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EdLoop JEE

CHEMISTRY · JEE MAIN

Amines & Nitrogen Compounds

Previous Year Questions with answers

220 questions · **160** papers · **2002–2026** · newest paper first

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What is in this PDF: every Amines & Nitrogen Compounds question we hold from past JEE Main and AIEEE papers, with its options and answer. Where an answer comes from a source other than the official final key, it says so next to the answer.

Step-by-step solutions for every question are free in the EdLoop JEE app (Google Play) and on app.edloop.in. More chapters: pyq.edloop.in/free-pdfs/

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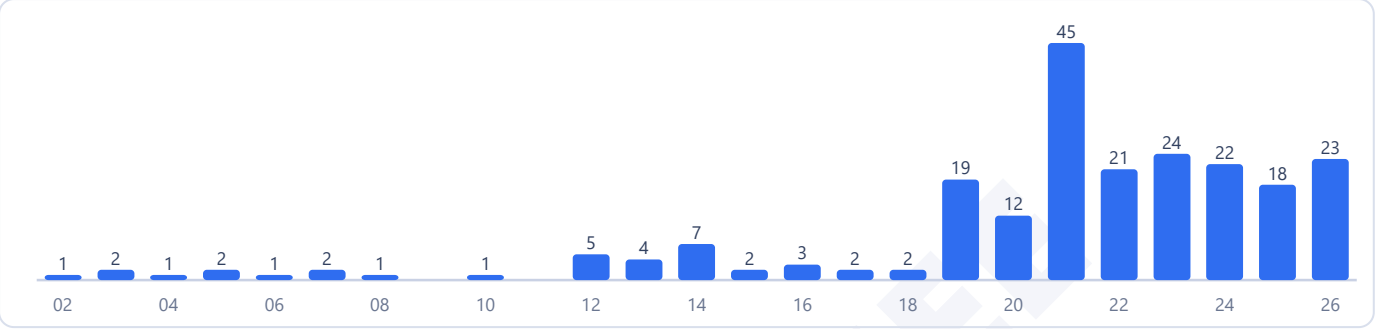
Chapter at a glance

4%	220	130 of 162	196 / 24
of Chemistry questions, 2019–2026	questions, 2002–2026	papers asked it, 2019–2026	MCQ / numerical, 2002–2026

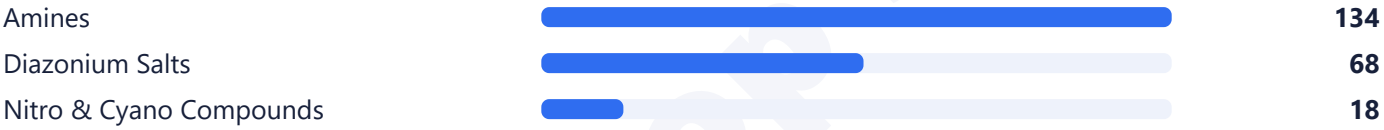
Trend. Steady: 1.1 questions per paper in 2024–2026 against 1.2 in 2019–2023.

Questions per year



Counts are the questions we hold: 220 in 160 papers. 2 questions in this chapter came back in more than one paper.

Most-asked topics in this chapter (2002–2026)



How often it comes up

Amines and nitrogen compounds covers basicity and diazonium transformations under Unit 18: Organic Compounds Containing Nitrogen in the Class 12 curriculum, holding rank 9 of 31 chapters with a 4.0% share of the chemistry section. In the 2019 to 2026 exam cycle, Amines & Nitrogen Compounds produced 184 questions across 162 exam papers, delivering 4.0% of the chemistry section and holding rank 9 of 31 chapters. During the 2002 to 2018 period, it accounted for 36 questions across 38 papers with a 2.7% share. Across recent 2024 to 2026 sessions, it yielded 63 questions across 58 papers, accounting for a 4.1% share. Comparing 2002 to 2018 against 2024 to 2026, the trend is up, whereas comparing 2019 to 2026 against 2024 to 2026, the testing share has remained about the same.

The topic has appeared every year from 2019 to 2026. Across 2019 to 2026, it averaged 1.1 questions per paper, identical to the 1.1 questions per paper observed across 2024 to 2026. Examiners included 24 numerical answer questions between 2019 and 2026, frequently involving reaction yields, molar mass ratios, or nitrogen percentages.

Most-asked topics

The syllabus organizes across three fundamental topics:

- Amines: The largest topic with 134 total questions (111 in 2019 to 2026), evaluated continuously through 2026. Major areas evaluate aqueous basicity sequences (interplay of inductive, hydration, and steric effects), Hinsberg reagent (benzenesulfonyl chloride) distinguishing primary, secondary, and tertiary amines, carbylamine test for primary amines, acylation (protecting amino groups during bromination or nitration of aniline), and Gabriel phthalimide synthesis.
- Diazonium Salts: Produced 68 total questions (57 in 2019 to 2026), tested through 2026. Focuses on diazotization of aniline under ice-cold conditions, Sandmeyer and Gattermann reactions for halobenzenes, replacement of the diazonium group by fluoride (Balz-Schiemann), iodide, cyanide, or hydrogen (hypophosphorous acid or ethanol), and azo dye coupling with phenol or beta-naphthol in alkaline conditions.

- Nitro & Cyano Compounds: Generated 18 total questions (16 in 2019 to 2026), active through 2026. Centers on selective reduction of nitro groups (ammonium sulfide Zinin reduction), catalytic hydrogenation of nitriles to primary amines, and acidic versus alkaline hydrolysis of alkyl cyanides and isocyanides.

What the questions look like

Examiners regularly evaluate reaction sequences revolving around aniline. A typical problem begins with nitrobenzene, reduces it with tin or iron in hydrochloric acid to aniline, protects the amino group with acetic anhydride to prevent polybromination, carries out monobromination at the para position, and hydrolyzes the anilide back to para-bromoaniline.

Diazonium problems frequently test synthetic routes to meta-substituted aromatics that cannot be prepared by direct electrophilic aromatic substitution, such as converting toluene via nitration, reduction, diazotization, and Sandmeyer reaction into 3,5-dibromotoluene.

How to practise it

Mastering nitrogen chemistry requires memorizing diagnostic tests and protecting strategies:

1. Memorize aqueous basicity orders: In aqueous solution, ethyl-substituted amines follow secondary > tertiary > primary > ammonia; methyl-substituted amines follow secondary > primary > tertiary > ammonia due to steric hindrance and hydration energies. 2. Master the Hinsberg test: Primary amines react with benzenesulfonyl chloride to give sulfonamides with an acidic N–H hydrogen, which dissolve in aqueous potassium hydroxide; secondary amines give sulfonamides without an acidic hydrogen, remaining insoluble in alkali; tertiary amines do not react. 3. Understand Gabriel phthalimide constraints: It prepares pure primary aliphatic amines exclusively; aryl halides cannot undergo the necessary SN2 displacement on the phthalimide anion, so aniline cannot be prepared this way. 4. Note Hofmann bromamide degradation: Treats an amide with bromine and alkali, releasing a primary amine containing exactly one fewer carbon atom via an isocyanate intermediate. 5. Review diazonium replacements: H_3PO_2 or CH_3CH_2OH reduces the diazonium group to a hydrogen atom, providing a classic method for removing an amino directing group from an aromatic ring.

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Q1 JEE Main 2026 · 8 Apr · Shift 2 MCQ

Which statements are **True** ?

A. In Hoffmann bromamide degradation, 4 moles of NaOH and 2 moles of Br_2 are consumed per mole of an amide

B. Hoffmann bromamide reaction is not given by alkyl amides.

C. Primary amines can be synthesized by Hoffmann bromamide degradation.

D. Secondary amide on reaction with Br_2 and NaOH will give secondary amine.

E. The by-products of Hoffmann degradation are Na_2CO_3, NaBr and H_2O.

Choose the **correct** answer from the options given below :

(A) A, C and E only
(B) B, C and D only
(C) C and E only
(D) C, D and E only

Answer: (C) C and E only · Official NTA final key

Q2 JEE Main 2026 · 6 Apr · Shift 1 Numerical

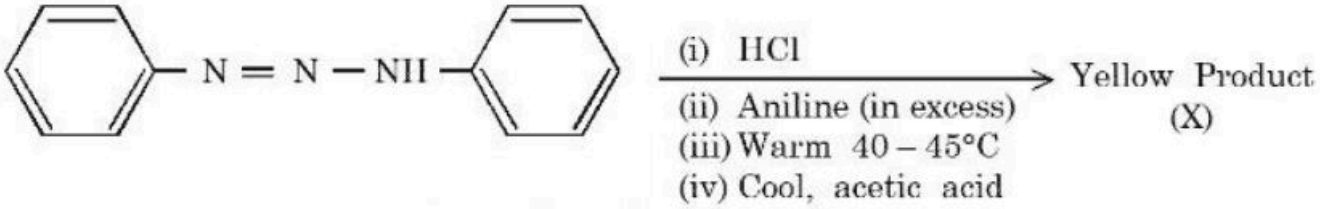
Consider the following sequence of reactions.

(see the figure above)

The percentage of nitrogen in the yellow product (X) formed is _____ %. (Nearest Integer)
(Given Molar mass in g mol^{-1} H:1, C:12, N:14)

Inscript

Consider the following sequence of reactions.



The percentage of nitrogen in the yellow product (X) formed is _____%.
(Nearest Integer)
(Given Molar mass in g mol^{-1} H:1, C:12, N:14)

Numerical value type: the answer is a number.

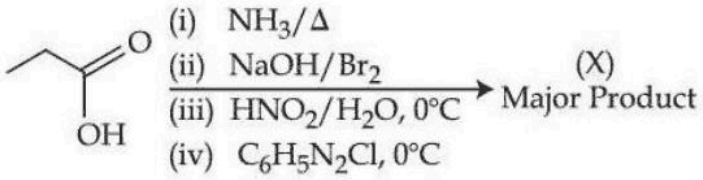
Answer: 21. · Official NTA final key

Q3 JEE Main 2026 · 6 Apr · Shift 2 MCQ

Consider the following organic reaction sequence. Choose the final product (X) from the following (consider the major product in all intermediate reactions)

(see the figure above)

Consider the following organic reaction sequence. Choose the final product (X) from the following (consider the major product in all intermediate reactions)



Options :

6911214315. Benzene

6911214316. Phenol

6911214317. Propanol

6911214318. Chlorobenzene

(A) Benzene
(B) Phenol
(C) Propanol
(D) Chlorobenzene

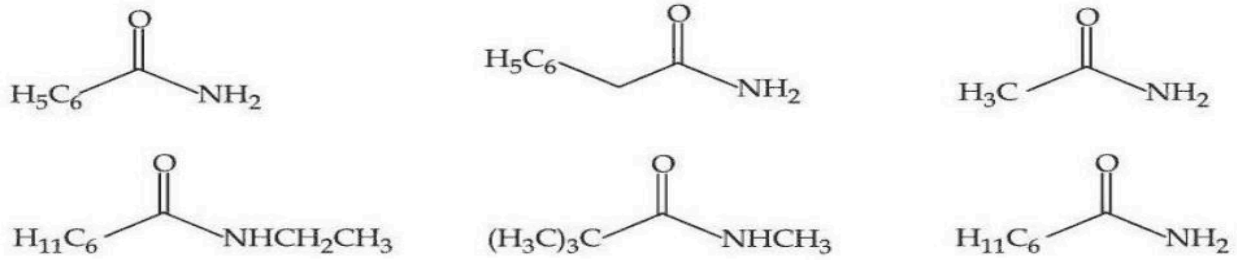
Answer: (A) Benzene · Official NTA final key

Q4 JEE Main 2026 · 6 Apr · Shift 2 MCQ

The number of compounds from the following which can undergo reaction with Br_2/KOH (alcoholic) to give respective products and these respective products can also be obtained separately by Gabriel phthalimide reaction is :

(see the figure above)

The number of compounds from the following which can undergo reaction with Br_2/KOH (alcoholic) to give respective products and these respective products can also be obtained separately by Gabriel phthalimide reaction is :



Options :

6911214319. 5

6911214320. 4

6911214321. 3

6911214322. 6

(A) 5

(B) 4

(C) 3

(D) 6

Answer: (C) 3 · Official NTA final key

Q5 JEE Main 2026 · 5 Apr · Shift 1 MCQ

Benzyl isocyanide can be obtained from

A. *(see the figure above)*

B. *(see the figure above)*

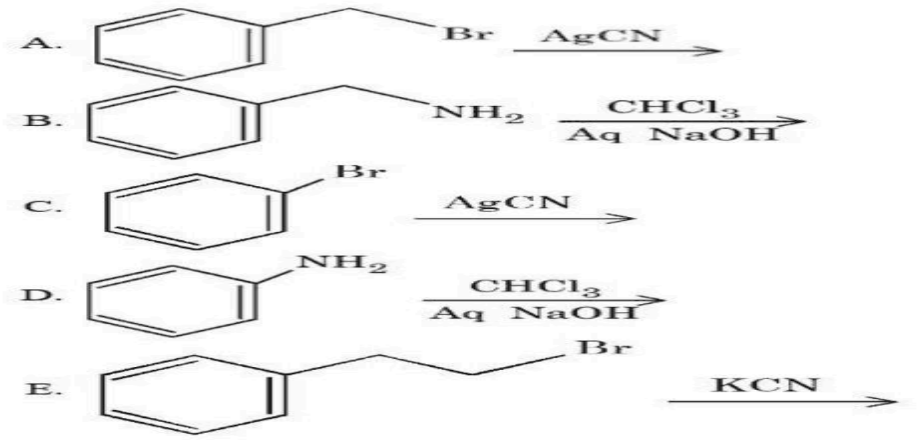
C. *(see the figure above)*

D. *(see the figure above)*

E. *(see the figure above)*

Choose the correct answer from the options given below:

Benzyl isocyanide can be obtained from



Choose the correct answer from the options given below:

Options :

6952781251. A and B Only

6952781252. A and C Only

6952781253. B and D Only

6952781254. D and E Only

(A) A and B Only

(B) A and C Only

(C) B and D Only

(D) D and E Only

Answer: (A) A and B Only · Official NTA final key

Q6 JEE Main 2026 · 5 Apr · Shift 1 MCQ

Identify the **incorrect** statements.

A. *(see the figure above)* is a stronger base than *(see the figure above)*

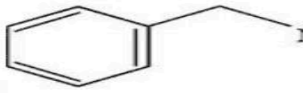
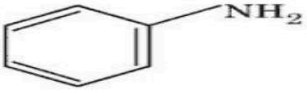
B. *(see the figure above)* can be synthesized by Gabriel phthalimide synthesis.

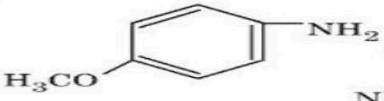
C. *(see the figure above)* $\xrightarrow{Br_2,\ NaOH}$ primary aromatic amine

D. *(see the figure above)* $\xrightarrow[(ii)\ \Delta]{(i)\ NaNO_2,\ HCl, 0^\circ C}$ product will dissolve in NaOH

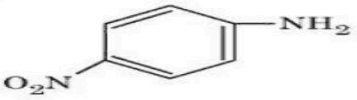
Choose the correct answer from the options given below:

Identify the **incorrect** statements.

A.  is a stronger base than 

B.  can be synthesized by Gabriel phthalimide synthesis.

C.  $\xrightarrow{Br_2,\ NaOH}$ primary aromatic amine

D.  $\xrightarrow[(ii)\ \Delta]{(i)\ NaNO_2,\ HCl,0°C}$ product will dissolve in NaOH

Choose the correct answer from the options given below:

Options :

6952781259. A and D Only

6952781260. A and C Only

6952781261. B and C Only

6952781262. A and B Only

(A) A and D Only

(B) A and C Only

(C) B and C Only

(D) A and B Only

Answer: (C) B and C Only · Official NTA final key

Q7 JEE Main 2026 · 5 Apr · Shift 2 MCQ

Given below are two statements :

Statement I : Heating benzamide with bromine in an ethanolic solution of sodium hydroxide will give benzylamine.

Statement II : Nitration of aniline with HNO_3/H_2SO_4 at 288 K produces *m*-nitroaniline in higher amount than *o*-nitroaniline (pH adjusted).

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 true but **Statement II** is false

(D) **Statement I** is false but **Statement II** is true

Answer: (D) Statement I is false but Statement II is true · Official NTA final key

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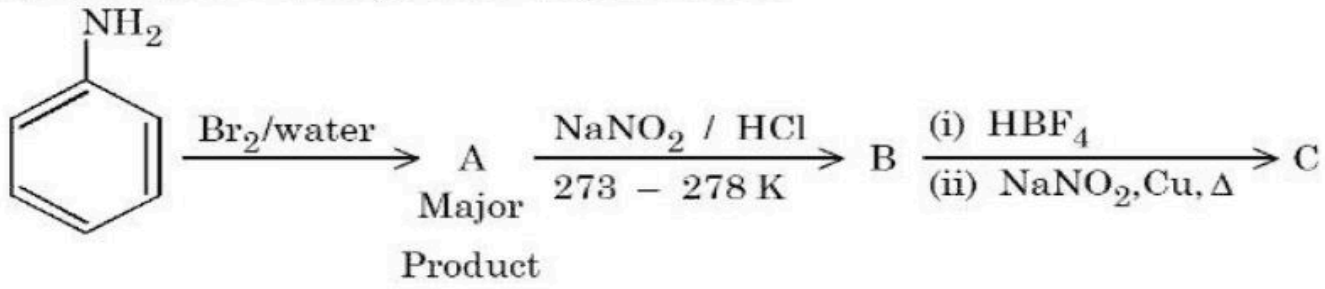
Q8 JEE Main 2026 · 4 Apr · Shift 1 MCQ

Product C of the following reaction sequence will be

(see the figure above)

Product C of the following reaction sequence will be



Options :

6952781000. 1-Bromo-4-nitrobenzene

6952781001. 1, 3, 5-Tribromo-2-nitrobenzene

6952781002. 4-Bromo-1-nitrobenzene

6952781003. 1, 3, 5-Tribromobenzene

(A) 1-Bromo-4-nitrobenzene
(B) 1, 3, 5-Tribromo-2-nitrobenzene
(C) 4-Bromo-1-nitrobenzene
(D) 1, 3, 5-Tribromobenzene

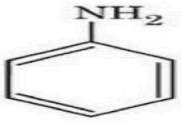
Answer: (B) 1, 3, 5-Tribromo-2-nitrobenzene · Official NTA final key

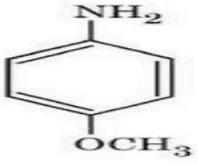
Q9 JEE Main 2026 · 4 Apr · Shift 2 MCQ

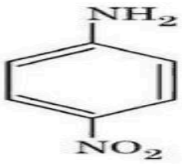
The strongest conjugate acid will result from:

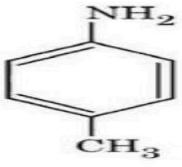
The strongest conjugate acid will result from:

Options :

6952781510. 

6952781511. 

6952781512. 

6952781513. 

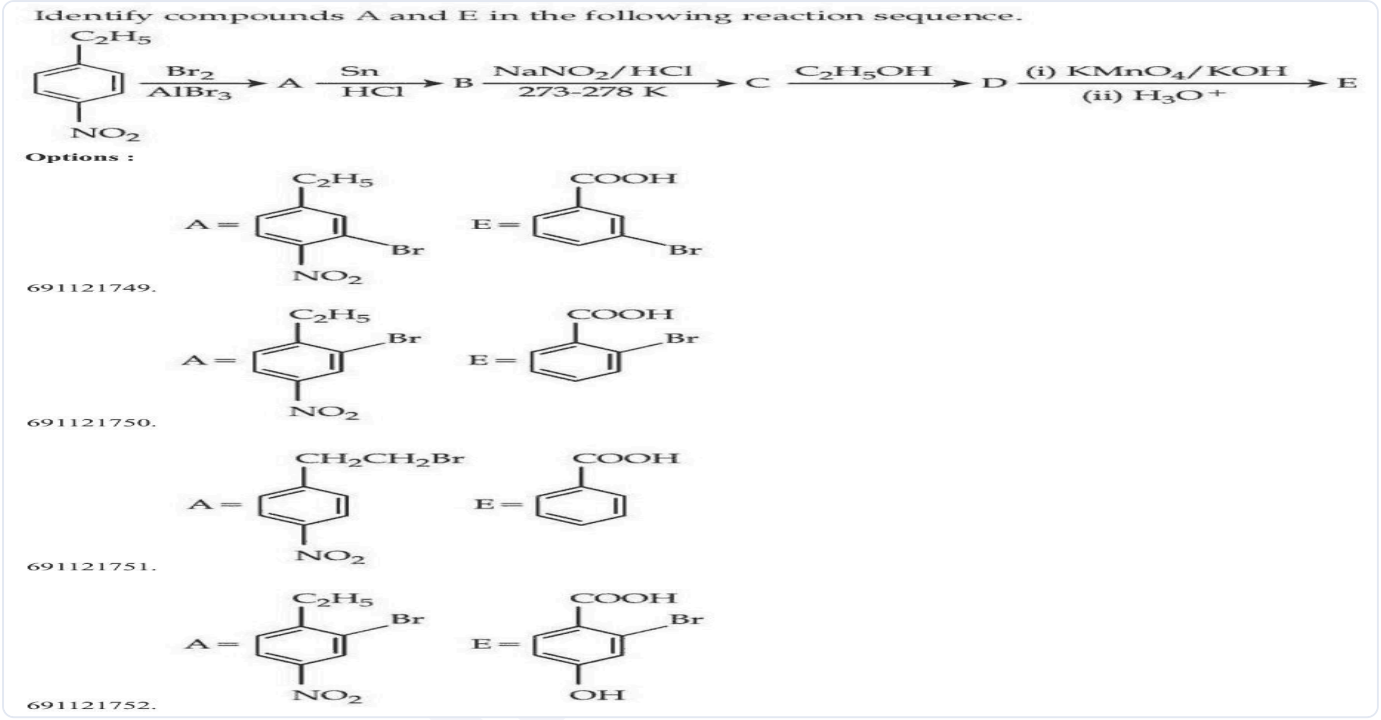
(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (C) · Official NTA final key

Q10 JEE Main 2026 · 2 Apr · Shift 2 MCQ

Identify compounds A and E in the following reaction sequence.

(see the figure above)



(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (B) · Official NTA final key

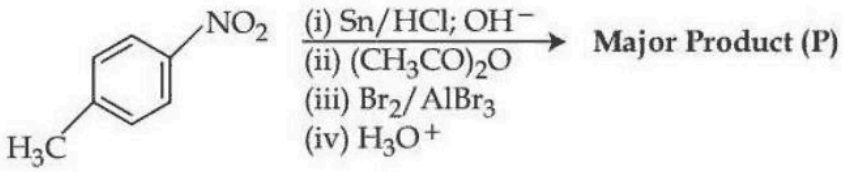
Q11 JEE Main 2026 · 2 Apr · Shift 2 Numerical

Consider the following reactions sequence

(see the figure above)

When the product (P) is subjected to Carius analysis using $AgNO_3$, 1.0 g of the product (P) will produce _____ g of the precipitate of AgBr. (Nearest Integer)
(Given : molar mass in g mol^{-1} C : 12, H : 1, O : 16, N : 14, Br : 80, Ag : 108)

Consider the following reactions sequence



When the product (P) is subjected to Carius analysis using $AgNO_3$, 1.0 g of the product (P) will produce _____ g of the precipitate of AgBr. (Nearest Integer)
(Given : molar mass in g mol^{-1} C : 12, H : 1, O : 16, N : 14, Br : 80, Ag : 108)

Numerical value type: the answer is a number.

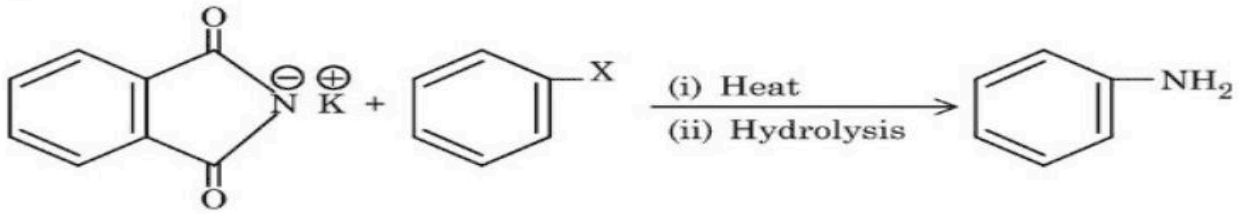
Answer: 1. · Official NTA final key

Q12 JEE Main 2026 · 28 Jan · Shift 1 MCQ

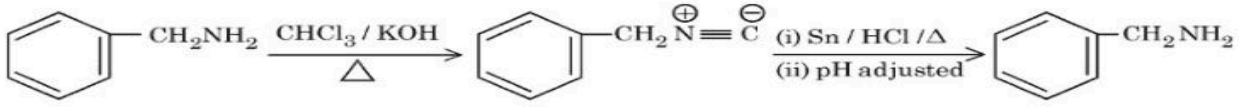
Consider the following reactions giving major product. Identify the correct reaction.

Q.65 Consider the following reactions giving major product. Identify the correct reaction.

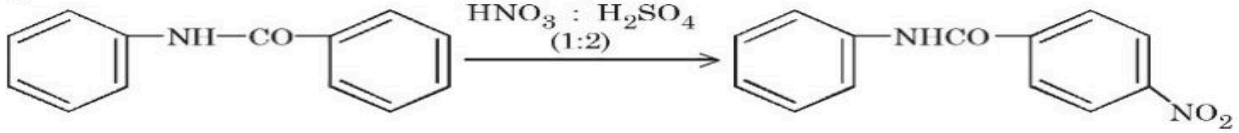
Options 1.



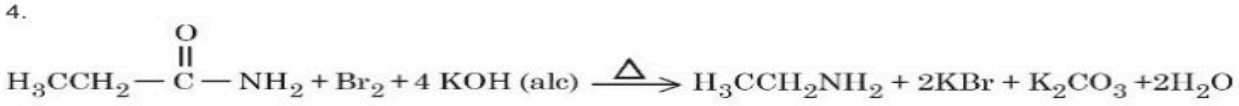
2.



3.



4.



(A) *see figure*

(B) *see figure*

(C) *see figure*

(D) $H_3CCH_2-\overset{\overset{O}{\|}}{C}-NH_2+Br_2+4\,KOH\,(alc)\xrightarrow{\Delta}H_3CCH_2NH_2+2KBr+K_2CO_3+2H_2O$

Answer: (D) $H_3CCH_2-\overset{\overset{O}{\|}}{C}-NH_2+Br_2+4\,KOH\,(alc)\xrightarrow{\Delta}H_3CCH_2NH_2+2KBr+K_2CO_3+2H_2O$ · Official NTA final key

Q13 JEE Main 2026 · 28 Jan · Shift 2 MCQ

Total number of alkali insoluble solid sulphonamides obtained by reaction of given amines with Hinsberg's reagent is _____.

Aniline, N-Methylaniline, Methanamine, N, N − Dimethylmethanamine, N-Methyl methanamine, Phenylmethanamine, N-propylaniline, N-phenylaniline, N, N-Dimethylaniline, Allyl amine, Isopropyl amine

(A) 2
(B) 4
(C) 5
(D) 8

Answer: (B) 4 · Official NTA final key

Q14 JEE Main 2026 · 28 Jan · Shift 2 MCQ

A student performed analysis of aliphatic organic compound 'X' which on analysis gave C=61.01%, H=15.25%, N=23.74%.

This compound, on treatment with HNO_2/H_2O produced another compound 'Y' which did not contain any nitrogen atom. However, the compound 'Y' upon controlled oxidation produced another compound 'Z' that responded to iodoform test.

The structure of 'X' is :

(A) $Ph-CH-NH_2$ with CH_3 attached below the CH
(B) $(CH_3)_2CH-NH_2$, drawn with two CH_3 groups bracketed to the CH
(C) $CH_3-CH_2CH-CH_3$ with NH_2 attached below the CH
(D) $CH_3CH_2CH_2NH_2$

Answer: (B) $(CH_3)_2CH-NH_2$, drawn with two CH_3 groups bracketed to the CH · Official NTA final key

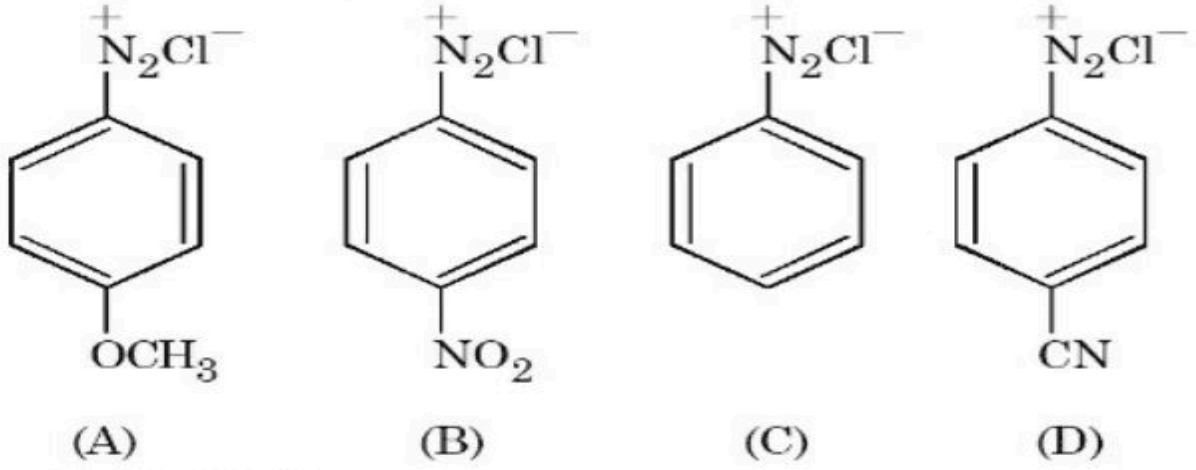
Q15 JEE Main 2026 · 24 Jan · Shift 1 MCQ

The correct stability order of the following diazonium salts is

(see the figure above)

(A) (B) (C) (D)

Q.57 The correct stability order of the following diazonium salts is



(A) (B) (C) (D)

Options 1. A > C > D > B
2. A > B > C > D
3. C > D > B > A
4. C > A > D > B

(A) A > C > D > B

(B) A > B > C > D

(C) C > D > B > A

(D) C > A > D > B

Answer: (A) A > C > D > B · Official NTA final key

Q16 JEE Main 2026 · 24 Jan · Shift 2 MCQ

Given below are two statements:

Statement I: The dipole moment of R-CN is greater than R-NC and R-NC can undergo hydrolysis under acidic medium to produce R−C(=O)−OH.

Statement II: R-CN hydrolyses under acidic medium to produce a compound which on treatment with $SOCl_2$, followed by the addition of NH_3 gives another compound(x). This compound (x) on treatment with NaOCl/NaOH gives a product, that on treatment with $CHCl_3$/KOH/Δ produces R-NC

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 true but Statement II is false

(D) Statement I is false but Statement II is true

Answer: (D) Statement I is false but Statement II is true · Official NTA final key

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Q17 JEE Main 2026 · 23 Jan · Shift 1 MCQ

Consider the following sequence of reactions.

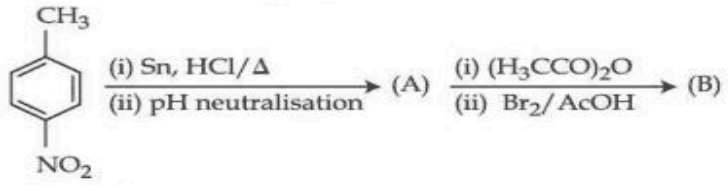
(see the figure above)

4-Nitrotoluene

Assuming that the reaction proceeds to completion, then 137 mg of 4-nitrotoluene will produce _____ mg of B.

(Given molar mass in g mol^{-1} H : 1, C : 12, N : 14, O : 16, Br : 80)

Q.57 Consider the following sequence of reactions.



4-Nitrotoluene

Assuming that the reaction proceeds to completion, then 137 mg of 4-nitrotoluene will produce _____ mg of B.

