

## Multiple Choice Questions

[MHT-CET 2009]

Iso-propyl amine is a

- a) Primary amine    b) secondary amine    c) tertiary amine    d) quaternary amine

[MHT-CET 2010]

N-ethyl-N-methylpropan-1-amine is

- a) 1° amine    b) 2° amine    c) 3° amine    d) 4° amine

[MHT-CET 2019]

How many primary amines are possible for molecular formula  $C_3H_9N$ ?

- a) 4    b) 2    c) 1    d) 3

[MHT-CET 2020]

Nitrogen atom in amines is

- a)  $sp$  hybridised    b)  $dsp^2$  hybridised    c)  $sp^2$  hybridised    d)  $sp^3$  hybridised

Molecular formula  $C_2H_7N$  represents

- a) only 1° amine    b) only 2° amine  
c) 1° amine and 2° amine    d) 2° amine and 3° amine

When alkyl halide is boiled with large excess of alcoholic ammonia it forms

- a) secondary amine    b) tertiary amine  
c) primary amine    d) quaternary ammonium salt

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

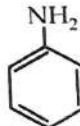
- a) 3    b) 2    c) 4    d) 1

[MHT-CET 2021]

Which among the following is a tertiary amine?

- a) 4-Bromobenzeneamine    b) N-ethyl-N-methyl propan-2-amine  
c) N-methylaniline    d) Phenyl methanamine

Which of the following is an example of secondary amine?

- a)  $(CH_3)_2N$     b)  $C_2H_5NH_2$     c)  $(C_2H_5)_2NH$     d) 

Which among following compounds is a primary amine?

- a) Ethyl methyl propyl amine    b) Hexamethylene diamine  
c) Diphenyl amine    d) N, N-Dimethyl aniline

Which among following compounds is a secondary amine?

- a) Hexane-1, 6-diamine    b) N, N-Dimethylbenzenamine  
c) N-Methylbenzenamine    d) Prop-2-en-1-amine

Which of the following is an example of primary amine?

- a) N-methyl aniline    b) N-phenylbenzenamine  
c) methyl phenylamine    d) Isopropyl amine

Which among the following compounds contains amino group?

- a) N-Phenylbenzenamine    b) 4-Bromoaniline  
c) N, N-Dimethylbenzenamine    d) N-Methylmethanamine

- tertiary amines have lowest boiling point amongst isomeric amines because they
- do not form H bonds
  - have highest molecular mass
  - are most basic in character
  - are more polar in nature.

### Nomenclature of amines

[MHT-CET 2004]

The IUPAC name of  $\text{H}_3\text{C}-\overset{\text{NH}_2}{\underset{|}{\text{CH}}}-\text{CH}_3$

- dimethyl amine
- 2-aminopropane
- isopropylamine
- 2-propanamine

[MHT-CET 2020]

IUPAC name of benzylamine is

- benzeneamine
- phenylethanamine
- phenylmethanamine
- N-Methylbenzenamine

IUPAC name of  $\text{CH}_3\text{N}(\text{C}_2\text{H}_5)_2$  is

- N, N-diethylmethanamine
- N-methyldiethanamine
- N-ethyl-N-methylethanamine
- N-methylethanamine

[MHT-CET 2022]

31. What is the IUPAC name of  $(\text{CH}_3)_2\text{N}-\text{CH}_3$  ?

- 2, 2-Dimethylmethanamine
- Trimethylamine
- N-Methyldimethanamine
- N, N-Dimethylmethanamine

### Preparation of amines

[MHT-CET 2005]

32. Acetonitrile on reducing gives

- propanamine
- methanamine
- ethanamine
- none of these

33.  $\text{CH}_3\text{Br} + \text{KCN (alc.)} \rightarrow \text{X} \xrightarrow[\text{Na/C}_2\text{H}_5\text{OH}]{\text{Reduction}} \text{Y}$ . What is Y in the series ?

