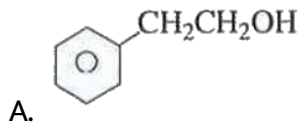
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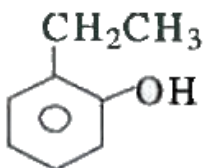
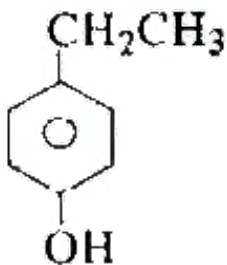
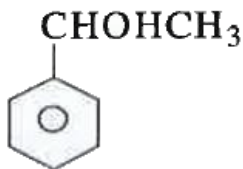
Practice Sheet 3 Linked Comprehension Type Questions Passage I

1. Carefully study the reaction give below and answer the questions



The structure of 'C' is



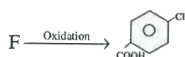
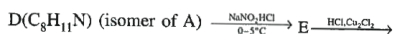
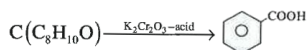
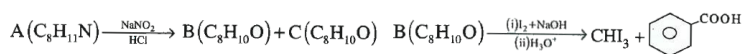


Answer: A

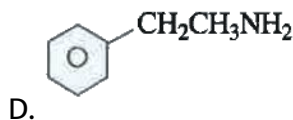
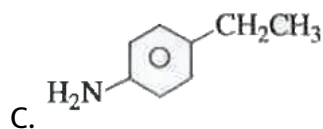
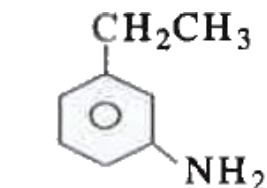
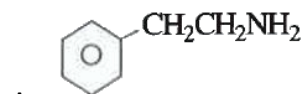


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2. Carefully study the reaction give below and answer the questions



The structure of 'D' is

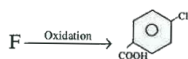
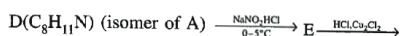
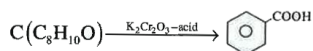
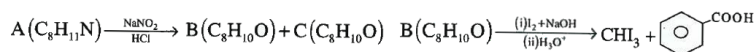


Answer: C

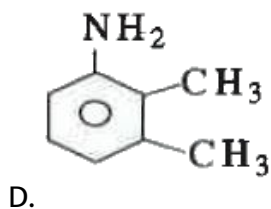
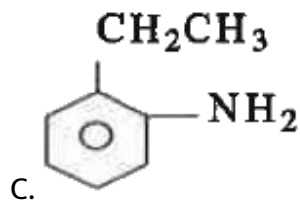
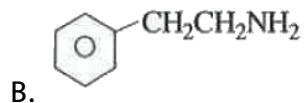
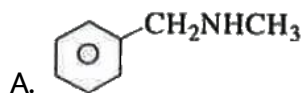


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3. Carefully study the reaction give below and answer the questions



The structure of 'A' is

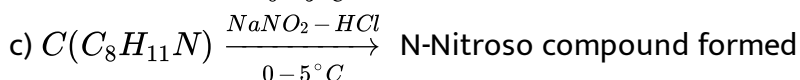
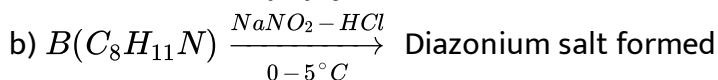
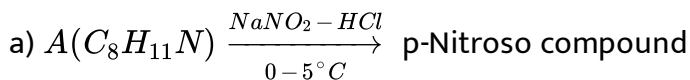


Answer: B

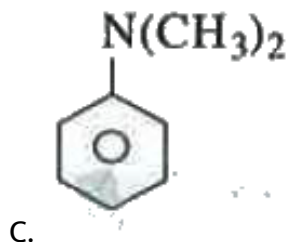
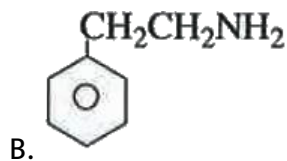
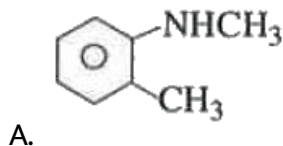


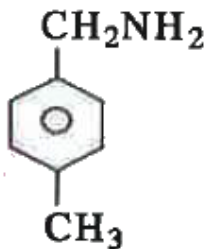
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1. Several isomeric amines are possible with the molecular formula $C_8H_{11}N$. On the basis of the reaction given by each of the isomers, identify the structure of the compound.



The structure of 'A' is likely to be





D.

Answer: C

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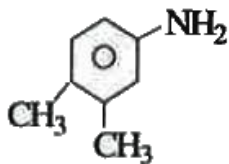
2. Several isomeric amines are possible with the molecular formula $C_8H_{11}N$. On the basis of the reaction given by each of the isomers, identify the structure of the compound.

a) $A(C_8H_{11}N) \xrightarrow[0-5^\circ C]{NaNO_2-HCl}$ p-Nitroso compound

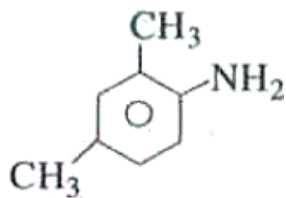
b) $B(C_8H_{11}N) \xrightarrow[0-5^\circ C]{NaNO_2-HCl}$ Diazonium salt formed

c) $C(C_8H_{11}N) \xrightarrow[0-5^\circ C]{NaNO_2-HCl}$ N-Nitroso compound formed

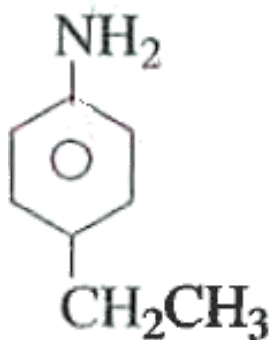
The structure of 'B' is



A.



B.



C.

D. All the above

Answer: D



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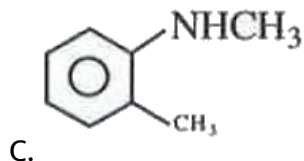
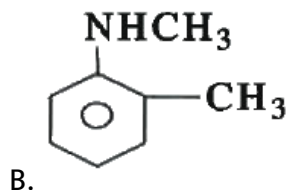
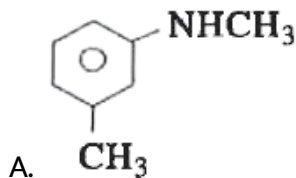
3. Several isomeric amines are possible with the molecular formula $C_8H_{11}N$. On the basis of the reaction given by each of the isomers, identify the structure of the compound.

a) $A(C_8H_{11}N) \xrightarrow[0-5^\circ C]{NaNO_2-HCl}$ p-Nitroso compound

b) $B(C_8H_{11}N) \xrightarrow[0-5^\circ C]{NaNO_2-HCl}$ Diazonium salt formed

c) $C(C_8H_{11}N) \xrightarrow[0-5^\circ C]{NaNO_2-HCl}$ N-Nitroso compound formed

The structure of 'C' is



D. All the above

Answer: D

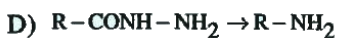
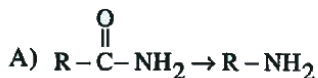


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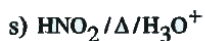
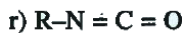
Practice Sheet 3 Match The Following Questions

1. Match the following

COLUMN-I



COLUMN-II



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2. Match the following

COLUMN-I

- A) Pyridine
- B) Quinoline
- C) Pyrimidine
- D) Pyrrole

COLUMN-II

- p) $pK_a = 2.70$
- q) $pK_a = 5.23$
- r) $pK_a = 0.40$
- s) $pK_a = 4.5$



[View Text Solution](#)

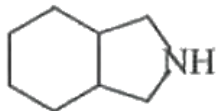
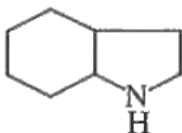
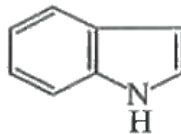
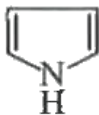
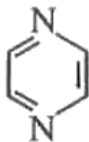
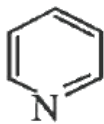
Practice Sheet 3 Integer Answer Type Questions

1. Number of p-disubstituted benzene compounds possible with molecular formula $C_8H_{11}N$ is



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2. How many of the following contain basic nitrogen



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3. Heterocyclic (six membered secondary amines possible for $C_6H_{13}N$



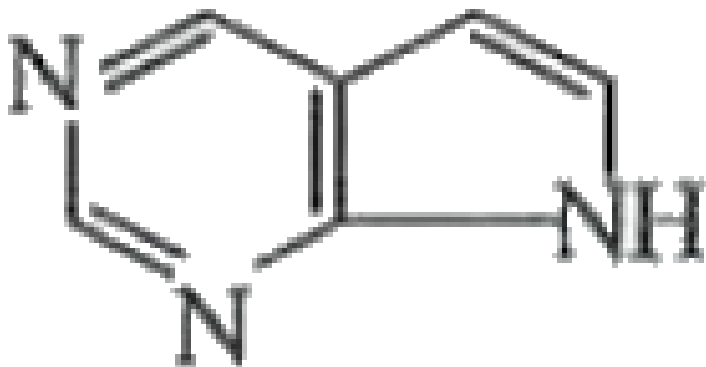
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4. Four membered heterocyclic secondary amines possible for $C_5H_{11}N$



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5. Total number of electrons contributed by all nitrogen atoms for delocalisation is



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6. Total number of amines possible for $C_4H_{11}N$ is (exclude stereoisomers)



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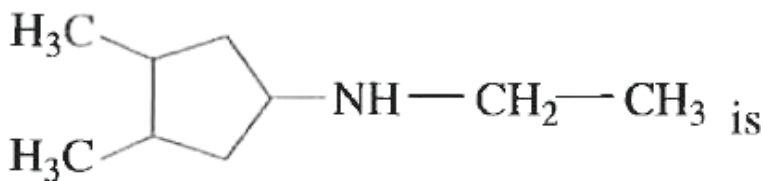
7. How many of the following give yellow oily liquid with $\text{NaNO}_2 + \text{HCl}$, $\text{CH}_2\text{CH}_2\text{NH}_2$, CH_3NHCH_3 , $\text{CH}_3\text{CH}_2\text{NHCH}_3$, $\text{CH}_3\text{CH}_2\text{NH}_2$.