(Given molar mass in g mol^{-1} H : 1, C : 12, N : 14, O : 16, Br : 80)

Options

1. 301
2. 208
3. 228
4. 146

(A) 301
(B) 208
(C) 228
(D) 146

Answer: (C) 228 · Official NTA final key

Q18 JEE Main 2026 · 23 Jan · Shift 2 MCQ

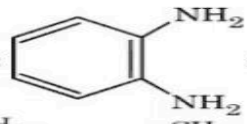
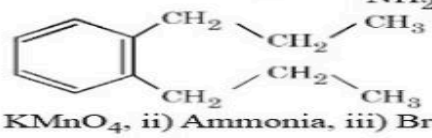
Given below are two statements:

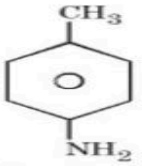
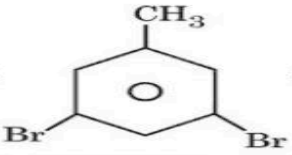
Statement I: *(see the figure above)* can be synthesized from *(see the figure above)* using simpler reagents in the order i) Acidic $KMnO_4$, ii) Ammonia, iii) Bromine and alkali

Statement II: *(see the figure above)* can be converted into *(see the figure above)* using reagents in the order i) Bromine-H_2O ii) $NaNO_2$/HCl (0 - 5 °C) (iii) Aq. H_3PO_2.

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

Q.51 Given below are two statements:

Statement I:  can be synthesized from  using simpler reagents in the order i) Acidic $KMnO_4$, ii) Ammonia, iii) Bromine and alkali

Statement II:  can be converted into  using reagents in the order i) Bromine-H_2O ii) $NaNO_2/HCl$ (0 - 5 °C) (iii) Aq. H_3PO_2 .

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

Options
1. Statement I is false but Statement II is true
2. Both Statement I and Statement II are false
3. Statement I is true but Statement II is false
4. Both Statement I and Statement II are true

(A) Statement I is false but Statement II is true
(B) Both Statement I and Statement II are false
(C) Statement I is true but Statement II is false
(D) Both Statement I and Statement II are true

Answer: (D) Both Statement I and Statement II are true · Official NTA final key

Q19 JEE Main 2026 · 23 Jan · Shift 2 MCQ

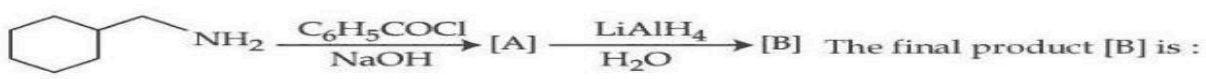
A student has been given a compound "x" of molecular formula- C_6H_7N. 'x' is sparingly soluble in water. However, on addition of dilute mineral acid, 'x' becomes soluble in water. 'x' when treated with $CHCl_3$ and KOH(alc), 'y' is produced. 'y' has a specific unpleasant smell. On treatment with benzenesulphonyl chloride, 'x' gives a compound 'z' which is soluble in alkali. The number of different "H" atoms present in 'z' is:-

(A) 5
(B) 4
(C) 8
(D) 7

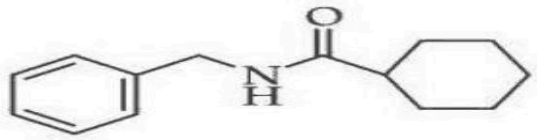
Answer: (D) 7 · Official NTA final key

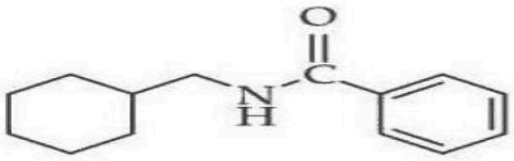
Q20 JEE Main 2026 · 22 Jan · Shift 2 MCQ

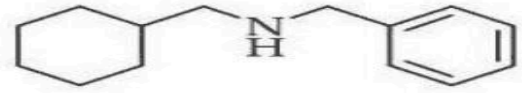
see figure

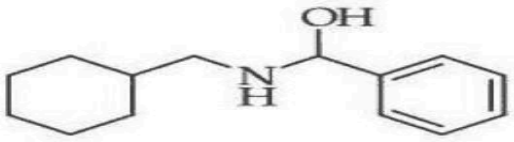
Q.61  The final product [B] is :

Options

1. 

2. 

3. 

4. 

(A) *see figure*

(B) *see figure*

(C) *see figure*

(D) *see figure*

Answer: (C) · Official NTA final key

Q21 JEE Main 2026 · 22 Jan · Shift 2 Numerical

The mass of benzanilide obtained from the benzoylation reaction of 5.8 g of aniline, if yield of product is 82%, is _____ g (nearest integer).

(Given molar mass in g mol^{-1} H : 1, C : 12, N : 14, O : 16)

Numerical value type: the answer is a number.

Answer: 10. · Official NTA final key

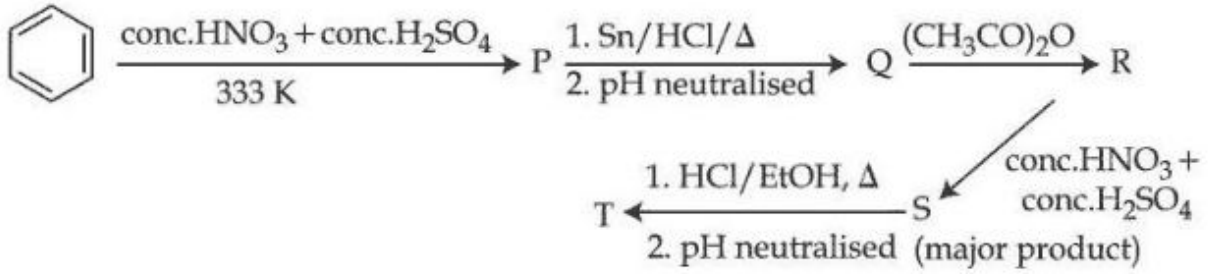
Q22 JEE Main 2026 · 21 Jan · Shift 1 Numerical

Consider the following reaction sequence

(see the figure above)

The percentage of nitrogen in product 'T' formed is _____ %. (Nearest integer) (Given molar mass in g mol^{-1} H : 1, C : 12, N : 14, O : 16)

Q.74 Consider the following reaction sequence



The percentage of nitrogen in product 'T' formed is _____%. (Nearest integer)
(Given molar mass in g mol^{-1} H : 1, C : 12, N : 14, O : 16)

Numerical value type: the answer is a number.

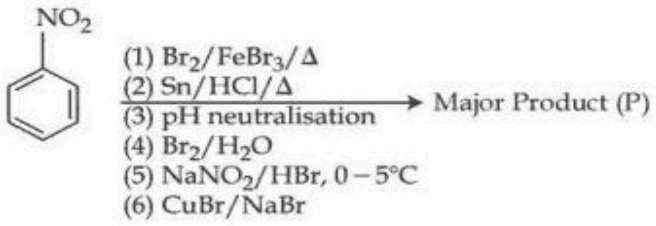
Answer: 20. · Official NTA final key

Q23 JEE Main 2026 · 21 Jan · Shift 2 MCQ

Consider the above sequence of reactions. The number of bromine atom(s) in the final product (P) will be :

(see the figure above)

Q.64



Consider the above sequence of reactions. The number of bromine atom(s) in the final product (P) will be :

Options

1. 3
2. 5
3. 6
4. 1

(A) 3
(B) 5
(C) 6
(D) 1

Answer: (B) 5 · Official NTA final key

Q24 JEE Main 2025 · 7 Apr · Shift 1 MCQ

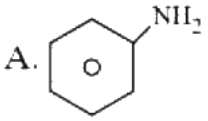
Which of the following amine (s) show (s) positive carbylamine test?

(see the figure above)

Choose the correct answer from the options given below:

CHEMISTRY **07-04-2025 (MORNING SESSION)**

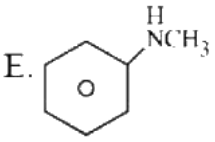
6. Which of the following amine (s) show (s) positive carbylamine test?

A. 

B. $(CH_3)_2NH$

C. CH_3NH_2

D. $(CH_3)_3N$

E. 

Choose the correct answer from the options given below:

(1) A and C Only (2) A and E Only (3) C Only (4) B, C and D Only

(A) A and C Only

(B) A and E Only

(C) C Only

(D) B, C and D Only

Answer: (A) A and C Only · Key from source paper

Q25 JEE Main 2025 · 7 Apr · Shift 2 MCQ

The descending order of basicity of following amines is :

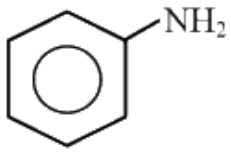
(see the figure above)

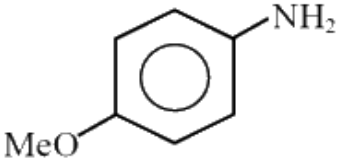
(D) CH_3NH_2

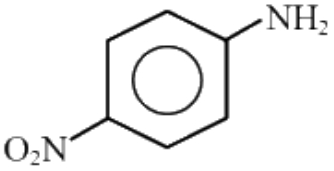
(E) $(CH_3)_2NH$

Choose the correct answer from the options given below :

17. The descending order of basicity of following amines is :

(A) 

(B) 

(C) 

(D) CH_3NH_2

(E) $(CH_3)_2NH$

Choose the correct answer from the options given below :

(1) $E > D > B > A > C$

(2) $E > A > D > C > B$

(3) $E > D > A > B > C$

(4) $B > E > D > A > C$

(A) E > D > B > A > C

(B) E > A > D > C > B

(C) E > D > A > B > C

(D) B > E > D > A > C

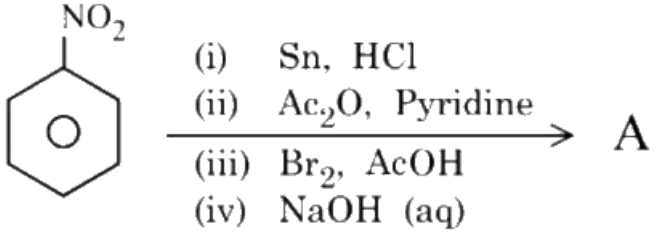
Answer: (A) E > D > B > A > C · Key from source paper

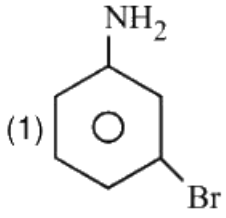
Q26 JEE Main 2025 · 4 Apr · Shift 1 MCQ

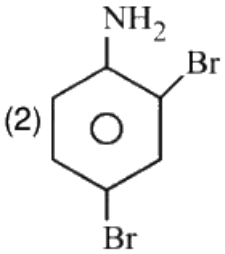
The major product (A) formed in the following reaction sequence is

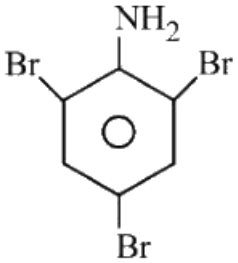
(see the figure above)

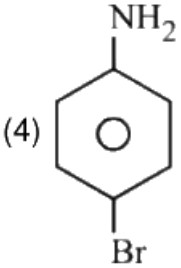
6. The major product (A) formed in the following reaction sequence is



(1) 

(2) 

(3) 

(4) 

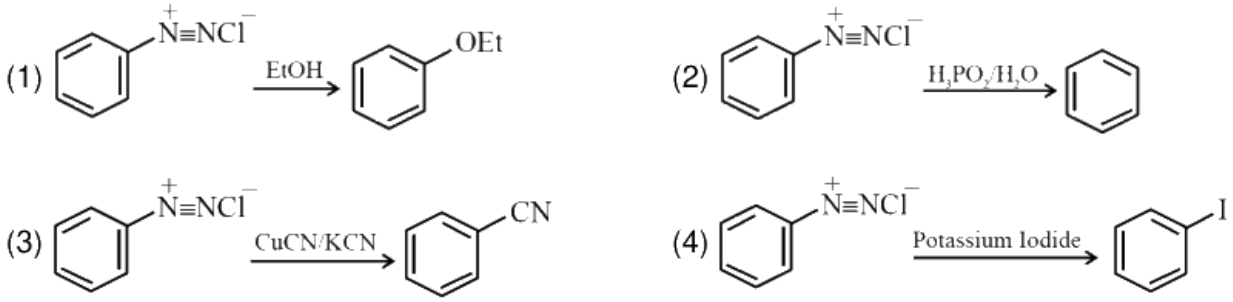
(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (D) · Key from source paper

Q27 JEE Main 2025 · 3 Apr · Shift 1 MCQ

In the following reactions, which one is NOT correct?

15. In the following reactions, which one is NOT correct?



(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

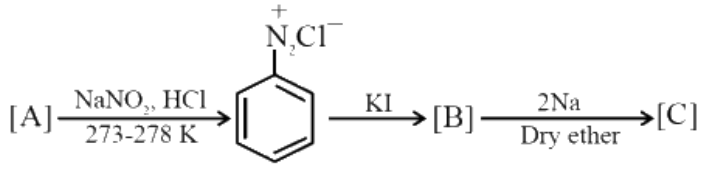
Answer: (A) · Key from source paper

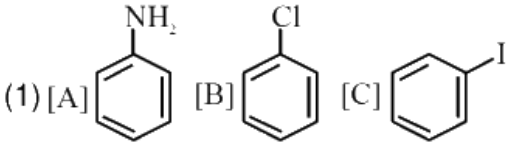
Q28 JEE Main 2025 · 3 Apr · Shift 1 MCQ

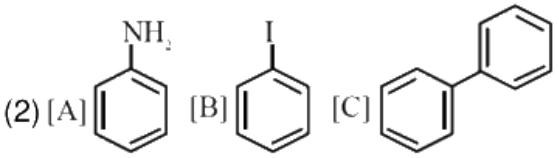
Identify $[A]$, $[B]$ and $[C]$, respectively in the following reaction sequence:

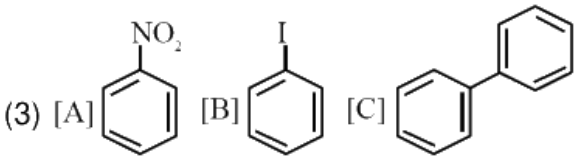
(see the figure above)

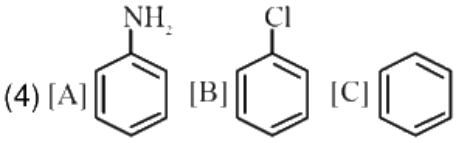
19. Identify [A], [B] and [C], respectively in the following reaction sequence:



(1) 

(2) 

(3) 

(4) 

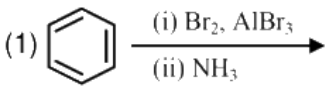
A *see figure*
B *see figure*
C *see figure*
D *see figure*

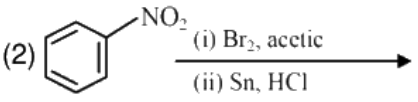
Answer: (B) · Key from source paper

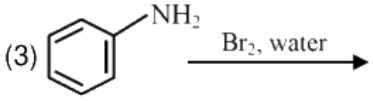
Q29 JEE Main 2025 · 3 Apr · Shift 2 MCQ

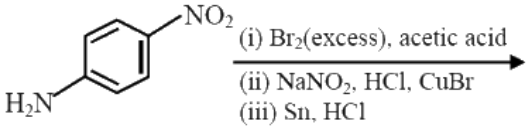
The sequence from the following that would result in giving predominantly 3,4,5 Tribromoaniline is :

8. The sequence from the following that would result in giving predominantly 3,4,5 Tribromoaniline is :

(1) 

(2) 

(3) 

(4) 

A *see figure*
B *see figure*
C *see figure*
D *see figure*

Answer: (D) · Key from source paper

Q30 JEE Main 2025 · 2 Apr · Shift 1 MCQ

The correct order of basic nature in aqueous solution for the bases $NH_3, H_2N-NH_2, CH_3CH_2NH_2, (CH_3CH_2)_2NH$ and $(CH_3CH_2)_3N$ is :

(A) $NH_3 < H_2N - NH_2 < (CH_3CH_2)_3N < CH_3CH_2NH_2 < (CH_3CH_2)_2NH$
(B) $NH_3 < H_2N - NH_2 < CH_3CH_2NH_2 < (CH_3CH_2)_2NH < (CH_3CH_2)_3N$
(C) $H_2N - NH_2 < NH_3 < (CH_3CH_2)_3N < CH_3CH_2NH_2 < (CH_3CH_2)_2NH$
(D) $NH_2 - NH_2 < NH_3 < CH_3CH_2NH_2 < (CH_3CH_2)_3N < (CH_3CH_2)_2NH$

Answer: (D) $NH_2 - NH_2 < NH_3 < CH_3CH_2NH_2 < (CH_3CH_2)_3N < (CH_3CH_2)_2NH$ · Key from source paper

Q31 JEE Main 2025 · 2 Apr · Shift 2 MCQ

When a concentrated solution of sulphanilic acid and 1-naphthylamine is treated with nitrous acid (273 K) and acidified with acetic acid, the mass (g) of 0.1 mole of product formed is :

(Given molar mass in $gmol^{-1} H : 1, C : 12, N : 14, O : 16, S : 32$)

(A) 343
(B) 330
(C) 33
(D) 66

Answer: (C) 33 · Key from source paper

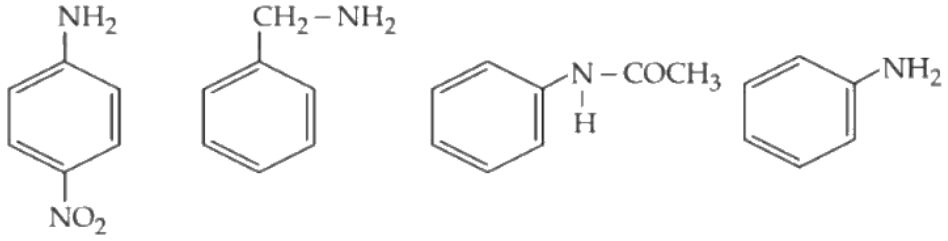
Q32 JEE Main 2025 · 29 Jan · Shift 1 Numerical

Given below are some nitrogen containing compounds

(see the figure above)

Each of them is treated with HCl separately. 1.0 g of the most basic compound will consume _____ mg of HCl. (Given molar mass in $gmol^{-1}$ C : 12, H : 1, O : 16, Cl : 35.5)

Q72. Given below are some nitrogen containing compounds



Each of them is treated with HCl separately. 1.0 g of the most basic compound will consume _____ mg of HCl. (Given molar mass in $gmol^{-1}$ C : 12, H : 1, O : 16, Cl : 35.5)

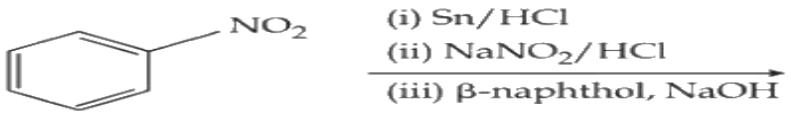
Numerical value type: the answer is a number.

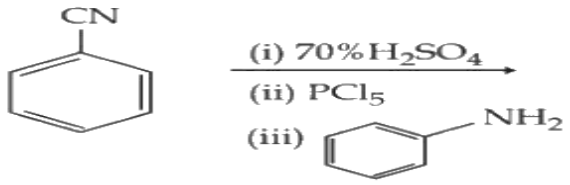
Answer: 341. · Key from source paper

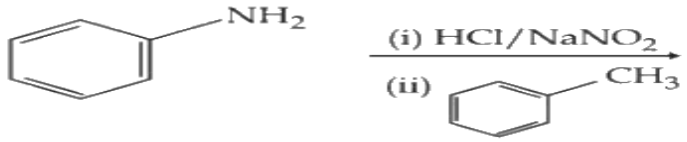
Q33 JEE Main 2025 · 29 Jan · Shift 2 MCQ

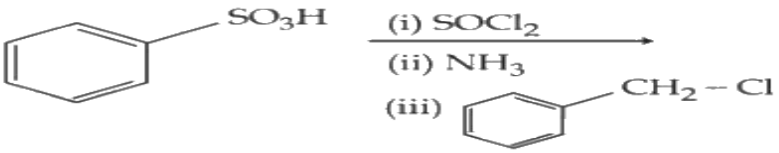
Which one of the following reaction sequences will give an azo dye?

Q59. Which one of the following reaction sequences will give an azo dye?

(1) 

(2) 

(3) 

(4) 

(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (A) · Key from source paper

Q34 JEE Main 2025 · 28 Jan · Shift 2 MCQ

Identify correct statements : (A) Primary amines do not give diazonium salts when treated with $NaNO_2$ in acidic condition. (B) Aliphatic and aromatic primary amines on heating with $CHCl_3$ and ethanolic KOH form carbylamines. (C) Secondary and tertiary amines also give carbylamine test. (D) Benzenesulfonyl chloride is known as Hinsberg's reagent. (E) Tertiary amines reacts with benzenesulfonyl chloride very easily. Choose the correct answer from the options given below :

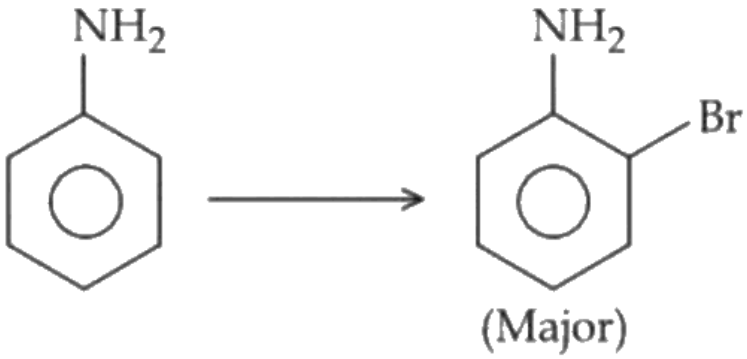
(A) (A) and (B) only
(B) (D) and (E) only
(C) (B) and (D) only
(D) (B) and (C) only

Answer: (C) (B) and (D) only · Key from source paper

Q35 JEE Main 2025 · 24 Jan · Shift 2 MCQ

see figure

Q66.



For reaction

The correct order of set of reagents for the above conversion is :

(1) $Br_2 \mid FeBr_3, H_2O(\Delta), NaOH$

(2) $H_2SO_4, Ac_2O, Br_2, H_2O(\Delta), NaOH$

(3) $Ac_2O, Br_2, H_2O(\Delta), NaOH$

(4) $Ac_2O, H_2SO_4, Br_2, NaOH$

(A) $Br_2 \mid FeBr_3, H_2O(\Delta), NaOH$

(B) $H_2SO_4, Ac_2O, Br_2, H_2O(\Delta), NaOH$

(C) $Ac_2O, Br_2, H_2O(\Delta), NaOH$

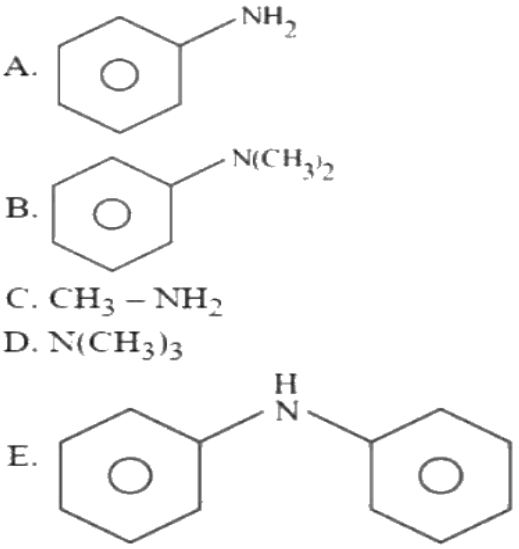
(D) $Ac_2O, H_2SO_4, Br_2, NaOH$

Answer: (B) $H_2SO_4, Ac_2O, Br_2, H_2O(\Delta), NaOH$ · Key from source paper

Q36 JEE Main 2025 · 23 Jan · Shift 1 MCQ

see figure

Q57.



Which among the following react with Hinsberg's reagent?

Choose the correct answer from the options given below:

(1) A, B and E Only

(2) A, C and E Only

(3) C and D Only

(4) B and D Only

(A) A, B and E Only
(B) A, C and E Only
(C) C and D Only
(D) B and D Only

Answer: (B) A, C and E Only · Key from source paper

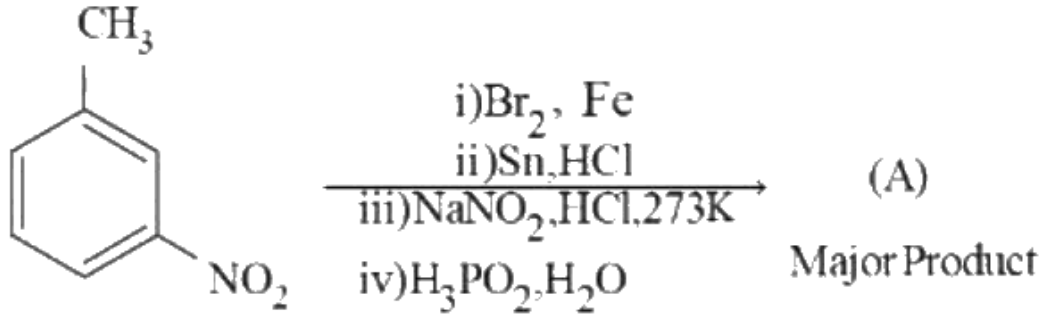
Q37 JEE Main 2025 · 23 Jan · Shift 1 Numerical

Consider the following sequence of reactions to produce major product (A)

(see the figure above)

Molar mass of product (A) is _____ $gmol^{-1}$. (Given molar mass in $gmol^{-1}$ of C : 12, H : 1, O : 16, Br : 80, N : 14, P : 31)

Q75. Consider the following sequence of reactions to produce major product (A)



Molar mass of product (A) is gmol^{-1}. (Given molar mass in gmol^{-1} of C : 12, H : 1, O : 16, Br : 80, N : 14, P : 31)

Numerical value type: the answer is a number.

Answer: 171. · Key from source paper

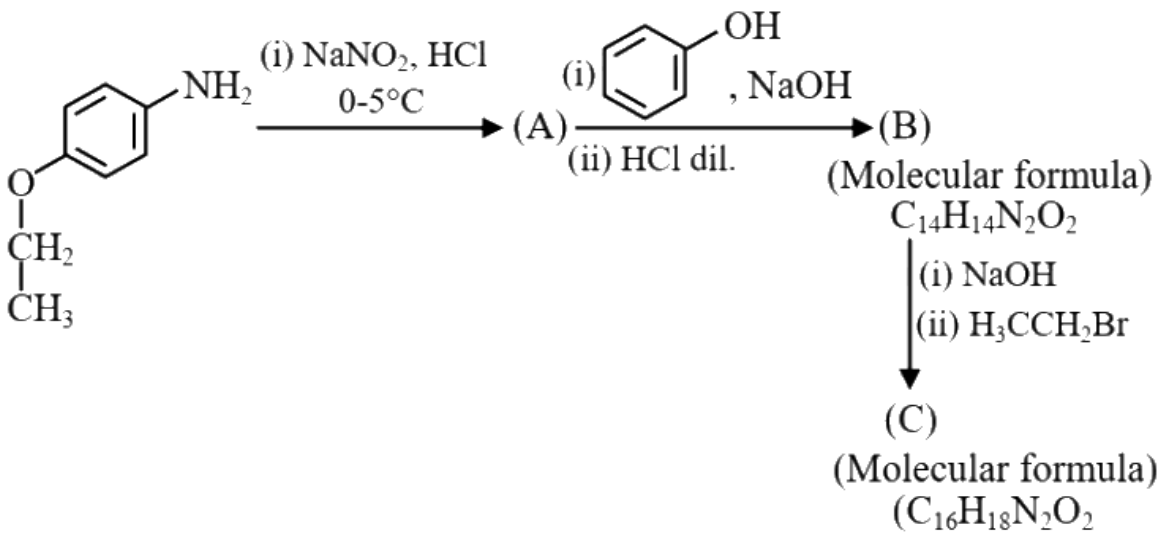
Q38 JEE Main 2025 · 23 Jan · Shift 2 Numerical

Consider the following sequence of reactions.

(see the figure above)

Total number of sp^3 hybridised carbon atoms in the major product C formed is _____

Q75. Consider the following sequence of reactions.



Total number of sp^3 hybridised carbon atoms in the major product C formed is_____

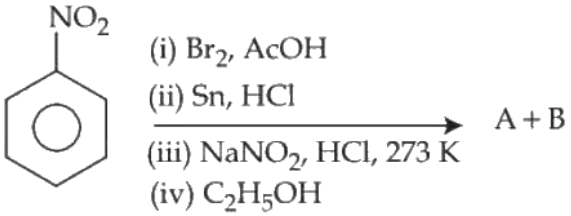
Numerical value type: the answer is a number.

Answer: 4. · Key from source paper

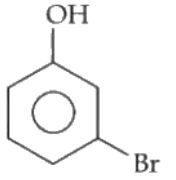
Q39 JEE Main 2025 · 22 Jan · Shift 1 MCQ

see figure

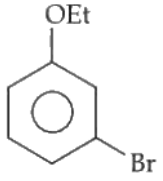
Q63.



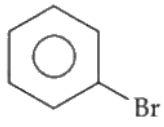
The products formed in the following reaction sequence are :

(1) 

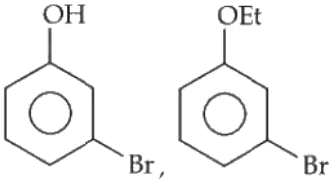
, $CH_3 - CHO$

(2) 

, $CH_3 - COOH$

(3) 

, $CH_3 - CHO$

(4) 

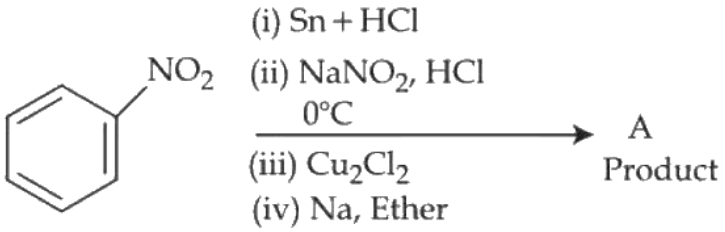
(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (C) · Key from source paper

Q40 JEE Main 2025 · 22 Jan · Shift 1 Numerical

see figure

Q73.



Consider the following sequence of reactions :

Molar mass of the product formed (A) is _____ $gmol^{-1}$.

Numerical value type: the answer is a number.

Answer: 154. · Key from source paper

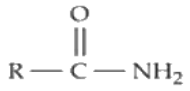
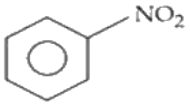
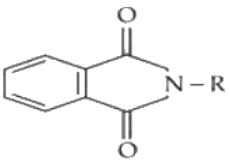
Q41 JEE Main 2025 · 22 Jan · Shift 2 MCQ

Match the Compounds (List - I) with the appropriate Catalyst/Reagents (List - II) for their reduction into corresponding amines.

(see the figure above)

Choose the correct answer from the options given below :

Q68. Match the Compounds (List - I) with the appropriate Catalyst/Reagents (List - II) for their reduction into corresponding amines.

List - I (Compounds)		List - II (Catalyst/Reagents)	
(A)		(I)	NaOH (aqueous)
(B)		(II)	H_2/Ni
(C)	$R-C\equiv N$	(III)	$LiAlH_4$, H_2O
(D)		(IV)	Sn, HCl

Choose the correct answer from the options given below :

(1) (A)-(II), (B)-(I), (C)-(III), (D)-(IV)
(2) (A)-(III), (B)-(II), (C)-(IV), (D)-(I)
(3) (A)-(II), (B)-(IV), (C)-(III), (D)-(I)
(4) (A)-(III), (B)-(IV), (C)-(II), (D)-(I)

(A) (A)-(II), (B)-(I), (C)-(III), (D)-(IV)

(B) (A)-(III), (B)-(II), (C)-(IV), (D)-(I)

(C) (A)-(II), (B)-(IV), (C)-(III), (D)-(I)

(D) (A)-(III), (B)-(IV), (C)-(II), (D)-(I)

Answer: (D) (A)-(III), (B)-(IV), (C)-(II), (D)-(I) · Key from source paper

Q42 JEE Main 2024 · 8 Apr · Shift 1 Numerical

If 279 g of aniline is reacted with one equivalent of benzenediazonium chloride, the maximum amount of aniline yellow formed will be _____ g. (nearest integer) (consider complete conversion).