- $\text{CH}_3\text{CN}$
- $\text{C}_2\text{H}_5\text{CN}$
- $\text{C}_2\text{H}_5\text{NH}_2$
- $\text{CH}_3\text{NH}_2$

[MHT-CET 2006]

34. An organic compound "A" having molecular formula  $\text{C}_2\text{H}_5\text{N}$  on reduction gave another compound B, upon treatment with nitrous acid "B" gave ethyl alcohol. On warming with chloroform and alcoholic KOH, it formed an offensive smelling compound "C". The compound "C" is

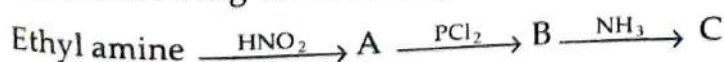
- $\text{CH}_3\text{CH}_2\text{NH}_2$
- $\text{CH}_3\text{CH}_2\text{N} \equiv \text{C}$
- $\text{CH}_3\text{C} \equiv \text{N}$
- $\text{CH}_3\text{CH}_2\text{OH}$

[MHT-CET 2009]

35. The compound that forms a yellow only liquid with nitrous acid is

- 2-methyl aniline
- methyl amine
- benzyl amine
- diethyl amine

36. In the following reaction sequence. Identify B.



- $\text{CH}_3\text{NH}_2$
- $\text{C}_2\text{H}_5\text{Cl}$
- $\text{CH}_3\text{CH}=\text{NH}$
- $(\text{CH}_3)_2\text{NH}_2$



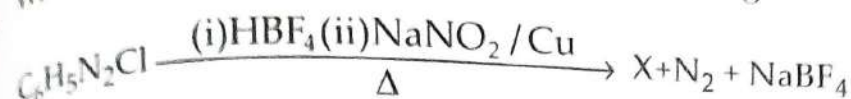
When propanamide is treated with bromine and aqueous sodium hydroxide, the compound formed is

- a) 1-propanamine    b) ethanamine    c) bromopropane    d) propene

Aniline reacts with bromine water at room temperature to give

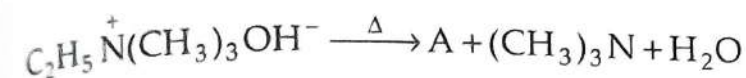
- a) 2, 4, 6-Tribromoaniline    b) Bromoaniline  
c) 4-Bromoaniline    d) 3-Bromoaniline

What is the product X obtained in the following reactions ?



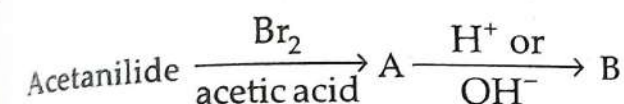
- a)  $\text{C}_6\text{H}_5\text{Cl}$     b)  $\text{C}_6\text{H}_5\text{F}$     c)  $\text{C}_6\text{H}_5\text{NO}_2$     d)  $\text{C}_6\text{H}_5\text{NH}_2$

Identify compound A in following reaction.



- a)  $\text{C}_6\text{H}_5\text{NH}_2$     b)  $\text{CH}_3\text{CH}_3$     c)  $\text{CH}_3\text{CH}_2\text{OH}$     d)  $\text{CH}_2=\text{CH}_2$

Identify 'A' and 'B' in following reaction respectively.



- a) 4-Bromoaniline and 4-Bromoacetanilide  
b) p-Bromoacetanilide and p-Bromoaniline  
c) Aniline and p-Bromoacetanilide  
d) Aniline and p-Bromoaniline

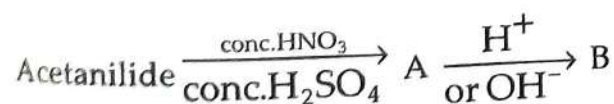
50. Which of the following reactions does NOT yield an amine ?

- a)  $\text{R-CN} + \text{H}_2\text{O} \xrightarrow{\text{H}^+}$     b)  $\text{R-X} + \text{NH}_3(\text{alco.}) \longrightarrow$   
c)  $\text{R-CH=NOH} \xrightarrow[\text{C}_2\text{H}_5\text{OH}]{\text{Na}}$     d)  $\text{R-NO}_2 \xrightarrow{\text{Sn/conc HCl}}$

51. Which of the following compounds is obtained when quaternary ammonium hydroxide is strongly heated ?

- a) Alkyne    b) Amide    c) Alkene    d) Alkane

52. Identify product B in following reaction.



- a) O-Nitroacetanilide    b) p-Nitroaniline  
c) Nitrobenzene    d) Aniline

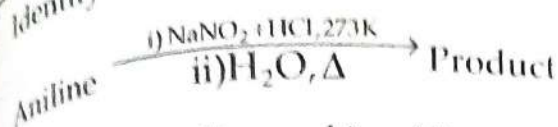
53. Which of the following amines cannot be prepared by Gabriel phthalimide synthesis?