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Practice Sheet 4 Single Answer Questions

1. The IUPAC name of the amine is :



- A. N-Ethyl 2,3 dimethyl cyclopentanamine
- B. N-Ethyl 3, 4 dimethyl cyclopentanamine
- C. N- 3, 4 dimethyl cyclopentanamine ethanamine
- D. N-Ethyl 3, 3 dimethyl cyclopentanamine

Answer: B



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2. The pyramidal inversion from one invertomer of chiral tetrahedral amine to another takes place via

- A. Carbocationic intermediate
- B. Anionic nitrogen intermediate
- C. Cationic nitrogen intermediate
- D. Planar nitrogen

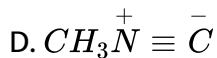
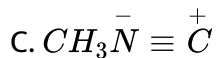
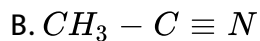
Answer: D



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3. In the following reaction, $CH_3NH_2 + CHCl_3 + KOH \rightarrow$ Nitrogen containing compound $+ KCl + H_2O$. The nitrogen containing

compound is

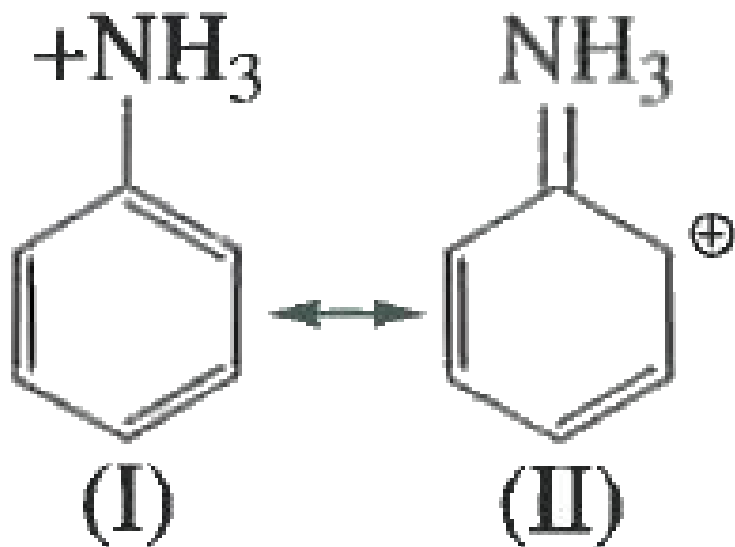


Answer: D



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



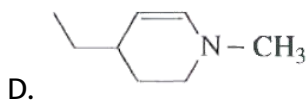
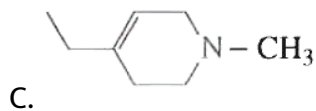
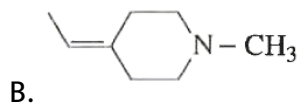
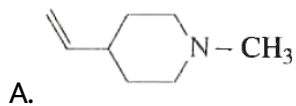
- A. II is not acceptable canonical structure because carbonium ions are less stable than ammonium ions
- B. II is not an acceptable canonical structure because it is nonaromatic
- C. II is not an acceptable canonical structure because nitrogen has 10 valence electrons
- D. II is an acceptable canonical structure

Answer: C



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5. Complete the following reaction

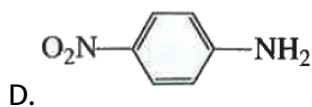
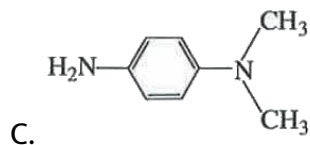
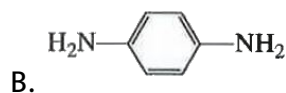
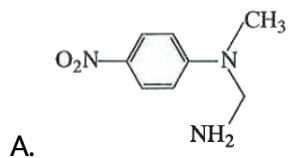
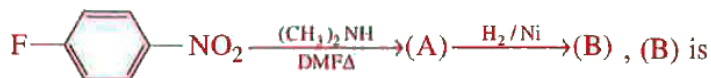


Answer: A



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6. Complete the following reaction

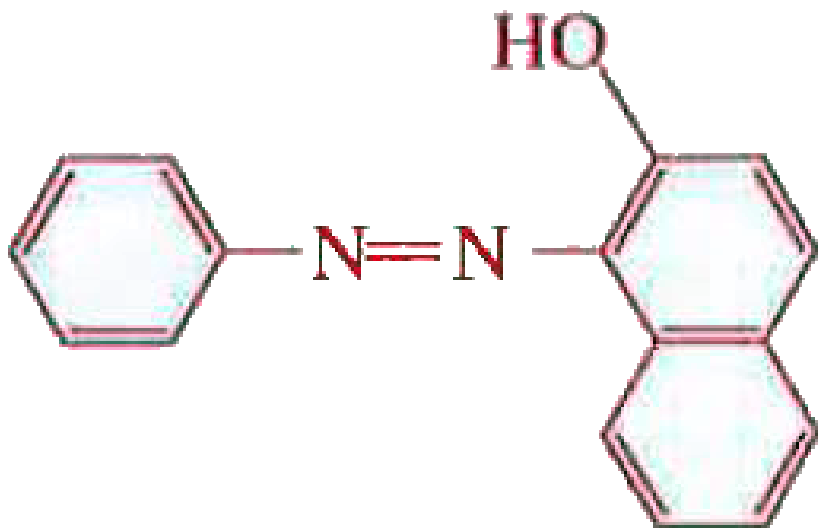


Answer: C

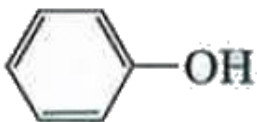


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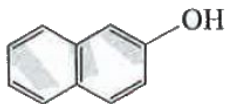
7. The product



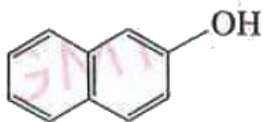
which is a red azo dye obtained on reacting benzene diazonium chloride with one of the following compounds.



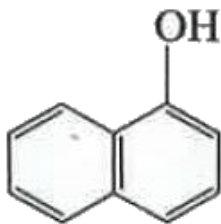
A.



B.



C.



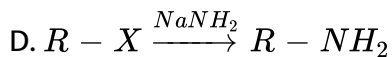
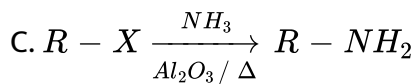
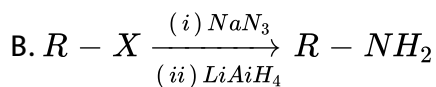
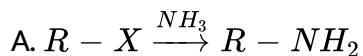
D.

Answer: B



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8. The best method for the preparation of primary amines is

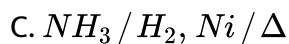
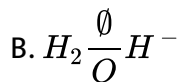
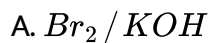


Answer: C



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9. Acetophenone can be converted into amine in a single step by step

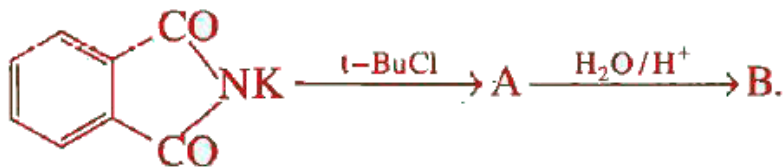


Answer: C

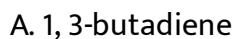


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10.



The final product is



C. isobutene

D. isobutanol

Answer: C



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11. N-ethyl formamide on treatment with $POCl_3$ in pyridine gives

A. Ethyl isocyanate

B. Ethyl isocyanide

C. Acetaldoxime

D. Ethyl cyanide

Answer: B



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12. Piperidine is a secondary amine, which is subjected to Hofmann elimination. The alkene formed as a final product is

- A. 1, 3-butadiene
- B. 1,4-pentadiene
- C. 1, 3-butadiyne
- D. 1, 2-pentadiene

Answer: B



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13. An organic compound with molecular formula C_3H_5N on hydrolysis gives an acid. The acid on heating with N_3H and conc. H_2SO_4 gives

- A. Propanamide
- B. Ethyl acetate
- C. Methyl amine

D. Ethyl amine

Answer: D



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Practice Sheet 4 More Than One Correct Answer Questions

1. $R - C \equiv N$ can be reduced to RCH_2NH using the reducing agent.

A. $H_2N - NH_2$

B. H_2 / Ni

C. NaOBr

D. $LiAlH_4$

Answer: A::D



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2. Tertiary amines may be obtained by :

- A. Gabriel phthalimide synthesis
- B. Heating an alcoholic solution of ammonia with excess of RX
- C. The hydrolysis of dialkyl cyanamide
- D. Thermal decomposition of quaternary ammonium hydroxide

Answer: B::D



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3. $CH_3CH_2NH_2$ is soluble in

- A. Dilute HCl
- B. $CuSO_4$ solution
- C. $AgNO_3$
- D. dil. H_2SO_4

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



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4. Which of the following statements is / are correct ?

- A. Primary amines show intermolecular hydrogen bonding
- B. Secondary amines show intermolecular hydrogen bonding
- C. Tertiary amines show intermolecular hydrogen bonding
- D. Amines have lower boiling points as compared to those of alcohols and carboxylic acid of comparable molar masses

Answer: A::B::D



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5. Which of the following statements is / are correct?

- A. Aliphatic amines are stronger bases than ammonia
- B. Aromatic amines are stronger bases than ammonia
- C. The alkyl group in alkyl ammonium ion stabilizes the ion more relative to the amine
- D. The aryl group in aryl ammonium ion stabilizes the ion less relative to the amine

Answer: A::C::D



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6. Which of the following statements is / are correct

- A. In gas phase the basic strength order among the three types of amines is $3^0 > 2^0 > 1^0$.
- B. Among the isomeric amines boiling points order is $3^0 > 2^0 > 1^0$

C. Alcohols are more water soluble than amines (of comparable molecular weight)

D. The C-N bond in Aromatic amines is shorter than that of in aliphatic amines

Answer: A::C::D



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Practice Sheet 4 Linked Comprehension Type Questions Passage I

1. The isomeric compounds 'A' and 'B' with molecular formula C_7H_9N gave the following reactions. When B is acetylated and then brominated, it gave one monobromo derivative. 'A' when treated with $NaNO_2$ and HCl gave the compound 'C'. 'C' was heated with acetic acid in the presence of conc. H_2SO_4 , a pleasant smelling liquid (D) was obtained. 'B' was treated with Na

'B' is

A. benzylamine

B. p-toluidine

C. o-toluidine

D. m-toluidine

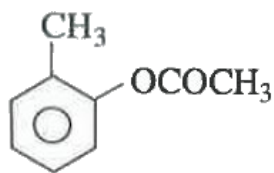
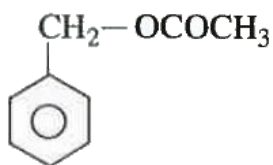
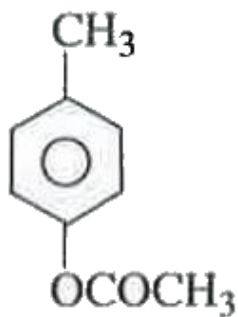
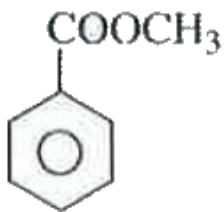
Answer: B



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2. The isomeric compounds 'A' and 'B' with molecular formula C_7H_9N gave the following reactions. When B is acetylated and then brominated, it gave one monobromo derivative. 'A' when treated with $NaNO_2$ and HCl gave the compound 'C'. 'C' was heated with acetic acid in the presence of conc. H_2SO_4 , a pleasant smelling liquid (D) was obtained. 'B' was treated with Na

'D' is



Answer: C



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3. The isomeric compounds 'A' and 'B' with molecular formula C_7H_9N gave the following reactions. When B is acetylated and then brominated, it gave one monobromo derivative. 'A' when treated with $NaNO_2$ and HCl gave the compound 'C'. 'C' was heated with acetic acid in the presence of conc. H_2SO_4 , a pleasant smelling liquid (D) was obtained. 'B' was treated with Na

'A' is

- A. o-toluidine
- B. N-methylaniline
- C. p-toluidine
- D. benzylamine

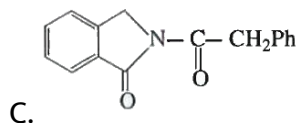
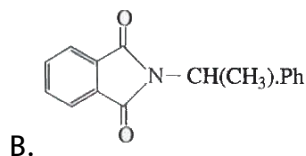
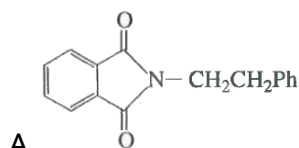
Answer: D



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1. An organic compound 'A' ($C_{16}H_{13}O_2N$) is insoluble in dil cold aqueous alkali but on warming gives a clear solution. 'A' when treated with dil H_2SO_4 gives $B(C_{16}H_{15}O_2N)$ which when boiled with conc. HCl under reflux and cooled, a solid compound $C(C_8H_6O_4)$ is crystallized out. The mother liquor when separated and concentrated gives $D(C_8H_{12}NCl)$.