Numerical value type: the answer is a number.

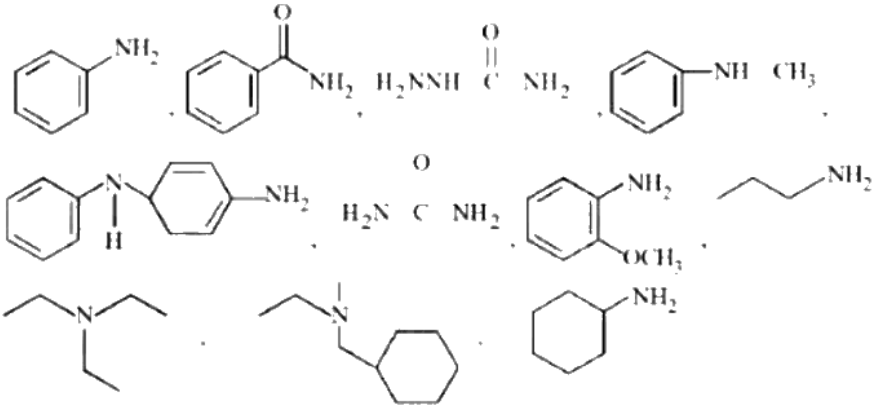
Answer: 591. · Key from source paper

Q43 JEE Main 2024 · 8 Apr · Shift 1 Numerical

Number of amine compounds from the following giving solids which are soluble in NaOH upon reaction with Hinsberg's reagent is _____

(see the figure above)

Q60. Number of amine compounds from the following giving solids which are soluble in NaOH upon reaction with



Hinsberg's reagent is _____

Numerical value type: the answer is a number.

Answer: 5. · Key from source paper

Q44 JEE Main 2024 · 8 Apr · Shift 2 MCQ

Given below are two statements : Statement (I) : All the following compounds react with p-toluenesulfonyl chloride. $C_6H_5NH_2$ $(C_6H_5)_2NH$ $(C_6H_5)_3N$ Statement (II) : Their products in the above reaction are soluble is aqueous NaOH. In the light of the above statements, choose the correct answer from the options given below

(A) Statement I is false but Statement II is true
(B) Statement I is true but Statement II is false
(C) Both Statement I and Statement II are true
(D) Both Statement I and Statement II are false

Answer: (D) Both Statement I and Statement II are false · Key from source paper

Q45 JEE Main 2024 · 6 Apr · Shift 1 Numerical

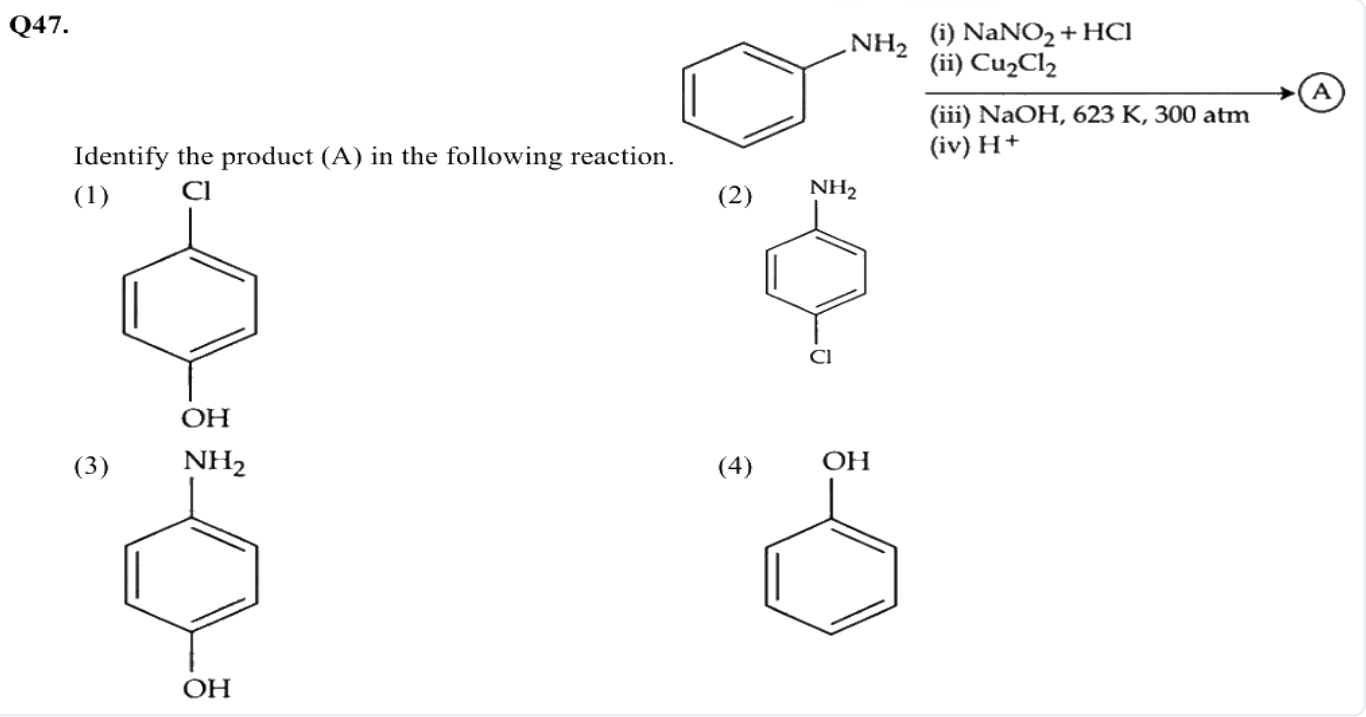
9.3 g of pure aniline upon diazotisation followed by coupling with phenol gives an orange dye. The mass of orange dye produced (assume 100\% yield/conversion) is _____ g. (nearest integer)

Numerical value type: the answer is a number.

Answer: 20. · Key from source paper

Q46 JEE Main 2024 · 6 Apr · Shift 2 MCQ

see figure



(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (D) · Key from source paper

Q47 JEE Main 2024 · 6 Apr · Shift 2 Numerical

An amine (X) is prepared by ammonolysis of benzyl chloride. On adding p-toluenesulphonyl chloride to it the solution remains clear. Molar mass of the amine (X) formed is _____ $gmol^{-1}$. (Given molar

mass in gmol^{-1}C : 12, H : 1, O : 16, N : 14)

Numerical value type: the answer is a number.

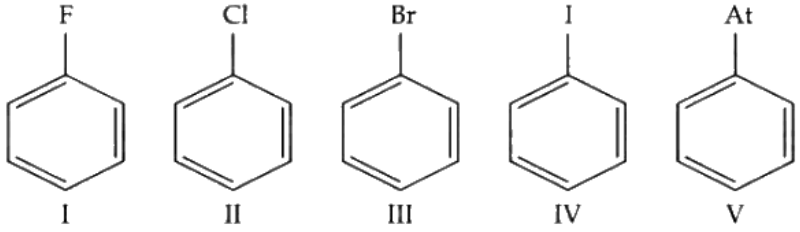
Answer: 287. · Key from source paper

Q48 JEE Main 2024 · 5 Apr · Shift 1 Numerical

The number of halobenzenes from the following that can be prepared by Sandmeyer's reaction is _____

(see the figure above)

Q58. The number of halobenzenes from the following that can be prepared by Sandmeyer's reaction is _____



Numerical value type: the answer is a number.

Answer: 2. · Key from source paper

Q49 JEE Main 2024 · 5 Apr · Shift 2 Numerical

X g of ethanamine was subjected to reaction with $NaNO_2$/HCl followed by hydrolysis to liberate N_2 and HCl. The HCl generated was completely neutralised by 0.2 moles of NaOH. X is _____ g.

Numerical value type: the answer is a number.

Answer: 9. · Key from source paper

Q50 JEE Main 2024 · 4 Apr · Shift 1 Numerical

Xg of ethylamine is subjected to reaction with $NaNO_2/HCl$ followed by water; evolved dinitrogen gas which occupied 2.24 L volume at STP. X is _____ $\times 10^{-1}$ g.

Numerical value type: the answer is a number.

Answer: 45. · Key from source paper

Q51 JEE Main 2024 · 4 Apr · Shift 2 Numerical

Phthalimide is made to undergo following sequence of reactions.

(i) KOH
(ii) Benzylchloride

Phthalimide $\longrightarrow$ 'P'

Total number of π bonds present in product 'P' is/are _____

Numerical value type: the answer is a number.

Answer: 8. · Key from source paper

Q52 JEE Main 2024 · 1 Feb · Shift 1 MCQ

Given below are two statements:

Statement (I) : Aminobenzene and aniline are same organic compounds.

Statement (II) : Aminobenzene and aniline are different organic compounds.

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

(A) Both Statement I and Statement II are correct
(B) Statement I is correct but Statement II is incorrect
(C) Statement I is incorrect but Statement II is correct
(D) Both Statement I and Statement II are incorrect

Answer: (B) Statement I is correct but Statement II is incorrect · Key from source paper

Q53 JEE Main 2024 · 1 Feb · Shift 1 MCQ

Given below are two statements : one is labelled as Assertion A and the other is labelled as Reason R.

Assertion A: Haloalkanes react with KCN to form alkyl cyanides as a main product while with AgCN form isocyanide as the main product.

Reason R: KCN and AgCN both are highly ionic compounds.

In the light of the above statement, choose the most appropriate answer from the options given below.

(A) A is correct but R is not correct
(B) Both A and R are correct but R is not the correct explanation of A
(C) A is not correct but R is correct
(D) Both A and R are correct and R is the correct explanation of A

Answer: (A) A is correct but R is not correct · Key from source paper

Q54 JEE Main 2024 · 1 Feb · Shift 1 MCQ

Given below are two statements:

Statement (I) : The NH_2 group in Aniline is ortho and para directing and a powerful activating group.

Statement (II) : Aniline does not undergo FriedelCraft's reaction (alkylation and acylation).

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

(A) Both Statement I and Statement II are correct
(B) Both Statement I and Statement II are incorrect
(C) Statement I is incorrect but Statement II is correct
(D) Statement I is correct but Statement II is incorrect

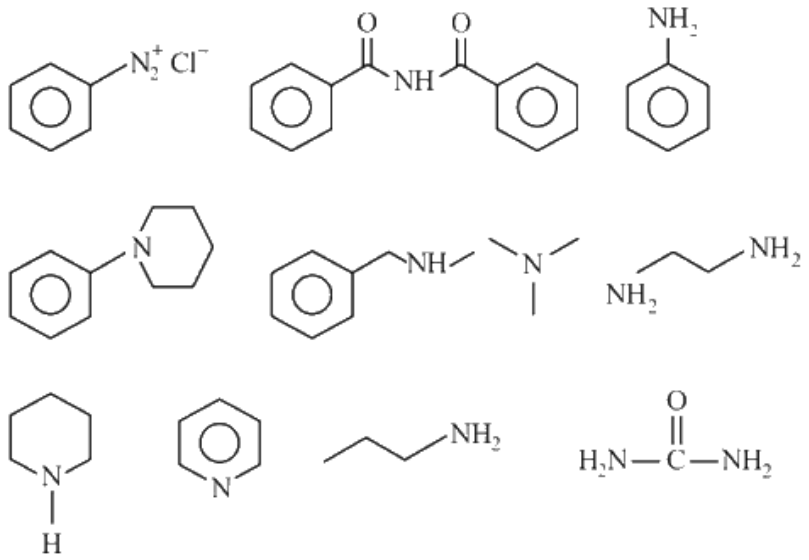
Answer: (A) Both Statement I and Statement II are correct · Key from source paper

Q55 JEE Main 2024 · 1 Feb · Shift 2 Numerical

Number of compounds which give reaction with Hinsberg's reagent is _____.

(see the figure above)

Q59. Number of compounds which give reaction with Hinsberg's reagent is _____.



Numerical value type: the answer is a number.

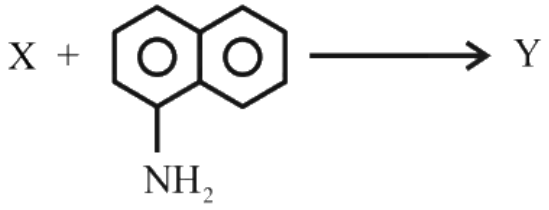
Answer: 5. · Key from source paper

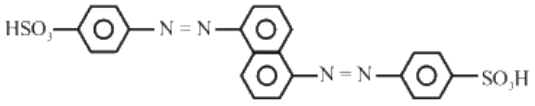
Q56 JEE Main 2024 · 31 Jan · Shift 2 MCQ

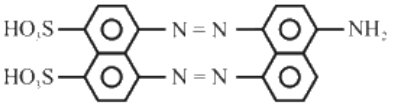
The azo-dye Y formed in the following reactions is Sulphanilic acid + $NaNO_2$ + $CH_3COOH \rightarrow X$

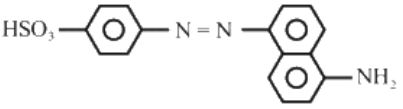
(see the figure above)

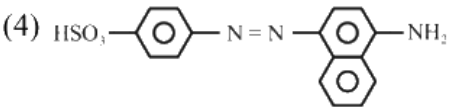
Q49. The azo-dye Y formed in the following reactions is Sulphanilic acid + $NaNO_2 + CH_3COOH \rightarrow X$



(1) 

(2) 

(3) 

(4) 

A *see figure*
B *see figure*
C *see figure*
D *see figure*

Answer: (D) · Key from source paper

Q57 JEE Main 2024 · 31 Jan · Shift 2 MCQ

Given below are two statements :

Statement I: Aniline reacts with con. H_2SO_4 followed by heating at 453 - 473 K gives p-aminobenzene sulphonic acid, which gives blood red colour in the 'Lassaigne's test'.

Statement II: In Friedel - Craft's alkylation and acylation reactions, aniline forms salt with the $AlCl_3$ catalyst. Due to this, nitrogen of aniline acquires a positive charge and acts as deactivating group.

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

A Statement I is false but statement II is true
B Both statement I and statement II are false
C Statement I is true but statement II is false
D Both statement I and statement II are true

Answer: (D) Both statement I and statement II are true · Key from source paper

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Q58 JEE Main 2024 · 31 Jan · Shift 2 Numerical

A compound x with molar mass $108g$ mol^{-1} undergoes acetylation to give product with molar mass $192g$ mol^{-1}. The number of amino groups in the compound x is _____.

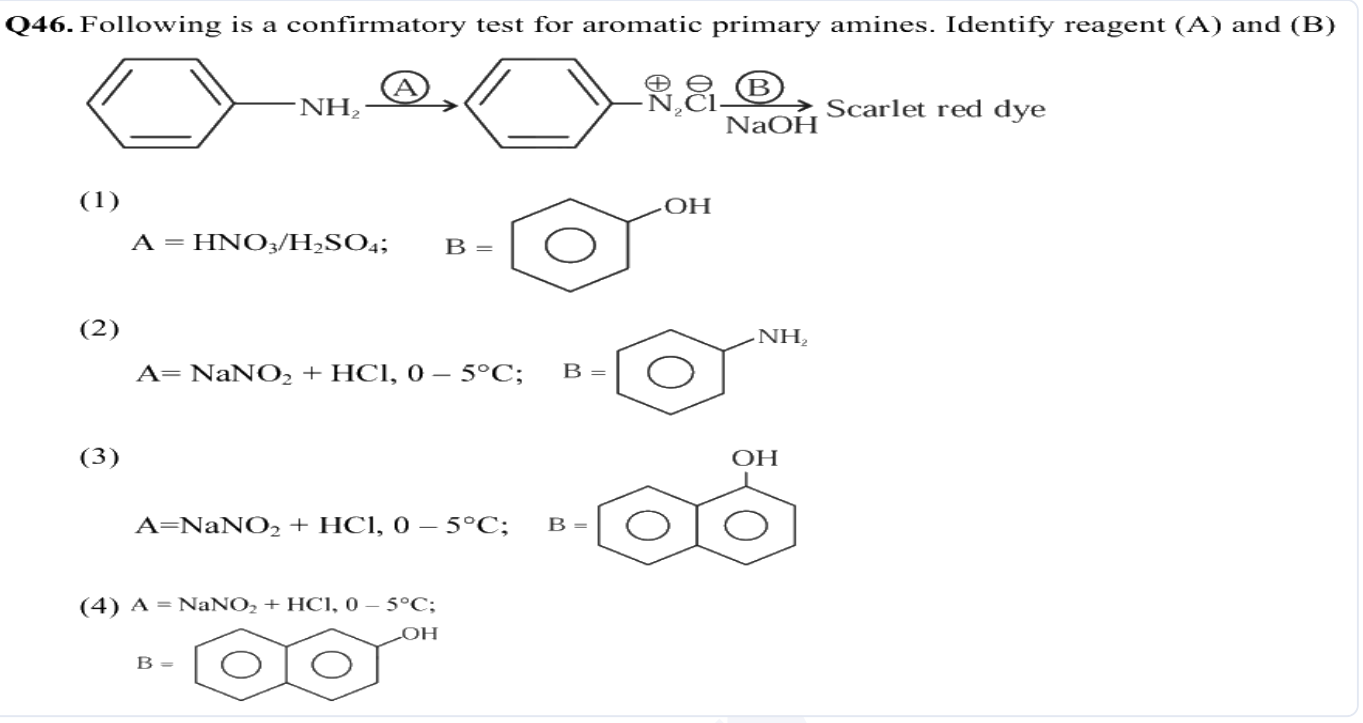
Numerical value type: the answer is a number.

Answer: 2. · Key from source paper

Q59 JEE Main 2024 · 30 Jan · Shift 1 MCQ

Following is a confirmatory test for aromatic primary amines. Identify reagent (A) and (B)

(see the figure above)



(A) $A = \mathrm{HNO_3/H_2SO_4}$; $B =$ *(see the figure above)* benzene ring with OH on its top right carbon (phenol).

(B) $A = \mathrm{NaNO_2 + HCl}$, $0 - 5^\circ\mathrm{C}$; $B =$ *(see the figure above)* benzene ring with $\mathrm{NH_2}$ on its top right carbon (aniline).

(C) $A = \mathrm{NaNO_2 + HCl}$, $0 - 5^\circ\mathrm{C}$; $B =$ *(see the figure above)* naphthalene (two fused rings) with OH on the top carbon of the right-hand ring next to the shared bond.

(D) $A = \mathrm{NaNO_2 + HCl}$, $0 - 5^\circ\mathrm{C}$; $B =$ *(see the figure above)* naphthalene (two fused rings) with OH on the upper-right carbon of the right-hand ring, one carbon further from the shared bond.

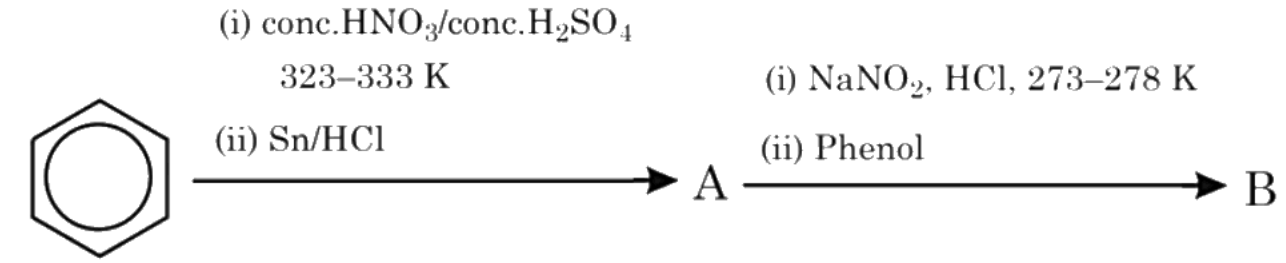
Answer: (D) $A = \mathrm{NaNO_2 + HCl}$, $0 - 5^\circ\mathrm{C}$; $B =$ *(see the figure above)* **naphthalene (two fused rings) with OH on the upper-right carbon of the right-hand ring, one carbon further from the shared bond.** · Key from source paper

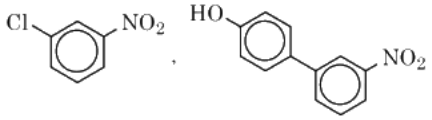
Q60 JEE Main 2024 · 30 Jan · Shift 2 MCQ

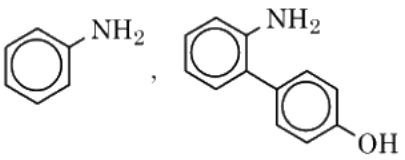
The products A and B formed in the following reaction scheme are respectively

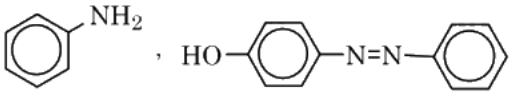
(see the figure above)

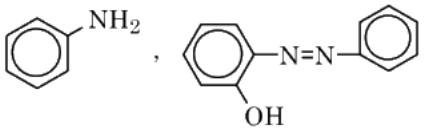
Q50. The products A and B formed in the following reaction scheme are respectively



(1) 

(2) 

(3) 

(4) 

(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (C) · Key from source paper

Q61 JEE Main 2024 · 29 Jan · Shift 2 MCQ

Alkyl halide is converted into alkyl isocyanide by reaction with

(A) NaCN
(B) NH_4CN
(C) KCN
(D) AgCN

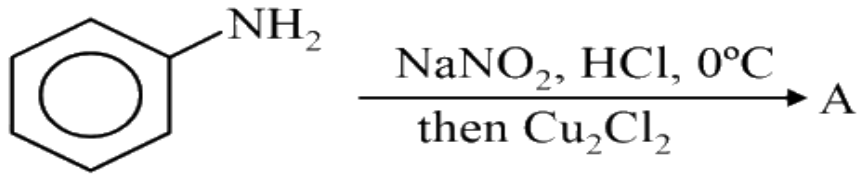
Answer: (D) AgCN · Key from source paper

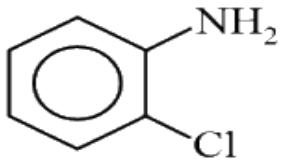
Q62 JEE Main 2024 · 29 Jan · Shift 2 MCQ

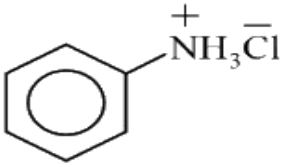
The product A formed in the following reaction is:

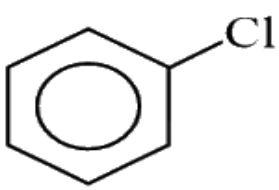
(see the figure above)

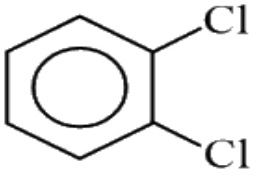
Q47. The product A formed in the following reaction is:



(1) 

(2) 

(3) 

(4) 

(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (C) · Key from source paper

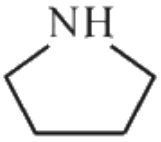
Q63 JEE Main 2024 · 27 Jan · Shift 2 MCQ

Identify B formed in the reaction.

$$Cl - CH_{24} - Cl \xrightarrow{\text{excess } NH_3} A \xrightarrow{NaOH} B + H_2O + NaCl$$

Q46. Identify B formed in the reaction.

$$Cl\text{-}CH_{24}\text{-}Cl \xrightarrow[\text{excess } NH_3]{} A \xrightarrow{NaOH} B + H_2O + NaCl$$

(1) 

(2) $H_2N\text{-}CH_{24}\text{-}NH_2$

(3) $^{-}ClH_3N^{+}\text{-}CH_{24}\text{-}\overset{+}{N}H_3Cl^{-}$

(4) 

(A) *see figure*

(B) $H_2N - CH_{24} - NH_2$

(C) $^{-}ClH_3N^{+} - CH_{24} - \overset{+}{N}H_3Cl^{-}$

(D) *see figure*

Answer: (B) $H_2N - CH_{24} - NH_2$ · Key from source paper

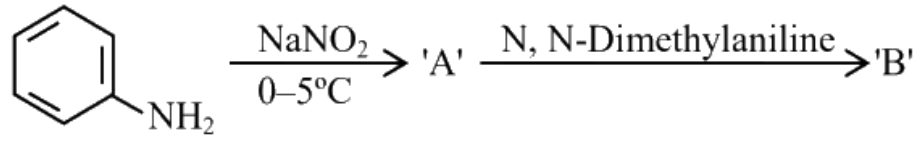
Q64 JEE Main 2023 · 15 Apr · Shift 1 MCQ

Consider the following sequence of reactions

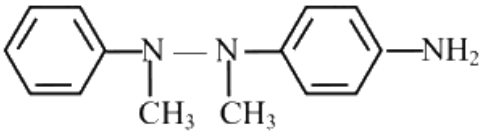
(see the figure above)

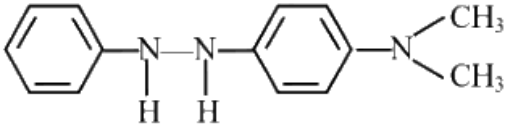
The product 'B' is

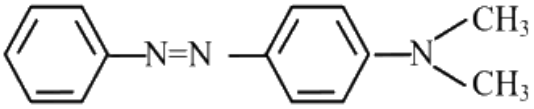
Q47. Consider the following sequence of reactions

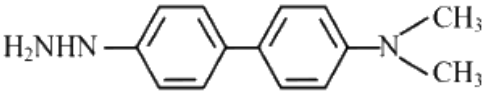


The product 'B' is

(1) 

(2) 

(3) 

(4) 

(A) (structure drawn, see figure)

(B) (structure drawn, see figure)

(C) (structure drawn, see figure)

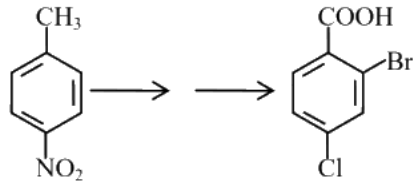
(D) (structure drawn, see figure)

Answer: (C) (structure drawn, see figure) · Key from source paper

Q65 JEE Main 2023 · 15 Apr · Shift 1 MCQ

see figure

Q48.



In the above conversion the correct sequence of reagents to be added is

(1) (i) $KMnO_4$, (ii) Br_2 / Fe, (iii) Fe /H^+, (iv) Cl_2 (2) (i) Br_2 / Fe, (ii) Fe /H^+, (iii) $KMnO_4$, (iv) Cl_2

(3) (i) Fe /H^+, (ii) HONO, (iii) CuCl, (iv) $KMnO_4$ (4) (i) Br_2 / Fe, (ii) Fe /H^+, (iii) HONO, (iv) CuCl (v) KM

(A) (i) $KMnO_4$, (ii) Br_2 / Fe, (iii) Fe /H^+, (iv) Cl_2

(B) (i) Br_2 / Fe, (ii) Fe /H^+, (iii) $KMnO_4$, (iv) Cl_2

(C) (i) Fe /H^+, (ii) HONO, (iii) CuCl, (iv) $KMnO_4$

(D) (i) Br_2 / Fe, (ii) Fe /H^+, (iii) HONO, (iv) CuCl (v) KM

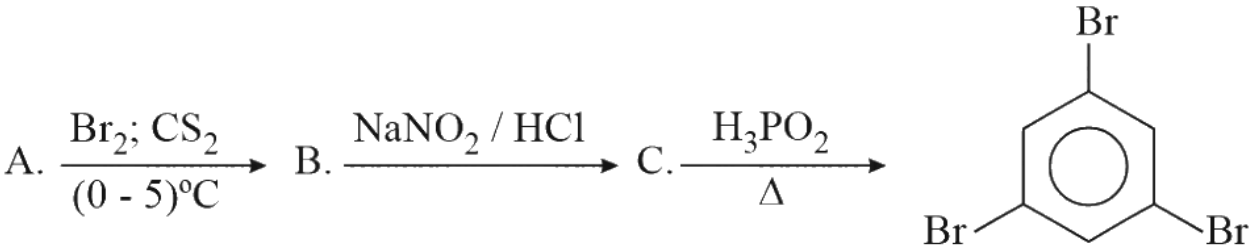
Answer: (D) (i) Br_2 / Fe, (ii) Fe /H^+, (iii) HONO, (iv) CuCl (v) KM · Key from source paper

Q66 JEE Main 2023 · 13 Apr · Shift 2 MCQ

Compound A from the following reaction sequence is :

(see the figure above)

Q48. Compound A from the following reaction sequence is :



(1) Benzoic Acid (2) Aniline

(3) Salicylic Acid (4) Phenol

(A) Benzoic Acid

(B) Aniline

(C) Salicylic Acid

(D) Phenol

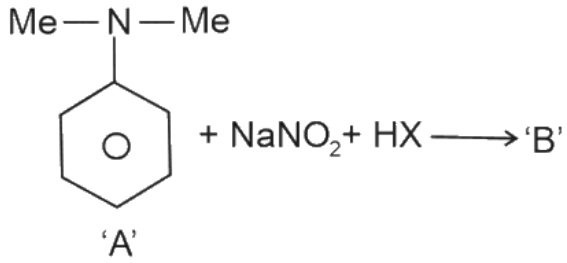
Answer: (B) Aniline · Checked by our team

Q67 JEE Main 2023 · 12 Apr · Shift 1 MCQ

The incorrect statement regarding the reaction given below is

(see the figure above)

Q52. The incorrect statement regarding the reaction given below is



(1) The product 'B' formed in the above reaction is p-nitroso compound at low temperature

(2) 'B' is N-nitroso ammonium compound

(3) The reaction occurs at low temperature

(4) The electrophile involved in the reaction is NO^+

(A) The product 'B' formed in the above reaction is p-nitroso compound at low temperature

(B) 'B' is N-nitroso ammonium compound

(C) The reaction occurs at low temperature

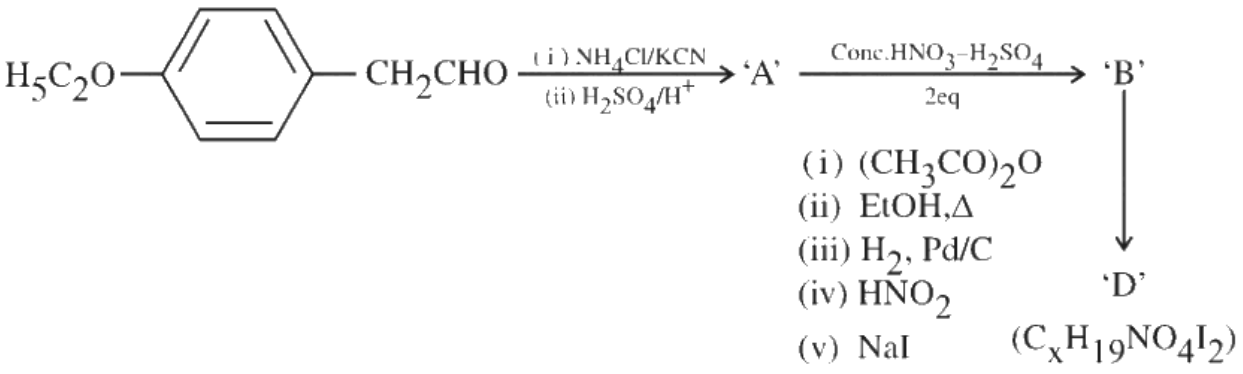
(D) The electrophile involved in the reaction is NO^+

Answer: (B) 'B' is N-nitroso ammonium compound · Key from source paper

Q68 JEE Main 2023 · 12 Apr · Shift 1 Numerical

see figure

Q56.



The value of x in compound 'D' is _____

Numerical value type: the answer is a number.