- a) Isopropylamine    b) Ethylamine    c) sec-Butylamine    d) Aniline

54. Which of the following reagents is used in Hoffmann elimination reaction of amines ?

- a)  $\text{CHCl}_3 + \text{KOH}$     b)  $\text{CH}_3\text{COCl}$     c)  $\text{Ag}_2\text{O}/\text{H}_2\text{O}, \Delta$     d)  $\text{NaNO}_2 + \text{HCl}$

Identify the product obtained in the following reaction.



- a) m-Nitroaniline      b) o-Nitroaniline      c) Phenol      d) p-Nitroaniline

Which of the following amines reacts with nitrous acid to form alcohol?

- a) Diphenyl amine      b) Trimethyl amine  
c) Methyl phenyl amine      d) Isopropyl amine

What is the number of moles of H atoms required to prepare one mole ethylamine from one mole acetamide?

- a) 2      b) 4      c) 3      d) 1

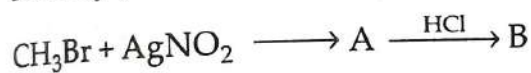
Which among following statements is NOT true about Gabriel phthalimide synthesis?

- a) In this method formation of N-alkyl phthalimide is involved.  
b) In this method sodium phthalate is also obtained  
c) This method is useful for preparation of aromatic amines  
d) In this method potassium salt of phthalimide is formed as an intermediate product.

How many molecules of methyl iodide are required to obtain tetramethyl ammonium iodide from dimethyl amine?

- a) 1      b) 3      c) 2      d) 4

Identify product 'B' in following reaction.



- a)  $\text{CH}_3\text{NO}_2$       b)  $\text{CH}_3\text{NH}_2$       c)  $\text{CH}_3\text{Cl}$       d)  $\text{CH}_3\text{OH}$

[MHT-CET 2022]

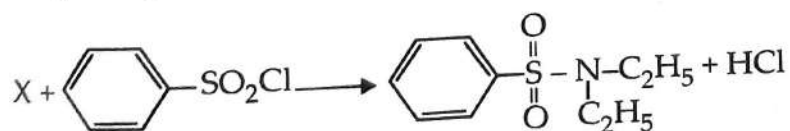
Identify Hinsberg reagent from following

- a) Benzoyl chloride      b) Benzyl chloride  
c) Benzene diazonium chloride      d) Benzene sulphonyl chloride

The reagent used in Hofmann elimination reaction is

- a)  $\text{LiAlH}_4$       b)  $\text{Na-Hg/H}_2\text{O}$       c)  $\text{HNO}_2$       d) Moist  $\text{Ag}_2\text{O}$

Identify compound X in the following reaction.



- a)  $\text{CH}_3\text{-NH-C}_2\text{H}_5$       b)  $\text{C}_2\text{H}_5\text{-NH}_2$       c)  $(\text{C}_2\text{H}_5)_2\text{-NH}$       d)  $(\text{C}_2\text{H}_5)_3\text{-N}$

The end product in Hofmann's exhaustive methylation of amines is

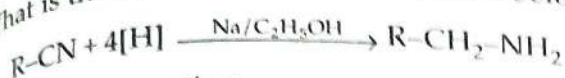
- a) Quaternary ammonium halide      b) Secondary amine  
c) Primary amine      d) Tertiary amine

Which of the following conversions needs the reagent  $\text{Sn/HCl}$ ?

- a)  $\text{R-NO}_2 \longrightarrow \text{R-NH}_2 + 2\text{H}_2\text{O}$       b)  $\text{R-CO-NH}_2 \longrightarrow \text{R-CH}_2 + \text{NH}_2$   
c)  $\text{R-C}\equiv\text{N} \longrightarrow \text{R-CH}_2 + \text{NH}_2$       d)  $\text{R-CO-NH}_2 \longrightarrow \text{R-NH}_2$



What is the name of the reaction stated below ?



a) Mendius reaction

b) Hofmann bromamide degradation

c) Gabriel phthalimide synthesis

d) Ammonolysis of alkyl halides

What is the number of stages involved in Gabriel phthalimide synthesis reactions ?