Structure of compound 'A' can be



D. Both (a) and (b)

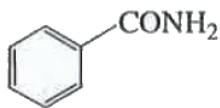
Answer: D



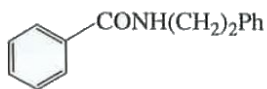
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2. An organic compound 'A' ($C_{16}H_{13}O_2N$) is insoluble in dil cold aqueous alkali but on warming gives a clear solution. 'A' when treated with dil H_2SO_4 gives $B(C_{16}H_{15}O_2N)$ which when boiled with conc. HCl under reflux and cooled, a solid compound $C(C_8H_6O_4)$ is crystallized out. The mother liquor when separated and concentrated gives $D(C_8H_{12}NCl)$.

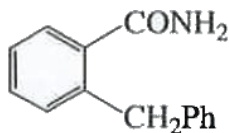
$B \xrightarrow[\Delta]{\text{Soda lime}}$ 'M' product (M) is



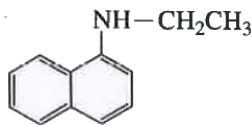
A.



B.



C.



D.

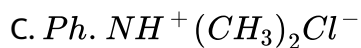
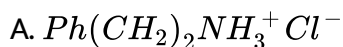
Answer: B



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3. An organic compound 'A' ($C_{16}H_{13}O_2N$) is insoluble in dil cold aqueous alkali but on warming gives a clear solution. 'A' when treated with dil H_2SO_4 gives $B(C_{16}H_{15}O_2N)$ which when boiled with conc. HCl under reflux and cooled, a solid compound $C(C_8H_6O_4)$ is crystallized out. The mother liquor when separated and concentrated gives $D(C_8H_{12}NCl)$.

Compound 'D' can be



D. Both (a) and (b)

Answer: D

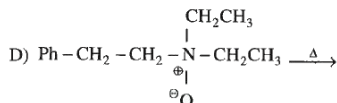
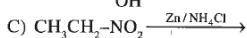
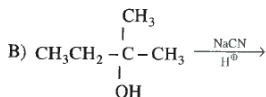
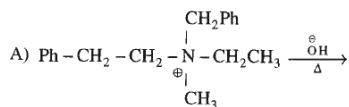


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Practice Sheet 4 Match The Following Questions

1. Match the following columns

COLUMN - I



COLUMN - II

p) Gives pungent smell on treatment

with CHCl_3 , $\text{OH}^{\ominus}$

q) 3^o times

r) Gives positive Tollen's test

r) The amine which is not prepared by Hofmann

ammonolysis process

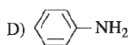
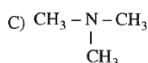
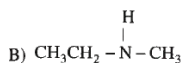
t) Hydroxyl amine



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2. Match the following columns

COLUMN - I



COLUMN - II

p) Treatment of NaNO_2 ,
 HCl gives N-nitroso compound

q) Treatment of NaNO_2 , HCl gives
diazoniumchloride

r) Treatment of excess CH_3I followed by

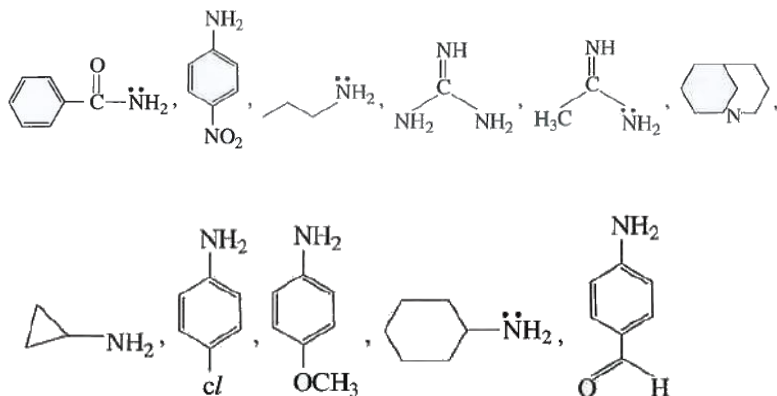
AgOH and heat gives out alkene

s) Treatment of HCl , Δ gives dealkylation



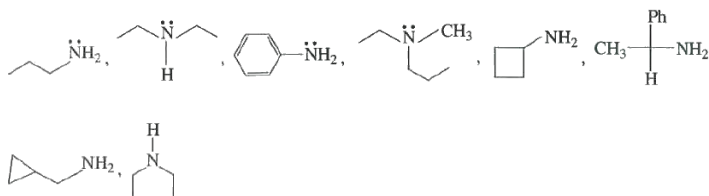
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1. Examine the structural formulas of the following compounds and identify how many are more basic than aniline



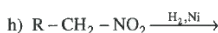
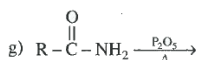
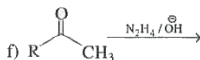
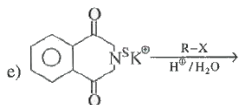
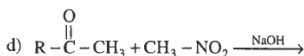
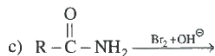
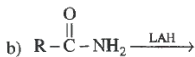
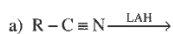
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2. Of the following amines how many can give carbylamine reaction.



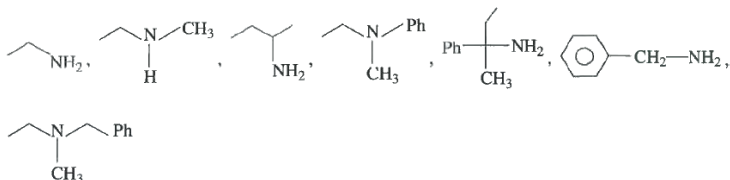
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3. Of the following reactions how many reactions are used for preparation of amines.



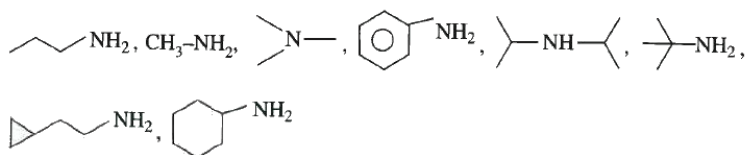
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4. Of the following amine how many can be separated by Hoffmann's mustard Oil Reaction.



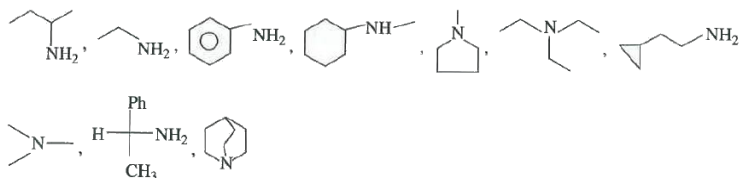
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5. How many of the following amines are prepared by Gabrielphthalamide reaction.



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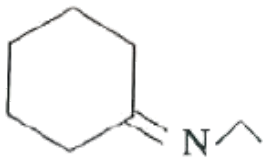
6. Of the following amines how many can give carbyl amine reaction



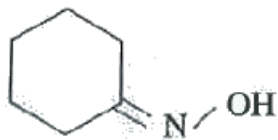
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Practice Sheet 5 Single Answer Questions

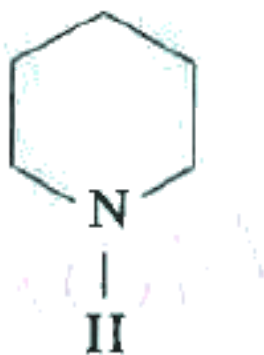
1. Which of the following compounds is an amine ?



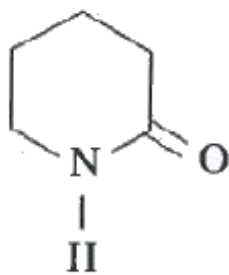
A.



B.



C.



D.

Answer: C

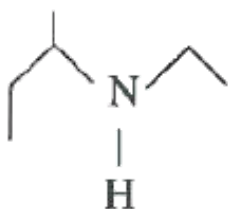


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2. Which of the following compounds exists as non-resolvable racemic mixture ?



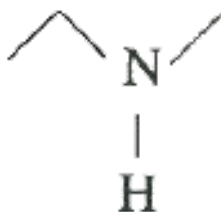
A.



B.



C.



D.

Answer: D

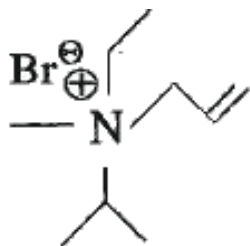


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3. Which of the following compounds loses optical activity due to pyramidal inversion ?



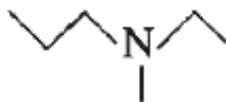
A.



B.



C.



D.

Answer: D

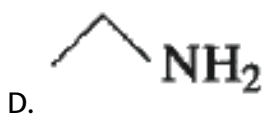
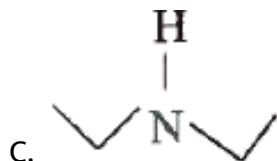
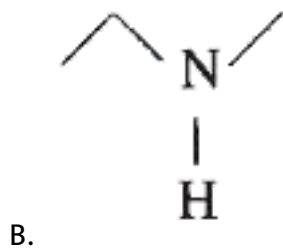


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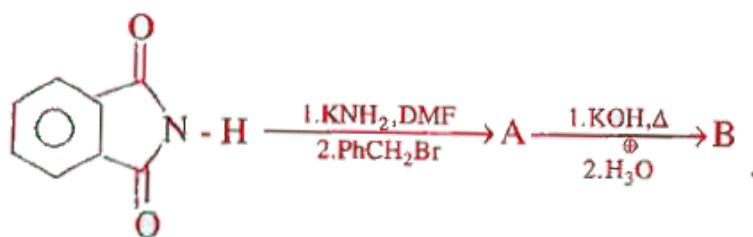
4.

The final product (B) is :



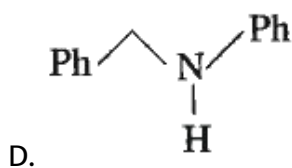
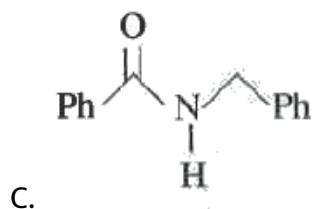
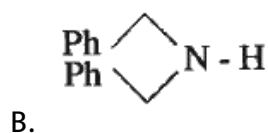
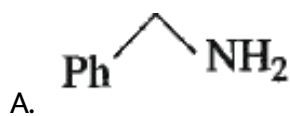
Answer: B

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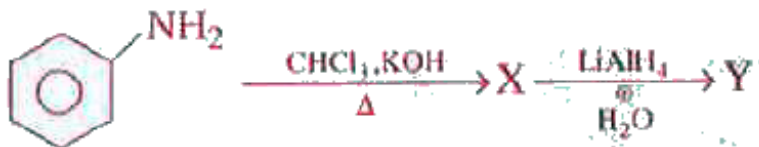
5.

The end product B of the above reaction is :



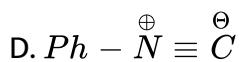
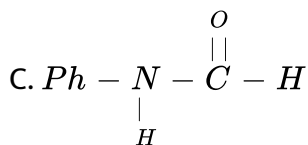
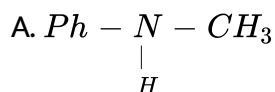
Answer: A

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6.