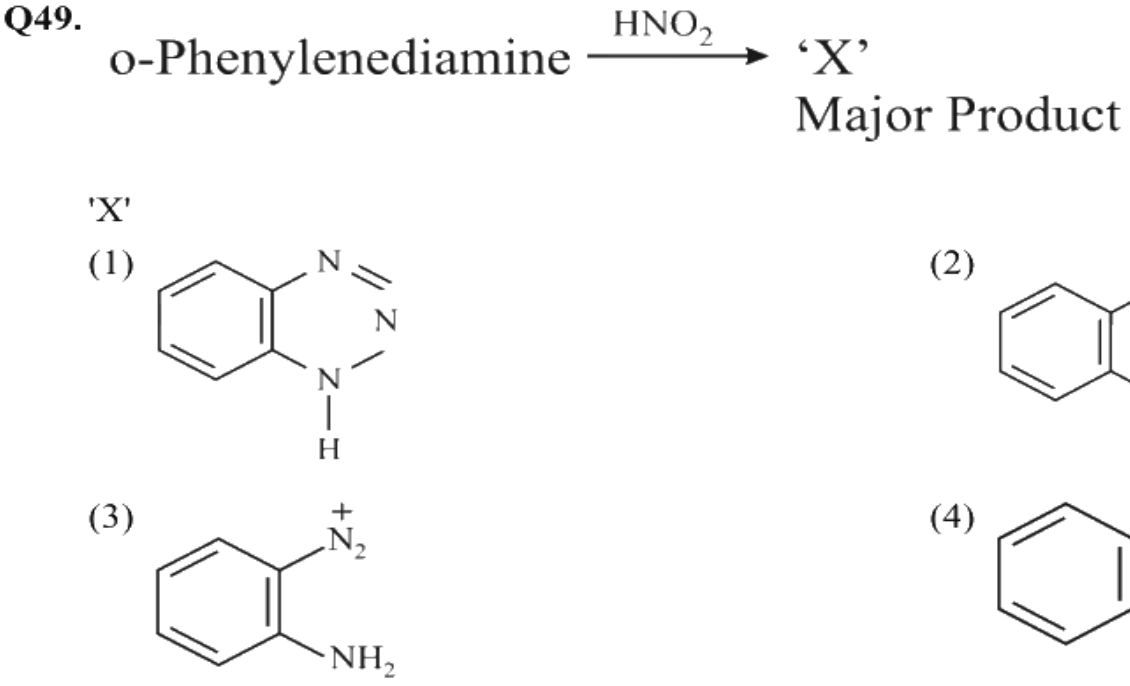
Answer: 15. · Key from source paper

Q69 JEE Main 2023 · 11 Apr · Shift 1 MCQ

o-Phenylenediamine $\xrightarrow{HNO_2}$ 'X' Major Product

'X'

Q49.



(A) *see figure*

(B) *see figure*

(C) *see figure*

(D) *see figure*

Answer: (A) · Key from source paper

Q70 JEE Main 2023 · 10 Apr · Shift 1 MCQ

Isomeric amines with molecular formula $C_8H_{11}N$ give the following tests

IsomerP $\Rightarrow$ Can be prepared by Gabriel phthalimide synthesis

IsomerQ $\Rightarrow$ Reacts with Hinsberg's reagent to give solid insoluble in NaOH

IsomerR $\Rightarrow$ Reacts with HONO followed by β-naphthol in NaOH to give red dye.

IsomersP, Q and R respectively are

(see the figure above)

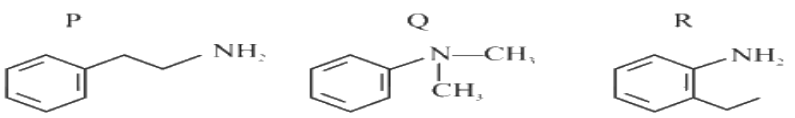
Q48. Isomeric amines with molecular formula $C_8H_{11}N$ give the following tests

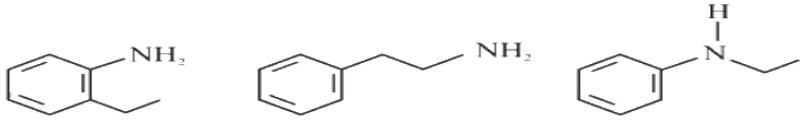
IsomerP ⇒ Can be prepared by Gabriel phthalimide synthesis

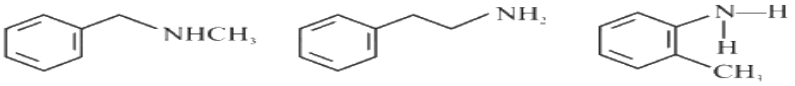
IsomerQ ⇒ Reacts with Hinsberg's reagent to give solid insoluble in NaOH

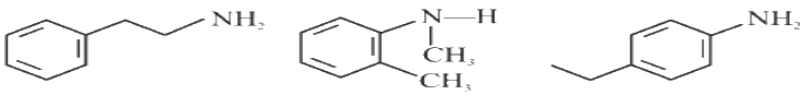
IsomerR ⇒ Reacts with HONO followed by β-naphthol in NaOH to give red dye.

IsomersP, Q and R respectively are

(1) 

(2) 

(3) 

(4) 

(A) *see figure*

(B) *see figure*

(C) *see figure*

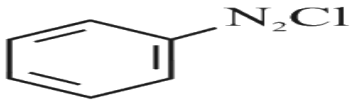
(D) *see figure*

Answer: (D) · Key from source paper

Q71 JEE Main 2023 · 8 Apr · Shift 1 MCQ

see figure

Q58. Match List I with List II :

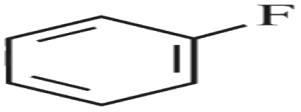


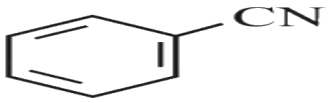
s reacted with reagents in List I to form products in List II

products in List II.

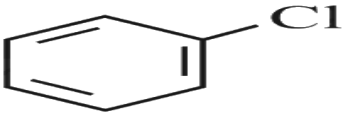
List I (Reagent) List II (Product)

A. 

I. 

B. HBF_4, Δ II. 

C. Cu, HCl III. 

D. CuCN/KCN IV. 

Choose the correct answer from the options given below:

(1) A-IV, B-III, C-II, D-I

(2) A-III, B-I, C-II, D-IV

(3) A-I, B-III, C-IV, D-II

(4) A-III, B-I, C-IV, D-II

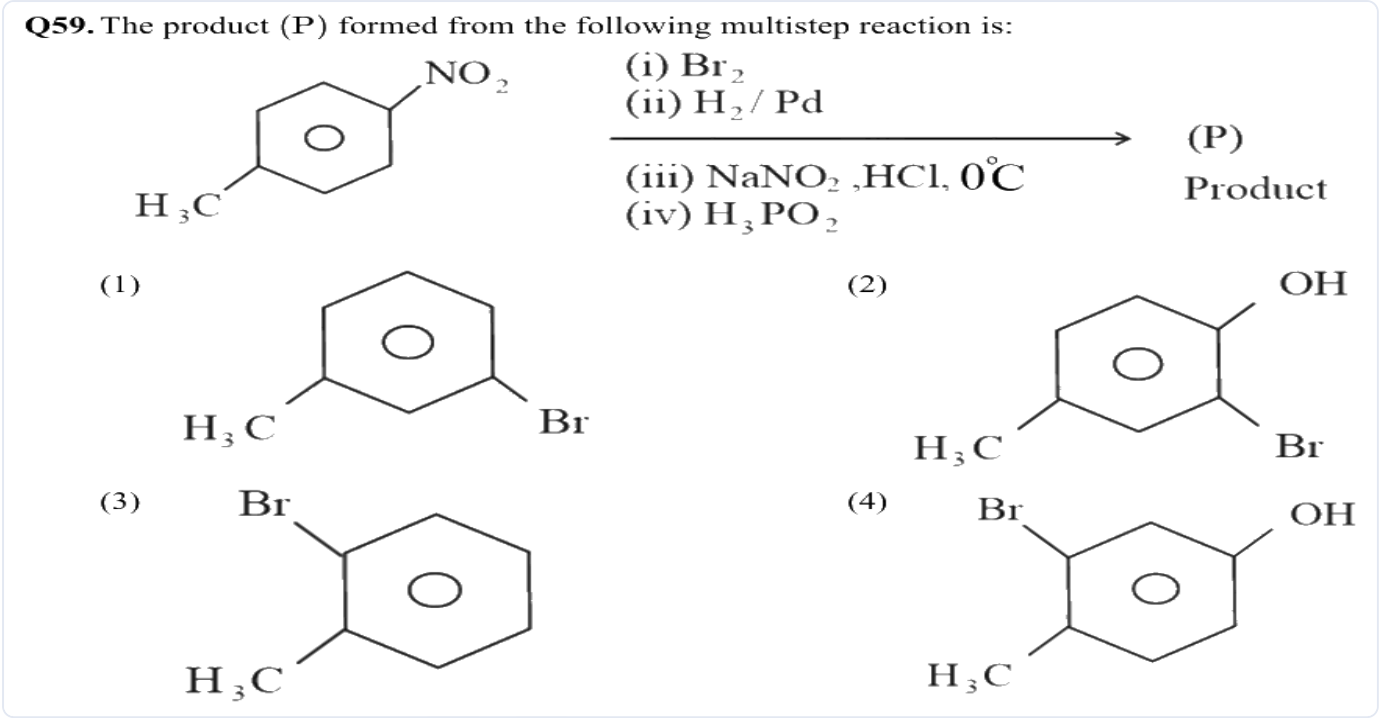
(A) A-IV, B-III, C-II, D-I
(B) A-III, B-I, C-II, D-IV
(C) A-I, B-III, C-IV, D-II
(D) A-III, B-I, C-IV, D-II

Answer: (D) A-III, B-I, C-IV, D-II · Key from source paper

Q72 JEE Main 2023 · 8 Apr · Shift 2 MCQ

The product (P) formed from the following multistep reaction is:

(see the figure above)



(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

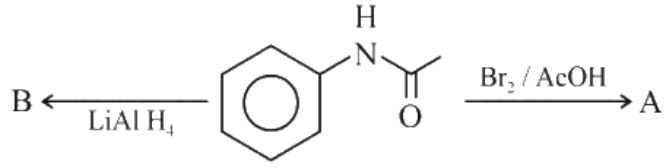
Answer: (C) · Key from source paper

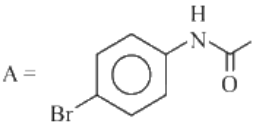
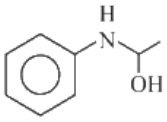
Q73 JEE Main 2023 · 6 Apr · Shift 1 MCQ

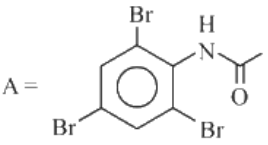
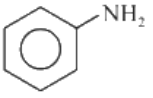
The major products A and B from the following reactions are :

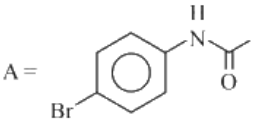
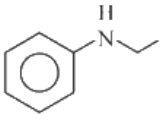
(see the figure above)

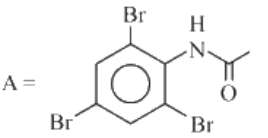
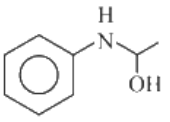
Q46. The major products A and B from the following reactions are :



(1) A =  , B = 

(2) A =  , B = 

(3) A =  , B = 

(4) A =  , B = 

(A) *see figure*

(B) *see figure*

(C) *see figure*

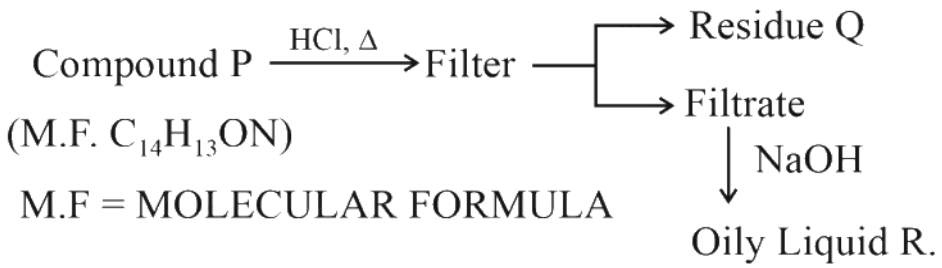
(D) *see figure*

Answer: (C) · Key from source paper

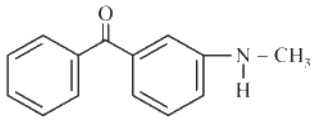
Q74 JEE Main 2023 · 6 Apr · Shift 1 MCQ

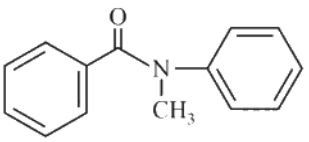
see figure

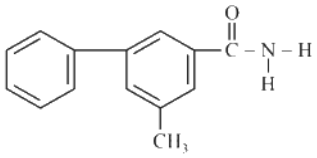
Q48.

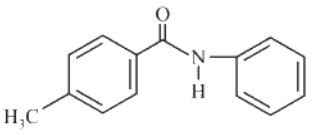


Compound P is neutral, Q gives effervescence with $NaHCO_3$ while R reacts with Hinsberg's reagent to give solid soluble in NaOH. Compound P is

(1) 

(2) 

(3) 

(4) 

(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (D) · Key from source paper

Q75 JEE Main 2023 · 6 Apr · Shift 2 Numerical

Number of isomeric aromatic amines with molecular formula $C_8H_{11}N$, which can be synthesized by Gabriel Phthalimide synthesis is _____ .

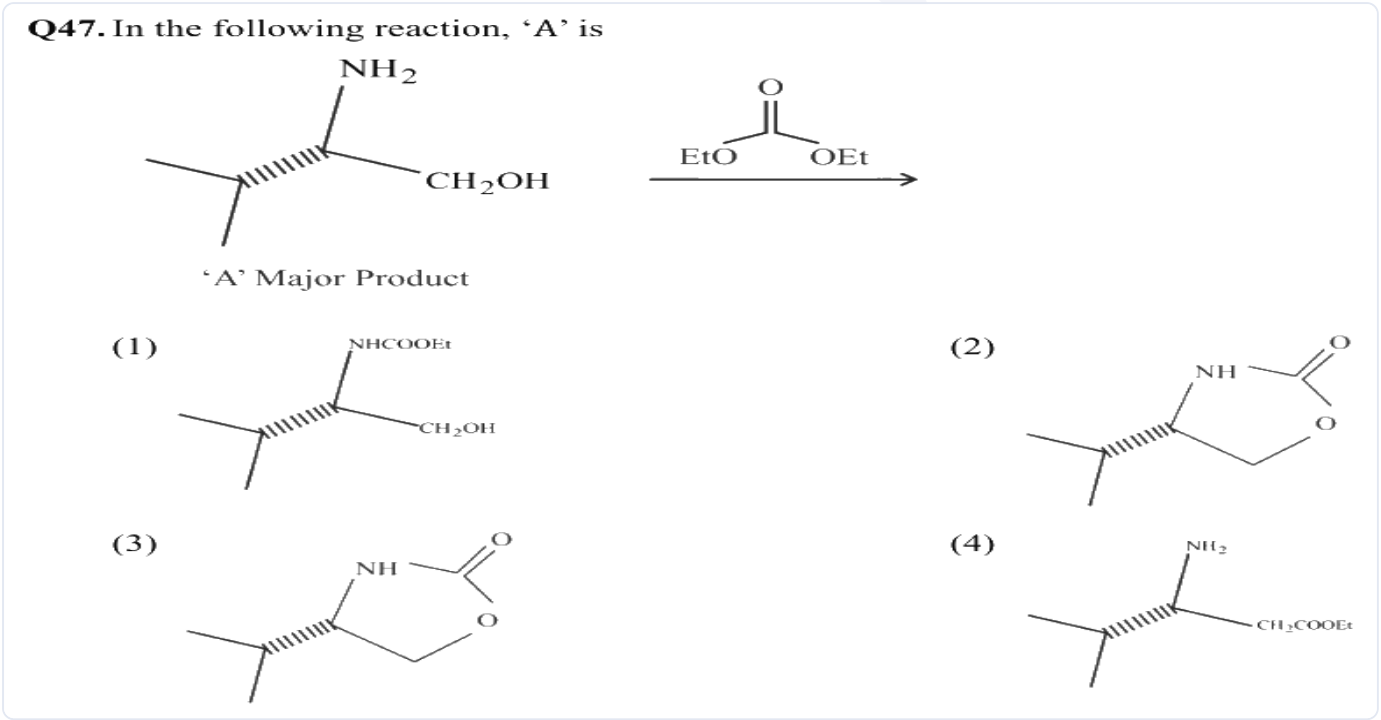
Numerical value type: the answer is a number.

Answer: 5. · Key from source paper

Q76 JEE Main 2023 · 1 Feb · Shift 1 MCQ

In the following reaction, 'A' is

(see the figure above)



(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (B) · Key from source paper

Q77 JEE Main 2023 · 1 Feb · Shift 2 MCQ

Given below are two statements: one is labelled as Assertion (A) and the other is labelled as Reason (R).

Assertion (A): α-halocarboxylic acid on reaction with dil. NH_3 gives good yield of α-amino carboxylic acid whereas the yield of amines is very low when prepared from alkyl halides.

Reason (R): Amino acids exist in zwitter ion form in aqueous medium.

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

(A) Both (A) and (R) are correct and (R) is the correct explanation of (A).

(B) Both (A) and (R) are correct but (R) is not the correct explanation of (A).

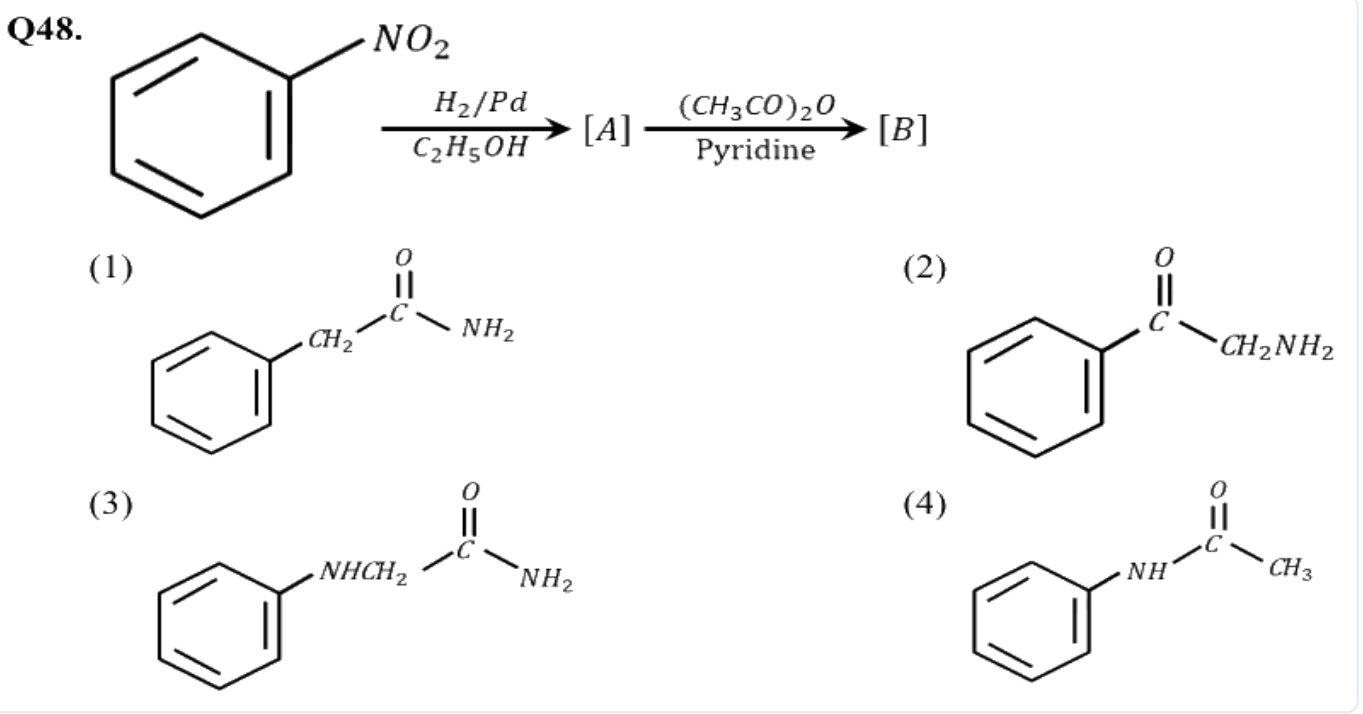
(C) (A) is correct but (R) is not correct.

(D) (A) is not correct but (R) is correct.

Answer: (A) Both (A) and (R) are correct and (R) is the correct explanation of (A). · Checked by our team

Q78 JEE Main 2023 · 31 Jan · Shift 1 MCQ

see figure



(A) *see figure*

(B) *see figure*

(C) *see figure*

(D) *see figure*

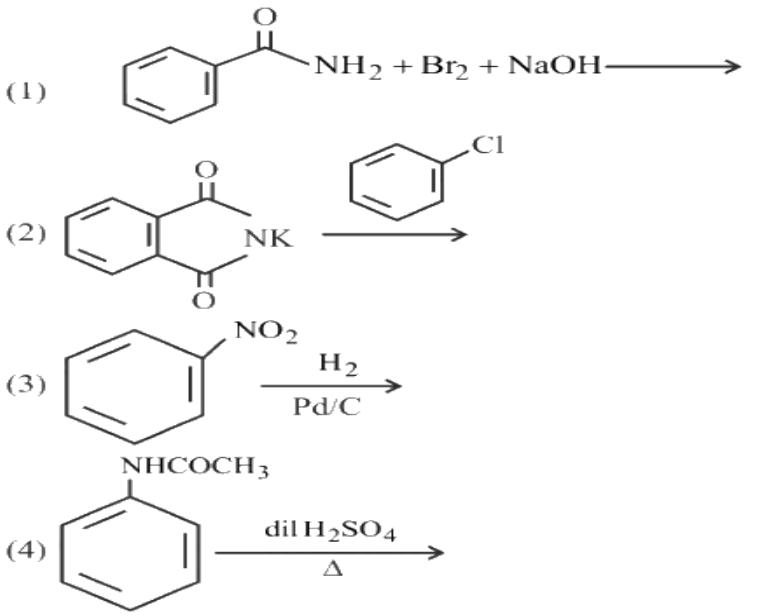
Answer: (D) · Key from source paper

Q79 JEE Main 2023 · 31 Jan · Shift 1 Numerical

How many of the transformation given below would result in aromatic amines?

(see the figure above)

Q60. How many of the transformation given below would result in aromatic amines?



Numerical value type: the answer is a number.

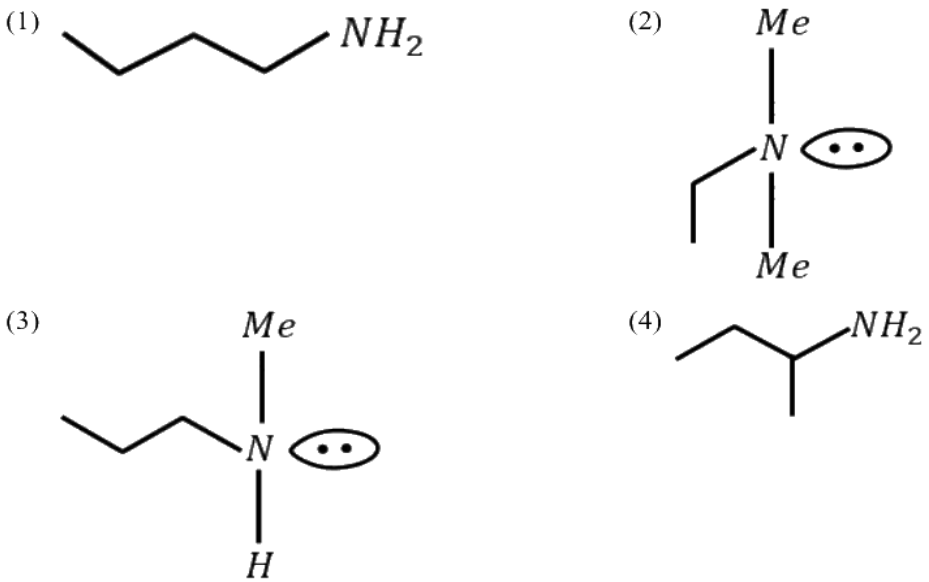
Answer: 3. · Key from source paper

Q80 JEE Main 2023 · 31 Jan · Shift 2 MCQ

An organic compound [A]($C_4H_{11}N$), shows optical activity and gives N_2 gas on treatment with HNO_2. The compound [A] reacts with $PhSO_2Cl$ producing a compound which is soluble in KOH. The structure of A is :

(see the figure above)

Q57. An organic compound [A]($C_4H_{11}N$), shows optical activity and gives N_2 gas on treatment with HNO_2. The compound [A] reacts with $PhSO_2Cl$ producing a compound which is soluble in KOH. The structure of A is :



(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

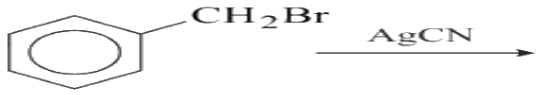
Answer: (D) · Key from source paper

Q81 JEE Main 2023 · 30 Jan · Shift 1 MCQ

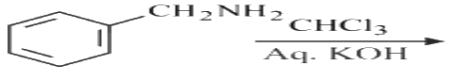
Benzyl isocyanide can be obtained by:
(A) *(see the figure above)*
(B) *(see the figure above)*
(C) *(see the figure above)*
(D) *(see the figure above)*
Choose the correct answer from the options given below:

Q46. Benzyl isocyanide can be obtained by:

(A)



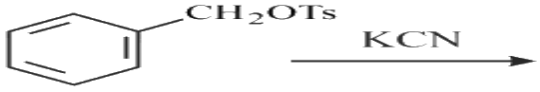
(B)



(C)



(D)



Choose the correct answer from the options given below:

(1) A and D
(2) Only B
(3) A and B
(4) B and C

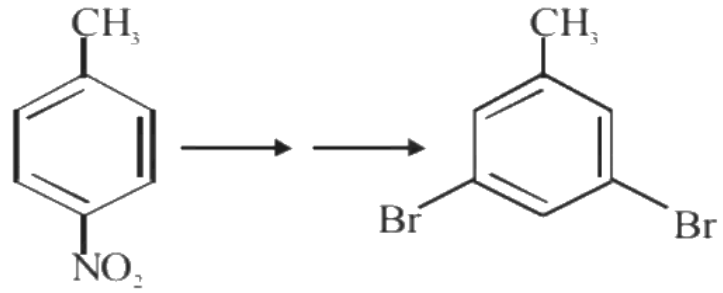
(A) A and D
(B) Only B
(C) A and B
(D) B and C

Answer: (C) A and B · Key from source paper

Q82 JEE Main 2023 · 30 Jan · Shift 2 MCQ

see figure

Q57.



(X) (Y)

In the above conversion of compound (X) to product (Y), the sequence of reagents to be used will be:

(1) (i) Br_2, Fe
(ii) Fe, H^+
(iii) $LiAlH_4$

(2) (i) $Br_2(aq)$
(ii) $LiAlH_4$
(iii) H_3O^+

(3) (i) Fe, H^+
(ii) $Br_2(aq)$
(iii) HNO_2
(iv) CuBr

(4) (i) Fe, H^+
(ii) $Br_2(aq)$
(iii) HNO_2
(iv) H_3PO_2

(A) (i) Br_2, Fe
(ii) Fe, H^+
(iii) $LiAlH_4$

(B) (i) $Br_2(aq)$
(ii) $LiAlH_4$
(iii) H_3O^+

(C) (i) Fe, H^+
(ii) $Br_2(aq)$
(iii) HNO_2
(iv) CuBr

(D) (i) Fe, H^+
(ii) $Br_2(aq)$
(iii) HNO_2
(iv) H_3PO_2

Answer: (D) (i) Fe, H^+
(ii) $Br_2(aq)$
(iii) HNO_2
(iv) H_3PO_2 · Key from source paper

Q83 JEE Main 2023 · 25 Jan · Shift 1 MCQ

The correct order in aqueous medium of basic strength in case of methyl substituted amines is:

(A) $Me_2NH > MeNH_2 > Me_3N > NH_3$

(B) $Me_2NH > Me_3N > MeNH_2 > NH_3$

(C) $NH_3 > Me_3N > MeNH_2 > Me_2NH$

(D) $Me_3N > Me_2NH > MeNH_2 > NH_3$

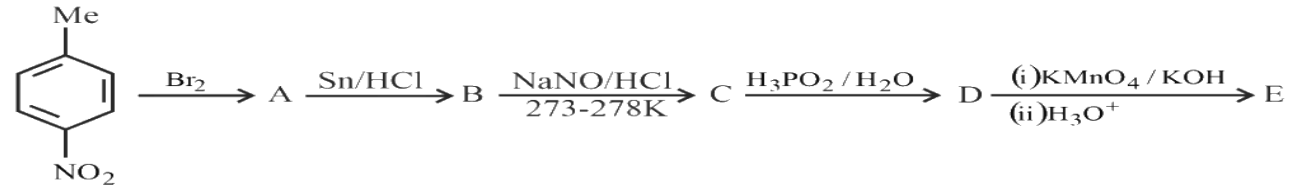
Answer: (A) $Me_2NH > MeNH_2 > Me_3N > NH_3$ · Key from source paper

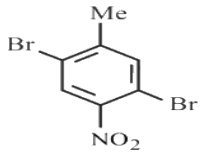
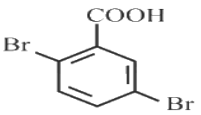
Q84 JEE Main 2023 · 25 Jan · Shift 1 MCQ

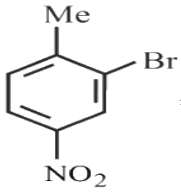
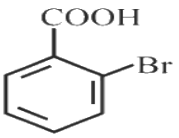
Identify the product formed (A and E)

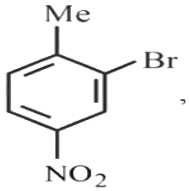
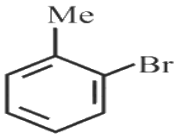
(see the figure above)

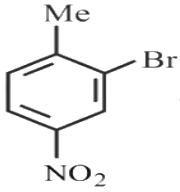
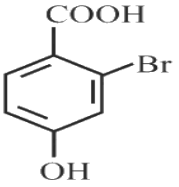
Q56. Identify the product formed (A and E)



(1) A =  , E = 

(2) A =  , E = 

(3) A =  , E = 

(4) A =  , E = 

(A) A = *(see the figure above)*, E = *(see the figure above)*

(B) A = *(see the figure above)*, E = *(see the figure above)*

(C) A = *(see the figure above)*, E = *(see the figure above)*

(D) A = *(see the figure above)*, E = *(see the figure above)*

Answer: (B) A = *(see the figure above)*, E = *(see the figure above)* · Key from source paper

Q85 JEE Main 2023 · 25 Jan · Shift 2 MCQ

Match List I with List II

List I (Amines)	List II (pKb)
A. Aniline	I. 3.25
B. Ethanamine	II. 3.00
C. N-Ethylethanamine	III. 9.38
D. N, N-Diethylethanamine	IV. 3.29

Choose the correct answer from the options given below:-

(A) A-I, B-IV, C-II, D-III
(B) A-III, B-II, C-I, D-IV
(C) A-III, B-II, C-IV, D-I
(D) A-III, B-IV, C-II, D-I

Answer: (D) A-III, B-IV, C-II, D-I · Key from source paper

Q86 JEE Main 2023 · 24 Jan · Shift 2 MCQ

Given below are two statements :

Statement I : Pure Aniline and other arylamines are usually colourless.

Statement II : Arylamines get coloured on storage due to atmospheric reduction.