a) 3

b) 2

c) 1

d) 4

Which statement from following is NOT correct when acetamide reacts with  $LiAlH_4$  / ether ?

a) Primary amine is obtained

b) Molar mass of product obtained is greater than acetamide

c) Reduction of acetamide occurs

d) Number of carbon atoms of product is same as in acetamide

### Physical and Chemical properties of amines

[MHT-CET 2004]

Primary amines ( $R-NH_2$ ) react with nitrous acid to give

a)  $R-NH_3^+NO_2^-$

b)  $ROH$

c)  $ROR$

d) None of these

[MHT-CET 2005]

Complete the following reaction,  $R-NH_2 + H_2SO_4 \rightarrow$

a)  $[R-NH_3]^+HSO_4^-$

b)  $[R-NH_3]_2^+SO_4^{2-}$

c)  $R-NH_2 \cdot H_2SO_4$

d) No reaction

[MHT-CET 2006]

The decreasing order of basic character of the three amines and ammonia is

a)  $NH_3 > CH_3CH_2 > C_2H_5NH_2 > C_6H_5NH_2$

b)  $C_2H_5NH_2 > CH_3NH_2 > NH_3 > C_6H_5NH_2$

c)  $C_6H_5NH_2 > C_2H_5NH_2 > CH_3NH_2 > NH_3$

d)  $CH_3NH_2 > C_2H_5NH_2 > C_6H_5NH_2 > NH_3$

[MHT-CET 2007]

Isopropyl amine with excess of acetyl chloride will give

a)  $(CH_3CO)_2N-CH-(CH_3)_2$

b)  $(CH_3)_2CH-\underset{\underset{H}{|}}{N}-COCH_3$

c)  $(CH_3)_2CHN(COCH_3)_2$

d)  $CH_2CH_2CH_2-\underset{\underset{H}{|}}{N}-COCH_3$

A mixture of ethyl amine, chloroform and alcoholic KOH on heating gives

a) alkyl cyanide

b) ethyl cyanate

c) ethyl isocyanide

d) ethyl isocyanate

[MHT-CET 2008]

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

a) benzyl alcohol

b) benzaldehyde

c) benzonitrile

d) benzyl isocyanide

When acetamide is treated with  $Br_2$  and caustic soda, the product formed is

a) N-bromamide

b) bromoacetic acid

c) methanamine

d) ethanamine

104. Which of the following amines is most basic in nature ?

- a) 2, 4 -Dimethylaniline  
b) 2, 4 -Dinitroaniline  
c) 2, 4 -Dichloroaniline  
d) 2, 4 -Dibromoaniline

105. Identify product B in following reaction.

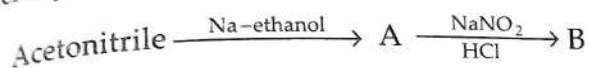


- a) Nitrobenzene  
b) Benzyl iodide  
c) Iodobenzene  
d) Benzenediazonium iodide

106. Which group from following decreases the basic strength in substituted aniline ?

- a)  $-\text{NH}_2$   
b)  $-\text{OCH}_3$   
c)  $-\text{CH}_3$   
d)  $-\text{C}_6\text{H}_5$

107. Identify the product B in following reaction.



- a) Sodium methanoate  
b) Sodium ethanoate  
c) Ethanamine  
d) Ethanol

108. Aniline on reaction with Bromine water at room temperature gives.

- a) m-Bromoaniline  
b) 2, 4, 6-T Tribromoaniline  
c) p-Bromoaniline  
d) o-Bromoniline

109. Which among the following decreasing orders of boiling points is correct for amines ?

- a) n-Butylamine > Ethyl dimethylamine > Diethylamine  
b) n-Butylamine > Diethylamine > Ethyl dimethylamine  
c) Diethylamine > Ethyl dimethylamine > n-Butylamine  
d) Ethyl dimethylamine > Diethylamine > n-Butylamine