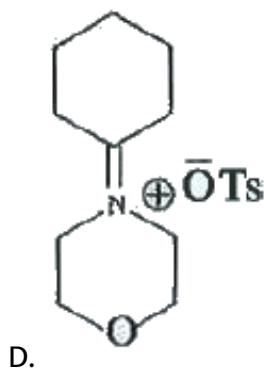
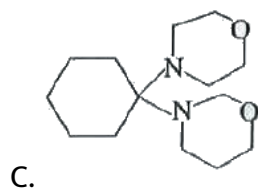
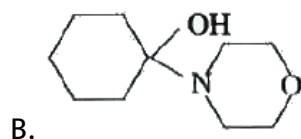
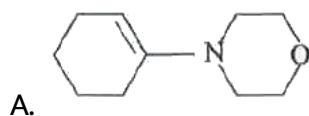
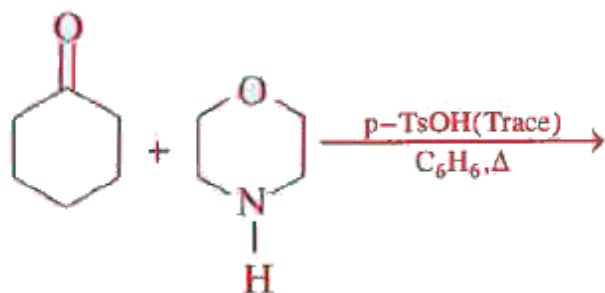
(Y) is



Answer: A

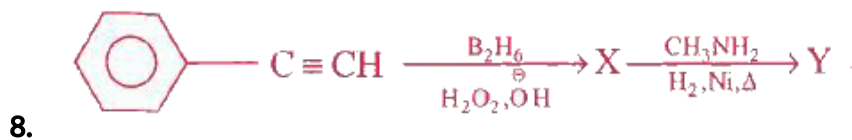
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7. The major product formed in the reaction :

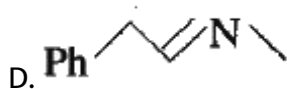
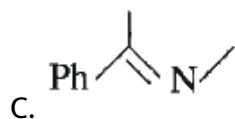
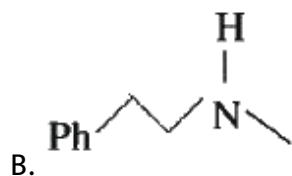
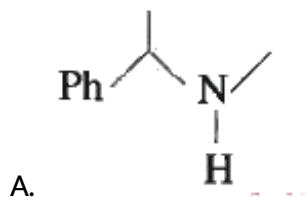


Answer: A

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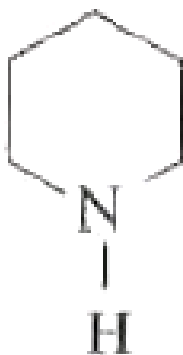
The final product (Y) is :



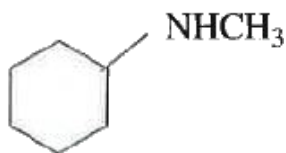
Answer: B



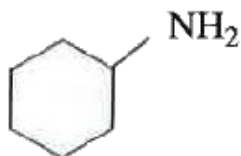
9. Among the following compounds which one will produce a Schiff base on reaction with cyclopentanone ?



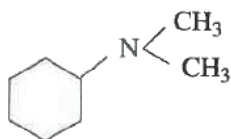
A.



B.



C.



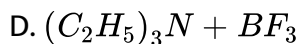
D.

Answer: C



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10. In which of the following reactions does the amine behaves as an acid ?

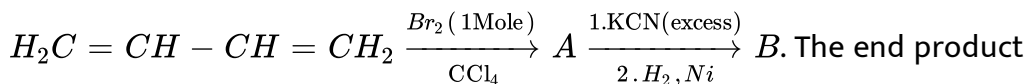


Answer: C

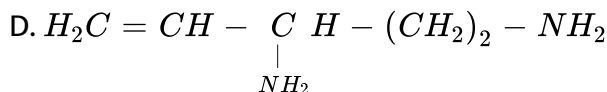
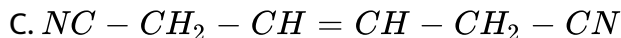
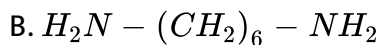
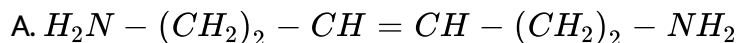


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11. Consider the following sequence of reactions:



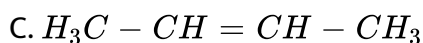
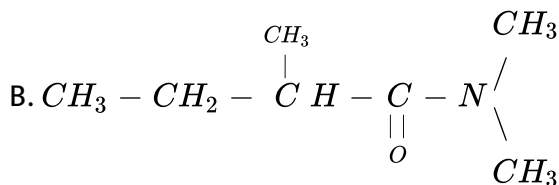
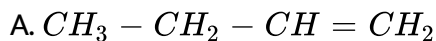
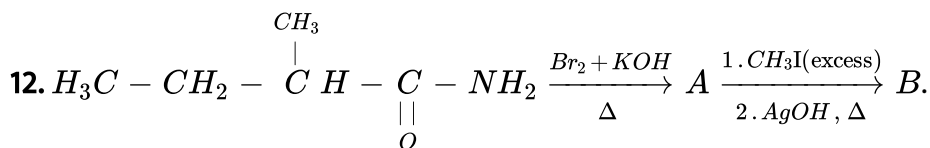
(B) is :

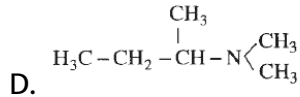


Answer: B



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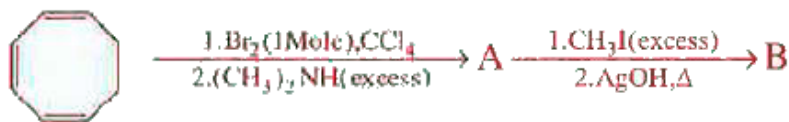


Answer: A



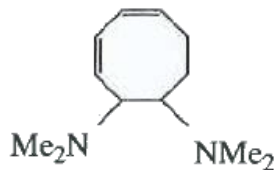
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13.

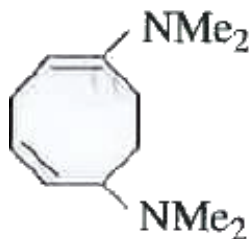


(Major product). The major product (B) is

A.

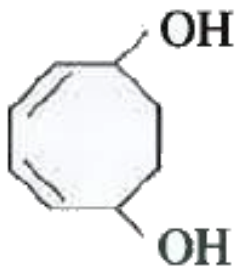


B.





C.



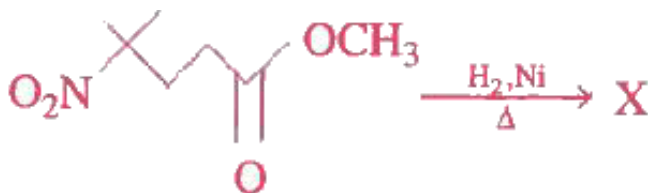
D.

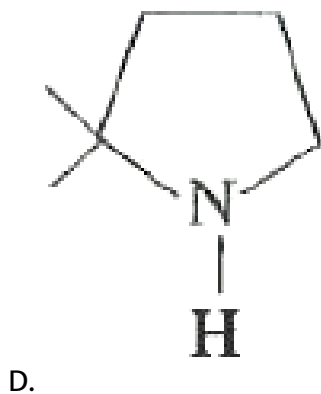
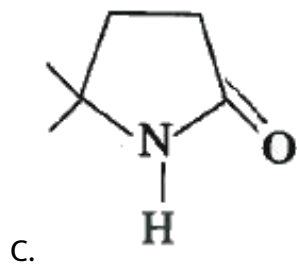
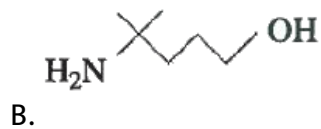
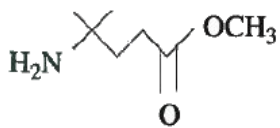
Answer: C



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14. The major product (X) of the reaction is



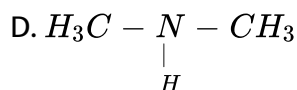
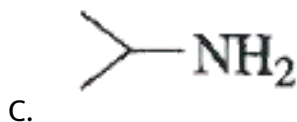
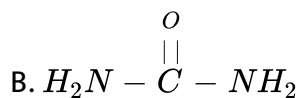
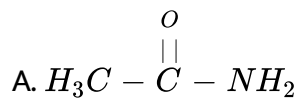


Answer: C



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15. Which of the following compounds does not liberate N_2 on treatment with HNO_2 ?



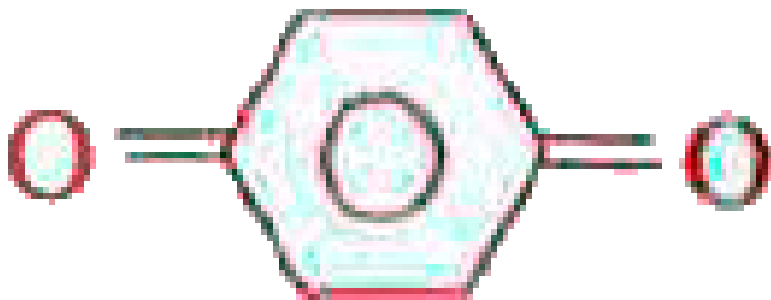
Answer: D



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Practice Sheet 5 More Than One Correct Answer Questions

1. Consider the following reaction $A \xrightarrow{K_2Cr_2O_7, H^+}$



The starting substance 'A' can be



A.



B.



C.



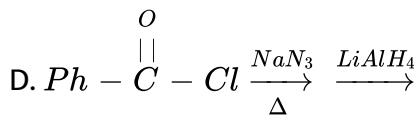
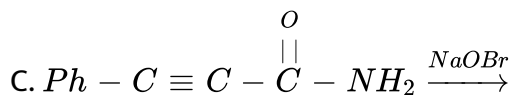
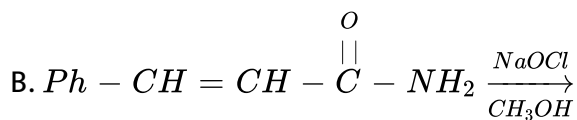
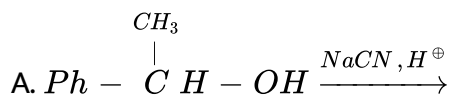
D.

Answer: A::B::D



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2. Which of the following reactions do not give 1⁰ amine ?

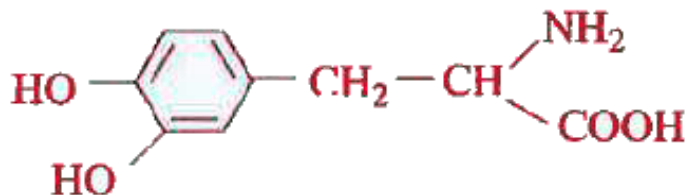


Answer: B::C::D



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3. Dopamine is a drug used in the treatment of Parkinson's disease



Which of the following statements about this compound are correct ?

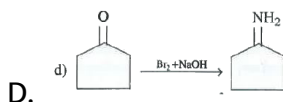
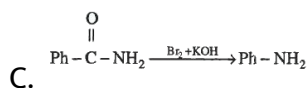
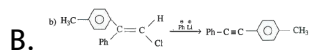
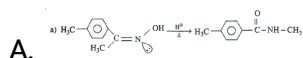
- A. It can exist only in optically active forms
- B. One mole will react with 3 mole of NaOH to form a salt
- C. It can exist as a zwitter ion in the aqueous solution
- D. It gives nitroso compound on treatment with HNO_2

Answer: A::B::C



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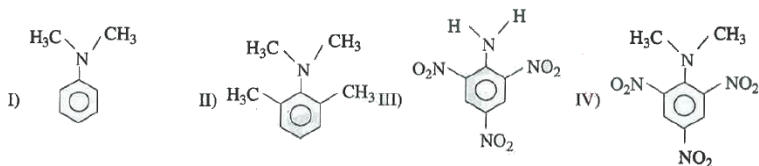
4. Which of the following reactions represent major products ?



Answer: A::B::C

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5. Consider the structures



Which of the following statements are correct ?

A. Basic strength of II is greater than I

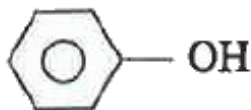
- B. Basic strength of II is less than that of I
- C. Basic strength of IV is greater than III
- D. Basic strength of IV is less than that of III

Answer: A::C

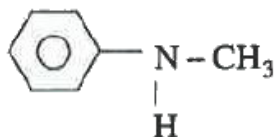


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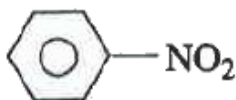
6. Which of the following give Liebermann nitroso reaction ?