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

(A) Both Statement I and Statement II are incorrect
(B) Both Statement I and Statement II are correct
(C) Statement I is correct but Statement II is incorrect
(D) Statement I is incorrect but Statement II is correct

Answer: (C) Statement I is correct but Statement II is incorrect · Key from source paper

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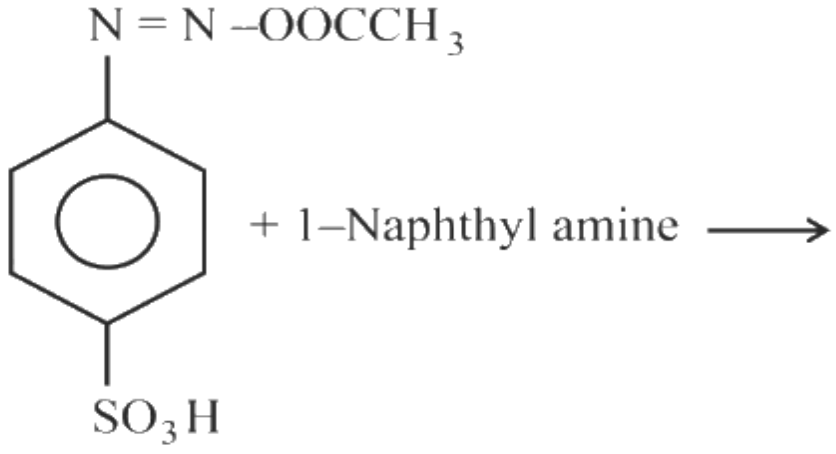
Q87 JEE Main 2023 · 24 Jan · Shift 2 MCQ

Choose the correct colour of the product for the following reaction.

(see the figure above) + 1-Naphthyl amine ⟶

Q57. Choose the correct colour of the product for the following reaction.



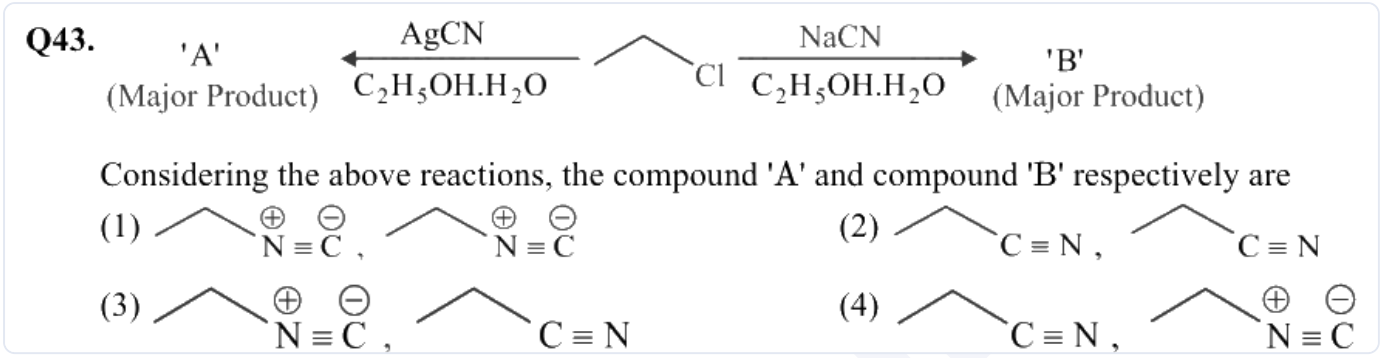
(1) Yellow
(2) White
(3) Red
(4) Blue

(A) Yellow
(B) White
(C) Red
(D) Blue

Answer: (C) Red · Key from source paper

Q88 JEE Main 2022 · 29 Jul · Shift 1 MCQ

see figure

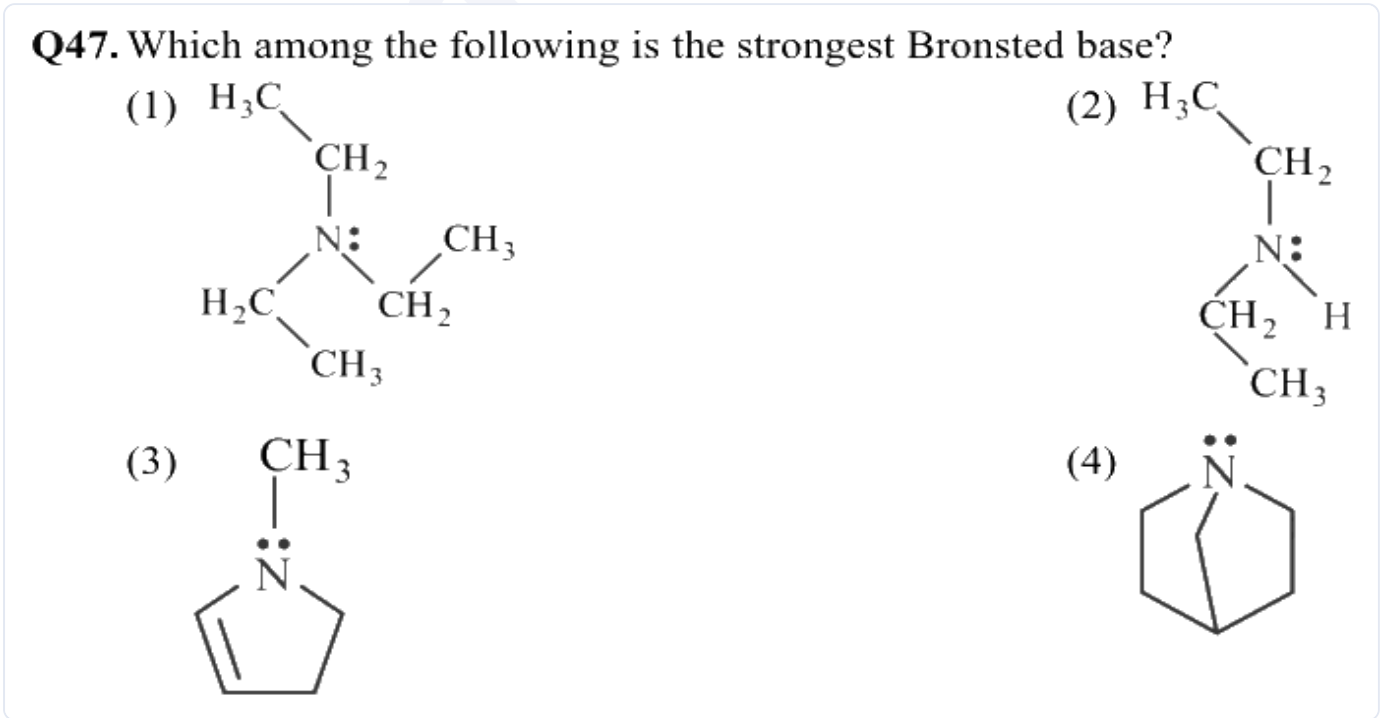


(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (C) · Key from source paper

Q89 JEE Main 2022 · 29 Jul · Shift 1 MCQ

Which among the following is the strongest Bronsted base?



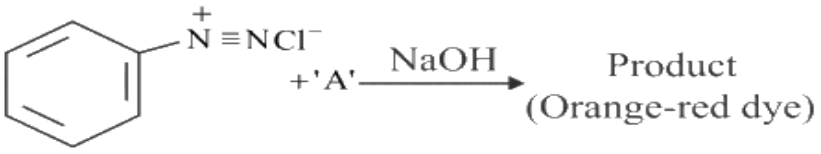
(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (D) · Key from source paper

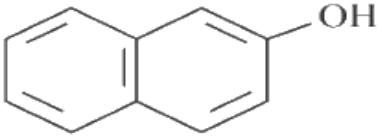
Q90 JEE Main 2022 · 29 Jul · Shift 1 MCQ

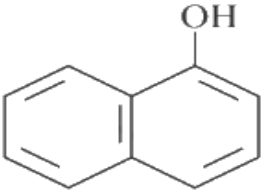
see figure

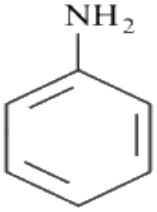
Q49.

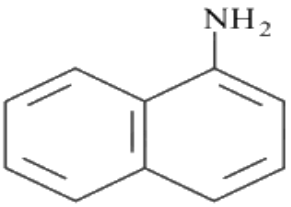


Which among the following represent reagent 'A'?

(1) 

(2) 

(3) 

(4) 

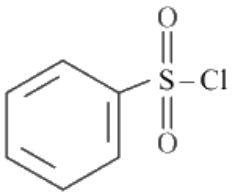
(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

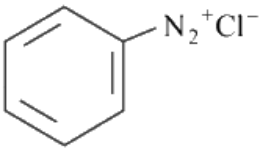
Answer: (A) · Key from source paper

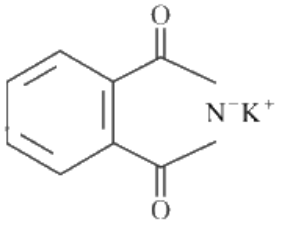
Q91 JEE Main 2022 · 29 Jul · Shift 2 MCQ

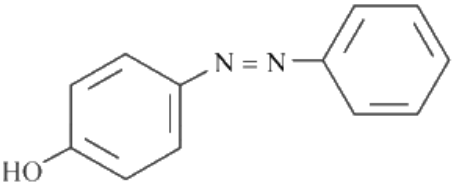
The Hinsberg reagent is

Q48. The Hinsberg reagent is

(1) 

(2) 

(3) 

(4) 

(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (A) · Key from source paper

Q92 JEE Main 2022 · 28 Jul · Shift 2 MCQ

Given below are two statements : one is labelled as Assertion A and the other is labelled as Reason R
Assertion A : Aniline on nitration yields ortho, meta & para nitro derivatives of aniline.
Reason R : Nitrating mixture is a strong acidic mixture.
In the light of the above statements, choose the correct answer from the options given below

(A) Both A and R are true and R is the correct explanation of A
(B) Both A and R are true but R is NOT the correct explanation of A
(C) A is true but R is false
(D) A is false but R is true

Answer: (A) Both A and R are true and R is the correct explanation of A · Key from source paper

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Q93 JEE Main 2022 · 27 Jul · Shift 1 MCQ

Match List-I with List-II

List-I	List-II
A Benzenesulphonyl chloride	I Test for primary amines
B Hoffmann bromamide reaction	II Anti Saytzeff
C Carbylamine reaction	III Hinsberg reagent
D Hoffmann orientation	IV Known reaction of Isocyanates.

Choose the correct answer from the options given below

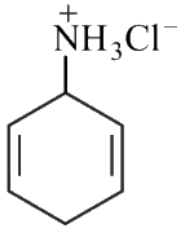
(A) A – IV, B – III, C – II, D – I
(B) A – IV, B – II, C – I, D – III
(C) A – III, B – IV, C – I, D – II
(D) A – IV, B – III, C – I, D – II

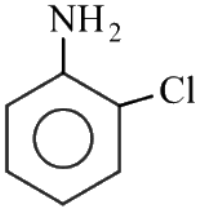
Answer: (C) A – III, B – IV, C – I, D – II · Key from source paper

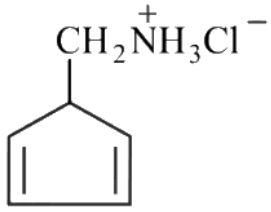
Q94 JEE Main 2022 · 27 Jul · Shift 2 MCQ

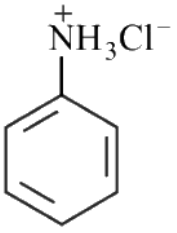
An organic compound 'A' contains nitrogen and chlorine. It dissolves readily in water to give a solution that turns litmus red. Titration of compound 'A' with standard base indicates that the molecular weight of 'A' is 131 ± 2. When a sample of 'A' is treated with aq. NaOH, a liquid separates which contains N but not Cl. Treatment of the obtained liquid with nitrous acid followed by phenol gives orange precipitate. The compound 'A' is
(see the figure above)

Q47. An organic compound 'A' contains nitrogen and chlorine. It dissolves readily in water to give a solution that turns litmus red. Titration of compound 'A' with standard base indicates that the molecular weight of 'A' is 131 ± 2. When a sample of 'A' is treated with aq. NaOH, a liquid separates which contains N but not Cl. Treatment of the obtained liquid with nitrous acid followed by phenol gives orange precipitate. The compound 'A' is

(1) 

(2) 

(3) 

(4) 

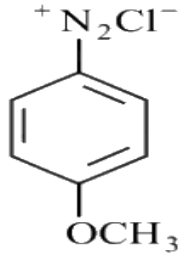
(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

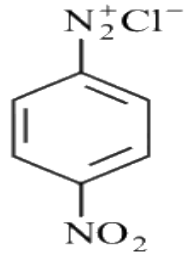
Answer: (D) · Key from source paper

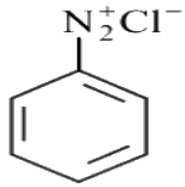
Q95 JEE Main 2022 · 26 Jul · Shift 1 MCQ

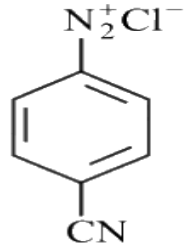
The correct stability order of the following diazonium salt is
(see the figure above)

Q39. The correct stability order of the following diazonium salt is

(A) 

(B) 

(C) 

(D) 

(1) (A) > (B) > (C) > (D)
(2) (A) > (C) > (D) > (B)
(3) (C) > (A) > (D) > (B)
(4) (C) > (D) > (B) > (A)

.

A (A) > (B) > (C) > (D)
B (A) > (C) > (D) > (B)
C (C) > (A) > (D) > (B)
D (C) > (D) > (B) > (A)

Answer: (B) (A) > (C) > (D) > (B) · Key from source paper

Q96 JEE Main 2022 · 26 Jul · Shift 1 MCQ

Given below are two statements: one is labelled as Assertion (A) and the other is labelled as Reason (R).

Assertion (A) : Experimental reaction of CH_3Cl with aniline and anhydrous $AlCl_3$ does not give o and p-methylaniline.

Reason (R) : The $-NH_2$ group of aniline becomes deactivating because of salt formation with anhydrous $AlCl_3$ and hence yields m-methyl aniline as the product.

In the light of the above statements, choose the most appropriate answer from the options given below

A Both (A) and (R) are true and (R) is the correct explanation of (A).
B Both (A) and (R) are true but (R) is not the correct explanation of (A).
C (A) is true, but (R) is false.
D (A) is false, but (R) is true.

Answer: (C) (A) is true, but (R) is false. · Key from source paper

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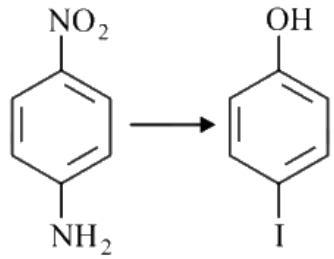
Q97 JEE Main 2022 · 26 Jul · Shift 2 MCQ

The correct sequential order of the reagents for the given reaction is

(see the figure above)

Q48. The correct sequential order of the reagents for the given reaction is



(1) $HNO_2, Fe\ /\ H^+, HNO_2, KI, H_2O\ /\ H^+$
(2) $HNO_2, KI, Fe\ /\ H^+, HNO_2, H_2O\ /$ warm
(3) $HNO_2, KI, HNO_2, Fe\ /\ H^+, H_2O\ /\ H^+$
(4) $HNO_2, Fe\ /\ H^+, KI, HNO_2, H_2O\ /$ warm

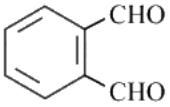
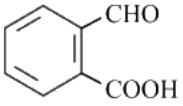
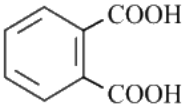
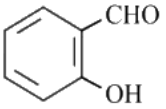
(A) $HNO_2, Fe/H^+, HNO_2, KI, H_2O/H^+$
(B) $HNO_2, KI, Fe/H^+, HNO_2, H_2O/$ warm
(C) $HNO_2, KI, HNO_2, Fe/H^+, H_2O/H^+$
(D) $HNO_2, Fe/H^+, KI, HNO_2, H_2O/$ warm

Answer: (B) $HNO_2, KI, Fe/H^+, HNO_2, H_2O/$ warm · Key from source paper

Q98 JEE Main 2022 · 25 Jul · Shift 1 MCQ

An organic compound 'A' on reaction with NH_3 followed by heating gives compound B. Which on further strong heating gives compound C $C_8H_5NO_2$. Compound C on sequential reaction with ethanolic KOH, alkyl chloride and hydrolysis with alkali gives a primary amine. The compound A is

Q47. An organic compound 'A' on reaction with NH_3 followed by heating gives compound B. Which on further strong heating gives compound C $C_8H_5NO_2$. Compound C on sequential reaction with ethanolic KOH, alkyl chloride and hydrolysis with alkali gives a primary amine. The compound A is

(1) 
(2) 
(3) 
(4) 

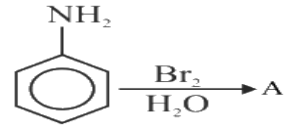
(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

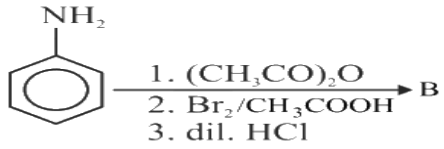
Answer: (C) · Key from source paper

Q99 JEE Main 2022 · 29 Jun · Shift 1 MCQ

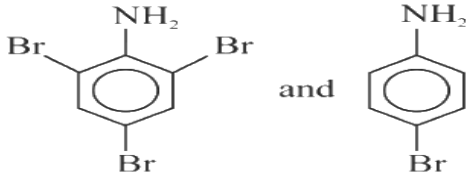
see figure

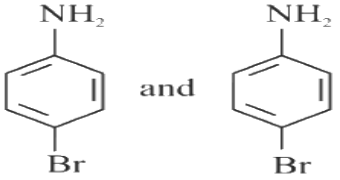
Q47.

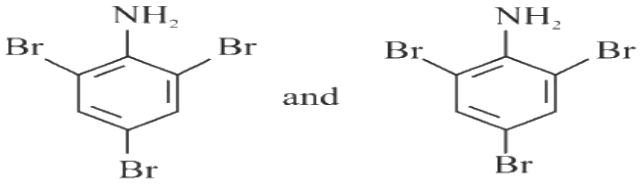


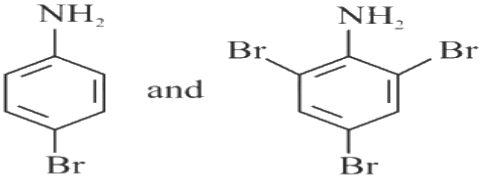


Consider the above reaction, the product A and product B respectively are

(1) 

(2) 

(3) 

(4) 

(A) *see figure*

(B) *see figure*

(C) *see figure*

(D) *see figure*

Answer: (A) · Key from source paper

Q100 JEE Main 2022 · 29 Jun · Shift 2 MCQ

In Friedel-Crafts alkylation of aniline, one gets:

(A) alkylated product with ortho and para substitution.

(B) secondary amine after acidic treatment.

(C) an amide product.

(D) positively charged nitrogen at benzene ring.

Answer: (D) positively charged nitrogen at benzene ring. · Key from source paper

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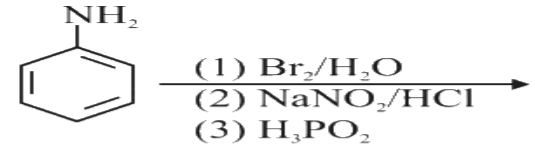
Q101 JEE Main 2022 · 28 Jun · Shift 1 MCQ

Identify the major product formed in the following sequence of reactions :

(see the figure above)

Q47. Identify the major product formed in the following sequence of reactions :



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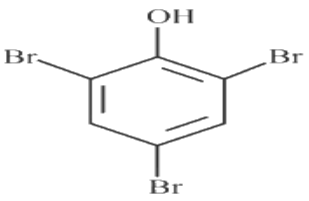

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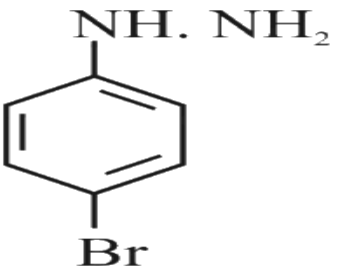

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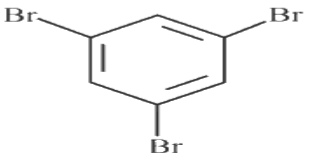

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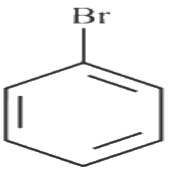


(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (C) · Key from source paper

Q102 JEE Main 2022 · 28 Jun · Shift 1 MCQ

A primary aliphatic amine on reaction with nitrous acid in cold (273 K) and there after raising temperature of reaction mixture to room temperature (298 K), gives a/an

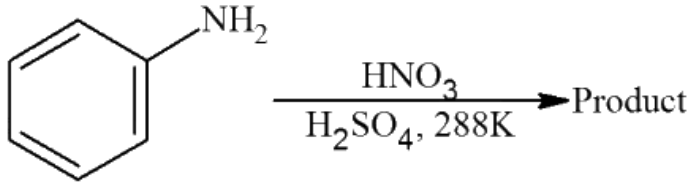
(A) Alcohol
(B) nitrile
(C) diazonium salt
(D) secondary amine

Answer: (A) Alcohol · Key from source paper

Q103 JEE Main 2022 · 28 Jun · Shift 2 MCQ

With respect to the following reaction, consider the given statements:
(see the figure above)
(A) o-Nitroaniline and p-nitroaniline are the predominant products.
(B) p-Nitroaniline and m-nitroaniline are the predominant products.
(C) HNO_3 acts as an acid.
(D) H_2SO_4 acts as an acid.
Choose the correct option.

Q47. With respect to the following reaction, consider the given statements:



(A) o-Nitroaniline and p-nitroaniline are the predominant products.

(B) p-Nitroaniline and m-nitroaniline are the predominant products.

(C) HNO_3 acts as an acid.

(D) H_2SO_4 acts as an acid.

Choose the correct option.

(1) (A) & (C) are correct statements.

(2) (A) & (D) are correct statement.

(3) (B) & (D) are correct statements.

(4) (B) & (C) are correct statements.

A (A) & (C) are correct statements.

B (A) & (D) are correct statement.

C (B) & (D) are correct statements.

D (B) & (C) are correct statements.

Answer: (C) (B) & (D) are correct statements. · Key from source paper

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Q104 JEE Main 2022 · 27 Jun · Shift 1 MCQ

Given below are two statements :

Statement - I : In Hofmann degradation reaction, the migration of only an alkyl group takes place from carbonyl carbon of the amide to the nitrogen atom.

Statement - II : The group is migrated in Hofmann degradation reaction to electron deficient atom.

In the light of the above statements, choose the most appropriate answer from the options given below

A Both Statement I and Statement II are correct.

B Both Statement I and Statement II are incorrect.

C Statement I is correct but Statement II is incorrect.

D Statement I is incorrect but Statement II is correct.

Answer: (D) Statement I is incorrect but Statement II is correct. · Checked by our team

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Q105 JEE Main 2022 · 26 Jun · Shift 2 MCQ

Which statement is NOT correct for p-toluenesulphonyl chloride?

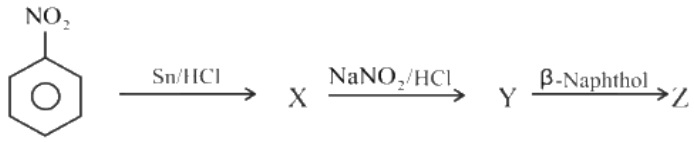
(A) It is hinsberg's reagent
(B) It is used to distinguish primary and secondary amines.
(C) On treatment with secondary amine, it leads to a product, that is soluble in alkali.
(D) It does not react with tertiary amine.

Answer: (C) On treatment with secondary amine, it leads to a product, that is soluble in alkali. · Key from source paper

Q106 JEE Main 2022 · 26 Jun · Shift 2 MCQ

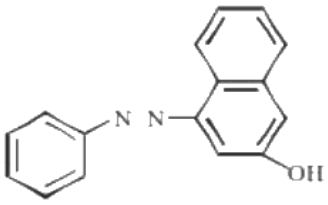
see figure

Q47.

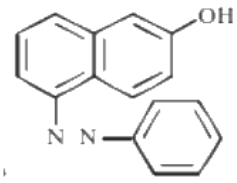


Identify 'Z' among the following

(1)



(2)



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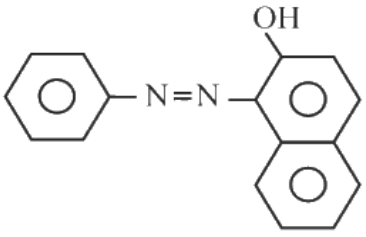

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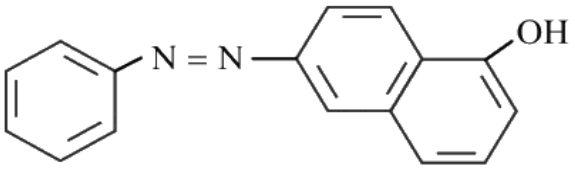


(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (C) · Key from source paper

Q107 JEE Main 2022 · 24 Jun · Shift 1 MCQ

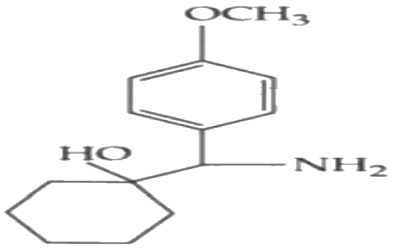
see figure

Q45.



The major product of the above reactions is

(1)



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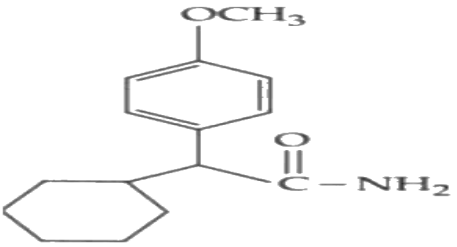

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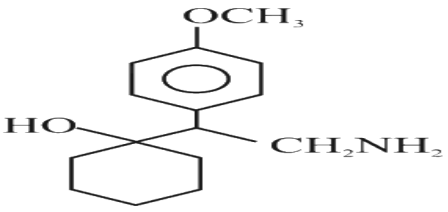

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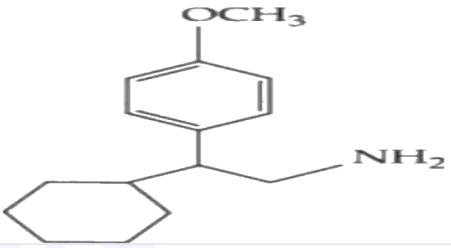


(A) *see figure*

(B) *see figure*

(C) *see figure*

(D) *see figure*

Answer: (C) · Key from source paper

Q108 JEE Main 2022 · 24 Jun · Shift 2 MCQ

The conversion of propan-1-ol to n-butylamine involves the sequential addition of reagents. The correct sequential order of reagents is

(A) (i) $SOCl_2$
(ii) KCN
(iii) H_2/ Ni, Na(Hg)/C_2H_5 OH

(B) (i) HCl
(ii) H_2/ Ni, Na(Hg)/C_2H_5 OH

(C) (i) $SOCl_2$
(ii) KCN
(iii) CH_3NH_2

(D) (i) HCl
(ii) CH_3NH_2

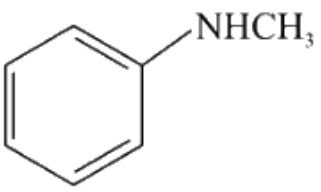
Answer: (A) (i) $SOCl_2$
(ii) KCN
(iii) H_2/ Ni, Na(Hg)/C_2H_5 OH · Key from source paper

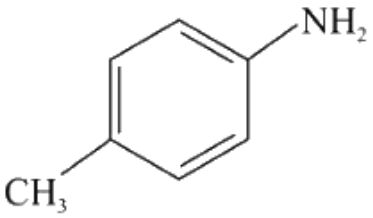
Q109 JEE Main 2021 · 1 Sep · Shift 2 MCQ

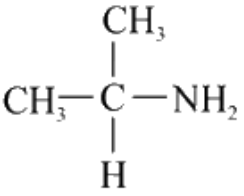
Which one of the following gives the most stable Diazonium salt ?

Q48. Which one of the following gives the most stable Diazonium salt ?

(1) $CH_3-CH_2-CH_2-NH_2$

(2) 

(3) 

(4) 

(A) $CH_3-CH_2-CH_2-NH_2$

(B) *see figure*

(C) *see figure*

(D) *see figure*

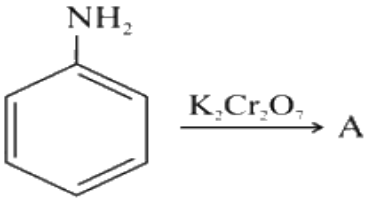
Answer: (C) · Key from source paper

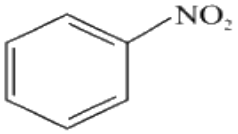
Q110 JEE Main 2021 · 1 Sep · Shift 2 MCQ

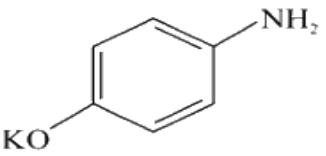
Identify A in the following reaction.

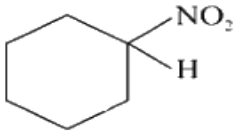
(see the figure above)

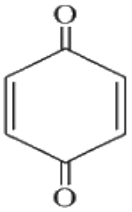
Q49. Identify A in the following reaction.



(1) 

(2) 

(3) 

(4) 

(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

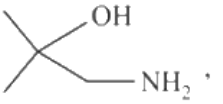
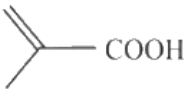
Answer: (D) · Key from source paper

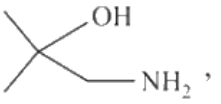
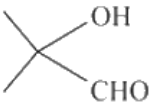
Q111 JEE Main 2021 · 31 Aug · Shift 1 MCQ

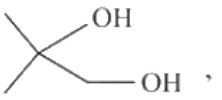
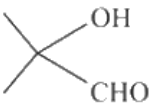
The major products A and B in the following set of reactions are:
(see the figure above)

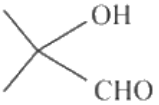
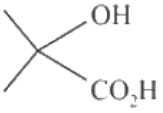
Q47. The major products A and B in the following set of reactions are:



(1) A =  , B = 

(2) A =  , B = 

(3) A =  , B = 

(4) A =  , B = 

(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (A) · Key from source paper

Q112 JEE Main 2021 · 31 Aug · Shift 1 Numerical

The total number of reagents from those given below, that can convert nitrobenzene into aniline is _____. (Integer answer)

I. $Sn - HCl$
II. $Sn - NH_4OH$
III. $Fe - HCl$
IV. $Zn - HCl$
V. $H_2 - Pd$
VI. $H_2 -$ Raney Nickel

Numerical value type: the answer is a number.

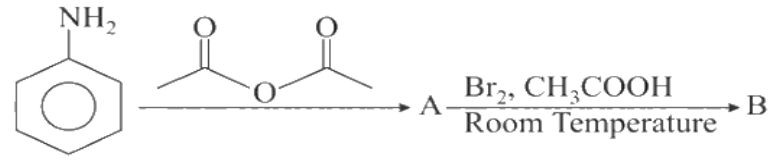
Answer: 5. · Key from source paper

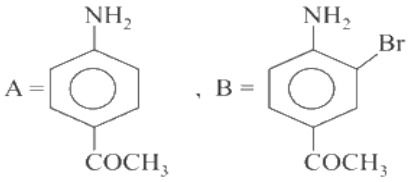
Q113 JEE Main 2021 · 31 Aug · Shift 2 MCQ

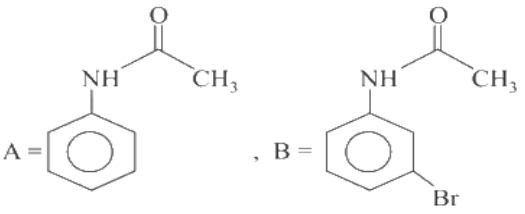
The major products A and B formed in the following reaction sequence are :

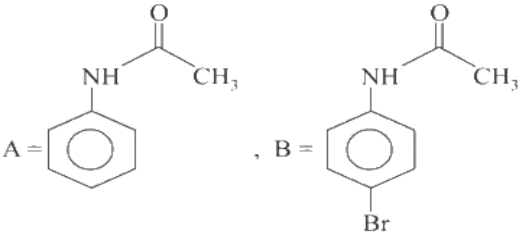
(see the figure above)

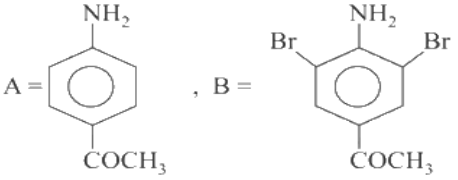
Q48. The major products A and B formed in the following reaction sequence are :



(1) 

(2) 

(3) 

(4) 

(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (C) · Key from source paper

Q114 JEE Main 2021 · 27 Aug · Shift 1 MCQ

Which of the following is not a correct statement for primary aliphatic amines?