110. In aqueous phase the order of basic strength of alkylamine is

- a)  $(\text{CH}_3)_2\text{NH} > (\text{CH}_3)_2\text{N} > \text{CH}_3\text{NH}_2 > \text{NH}_3$   
b)  $(\text{CH}_3)_2\text{NH} > (\text{CH}_3)_2\text{NH}_2 > (\text{CH}_3)_3\text{N} > \text{NH}_3$   
c)  $(\text{CH}_3)_2\text{N} > (\text{CH}_3)_2\text{NH} > \text{CH}_3\text{NH}_2 > \text{NH}_3$   
d)  $\text{CH}_3\text{NH}_2 > (\text{CH}_3)_2\text{NH} > (\text{CH}_3)_3\text{N} > \text{NH}_3$

111. Which of the following compounds has highest boiling point ?

- a)  $\text{CH}_3(\text{CH}_2)_2\text{CH}_2\text{OH}$   
b)  $\text{C}_2\text{H}_5\text{CH}(\text{CH}_2)_2$   
c)  $\text{CH}_3(\text{CH}_2)_2\text{CH}_2\text{NH}_2$   
d)  $(\text{C}_2\text{H}_5)_2\text{NH}$

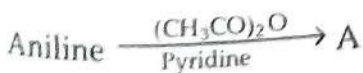
112. Among the following isomeric amines, the amine having highest boiling point is

- a) ethyldimethylamine  
b) tert-butylamine  
c) diethylamine  
d) n-butylamine

113. Identify the product obtained when benzamide is treated with bromine and aqueous sodium hydroxide.

- a) Aniline  
b) Phenol  
c) Benzyl alcohol  
d) Bromobenzene

114. Identify the product 'A' in the following reaction.






- a) Acentanilide  
b) Sulphanilic acid  
c) Benzenediazonium chloride  
d) p-nitroacentanilide



What is the product formed when aniline is treated with  $\text{NaNO}_2 + \text{HCl}$  previous to hydrolysis?

- a) Phenol  
b) Benzene  
c) Benzene diazonium chloride  
d) Phenol +  $\text{N}_2 \uparrow$





Which one of the following is an aromatic amine?

- a)   $\text{CH}_2\text{CH}_2\text{NH}_2$   
b)  $\text{C}_5\text{H}_9\text{NH}_2$   
c)   
d) 

What is the product formed when benzene diazonium chloride reacts with ethanol?

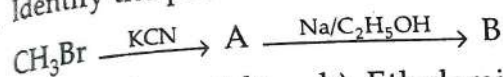
- a) Ethyl benzene  
b) Benzene  
c) Phenol  
d) Benzyl alcohol

Which among the following compounds is NOT prepared by Sandmeyer's reaction?

- a)   
b)   
c)   
d) 

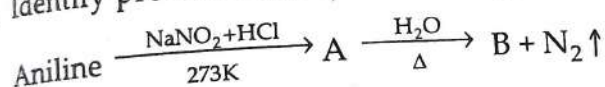
[MHT-CET 2023]

Identify the product 'B' in the following sequence of reactions.



- a) Methyl cyanide  
b) Ethylamine  
c) Methylamine  
d) Ethyl cyanide

Identify product B in the following reaction.

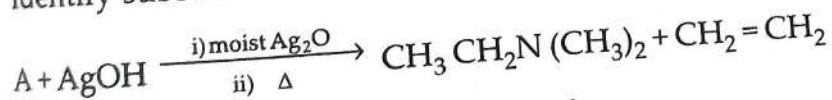


- a) Chlorobenzene  
b) Benzyl alcohol  
c) Benzenediazonium chloride  
d) Phenol

Select the correct increasing order of boiling points of alcohols, amines and carboxylic acids of comparable molar mass from the following.

- a) Alcohols < Amines < Carboxylic acids  
b) Amines < Carboxylic acids < Alcohols  
c) Amines < Alcohols < Carboxylic acids  
d) Carboxylic acids < Alcohols < Amines

Identify substrate A in the following reaction.



- a) Diethyldimethyl ammonium halide  
b) Ethyltrimethyl ammonium halide  
c) Diethyldimethyl ammonium hydroxide  
d) Ethyltrimethyl ammonium hydroxide

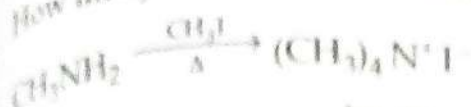
Which of the following reaction is Hofmann's elimination?