A.



B.



C.



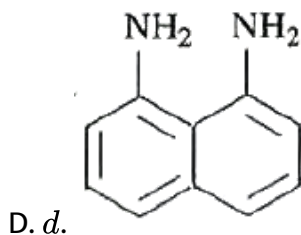
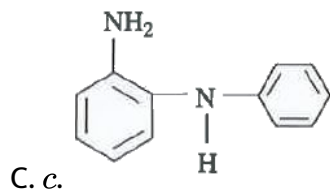
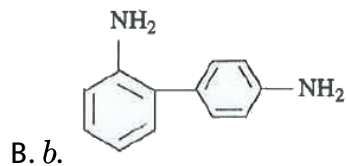
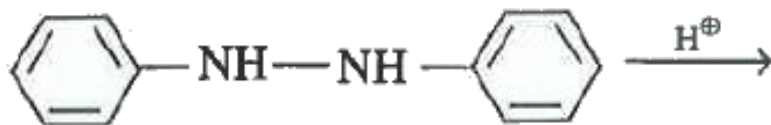
D.

Answer: A::B



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7. Find out products which are formed by the following reaction

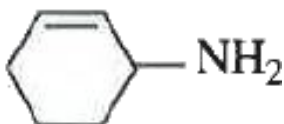


Answer: A::B

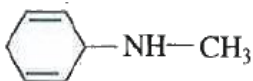


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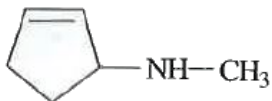
8. The structural form of a compound $A(C_6H_{11}N)$ is resolvable, dissolve in dil.HCl and reacts with HNO_3 . Compound a could be



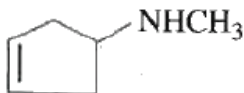
A. a.



B. b.



C. c.



D. d.

Answer: A::C::D



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1. Amines are less reactive in substitution reactions. Their reactivity is much lesser than alcohols and alkylfluorides towards substitution. Protonation of the amino group makes it a better leaving group, but not nearly as good a leaving group as a protonated alcohol. Protonated amino groups cannot be displaced by OH^- because it would react immediately with the acidic hydrogen which would convert it into a poor nucleophile.

The leaving group in quaternary ammonium ion has about the same leaving tendency as a protonated amino group but does not have acidic hydrogen. The reaction of a quaternary ammonium ion with hydroxide ion is known as Hoffmann elimination reaction. The leaving group is tertiary amine. Since a tertiary amine is only a moderately good leaving group, the reaction requires heat. The carbon to which the tertiary amine is attached is designated as α carbon.

When the hydroxide ion starts to remove a β H from a quaternary ammonium ion, the leaving group does not immediately start to leave because a tertiary amine is not a good leaving group. As a result, a partial

negative charge builds up on the carbon from which the proton is removed.

Which of the following statements is correct?

- A. PK_n value of protonated amine is more than that of protonated alcohol
- B. PK_a value of the protonated amine is less than that of protonated alcohol
- C. PK_a value for protonated amine is equals to that protonated alcohol
- D. PK_a value of amine is less than that of alcohol

Answer: A



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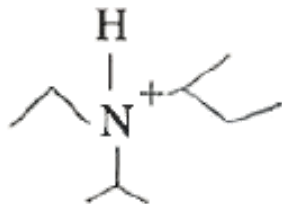
2. Amines are less reactive in substitution reactions. Their reactivity is much lesser than alcohols and alkylfluorides towards substitution.

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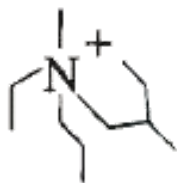
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When the hydroxide ion starts to remove a β H from a quaternary ammonium ion, the leaving group does not immediately start to leave because a tertiary amine is not a good leaving group. As a result, a partial negative charge builds up on the carbon from which the proton is removed.

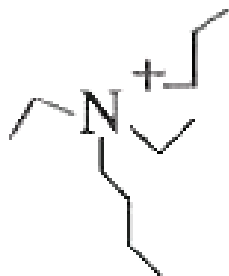
Which of the following statements is correct?



A.



B.



C.

D. none

Answer: D



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3. Amines are less reactive in substitution reactions. Their reactivity is much lesser than alcohols and alkylfluorides towards substitution.

Protonation of the amino group makes it a better leaving group, but not nearly as good a leaving group as a protonated alcohol. Protonated amino groups cannot be displaced by OH^- because it would react immediately with the acidic hydrogen which would convert it into a poor nucleophile.

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When the hydroxide ion starts to remove a β H from a quaternary ammonium ion, the leaving group does not immediately start to leave because a tertiary amine is not a good leaving group. As a result, a partial negative charge builds up on the carbon from which the proton is removed.

Which of the following statements are true regarding Hoffmann elimination ?

- A. it follows anti-zaitsev elimination
- B. it forms only zaitsev product
- C. no polar compounds are formed at the end of the reaction
- D. it is given by only 1⁰ amines

Answer: A



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4. Amines are less reactive in substitution reactions. Their reactivity is much lesser than alcohols and alkylfluorides towards substitution. Protonation of the amino group makes it a better leaving group, but not nearly as good a leaving group as a protonated alcohol. Protonated amino groups cannot be displaced by OH^- because it would react immediately with the acidic hydrogen which would convert it into a poor nucleophile.

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When the hydroxide ion starts to remove a β H from a quaternary ammonium ion, the leaving group does not immediately start to leave because a tertiary amine is not a good leaving group. As a result, a partial negative charge builds up on the carbon from which the proton is removed.

The compounds 'C' in question number 31 on heating with moist silver oxide gives

- A. Propene
- B. 1-Butene
- C. Ethylene
- D. 2-Butene

Answer: C



5. Amines are less reactive in substitution reactions. Their reactivity is much lesser than alcohols and alkylfluorides towards substitution. Protonation of the amino group makes it a better leaving group, but not nearly as good a leaving group as a protonated alcohol. Protonated amino groups cannot be displaced by OH^- because it would react immediately with the acidic hydrogen which would convert it into a poor nucleophile.

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When the hydroxide ion starts to remove a β H from a quaternary ammonium ion, the leaving group does not immediately start to leave because a tertiary amine is not a good leaving group. As a result, a partial

negative charge builds up on the carbon from which the proton is removed.

Which of the following statements is correct?

- A. A and B
- B. B and C
- C. A, B and C
- D. All are inactive

Answer: A



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Practice Sheet 5 Linked Comprehension Type Questions Passage II

1. There are some isomeric amines containing only one N atom. Each one of which forms a chloride salt on treatment with HCl containing 32.42% chlorine. None of them decolorizes Br_2 water.

How many of them can evolve N_2 on reaction with HNO_2 ?

A. 2

B. 3

C. 4

D. 5

Answer: C



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Practice Sheet 5 Linked Comprehension Type Questions

1. There are some isomeric amines containing only one N atom. Each one of which forms a chloride salt on treatment with HCl containing 32.42% chlorine. None of them decolorizes Br_2 water.

How many of them contains chiral carbon ?

A. 1

B. 2

C. 3

D. 4

Answer: A



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2. There are some isomeric amines containing only one N atom. Each one of which forms a chloride salt on treatment with HCl containing 32.42% chlorine. None of them decolorizes Br_2 water.

How many of them does not give carbyl amine test ?

A. 2

B. 3

C. 4

D. 5

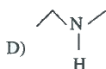
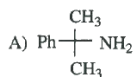
Answer: C



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3. Match the following columns

COLUMN-I



COLUMN-II

p) Treatment of CS_2 , HgCl_2 gives out alkyl isothiocyanate

q) Treatment of $\text{Ph}-\text{SO}_2-\text{Cl}$ produces the solid compound

r) Treatment of H_2O , Δ gives out alkene

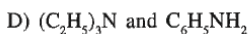
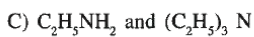
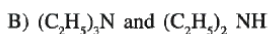
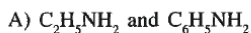
s) Treatment of CS_2 produces dithio carbamic acid



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4. Match the following columns

COLUMN - I (Amines)



COLUMN - II (Distinguished by)

p) Carbylamine test

q) Azo dyd test

r) Hinsberg reagents

s) Libermann nitroso reaction

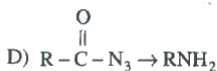
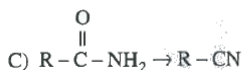
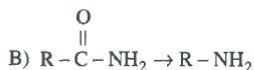
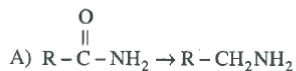


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Practice Sheet 5 Match The Following Questions

1. Match the following columns

COLUMN-I



COLUMN-II

p) Schmidt reaction

q) P_2O_5

r) Hofmann reaction

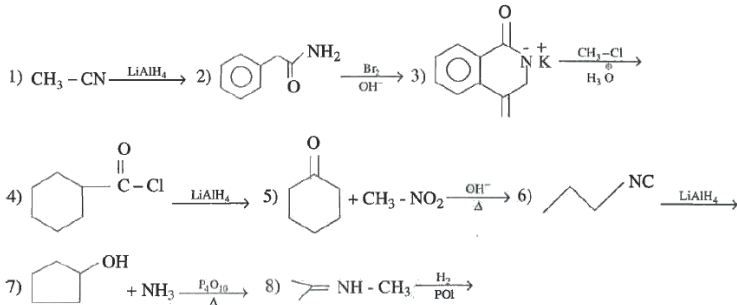
s) LiAlH_4



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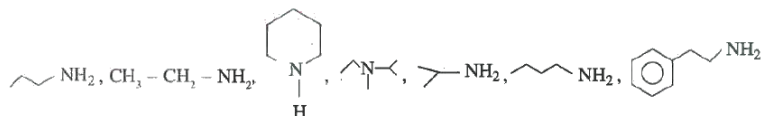
Practice Sheet 5 Integer Answer Type Questions

1. Of the following reactions, how many reaction are used for the preparation of amines

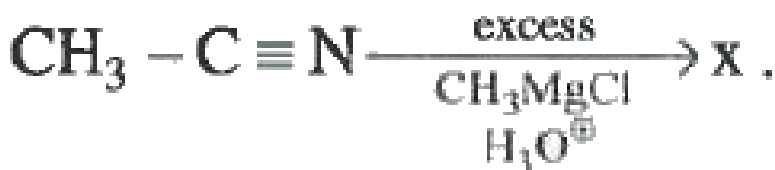


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2. Of the following amines how many can be separated by Hoffmann's mustard oil reaction



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3.

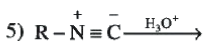
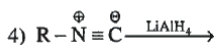
No. of πe^- 's in the product

4. Of the following reactions, how many, are used for (a) preparation of 1⁰-Amines, (b) preparation of 2⁰-amines, (c) preparation of 3⁰-Amines

1) Hoffmann's Hypobromide reaction

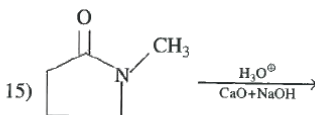
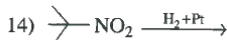
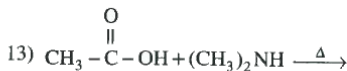
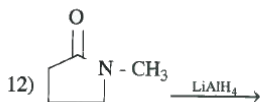
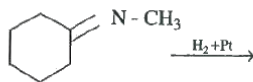
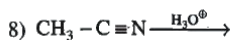
2) Curtius rearrangement

3) Schmidt reaction

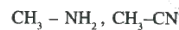


6) Gabriel phthalimide reaction

7) Lossen rearrangement

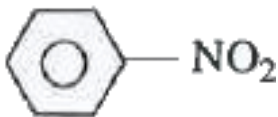


5. How many of the following nucleophiles are better than NH_3 for nucleophilic substitution reaction

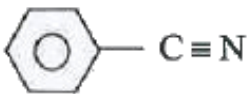


Practice Sheet 6 Single Answer Questions

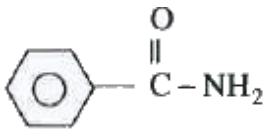
1. An organic compound (A) on reduction gives a compound (B) which on reaction with $CHCl_3$ and NaOH form (C). The compound (C) on catalytic reduction gives N-methylaniline. The compound (A) is



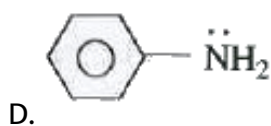
A.