(A) Primary amines can be prepared by the Gabriel phthalimide synthesis.
(B) Primary amines are less basic than the secondary amines.
(C) The intermolecular association in primary amines is less than the intermolecular association in secondary amines.
(D) Primary amines on treating with nitrous acid solution form corresponding alcohols except methyl amine.

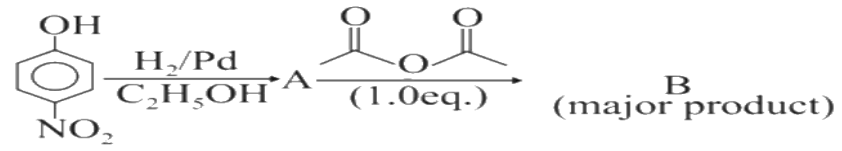
Answer: (C) The intermolecular association in primary amines is less than the intermolecular association in secondary amines. · Key from source paper

Q115 JEE Main 2021 · 27 Aug · Shift 2 MCQ

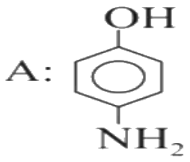
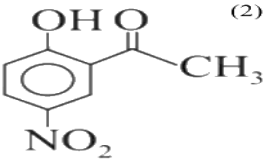
The correct structures of A and B formed in the following reactions are :

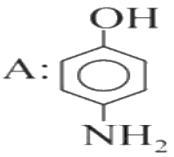
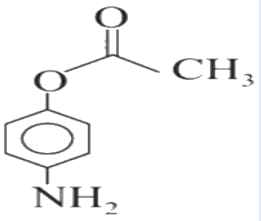
(see the figure above)

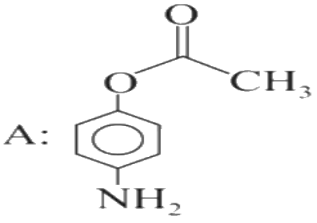
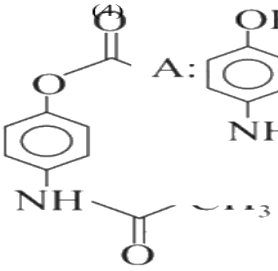
Q46. The correct structures of A and B formed in the following reactions are :

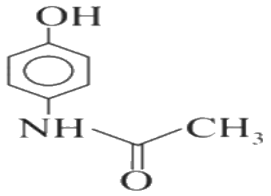


(major product)

(1) A:  , B: 

(2) A:  , B: 

(3) A:  , B: 

(4) A: , B: 

(A) A: *(see the figure above)* 4-aminophenol (benzene ring with OH and NH2 para); B: *(see the figure above)* benzene ring with OH, an adjacent C(=O)CH3 group (acetyl) and NO2 at the position para to OH

(B) A: *(see the figure above)* 4-aminophenol (benzene ring with OH and NH2 para); B: *(see the figure above)* 4-aminophenyl acetate (benzene ring with O-C(=O)-CH3 and NH2 para)

(C) A: *(see the figure above)* 4-aminophenyl acetate (benzene ring with O-C(=O)-CH3 and NH2 para); B: *(see the figure above)* benzene ring with O-C(=O)-CH3 and, para to it, NH-C(=O)-CH3

(D) A: *(see the figure above)* 4-aminophenol (benzene ring with OH and NH2 para); B: *(see the figure above)* N-(4-hydroxyphenyl)acetamide (benzene ring with OH and NH-C(=O)-CH3 para)

Answer: (D) A: *(see the figure above)* **4-aminophenol (benzene ring with OH and NH2 para); B:** *(see the figure above)* **N-(4-hydroxyphenyl)acetamide (benzene ring with OH and NH-C(=O)-CH3 para)** · Key from source paper

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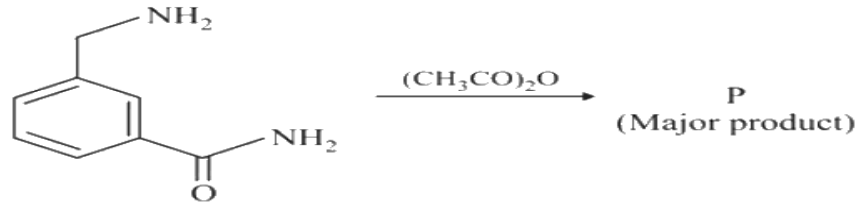
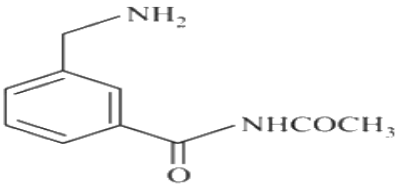
Q116 JEE Main 2021 · 26 Aug · Shift 2 MCQ

see figure

Q49.



The Major Product in the above reaction is :

(1)


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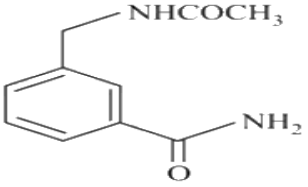
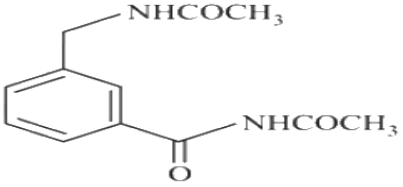


(3)


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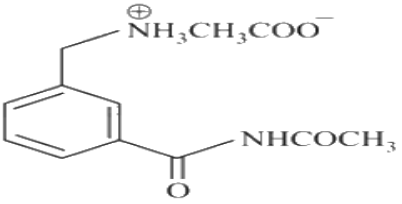

(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (B) · Key from source paper

Q117 JEE Main 2021 · 27 Jul · Shift 1 MCQ

Given below are two statements :
Statement I : Aniline is less basic than acetamide.
Statement II : In aniline, the lone pair of electrons on nitrogen atom is delocalised over benzene ring due to resonance and hence less available to a proton.
Choose the most appropriate option ;

(A) Statement I is true but statement II is false.
(B) Statement I is false but statement II is true.
(C) Both statement I and statement II are true.
(D) Both statement I and statement II are false.

Answer: (B) Statement I is false but statement II is true. · Key from source paper

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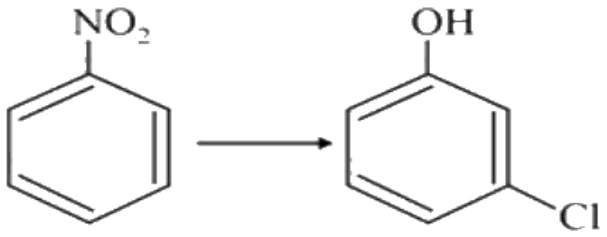
Q118 JEE Main 2021 · 27 Jul · Shift 2 MCQ

The correct sequence of correct reagents for the following transformation is :-
(see the figure above)

Q38. The correct sequence of correct reagents for the following transformation is :-



(1) (i) Fe, HCl
(ii) Cl_2, HCl,
(iii) $NaNO_2$, HCl, $0^\circ C$
(iv) H_2O/H^+

(2) (i) Fe, HCl
(ii) $NaNO_2$, HCl, $0^\circ C$
(iii) H_2O/H^+
(iv) Cl_2, $FeCl_3$

(3) (i) Cl_2, $FeCl_3$
(ii) Fe, HCl
(iii) $NaNO_2$, HCl, $0^\circ C$
(iv) H_2O/H^+

(4) (i) Cl_2, $FeCl_3$
(ii) $NaNO_2$, HCl, $0^\circ C$
(iii) Fe, HCl
(iv) H_2O/H^+

A (i) Fe, HCl
(ii) Cl_2, HCl,
(iii) $NaNO_2$, HCl, $0^\circ C$
(iv) H_2O/H^+

B (i) Fe, HCl
(ii) $NaNO_2$, HCl, $0^\circ C$
(iii) H_2O/H^+
(iv) Cl_2, $FeCl_3$

C (i) Cl_2, $FeCl_3$
(ii) Fe, HCl
(iii) $NaNO_2$, HCl, $0^\circ C$
(iv) H_2O/H^+

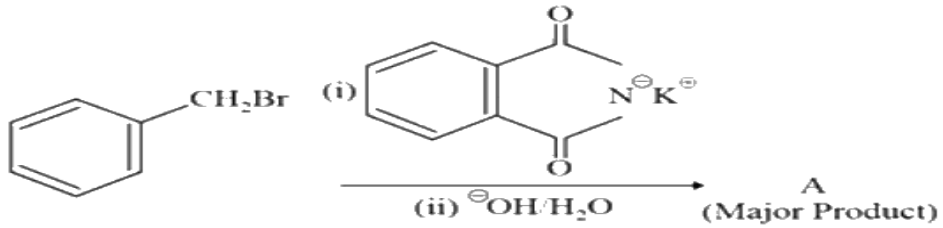
D (i) Cl_2, $FeCl_3$
(ii) $NaNO_2$, HCl, $0^\circ C$
(iii) Fe, HCl
(iv) H_2O/H^+

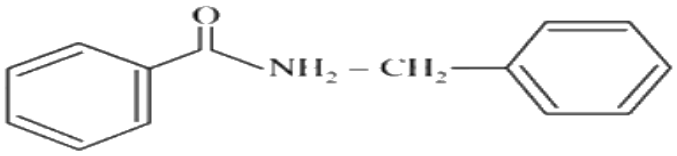
Answer: (C) (i) Cl_2, $FeCl_3$
(ii) Fe, HCl
(iii) $NaNO_2$, HCl, $0^\circ C$
(iv) H_2O/H^+ · Key from source paper

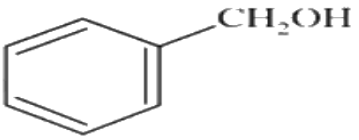
Q119 JEE Main 2021 · 27 Jul · Shift 2 MCQ

What is A in the following reaction?
(see the figure above)

Q45. What is A in the following reaction?



(1)


(2)


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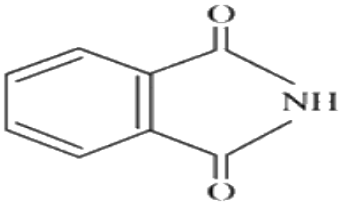
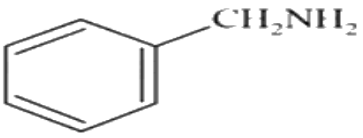


(4)


(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (D) · Key from source paper

Q120 JEE Main 2021 · 27 Jul · Shift 2 MCQ

$R - CN \xrightarrow[(ii)H_2O]{(i)\ DIBAL-H} R - Y$ Consider the above reaction and identify "Y"

(A) $-CH_2NH_2$
(B) $-CONH_2$
(C) $-CHO$
(D) $-COOH$

Answer: (C) $-CHO$ · Key from source paper

Q121 JEE Main 2021 · 25 Jul · Shift 1 MCQ

Given below are two statements, one is labelled as Assertion (A) and other is labelled as Reason (R).
Assertion (R) : Gabriel phthalimide synthesis cannot be used to prepare aromatic primary amines.
Reason : Aryl halides do not undergo nucleophilic substitution reaction.
In the light of the above statements, choose the correct answer from the options given below:

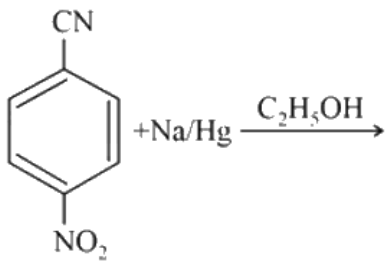
(A) Both (A) and (R) true but (R) is not the correct explanation of (A).
(B) (A) is false but (R) is true.
(C) Both (A) and (R) true and (R) is correct explanation of (A).
(D) (A) is true but (R) is false.

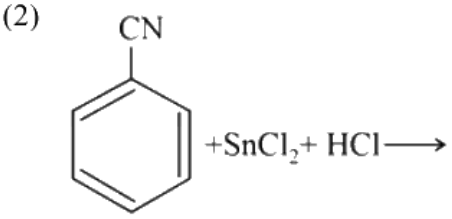
Answer: (C) Both (A) and (R) true and (R) is correct explanation of (A). · Key from source paper

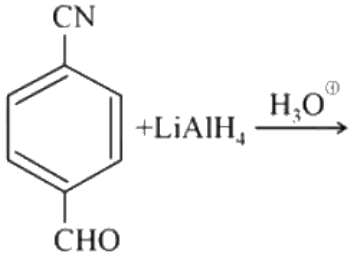
Q122 JEE Main 2021 · 25 Jul · Shift 1 MCQ

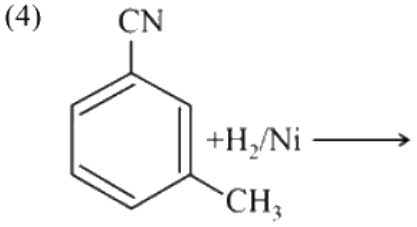
Which one of the products of the following reactions does not react with Hinsberg reagent to form sulphonamide?

Q46. Which one of the products of the following reactions does not react with Hinsberg reagent to form sulphonamide?

(1) 

(2) 

(3) 

(4) 

(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (B) · Key from source paper

Q123 JEE Main 2021 · 25 Jul · Shift 1 MCQ

Which one of the following compounds will liberate CO_2, when treated with $NaHCO_3$?

Q47. Which one of the following compounds will liberate CO_2, when treated with $NaHCO_3$?

(1) $CH_3)_3\overset{\oplus}{N}H\overset{\ominus}{Cl}$
(2) $CH_3)_4\overset{\oplus\ominus}{N}OH$
(3) $CH_3 - \overset{\overset{O}{\|}}{C} - NH_2$
(4) CH_3NH_2

(A) $CH_{33}\overset{\oplus}{N}H\overset{\ominus}{Cl}$

(B) $CH_{34}\overset{\oplus}{N}\overset{\ominus}{O}H$

(C) *see figure*

(D) CH_3NH_2

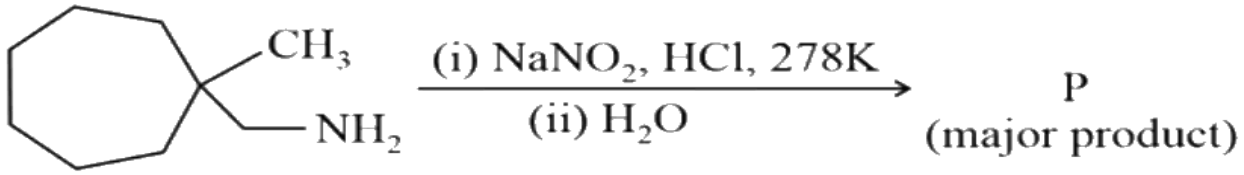
Answer: (A) $CH_{33}\overset{\oplus}{N}H\overset{\ominus}{Cl}$ · Key from source paper

Q124 JEE Main 2021 · 25 Jul · Shift 2 MCQ

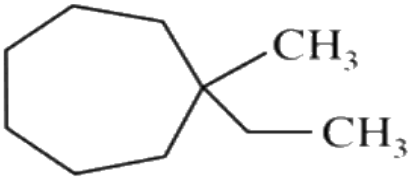
What is the major product "P" of the following reaction ?

(see the figure above)

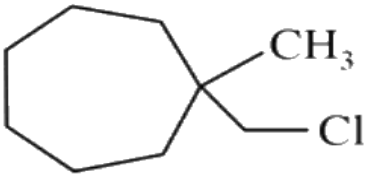
Q45. What is the major product "P" of the following reaction ?



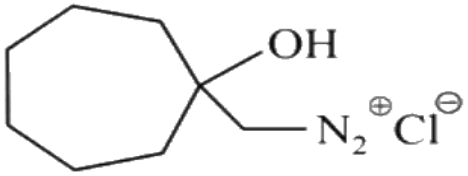
(1)



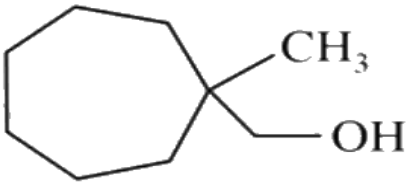
(2)



(3)



(4)



(A) *see figure*

(B) *see figure*

(C) *see figure*

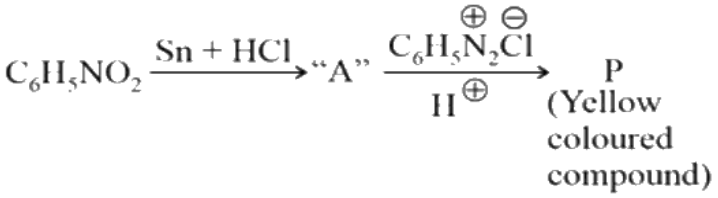
(D) *see figure*

Answer: (D) · Key from source paper

Q125 JEE Main 2021 · 25 Jul · Shift 2 MCQ

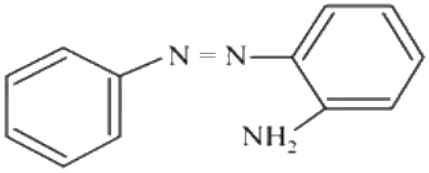
see figure

Q47.

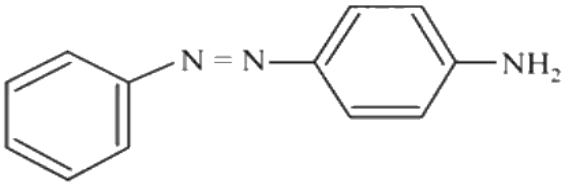


Consider the above reaction, the Product "P" is :

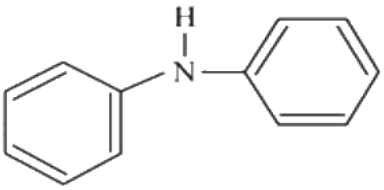
(1)



(2)



(3)



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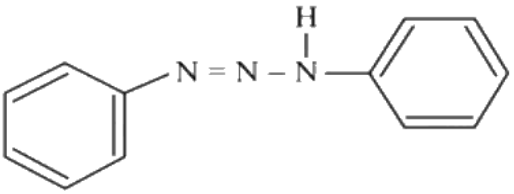


(A) *see figure*

(B) *see figure*

(C) *see figure*

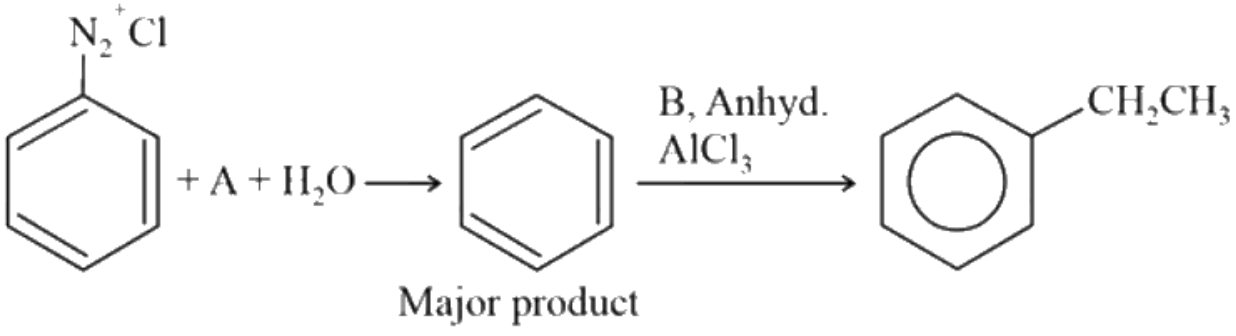
(D) *see figure*

Answer: (B) · Key from source paper

Q126 JEE Main 2021 · 22 Jul · Shift 1 MCQ

see figure

Q38.



In the chemical reactions given above *A* and *B* respectively are :

(1) H_3PO_2 and CH_3CH_2Cl

(2) CH_3CH_2OH and H_3PO_2

(3) H_3PO_2 and CH_3CH_2OH

(4) CH_3CH_2Cl and H_3PO_2

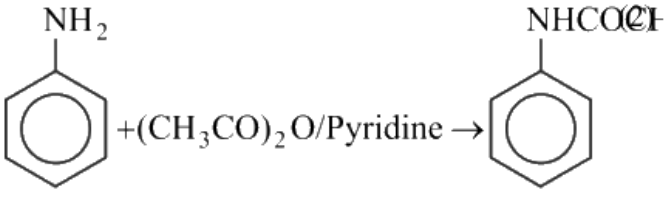
(A) H_3PO_2 and CH_3CH_2Cl
(B) CH_3CH_2OH and H_3PO_2
(C) H_3PO_2 and CH_3CH_2OH
(D) CH_3CH_2Cl and H_3PO_2

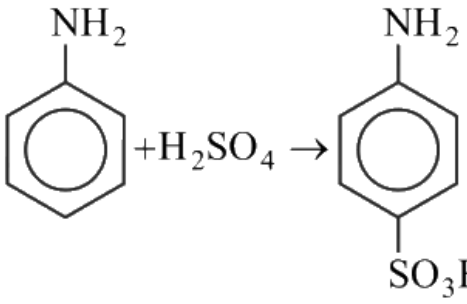
Answer: (A) H_3PO_2 and CH_3CH_2Cl · Key from source paper

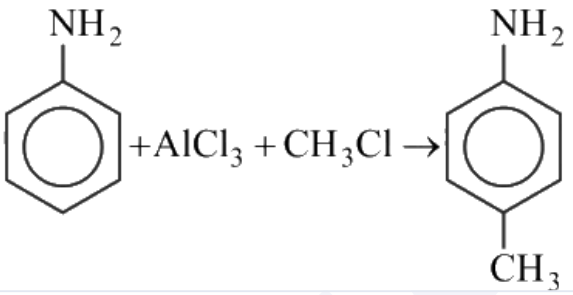
Q127 JEE Main 2021 · 22 Jul · Shift 1 MCQ

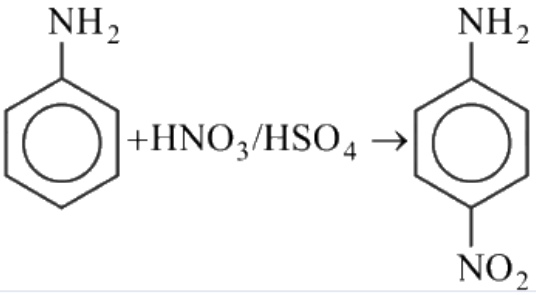
Which one of the following reactions does not occur ?

Q48. Which one of the following reactions does not occur ?

(1) 



(3) 

(4) 

(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (C) · Key from source paper

Q128 JEE Main 2021 · 20 Jul · Shift 1 MCQ

Compound A is converted to B on reaction with $CHCl_3$ and KOH. The compound B is toxic and can be decomposed by C. A, B and C respectively are:

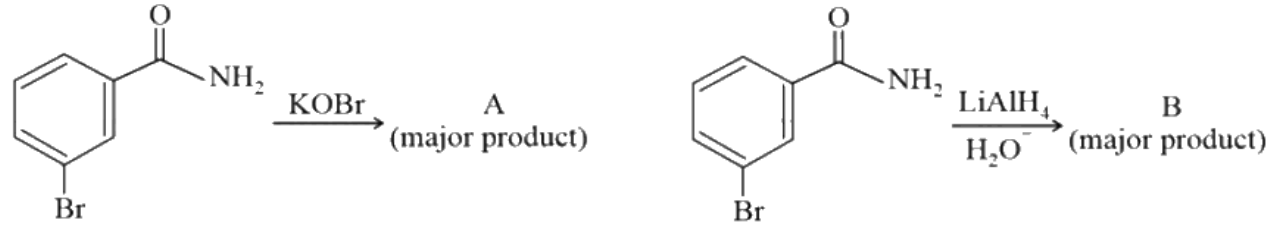
(A) primary amine, nitrile compound, conc. HCl
(B) secondary amine, isonitrile compound, conc. NaOH
(C) primary amine, isonitrile compound, conc. HCl
(D) secondary amine, nitrile compound, conc. NaOH

Answer: (C) primary amine, isonitrile compound, conc. HCl · Key from source paper

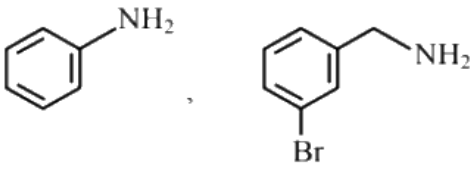
Q129 JEE Main 2021 · 20 Jul · Shift 2 MCQ

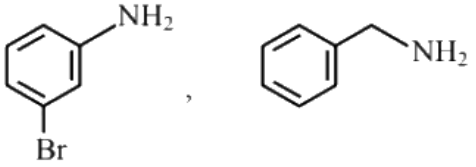
see figure

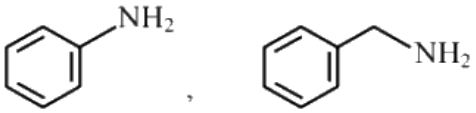
Q47.

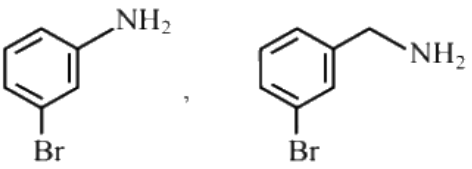


In the above reactions, product A and product B respectively are:

(1) 

(2) 

(3) 

(4) 

(A) *see figure*

(B) *see figure*

(C) *see figure*

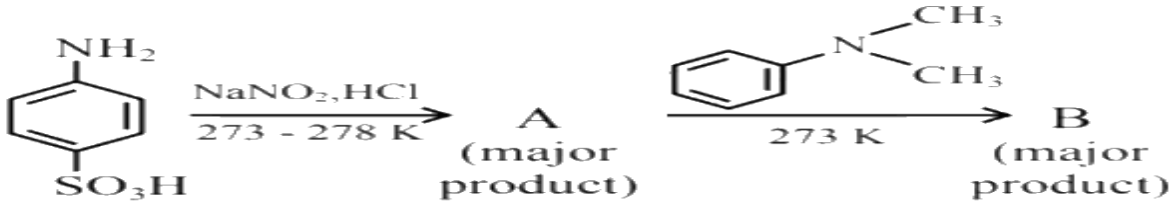
(D) *see figure*

Answer: (D) · Key from source paper

Q130 JEE Main 2021 · 20 Jul · Shift 2 MCQ

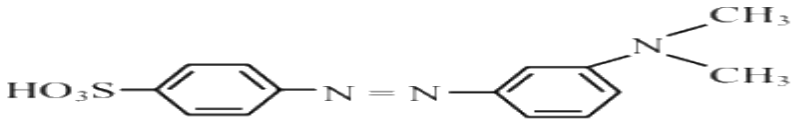
see figure

Q48.

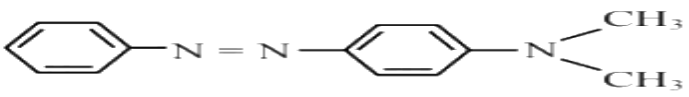


Consider the above reaction, compound B is:

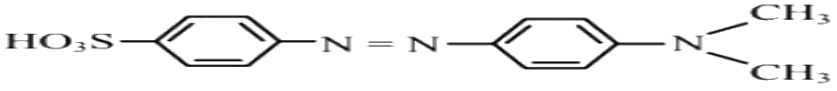
(1)



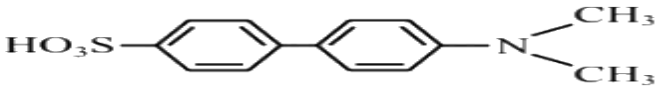
(2)



(3)



(4)



(A) *see figure*

(B) *see figure*

(C) *see figure*

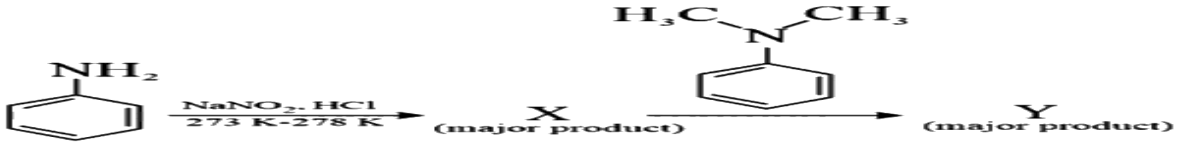
(D) *see figure*

Answer: (C) · Key from source paper

Q131 JEE Main 2021 · 18 Mar · Shift 1 MCQ

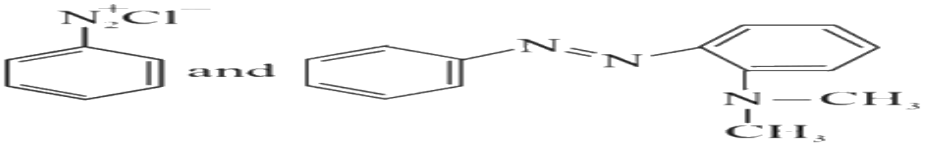
see figure

Q47.