- a)  $\text{RCONH}_2 \xrightarrow{\text{Br}_2, \text{KOH(aq)}} \text{RNH}_2$   
b)  $\text{R-NH}_2 \xrightarrow{\text{R-X excess}} \text{R}_4\text{NX}$   
c)  $\text{R}_4\text{-NX} \xrightarrow[\Delta]{\text{Ag}_2\text{O(moist)}} \text{Alkene} + \text{R}_3\text{N}$   
d)  $\text{RCN} \xrightarrow{\text{Na/C}_2\text{H}_5\text{OH}} \text{RCH}_2\text{NH}_2$

Identify 'A' in the following reaction:  $\text{A} \xrightarrow[\text{ether}]{\text{LiAlH}_4} \text{Ethanamine}$

- a)  $\text{C}_2\text{H}_5\text{CN}$   
b)  $\text{CH}_3\text{CONH}_2$   
c)  $\text{C}_2\text{H}_5\text{CONH}_2$   
d)  $\text{CH}_3\text{NO}_2$

How many moles of iodomethane are consumed in the following conversion?



- a) Four                      b) Three                      c) Two                      d) One

Which of the following isomers has highest boiling point?

- a) tert-Butylamine      b) Ethyldimethylamine  
c) Diethylamine          d) n-Butylamine

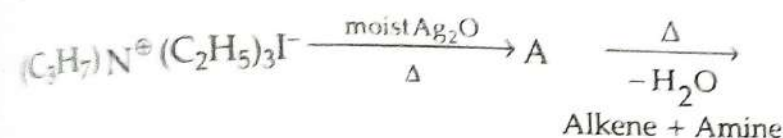
Which among the following has highest basic strength?

- a) Ammonia                  b) Ethylamine  
c) Diethylamine              d) Triethylamine

Identify an aromatic, mixed, 3° amine among the following compounds.

- a)  $\text{C}_6\text{H}_5\text{NHC}_2\text{H}_5$       b)  $(\text{C}_2\text{H}_5)_3\text{N}$       c)  $(\text{CH}_3)_3\text{N}$       d)  $\text{C}_6\text{H}_5\text{N}(\text{CH}_3)_2$

Identify the alkene obtained as major product in the following Hofmann elimination reaction.



- a) Propene                      b) Ethene                      c) But-1-ene                      d) But-2-ene

Which of the following does not have intermolecular hydrogen bonding?

- a) Cyclohexylamine      b) Allylamine                      c) Trimethylamine      d) Diphenylamine

Identify the number of moles of ethene obtained when n moles of N, N, N-triethylpropylammonium iodide is treated with moist  $\text{Ag}_2\text{O}$  and then heated.

- a) n                                  b) 2n                                  c) 3n                                  d) 4n

What is the formula of Hinsberg's reagent?

- a)  $\text{C}_6\text{H}_5\text{SOCl}_2$                       b)  $\text{C}_2\text{H}_5\text{SO}_2\text{Cl}$                       c)  $\text{C}_6\text{H}_5\text{SO}_2\text{Cl}$                       d)  $\text{C}_2\text{H}_5\text{CrOCl}_2$

How many isomers of  $\text{C}_4\text{H}_{11}\text{N}$  are secondary amines?

- a) One                                  b) Two                                  c) Three                                  d) Four

What is IUPAC name of Ethylmethylisopropylamine?

- a) N-Methyl-N-isopropylethanamine      b) N-Ethyl-N-methyl propan-1-amine  
c) N-Ethyl-N-methylpropan-2-amine      d) N-Ethyl-N-isopropylmethanamine

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Given below are two statements :

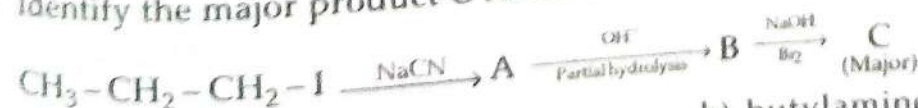
**Statement I :** Aniline does not undergo Friedel Crafts alkylation reaction

**Statement II :** Aniline can not be prepared through Gabriel synthesis.

In the light of the above statements, choose the correct answer from the options given below :

- a) Both statement I and statement II are true.  
b) Both statement I and Statement II are false.  
c) Statement I is correct but statement II is false  
d) Statement I is incorrect but statement II is true

Identify the major product C formed in the following reaction sequence:



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- a) propylamine                      b) butylamine  
c) butanamide                      d)  $\alpha$ -bromobutanoic acid