B.



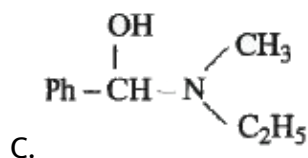
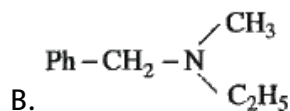
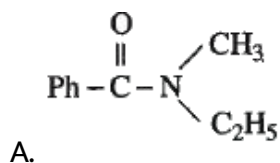
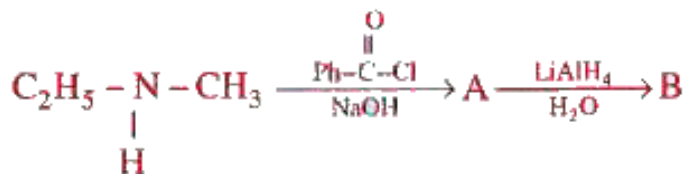
C.

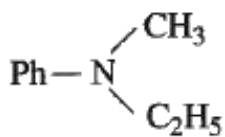


Answer: A

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2. The end product (B) of the reaction sequence





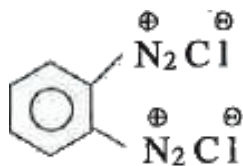
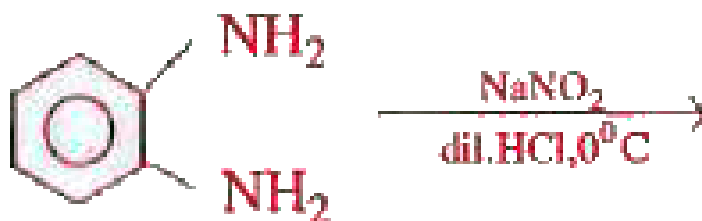
D.

Answer: B

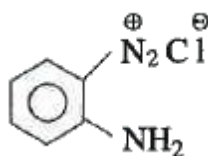


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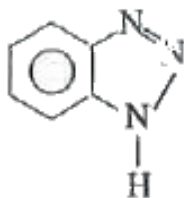
3. The major product of the reaction is



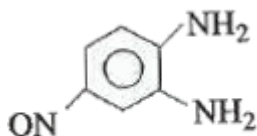
A.



B.



C.



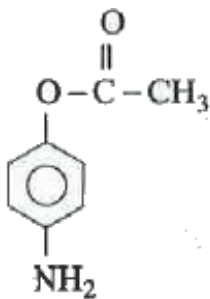
D.

Answer: C

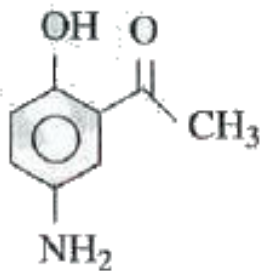


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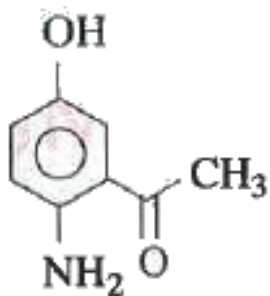
4. The reaction of p-aminophenol with one mole of acetyl chloride in presence of pyridine gives



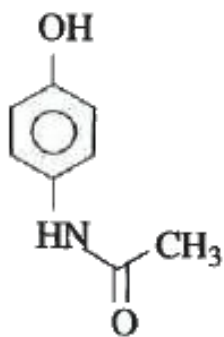
A.



B.



C.



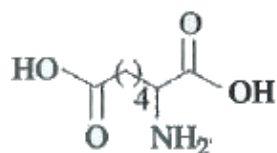
D.

Answer: D

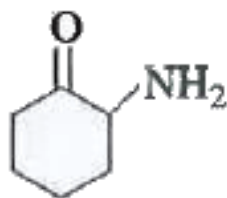


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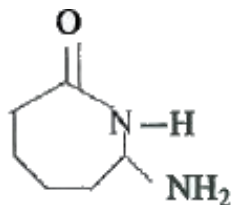
5. The major product (X) formed in the reaction



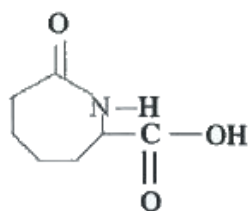
A.



B.



C.



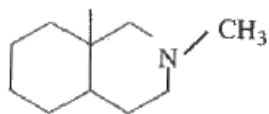
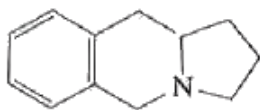
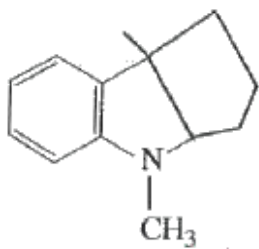
D.

Answer: A



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6. Only one of the following amines will lose its nitrogen atom as trimethyl amine by repeated Hofmann elimination reactions



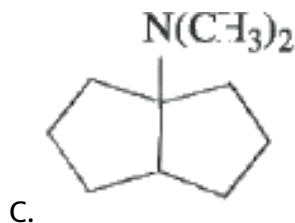
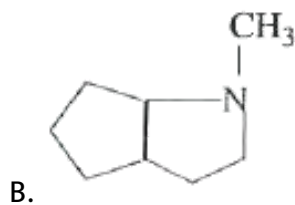
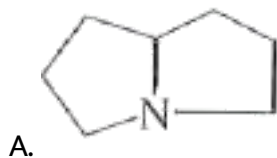
Answer: D

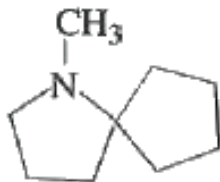


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7. The nitrogen atom in each of the following tertiary amines may be removed as trimethyl amine by repeated Hofmann elimination.

Which of the following amines requires the greater number of Hoffmann sequence to accomplish this ?





D.

Answer: A

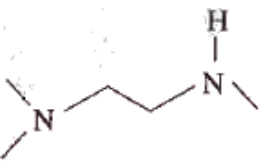


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8. The Hinsberg test of a $C_5H_{14}N_2$ compound produces a solid that is insoluble in 10% aq. NaOH. This solid derivative dissolves in 10% aq. sulphuric acid. Which of the following would best fit these facts ?



A.

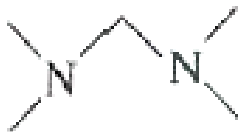


B.



C.

D.

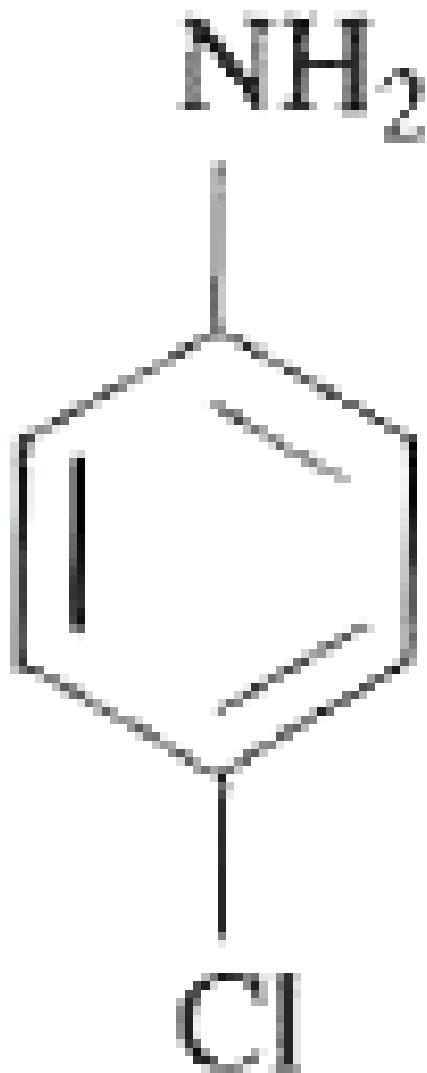


Answer: B



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9. Which of the following amines reacts most rapidly with

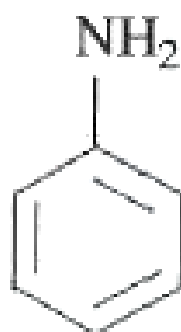




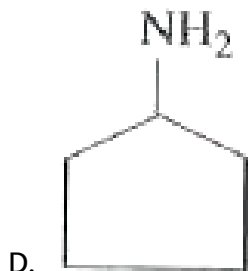
A.



B.



C.

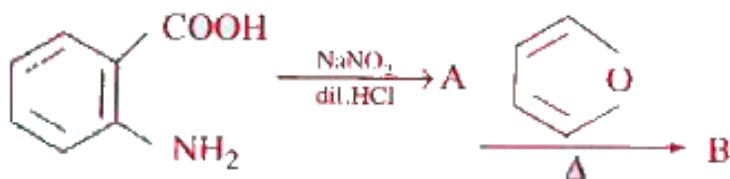


Answer: D

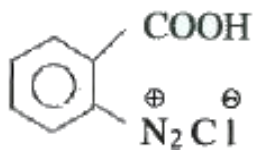
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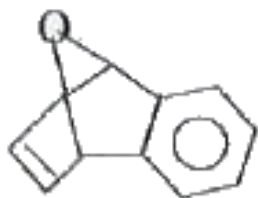
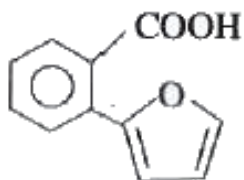
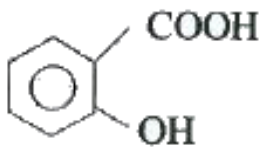
10.

Identify B :



A.



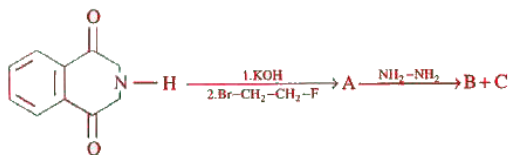


Answer: D

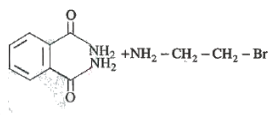
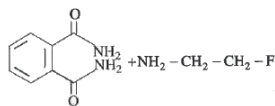
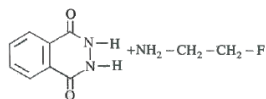
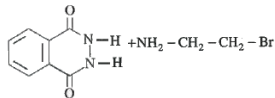


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11. Consider the following sequence of reactions



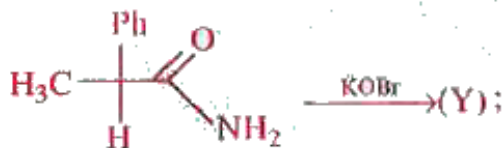
The products (B) and (C) are



Answer: B

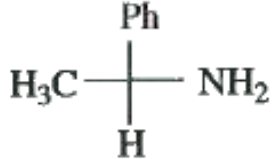


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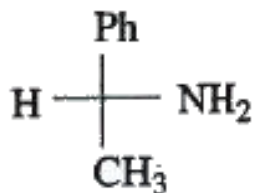


12.

Product (Y) of the reaction

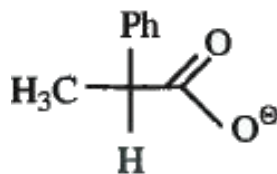


A.



B.