Considering the above reaction, X and Y respectively are:

(1)



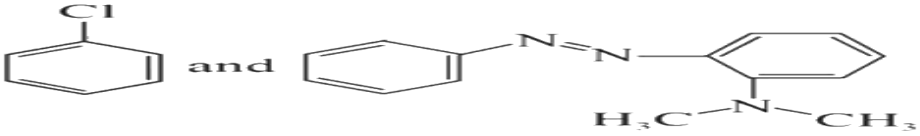
(2)



(3)



(4)

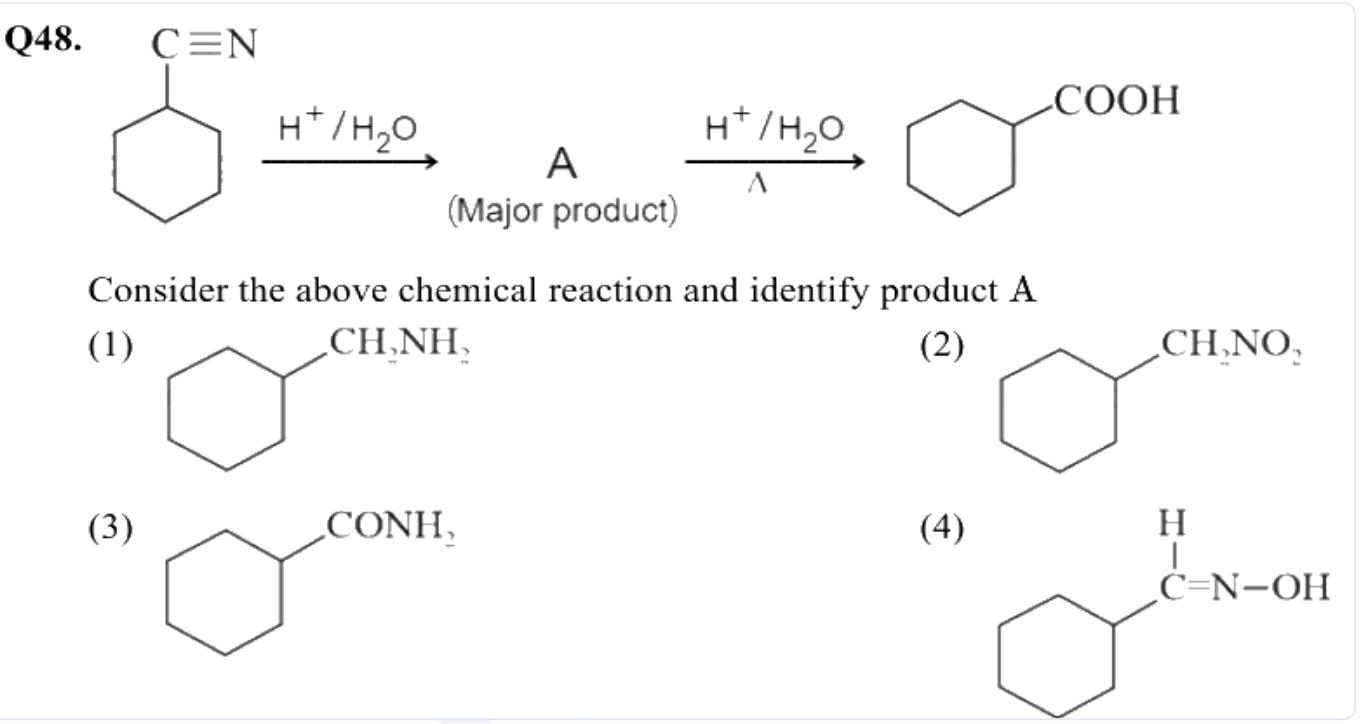


(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (B) · Key from source paper

Q132 JEE Main 2021 · 18 Mar · Shift 1 MCQ

see figure



(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (C) · Key from source paper

Q133 JEE Main 2021 · 18 Mar · Shift 1 Numerical

A reaction of 0.1 mole of Benzylamine with bromomethane gave $23\ \mathrm{g}$ of Benzyl trimethyl ammonium bromide. The number of moles of bromomethane consumed in this reaction are $\mathrm{n} \times 10^{-1}$, when n = _____ (Round off to the Nearest Integer).
(Given : Atomic masses : C : 12.0 u, H : 1.0 u, N : 14.0 u, Br : 80.0 u)

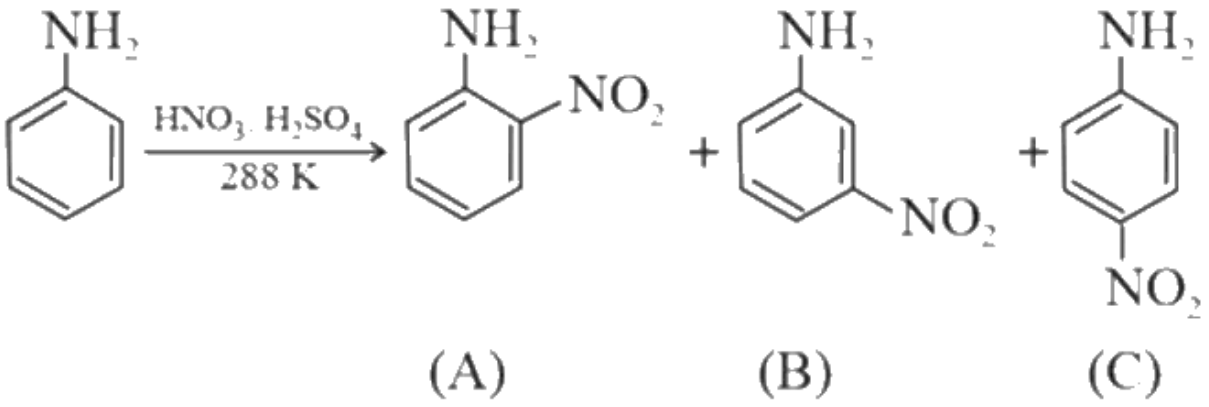
Numerical value type: the answer is a number.

Answer: 3. · Key from source paper

Q134 JEE Main 2021 · 18 Mar · Shift 2 MCQ

see figure

Q38.



(A) (B) (C)

Consider the given reaction, percentage yield of :

(1) $C > A > B$

(2) $B > C > A$

(3) $A > C > B$

(4) $C > B > A$

(A) $C > A > B$

(B) $B > C > A$

(C) $A > C > B$

(D) $C > B > A$

Answer: (D) $C > B > A$ · Key from source paper

Q135 JEE Main 2021 · 18 Mar · Shift 2 MCQ

An organic compound A on treatment with benzene sulfonyl chloride gives compound B. B is soluble in dil. NaOH solution. Compound A is :

(A) $C_6H_5 - N(CH_3)_2$

(B) $C_6H_5 - NHCH_2\,CH_3$

(C) $C_6H_5 - CH_2\,NHCH_3$

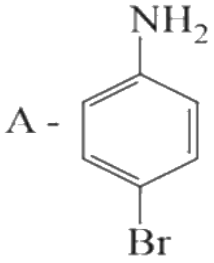
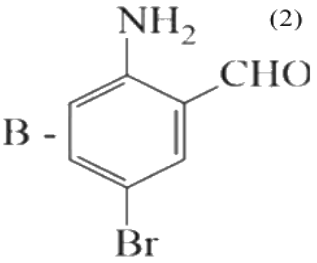
(D) $C_6H_5 - CH - NH_2$ with a CH_3 group on the CH

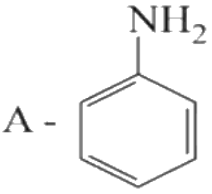
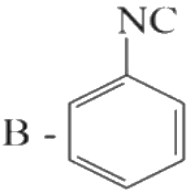
Answer: (D) $C_6H_5 - CH - NH_2$ **with a** CH_3 **group on the CH** · Key from source paper

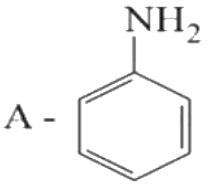
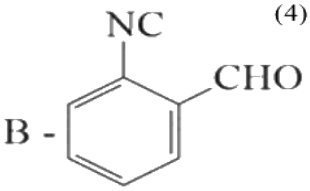
Q136 JEE Main 2021 · 17 Mar · Shift 1 MCQ

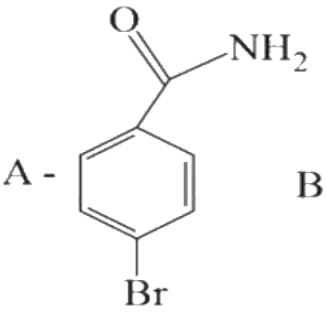
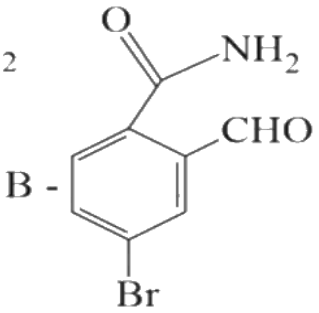
Hoffmann bromamide degradation of benzamide gives product A, which upon heating with $CHCl_3$ and NaOH gives product B. The structures of A and B are:

Q47. Hoffmann bromamide degradation of benzamide gives product A, which upon heating with $CHCl_3$ and NaOH gives product B. The structures of A and B are:

(1) A -  B - 

(2) A -  B - 

(3) A -  B - 

(4) A -  B - 

(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (B) · Key from source paper

Q137 JEE Main 2021 · 17 Mar · Shift 1 MCQ

Which of the following reaction is an example of ammonolysis?

(A) $C_6H_5COCl + C_6H_5NH_2 \rightarrow C_6H_5CONHC_6H_5$

(B) $C_6H_5CH_2CN \xrightarrow{[H]} C_6H_5CH_2CH_2NH_2$

(C) $C_6H_5NH_2 \xrightarrow{HCl} C_6H_5NH_3Cl^-$

(D) $C_6H_5CH_2Cl + NH_3 \rightarrow C_6H_5CH_2NH_2$

Answer: (D) $C_6H_5CH_2Cl + NH_3 \rightarrow C_6H_5CH_2NH_2$ · Key from source paper

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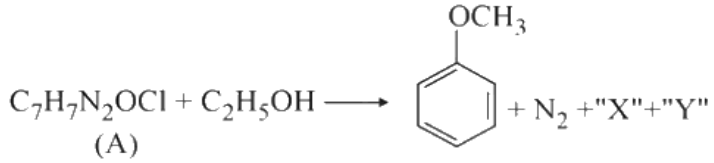
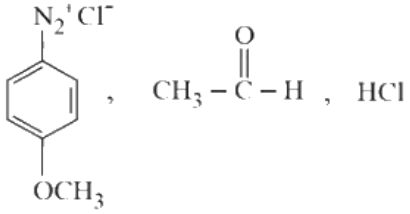
Q138 JEE Main 2021 · 17 Mar · Shift 2 MCQ

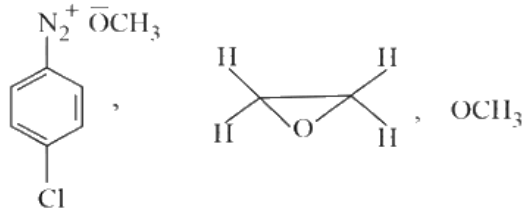
see figure

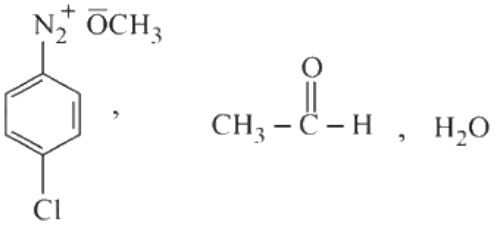
Q46.

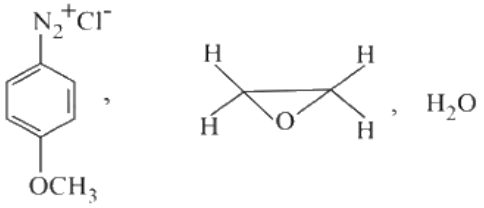


In the above reaction, the structural formula of (A), "X" and "Y" respectively are :

(1) 

(2) 

(3) 

(4) 

A *see figure*

B *see figure*

C *see figure*

D *see figure*

Answer: (A) · Key from source paper

Q139 JEE Main 2021 · 17 Mar · Shift 2 MCQ

Primary, secondary and tertiary amines can be separated using:

A Para-Toluene sulphonyl chloride

B Chloroform and KOH

C Benzene sulphonic acid

D Acetyl amide

Answer: (A) Para-Toluene sulphonyl chloride · Key from source paper

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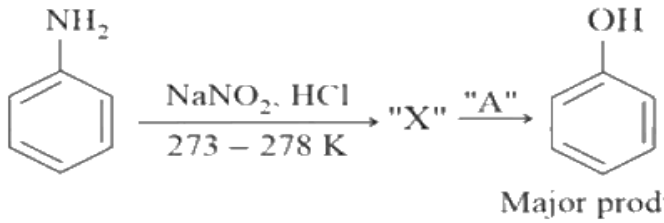
Q140 JEE Main 2021 · 16 Mar · Shift 1 MCQ

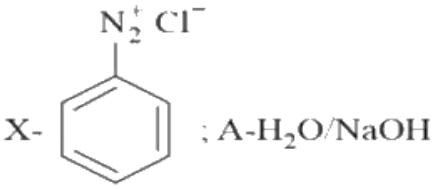
see figure

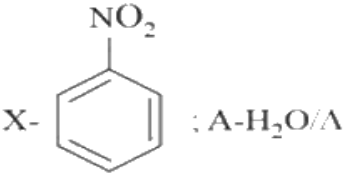
Q47.

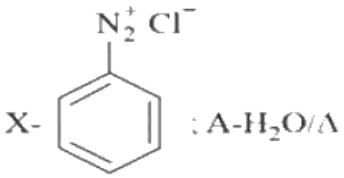


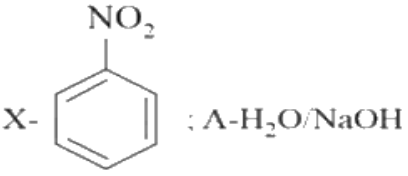
Major product

In the above chemical reaction, intermediate "X" and reagent/condition "A" are :

(1) 

(2) 

(3) 

(4) 

(A) X- *(see the figure above)* benzene ring with $N_2^+Cl^-$ (benzenediazonium chloride); A-$H_2O/NaOH$

(B) X- *(see the figure above)* benzene ring with NO_2 (nitrobenzene); A-H_2O/Δ

(C) X- *(see the figure above)* benzene ring with $N_2^+Cl^-$ (benzenediazonium chloride); A-H_2O/Δ

(D) X- *(see the figure above)* benzene ring with NO_2 (nitrobenzene); A-$H_2O/NaOH$

Answer: (C) X- *(see the figure above)* **benzene ring with $N_2^+Cl^-$ (benzenediazonium chloride); A-H_2O/Δ** · Key from source paper

Q141 JEE Main 2021 · 16 Mar · Shift 2 MCQ

Ammonolysis of Alkyl halides followed by the treatment with NaOH solution can be used to prepare primary, secondary and tertiary amines. The purpose of NaOH in the reaction is.

(A) to remove basic impurities

(B) to activate NH_3 used in the reaction

(C) to remove acidic impurities

(D) to increase the reactivity of alkyl halide.

Answer: (C) to remove acidic impurities · Key from source paper

Q142 JEE Main 2021 · 16 Mar · Shift 2 MCQ

Which of the following is least basic?

(A) $(CH_3\ CO)\ddot{N}HC_2H_5$

(B) $(C_2H_5)_3\ddot{N}$

(C) $(CH_3\ CO)_2\ddot{N}H$

(D) $(C_2H_5)_2\ddot{N}H$

Answer: (C) $(CH_3\ CO)_2\ddot{N}H$ · Key from source paper

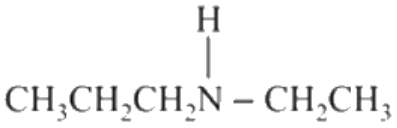
Q143 JEE Main 2021 · 26 Feb · Shift 1 MCQ

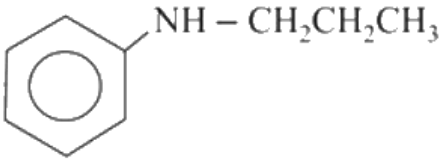
An amine on reaction with benzenesulphonyl chloride produces a compound insoluble in alkaline solution. This amine can be prepared by ammonolysis of ethyl chloride. The correct structure of amine is:

Q48. An amine on reaction with benzenesulphonyl chloride produces a compound insoluble in alkaline solution. This amine can be prepared by ammonolysis of ethyl chloride. The correct structure of amine is:

(1) $CH_3\,CH_2\,NH_2$

(2) $CH_3\,CH_2\,CH_2\,NHCH_3$

(3) 

(4) 

(A) $CH_3CH_2NH_2$

(B) $CH_3CH_2CH_2NHCH_3$

(C) $CH_3CH_2CH_2 - N(H) - CH_2CH_3$ (drawn with H above the N)

(D) *see figure*

Answer: (C) $CH_3CH_2CH_2 - N(H) - CH_2CH_3$ **(drawn with H above the N)** · Key from source paper

Q144 JEE Main 2021 · 26 Feb · Shift 2 MCQ

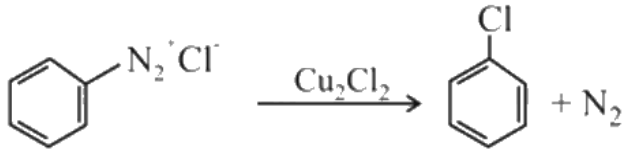
Match List-I with List-II.

List-I	List-II
(a) *(see the figure above)*	(i) Wurtz reaction
(b) *(see the figure above)*	(ii) Sandmeyer reaction
(c) $2\,CH_3CH_2Cl + 2Na \xrightarrow{\text{Ether}} C_2H_5 - C_2H_5 + 2\,NaCl$	(iii) Fittig reaction
(d) $2C_6H_5Cl + 2Na \xrightarrow{\text{Ether}} C_6H_5 - C_6H_5 + 2\,NaCl$	(iv) Gatterman reaction

Choose the correct answer from the options given below:

Q41. Match List-I with List-II.

List-I | List-II

(a)  (i) Wurtz reaction

(b)  (ii) Sandmeyer reaction

(c) $2\,CH_3\,CH_2\,Cl + 2Na \xrightarrow{Ether} C_2H_5 - C_2H_5 + 2\,NaCl$ (iii) Fittig reaction

(d) $2C_6H_5Cl + 2Na \xrightarrow{Ether} C_6H_5 - C_6H_5 + 2\,NaCl$ (iv) Gatterman reaction

Choose the correct answer from the options given below:

(1) (a) → (iii), (b) → (iv), (c) → (i), (d) → (ii) (2) (a) → (ii), (b) → (i), (c) → (iv), (d) → (iii)

(3) (a) → (iii), (b) → (i), (c) → (iv), (d) → (ii) (4) (a) → (ii), (b) → (iv), (c) → (i), (d) → (iii)

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

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

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

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

Answer: (D) (a) → (ii), (b) → (iv), (c) → (i), (d) → (iii) · Key from source paper

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Q145 JEE Main 2021 · 26 Feb · Shift 2 MCQ

A. Phenyl methanamine

B. N, N-Dimethylaniline

C. N-Methyl aniline

D. Benzenamine

Choose the correct order of basic nature of the above amines.

(A) $A > B > C > D$

(B) $A > C > B > D$

(C) $D > B > C > A$

(D) $D > C > B > A$

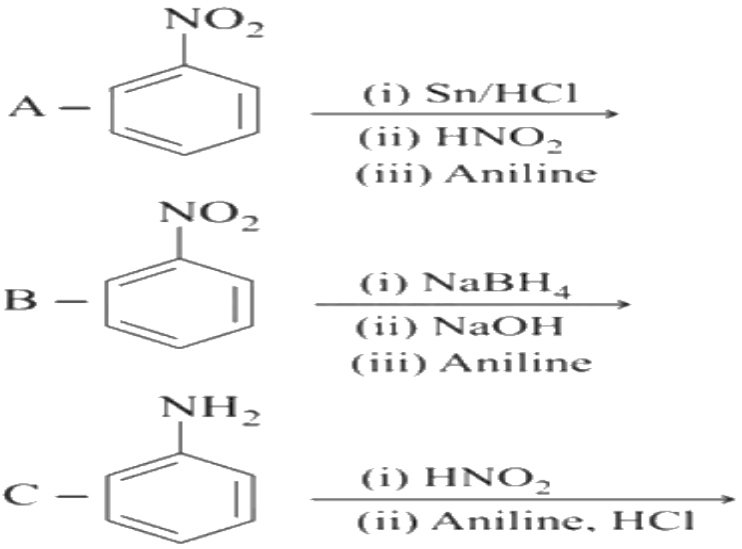
Answer: (A) $A > B > C > D$ · Key from source paper

Q146 JEE Main 2021 · 25 Feb · Shift 1 MCQ

Which of the following reaction/s will not give p -aminoazobenzene?

(see the figure above)

Q39. Which of the following reaction/s will not give *p* -aminoazobenzene?



(1) B only
(2) A only
(3) C only
(4) A and B

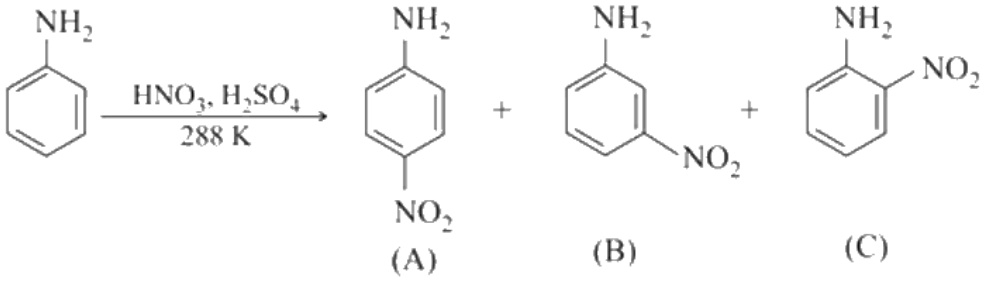
(A) B only
(B) A only
(C) C only
(D) A and B

Answer: (A) B only · Key from source paper

Q147 JEE Main 2021 · 25 Feb · Shift 2 MCQ

see figure

Q36.



Correct statement about the given chemical reaction is

(1) Reaction is possible and compound (A) will be major product.
(2) $-\ddot{N}H_2$ group is ortho and para directive, so product (B) is not possible.
(3) Reaction is possible and compound (B) will be the major product.
(4) The reaction will form sulphonated product instead of nitration.

(A) Reaction is possible and compound (A) will be major product.

(B) $-\ddot{N}H_2$ group is ortho and para directive, so product (B) is not possible.

(C) Reaction is possible and compound (B) will be the major product.

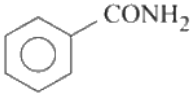
(D) The reaction will form sulphonated product instead of nitration.

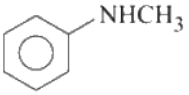
Answer: (A) Reaction is possible and compound (A) will be major product. · Key from source paper

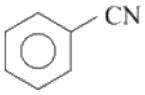
Q148 JEE Main 2021 · 25 Feb · Shift 2 MCQ

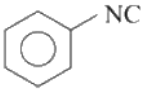
Carbylamine test is used to detect the presence of primary amino group in an organic compound. Which of the following compound is formed when this test is performed with aniline?

Q49. Carbylamine test is used to detect the presence of primary amino group in an organic compound. Which of the following compound is formed when this test is performed with aniline?

(1) 

(2) 

(3) 

(4) 

(A) *see figure*

(B) *see figure*

(C) *see figure*

(D) *see figure*

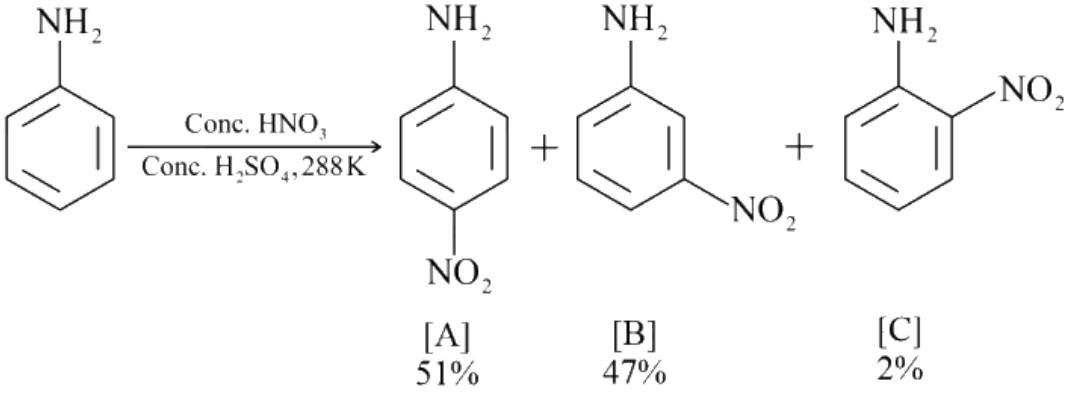
Answer: (D) · Key from source paper

Q149 JEE Main 2021 · 24 Feb · Shift 1 MCQ

In the following reaction, the reason why meta-nitro product also formed is:

(see the figure above)

Q37. In the following reaction, the reason why meta-nitro product also formed is:



(1) Formation of anilinium ion
(2) -NH_2 group is highly meta-directive
(3) -NO_2 substitution always takes place at meta-position
(4) low temperature

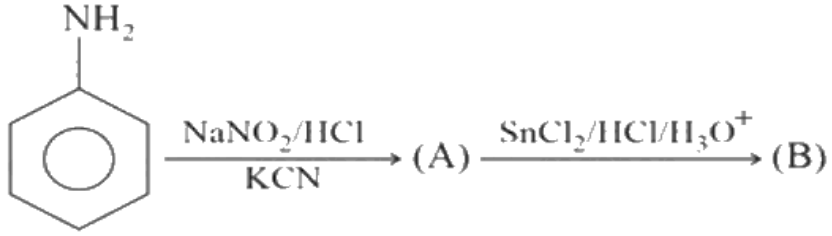
(A) Formation of anilinium ion
(B) $-NH_2$ group is highly meta-directive
(C) $-NO_2$ substitution always takes place at meta-position
(D) low temperature

Answer: (A) Formation of anilinium ion · Key from source paper

Q150 JEE Main 2021 · 24 Feb · Shift 1 MCQ

A and B in the following reactions are:
(see the figure above)

Q47. A and B in the following reactions are:



(1) (A): $\overset{+}{N}_2Cl^-$ (B): CHO

(2) (A): CN (B): Cl

(3) (A): $\overset{+}{N}_2Cl^-$ (B): Cl

(4) (A): CN (B): CHO

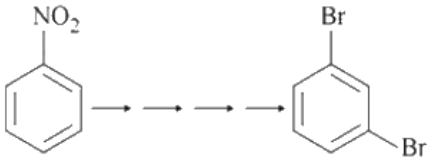
(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (D) · Key from source paper

Q151 JEE Main 2021 · 24 Feb · Shift 2 MCQ

What is the correct sequence of reagents used for converting nitrobenzene into m-dibromobenzene? *(see the figure above)*

Q37. What is the correct sequence of reagents used for converting nitrobenzene into m-dibromobenzene?



(1) $\xrightarrow{Sn/HCl} / \xrightarrow{KBr} / \xrightarrow{Br_2} / \xrightarrow{H^+}$

(2) $\xrightarrow{Br_2/Fe} / \xrightarrow{Sn/HCl} / \xrightarrow{NaNO_2/HCl} / \xrightarrow{CuBr/HBr}$

(3) $\xrightarrow{NaNO_2} / \xrightarrow{HCl} / \xrightarrow{KBr} / \xrightarrow{H^+}$

(4) $\xrightarrow{Sn/HCl} / \xrightarrow{Br_2} / \xrightarrow{NaNO_2} / \xrightarrow{NaBr}$

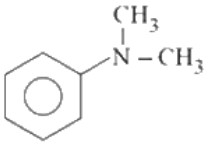
(A) $\xrightarrow{Sn/HCl} / \xrightarrow{KBr} / \xrightarrow{Br_2} / \xrightarrow{H^+}$
(B) $\xrightarrow{Br_2/Fe} / \xrightarrow{Sn/HCl} / \xrightarrow{NaNO_2/HCl} / \xrightarrow{CuBr/HBr}$
(C) $\xrightarrow{NaNO_2} / \xrightarrow{HCl} / \xrightarrow{KBr} / \xrightarrow{H^+}$
(D) $\xrightarrow{Sn/HCl} / \xrightarrow{Br_2} / \xrightarrow{NaNO_2} / \xrightarrow{NaBr}$

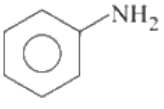
Answer: (B) $\xrightarrow{Br_2/Fe} / \xrightarrow{Sn/HCl} / \xrightarrow{NaNO_2/HCl} / \xrightarrow{CuBr/HBr}$ · Key from source paper

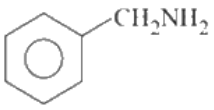
Q152 JEE Main 2021 · 24 Feb · Shift 2 MCQ

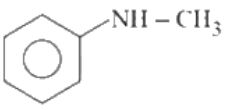
The diazonium salt of which of the following compounds will form a coloured dye on reaction with β-Naphthol in NaOH?

Q47. The diazonium salt of which of the following compounds will form a coloured dye on reaction with β-Naphthol in NaOH?

(1) 

(2) 

(3) 

(4) 

(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

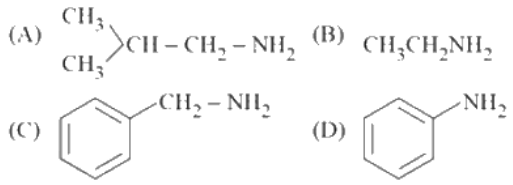
Answer: (B) · Key from source paper

Q153 JEE Main 2021 · 24 Feb · Shift 2 Numerical

The total number of amines among the following which can be synthesized by Gabriel synthesis is _____.

(A) $(CH_3)_2CH - CH_2 - NH_2$
(B) $CH_3CH_2NH_2$
(C) *(see the figure above)*
(D) *(see the figure above)*

Q60. The total number of amines among the following which can be synthesized by Gabriel synthesis is _____.



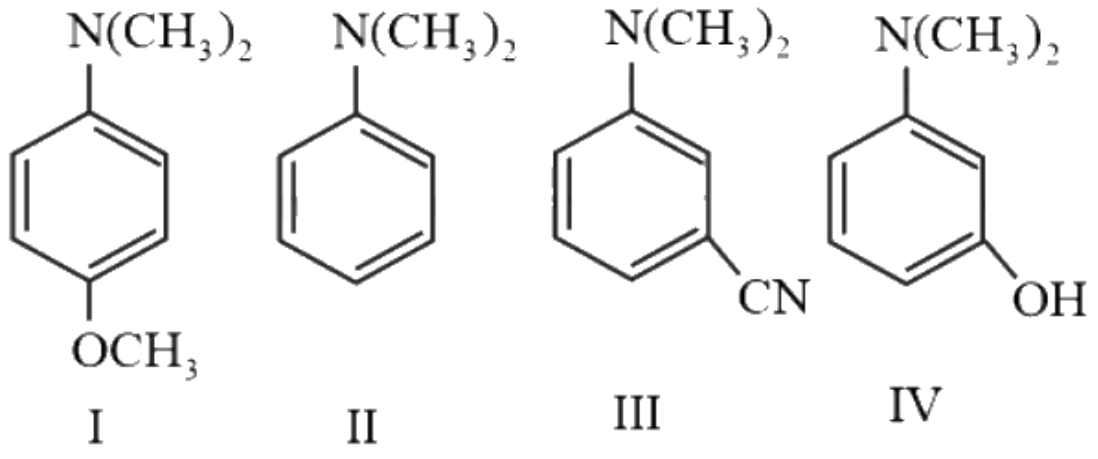
Numerical value type: the answer is a number.

Answer: 3. · Key from source paper

Q154 JEE Main 2020 · 6 Sep · Shift 1 MCQ

The increasing order of pK_b values of the following compounds is :
(see the figure above)

Q44. The increasing order of pK_b values of the following compounds is :



(1) II < IV < III < I
(2) I < II < IV < III
(3) II < I < III < IV
(4) I < II < III < IV

(A) II < IV < III < I

(B) I < II < IV < III

(C) II < I < III < IV

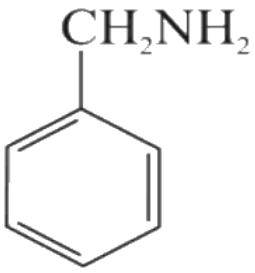
(D) I < II < III < IV

Answer: (B) I < II < IV < III · Key from source paper

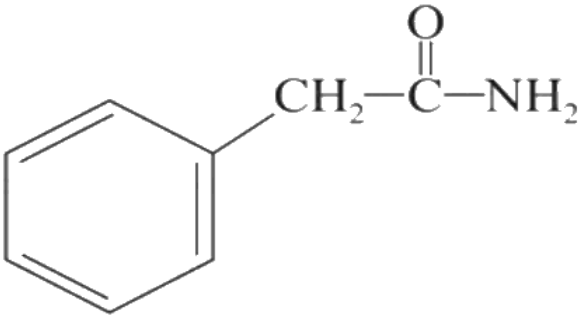
Q155 JEE Main 2020 · 6 Sep · Shift 2 MCQ

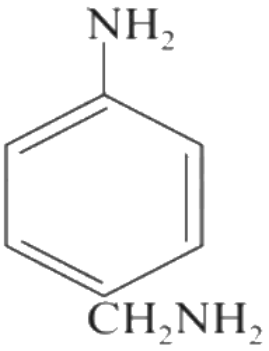
Which of the following compounds can be prepared in good yield by Gabriel phthalimide synthesis ?

Q43. Which of the following compounds can be prepared in good yield by Gabriel phthalimide synthesis ?