C. Mixture of (a) and (b)

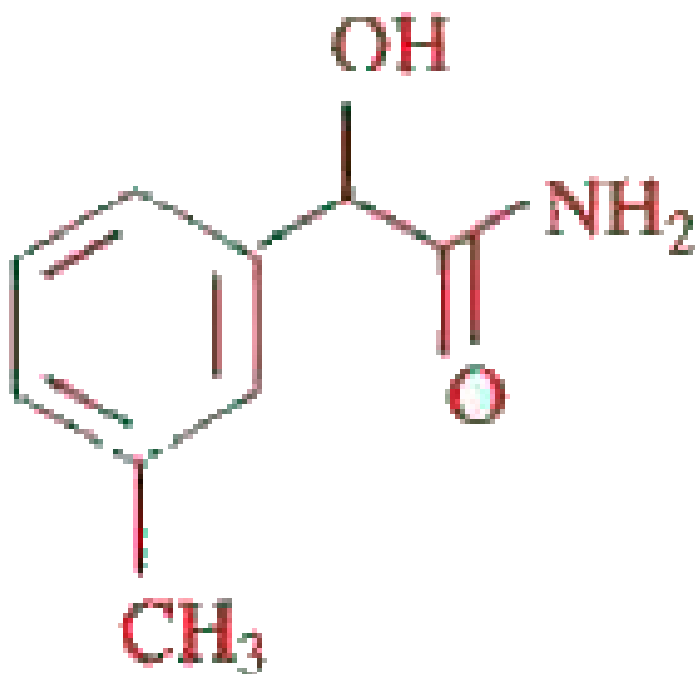


D.

Answer: A

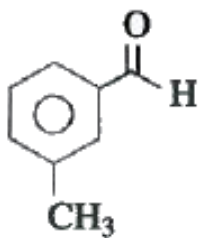


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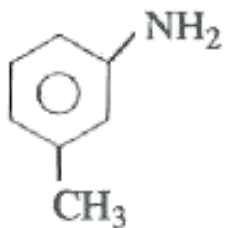


13.

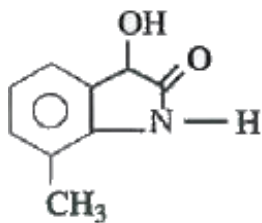
$\xrightarrow{\text{Br}_2 + \text{KOH}}$ Product. The final product is



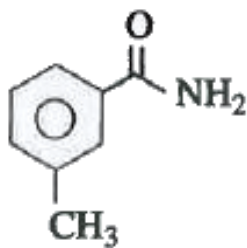
A. A.



B. *B.*



C. *C.*



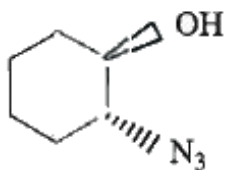
D. *D.*

Answer: A

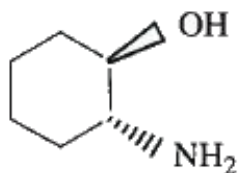


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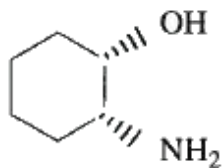
14. Identify the final product of following reaction



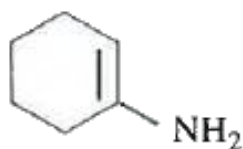
A.



B.



C.



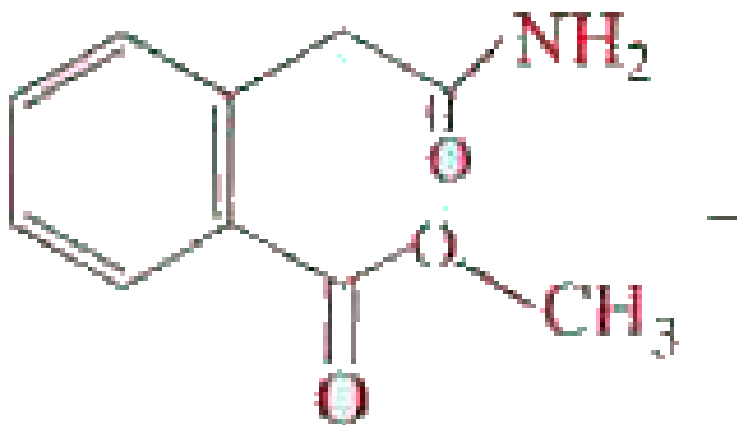
D.

Answer: B

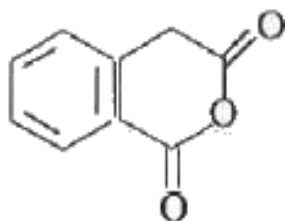


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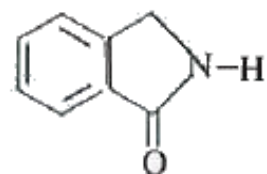
15. Consider the following sequence of reaction



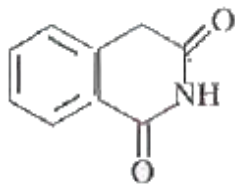
1. $\text{Br}_2 + \text{KOH}$
2. Δ → . The final product is



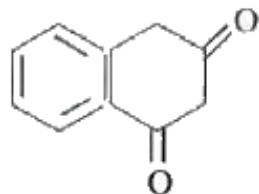
A.



B.



C.



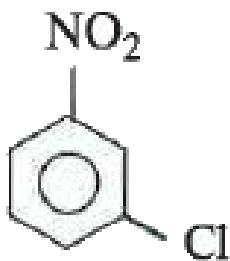
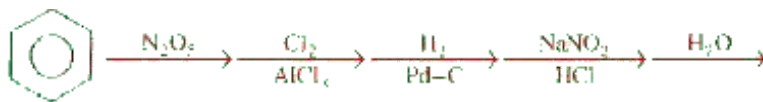
D.

Answer: B

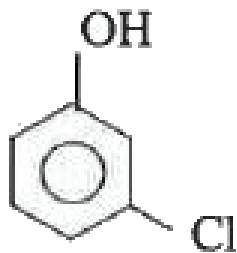


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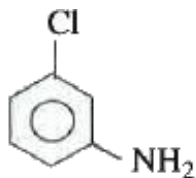
16. Identify the final product of following sequence of reaction



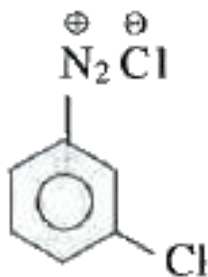
A.



B.



C.



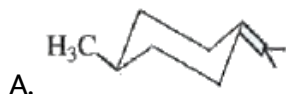
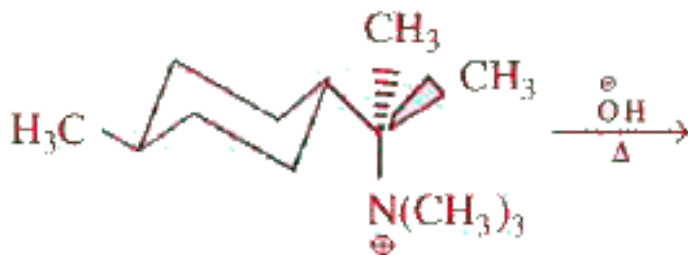
D.

Answer: B



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17. Identify the major product of following reaction :



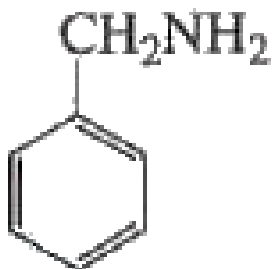
D. none of these

Answer: C

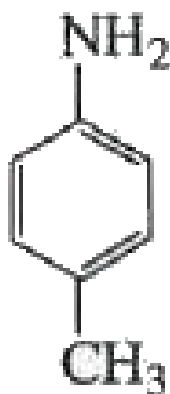


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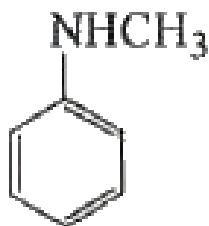
1. Which of the following amine(s) after diazotization will form deeply coloured azodye with alkaline solution of β -naphthol :



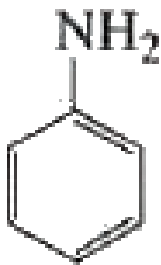
A.



B.



C.



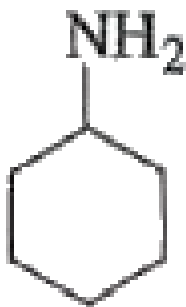
D.

Answer: B::D

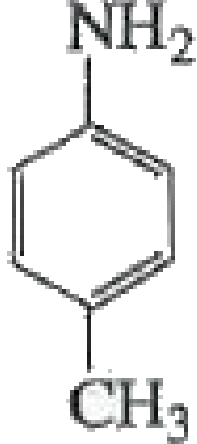


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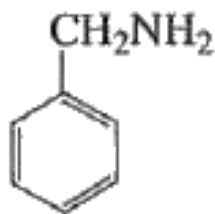
2. The amines that will give off N_2 upon treatment with $NaNO_2$ and dil. H_2SO_4 at 0 to $5^{\circ}C$ is(are)



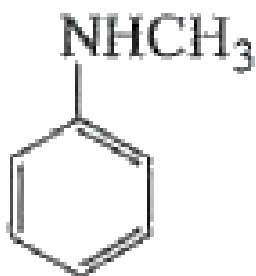
A.



B.



C.



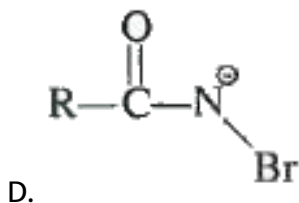
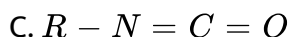
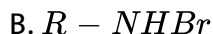
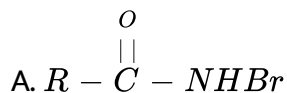
D.

Answer: A::C



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3. Reaction of $RCONH_2$ with a mixture of Br_2 and KOH gives RNH_2 as the main product. The intermediates involved in the reaction are

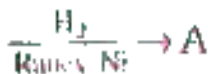
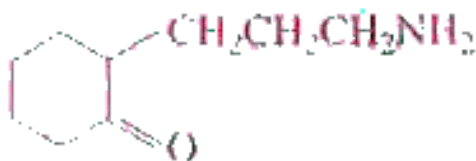


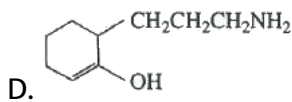
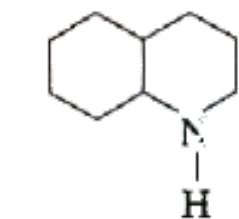
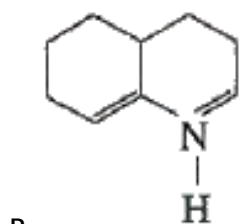
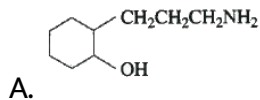
Answer: A::C::D



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4. Complete the following reaction





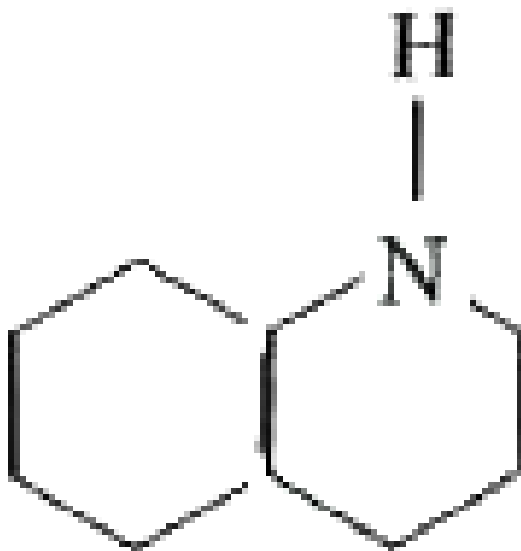
Answer: C



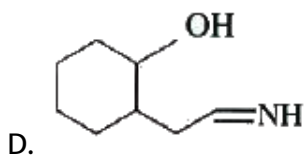
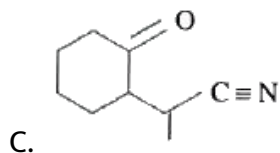
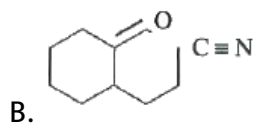
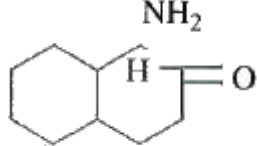
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1. An organic compound 'A' has molecular formula $C_9H_{13}NO$ and it can be resolved into enantiomers. A does not decolourise bromine water solution. A on refluxing with dilute H_2SO_4 , yields another resolvable compound $B(C_9H_{14}O_3)$ which gives effervescence with $NaHCO_3$. B on treatment with $NaBH_4$ yields $C(C_9H_{16}O_3)$ on heating with concentrated H_2SO_4 yields ester D ($C_6H_{14}O_2$).

Compound A on reduction with $LiAlH_4$ followed by treatment of H_2SO_4 yields following compound :



Find out structure of compound 'A'



Answer: B

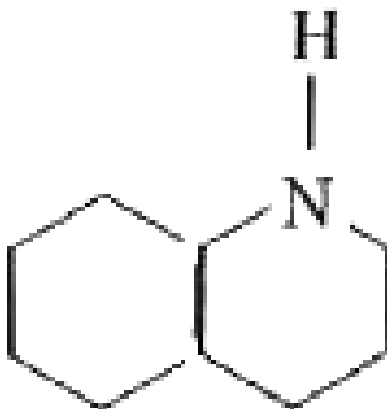


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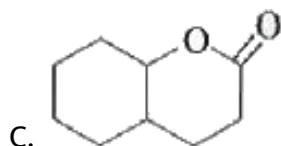
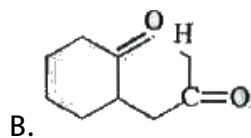
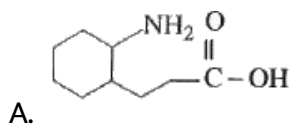
2. An organic compound 'A' has molecular formula $C_9H_{13}NO$ and it can be resolved into enantiomers. A does not decolourise bromine water solution. A on refluxing with dilute H_2SO_4 , yields another resolvable compound B ($C_9H_{14}O_3$) which gives effervescence with $NaHCO_3$. B on

treatment with NaBH_4 yields $\text{C}(\text{C}_9\text{H}_{16}\text{O}_3)$ on heating with concentrated H_2SO_4 yields ester D ($\text{C}_6\text{H}_{14}\text{O}_2$).

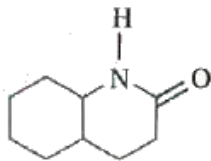
Compound A on reduction with LiAlH_4 followed by treatment of H_2SO_4 yields following compound :



The sweet smelling neutral compound D is



D.



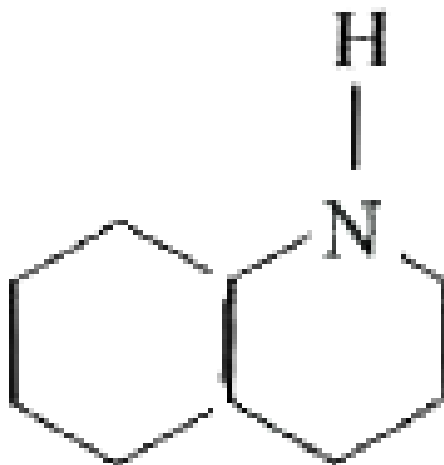
Answer: C



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3. An organic compound 'A' has molecular formula $C_9H_{13}NO$ and it can be resolved into enantiomers. A does not decolourise bromine water solution. A on refluxing with dilute H_2SO_4 , yields another resolvable compound $B(C_9H_{14}O_3)$ which gives effervescence with $NaHCO_3$. B on treatment with $NaBH_4$ yields $C(C_9H_{16}O_3)$ on heating with concentrated H_2SO_4 yields ester D ($C_6H_{14}O_2$).

Compound A on reduction with $LiAlH_4$ followed by treatment of H_2SO_4 yields following compound :



Due to reduction of optically pure 'B' two isomeric product 'C' form.

Isomeric product 'C' are :

- A. Enantiomers
- B. Diastereomers
- C. Position isomers
- D. Functional isomers

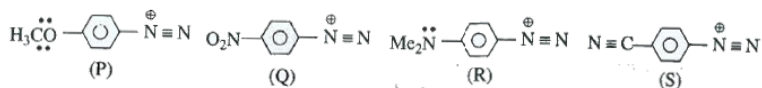
Answer: B



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1. when an primary aromatic amine is treated with $NaNO_2 + HCl$ at $0^\circ - 5^\circ C$, a diazonium salt is formed and the reaction is called diazo reaction. In this reaction mineral acid must be added to prevent the coupling reaction of diazonium salt with excess of aryl amine. Diazonium salt is highly useful in the synthesis of number of coloured dyes.

For the following diazonium ion the decreasing order of reactivity of these ion in azo-coupling reaction



A. $Q > S > R > P$

B. $Q > S > P > R$

C. $P > Q > R > S$

D. $S > R > Q > P$

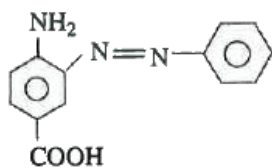
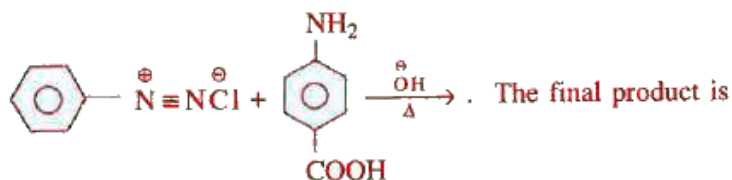
Answer: B



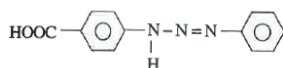
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2. when an primary aromatic amine is treated with $NaNO_2 + HCl$ at $0^\circ - 5^\circ C$, a diazonium salt is formed and the reaction is called diazo reaction. In this reaction mineral acid must be added to prevent the coupling reaction of diazonium salt with excess of aryl amine. Diazonium salt is highly useful in the synthesis of number of coloured dyes.

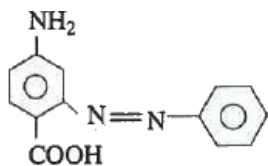
In the given reaction



A.

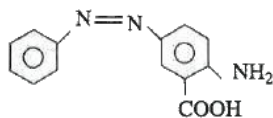


B.



C.

D.



Answer: A

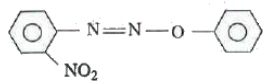


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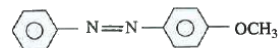
3. when an primay aromatic amine is treated with $NaNO_2 + HCl$ at $0^0 - 5^0C$, a diazonium salt is formed and the reaction is called diazo reaction. In this reaction mineral acid must be added to prevent the coupling reaction of diazonium salt with excess of aryl amine. Diazonium salt is highly useful in the synthesis of number of coloured dyes.

When 2, 4-dinitroaniline react with $NaNO_2 + HCl$ at 5^0C followed by reaction with anisole, a coloured compound is formed which can be given as

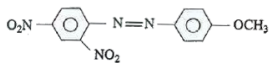
A.



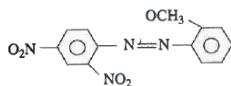
B.



C.



D.



Answer: C

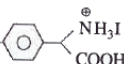
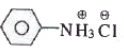
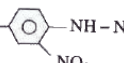


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Practice Sheet 6 Match The Following Questions

1. Match the following

COLUMN - I

- A) $\text{H}_2\text{N}-\text{NH}_3^+\text{Cl}^-$
- B) 
- C) 
- D) 

COLUMN - II

- p) Na extract of compound gives prussian blue colour with FeSO_4
- q) Positive FeCl_3 test
- r) White ppt. with AgNO_3
- s) react with aldehyde to form the corresponding hydrazone derivative



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2. Match the following

COLUMN - I

- A) $C_2H_5 - NH_2$
- B) $(C_2H_5)_2NH$
- C) $(C_2H_5)_3N$
- D) $C_6H_5NH_2$

COLUMN - II

- p) Reaction with $NaNO_2 + HCl$
- q) Reaction with $CHCl_3 + KOH$
- r) Formation of N-nitrosodiethyl amine with HNO_2
- s) Formation of triethyl ammonium nitroso with HNO_2



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Practice Sheet 6 Integer Answer Type Questions

1. How many aromatic (six membered carbocyclic) isomers possible for MFC_7H_9N .



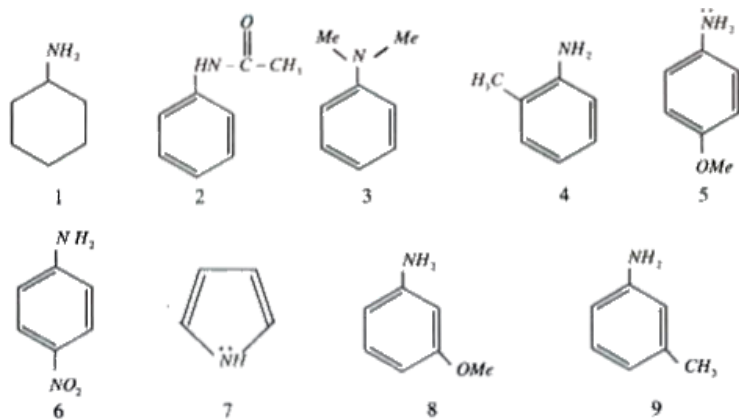
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2. What is the No. of isomers with pyridine nucleus possible for compounds having MFC_7H_9N ?



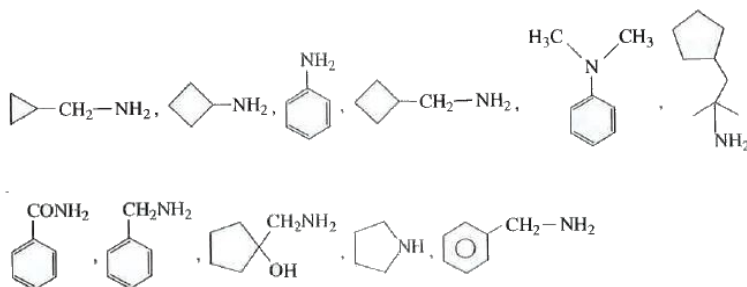
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3. Among the following compounds how many of them is more basic than aniline?



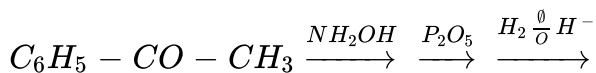
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4. How many of the below listed compounds on treatment with HNO_2 would go for ring expansion?



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5. The total number of organic products formed at the end of the reaction sequence is / are



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6. Urea reacts with Br₂ in dil HCl to liberate N₂. How many moles of bromine is required to completely react with one mole of urea?



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7. How many isomeric butanes are formed by the diazotization of *n*-Bu-NH₂?

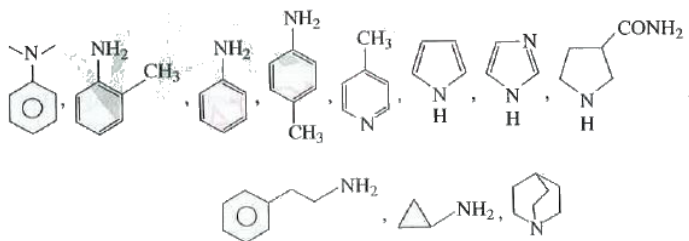


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8. How many moles of NaOH are consumed in the following Hofmann Bromamide reaction?

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9. How many of the following amines are more basic than aniline?



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