(1) 

(2) $CH_3 - CH_2 - NHCH_3$

(3) 

(4) 

(A) *see figure*

(B) $CH_3 - CH_2 - NHCH_3$

(C) *see figure*

(D) *see figure*

Answer: (A) · Key from source paper

Q156 JEE Main 2020 · 5 Sep · Shift 1 MCQ

The most appropriate reagent for conversion of $C_2H_5\ CN$ into $CH_3\ CH_2\ CH_2\ NH_2$ is :

(A) $NaBH_4$

(B) CaH_2

(C) $LiAlH_4$

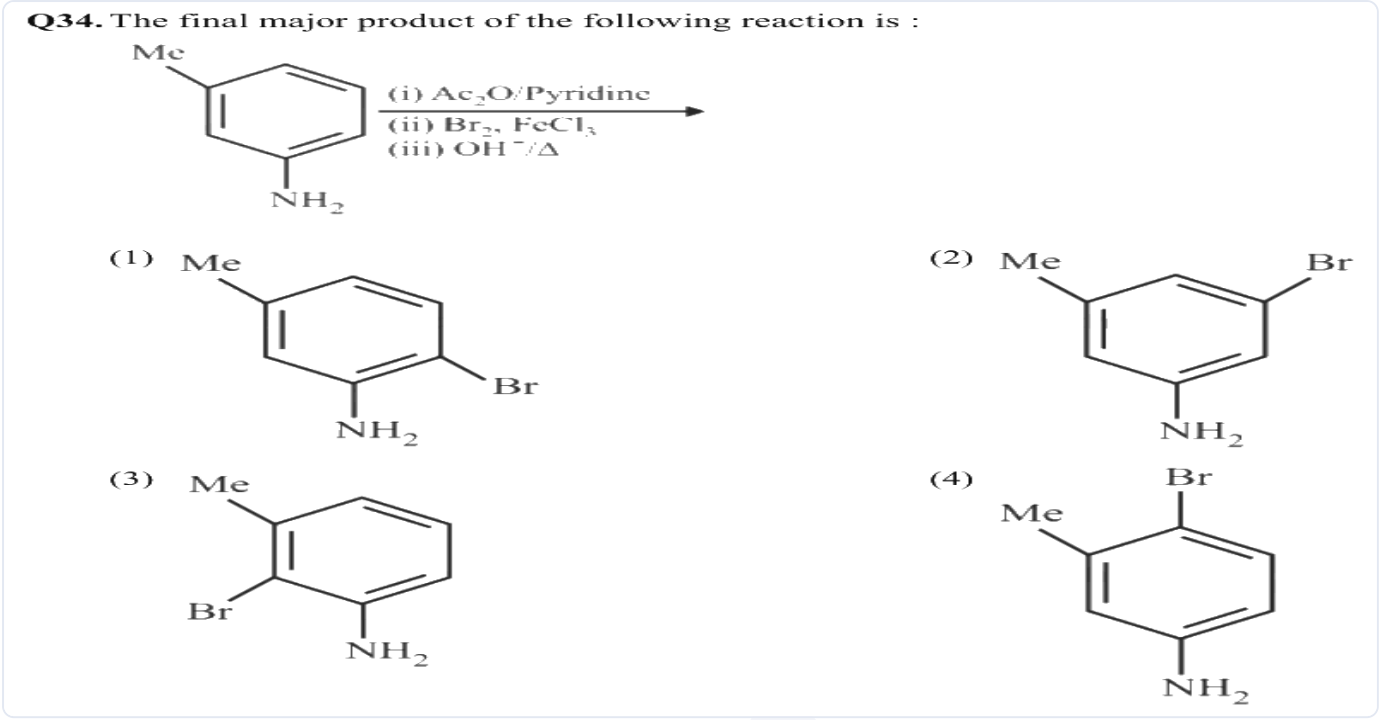
(D) $Na(CN)\ BH_3$

Answer: (C) $LiAlH_4$ · Key from source paper

Q157 JEE Main 2020 · 5 Sep · Shift 2 MCQ

The final major product of the following reaction is :

(see the figure above)



(A) *see figure*

(B) *see figure*

(C) *see figure*

(D) *see figure*

Answer: (D) · Key from source paper

Q158 JEE Main 2020 · 4 Sep · Shift 1 MCQ

Which of the following will react with $CHCl_3$ + alc. KOH?

(A) Adenine and proline

(B) Thymine and proline

(C) Adenine and lysine

(D) Adenine and thymine

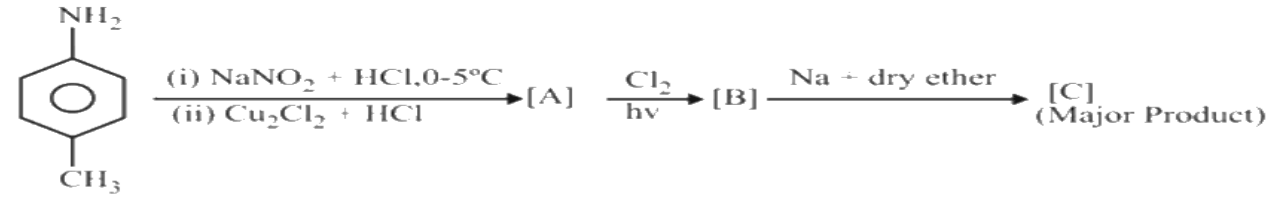
Answer: (C) Adenine and lysine · Key from source paper

Q159 JEE Main 2020 · 4 Sep · Shift 2 MCQ

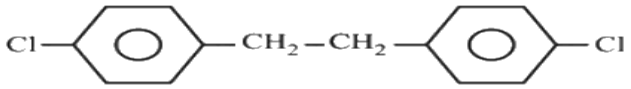
In the following reaction sequence, [C] is :

(see the figure above)

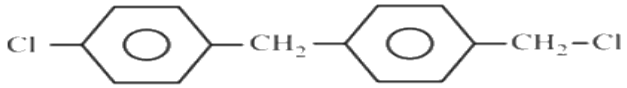
Q44. In the following reaction sequence, [C] is :



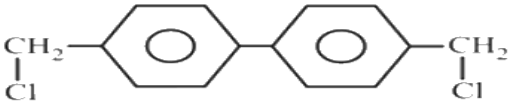
(1)



(2)



(3)



(4)



(A) *see figure*

(B) *see figure*

(C) *see figure*

(D) *see figure*

Answer: (A) · Key from source paper

Q160 JEE Main 2020 · 3 Sep · Shift 2 MCQ

Three isomers A, B and C (mol. formula $C_8H_{11}N$) give the following results:

$$\text{A and C} \xrightarrow{\text{Dianotization}} \text{P} + \text{Q} \xrightarrow[\text{(ii) acidation}(KMnO_4+H^+)]{\text{(i) Hydrolyds}} \text{R (product of A)} + \text{S (product of C)}$$

R has lower boiling point than S

$$\text{B} \xrightarrow{C_6H_5SO_2Cl} \text{alkali-insoluble product}$$

A, B and C, respectively are:

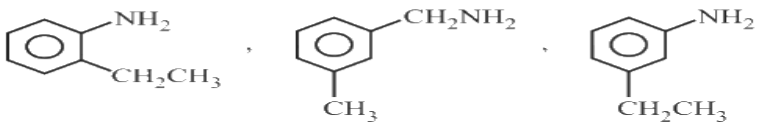
Q43. Three isomers A, B and C (mol. formula $C_8H_{11}N$) give the following results:

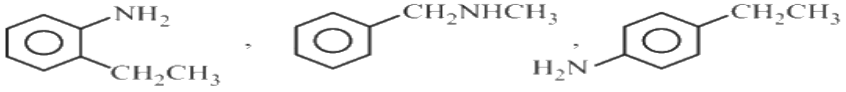
A and C $\xrightarrow{\text{Dianotization}}$ P + Q $\xrightarrow[\text{(ii) acidation}(KMnO_4+H^+)]{\text{(i) Hydrolyds}}$ R (product of A) + S (product of C)

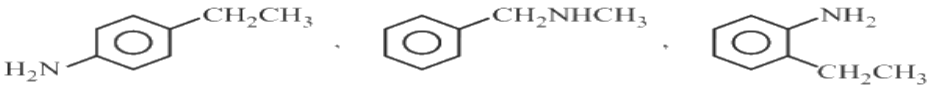
R has lower boiling point than S

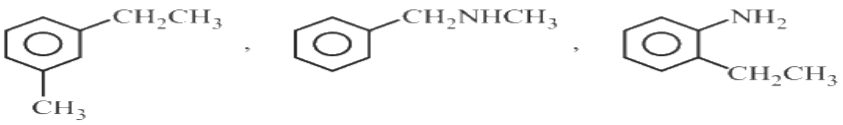
B $\xrightarrow{C_6H_5SO_2Cl}$ alkali-insoluble product

A, B and C, respectively are:

(1) 

(2) 

(3) 

(4) 

(A) *see figure*

(B) *see figure*

(C) *see figure*

(D) *see figure*

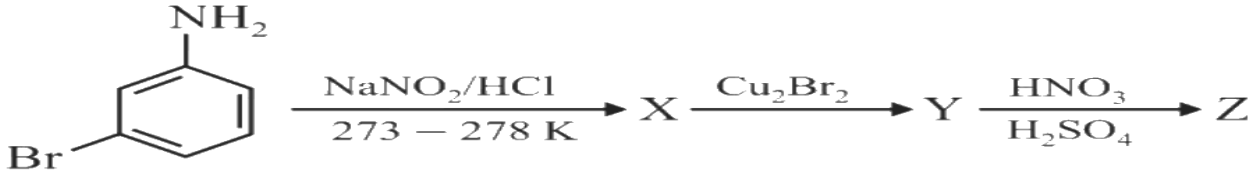
Answer: (B) · Key from source paper

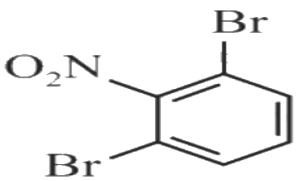
Q161 JEE Main 2020 · 9 Jan · Shift 1 MCQ

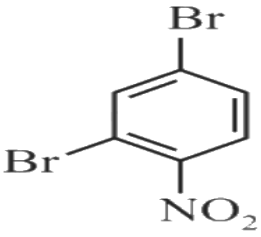
The major product Z obtained in the following reaction scheme is:

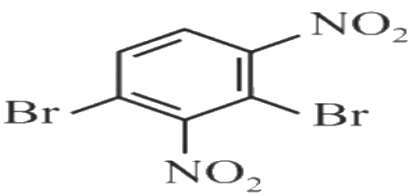
(see the figure above)

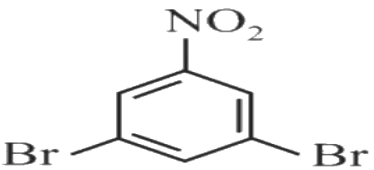
Q44. The major product Z obtained in the following reaction scheme is:



(1) 

(2) 

(3) 

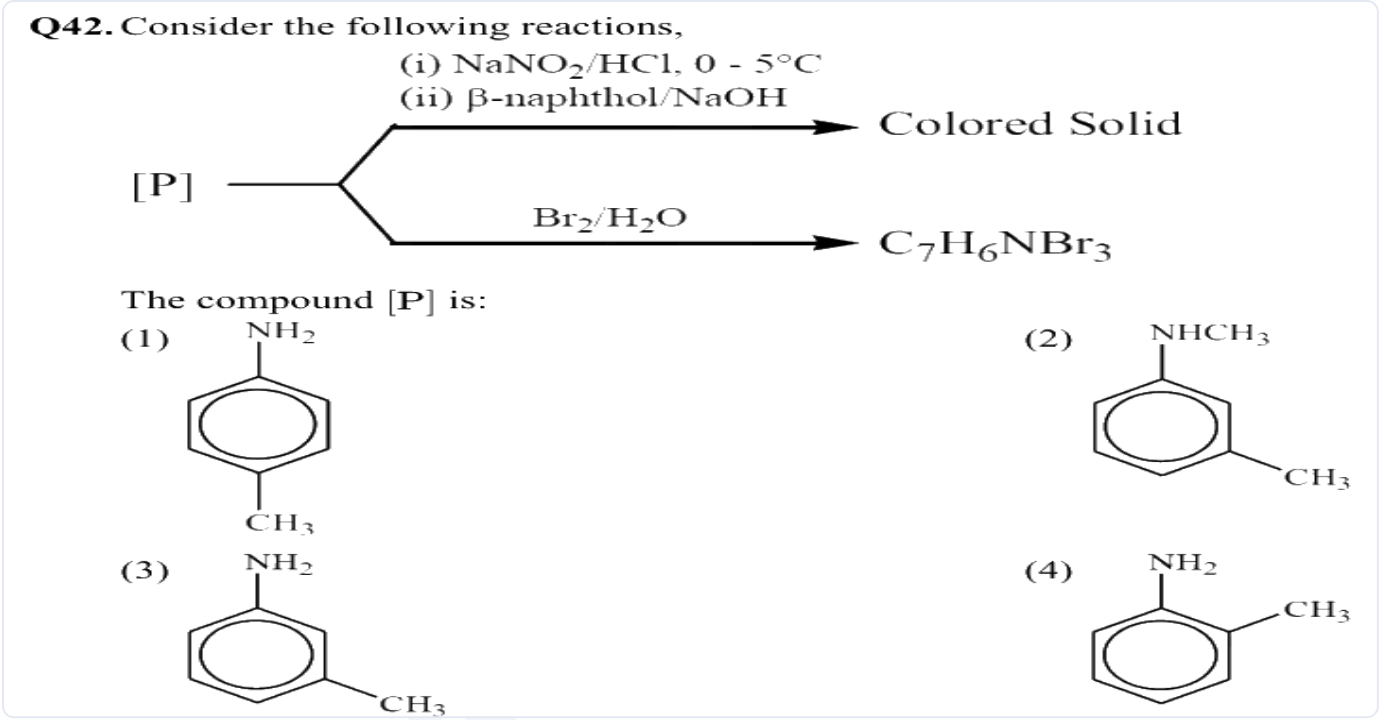
(4) 

(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (B) · Key from source paper

Q162 JEE Main 2020 · 9 Jan · Shift 2 MCQ

Consider the following reactions,
(see the figure above)
The compound [P] is:



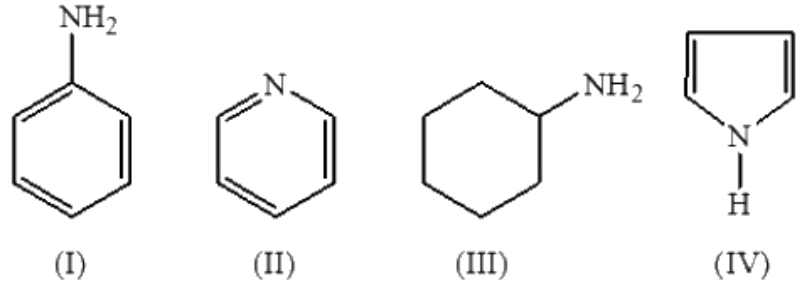
(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (C) · Key from source paper

Q163 JEE Main 2020 · 9 Jan · Shift 2 MCQ

The decreasing order of basicity of the following amines is:
(see the figure above)

Q43. The decreasing order of basicity of the following amines is:



(I) (II) (III) (IV)

(1) (I) > (III) > (IV) > (II)
(2) (III) > (I) > (II) > (IV)
(3) (II) > (III) > (IV) > (I)
(4) (III) > (II) > (I) > (IV)

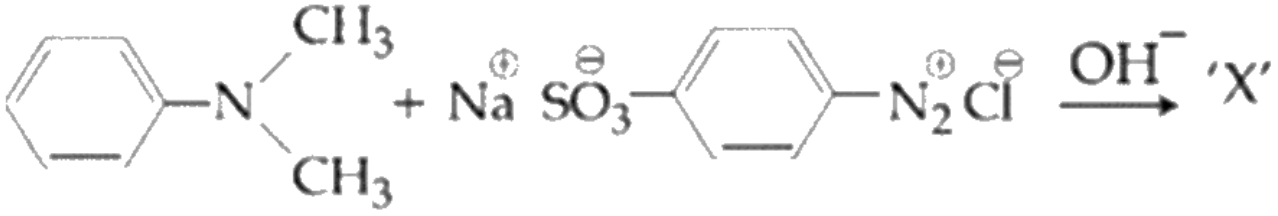
(A) (I) > (III) > (IV) > (II)
(B) (III) > (I) > (II) > (IV)
(C) (II) > (III) > (IV) > (I)
(D) (III) > (II) > (I) > (IV)

Answer: (D) (III) > (II) > (I) > (IV) · Key from source paper

Q164 JEE Main 2020 · 7 Jan · Shift 1 MCQ

Consider the following reaction:
(see the figure above)
The product 'X' is used:

Q44. Consider the following reaction:



The product 'X' is used:
(1) in protein estimation as an alternative to ninhydrin
(2) in acid base titration as an indicator
(3) as food grade colourant
(4) in laboratory test for phenols

(A) in protein estimation as an alternative to ninhydrin
(B) in acid base titration as an indicator
(C) as food grade colourant
(D) in laboratory test for phenols

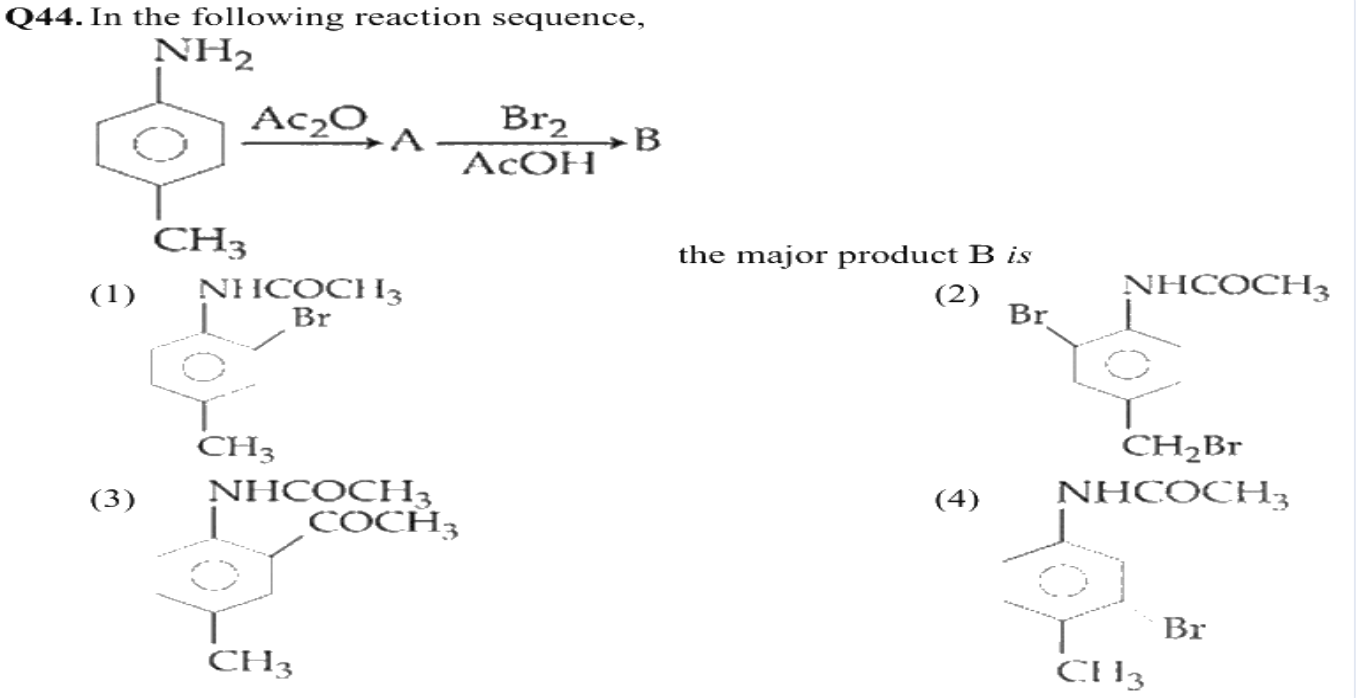
Answer: (B) in acid base titration as an indicator · Key from source paper

Q165 JEE Main 2020 · 7 Jan · Shift 2 MCQ

In the following reaction sequence,

(see the figure above)

the major product B is



A *see figure*

B *see figure*

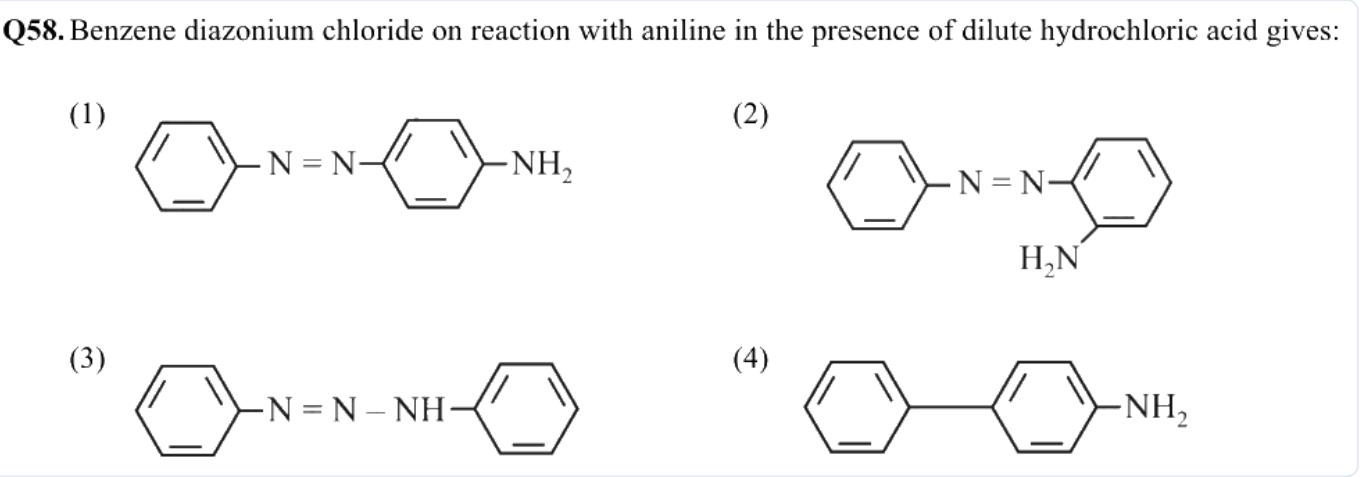
C *see figure*

D *see figure*

Answer: (A) · Key from source paper

Q166 JEE Main 2019 · 12 Apr · Shift 2 MCQ

Benzene diazonium chloride on reaction with aniline in the presence of dilute hydrochloric acid gives:



(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

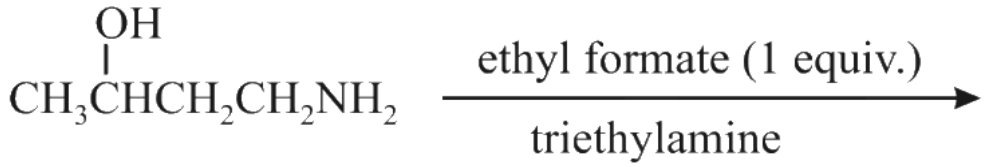
Answer: (A) · Key from source paper

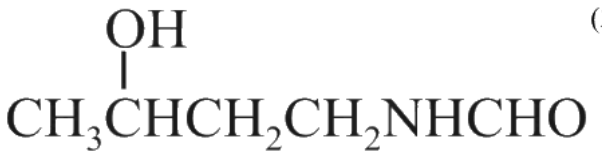
Q167 JEE Main 2019 · 10 Apr · Shift 1 MCQ

The major product of the following reaction is:

(see the figure above)

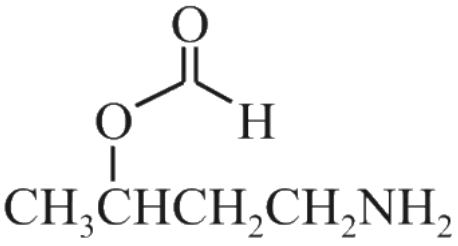
Q57. The major product of the following reaction is:



(1) 

(2) 

(3) $CH_3CH = CH - CH_2NH_2$

(4) 

(A) *see figure*
(B) *see figure*
(C) $CH_3CH = CH - CH_2NH_2$
(D) *see figure*

Answer: (A) · Key from source paper

Q168 JEE Main 2019 · 10 Apr · Shift 1 MCQ

Ethylamine ($C_2H_5NH_2$) can be obtained from N-ethylphthalimide on treatment with:

(A) CaH_2
(B) NH_2NH_2
(C) H_2O
(D) $NaBH_4$

Answer: (B) NH_2NH_2 · Key from source paper

Q169 JEE Main 2019 · 10 Apr · Shift 2 MCQ

Which of the following is not a correct method of the preparation of benzyl amine from cyano benzene?

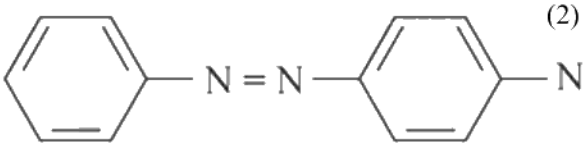
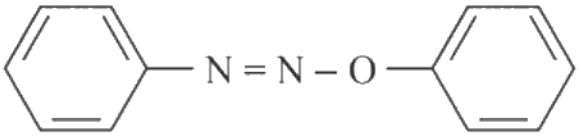
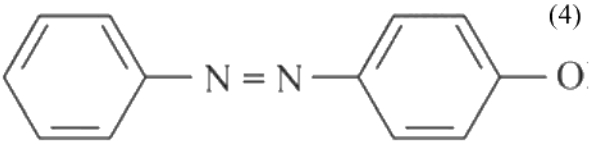
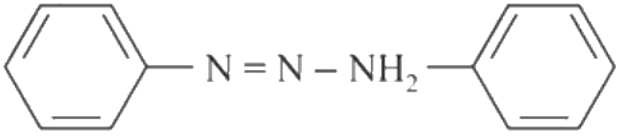
(A) H_2 / Ni
(B) (i) HCl / H_2O (ii) $NaBH_4$
(C) (i) $SnCl_2$ + HClgas (ii) $NaBH_4$
(D) (i) $LiAlH_4$ (ii) H_3O^+

Answer: (B) (i) HCl / H_2O (ii) $NaBH_4$ · Key from source paper

Q170 JEE Main 2019 · 9 Apr · Shift 1 MCQ

Aniline dissolved in dilute HCl is reacted with sodium nitrite at $0^\circ C$. This solution was added dropwise to a solution containing an equimolar mixture of aniline and phenol in dilute HCl. The structure of the major product is
(see the figure above)

Q59. Aniline dissolved in dilute HCl is reacted with sodium nitrite at $0^\circ C$. This solution was added dropwise to a solution containing an equimolar mixture of aniline and phenol in dilute HCl. The structure of the major product is

(1) 
(2) 
(3) 
(4) 

(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

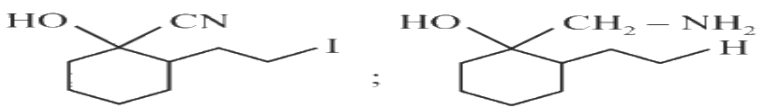
Answer: (A) · Key from source paper

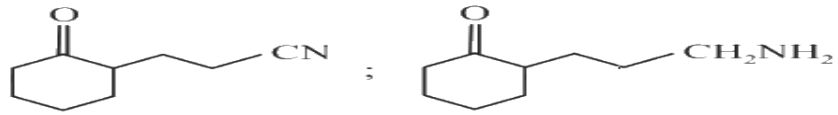
Q171 JEE Main 2019 · 9 Apr · Shift 2 MCQ

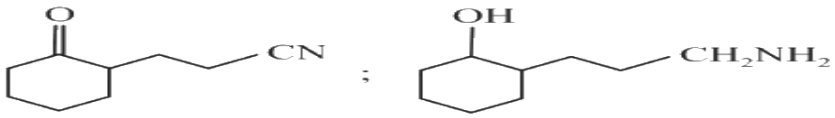
The major products A and B for the following reactions are, respectively:
(see the figure above)

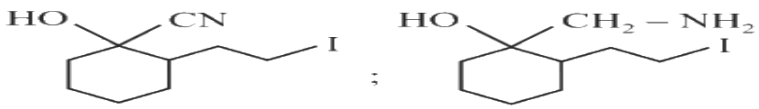
Q56. The major products A and B for the following reactions are, respectively:



(1) 

(2) 

(3) 

(4) 

(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (C) · Key from source paper

Q172 JEE Main 2019 · 9 Apr · Shift 2 MCQ

Hinsberg's reagent is:

(A) $C_6H_5SO_2Cl$
(B) $SOCl_2$
(C) $(COCl)_2$
(D) C_6H_5COCl

Answer: (A) $C_6H_5SO_2Cl$ · Key from source paper

Q173 JEE Main 2019 · 8 Apr · Shift 1 MCQ

Which of the following amines can be prepared by Gabriel phthalimide reaction?

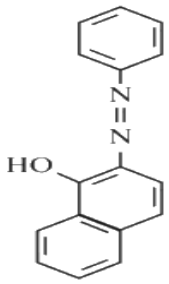
(A) t - butylamine
(B) n - butylamine
(C) triethylamine
(D) neo - pentylamine

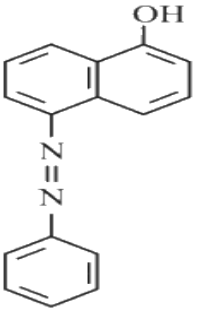
Answer: (B) n - butylamine · Key from source paper

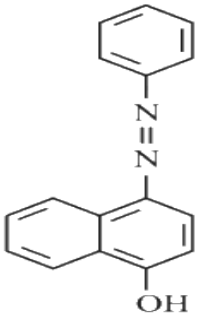
Q174 JEE Main 2019 · 8 Apr · Shift 1 MCQ

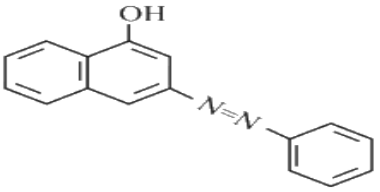
Coupling of benzene diazonium chloride with 1 - naphthol in alkaline medium will give:

Q58. Coupling of benzene diazonium chloride with 1 - naphthol in alkaline medium will give:

(1) 

(2) 

(3) 

(4) 

(A) *see figure*

(B) *see figure*

(C) *see figure*

(D) *see figure*

Answer: (C) · Key from source paper

Q175 JEE Main 2019 · 8 Apr · Shift 1 MCQ

In the following compounds, the decreasing order of basic strength will be:

(A) $C_2H_5NH_2 > NH_3 > (C_2H_5)_2NH$

(B) $(C_2H_5)_2NH > NH_3 > C_2H_5NH_2$

(C) $NH_3 > C_2H_5NH_2 > (C_2H_5)_2NH$

(D) $(C_2H_5)_2NH > C_2H_5NH_2 > NH_3$

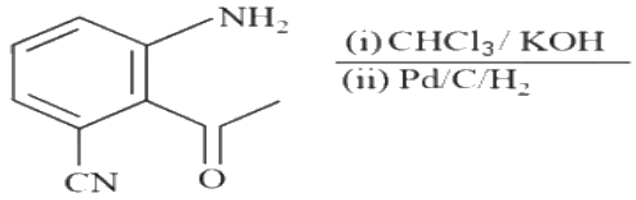
Answer: (D) $(C_2H_5)_2NH > C_2H_5NH_2 > NH_3$ · Key from source paper

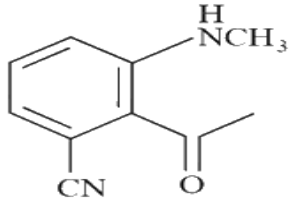
Q176 JEE Main 2019 · 8 Apr · Shift 2 MCQ

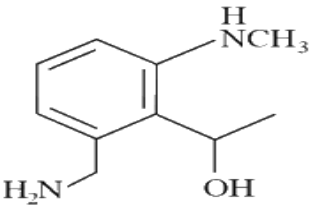
The major product obtained in the following reaction is:

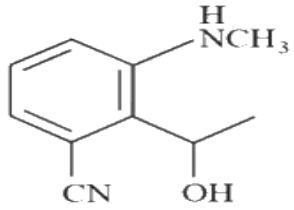
(see the figure above)

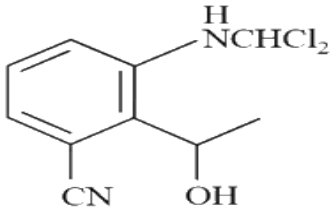
Q57. The major product obtained in the following reaction is:



(1)


(2)


(3)


(4)


(A) *see figure*

(B) *see figure*

(C) *see figure*

(D) *see figure*

Answer: (B) · Key from source paper

Q177 JEE Main 2019 · 12 Jan · Shift 1 MCQ

The increasing order of reactivity of the following compounds towards reaction with alkyl halides directly is:

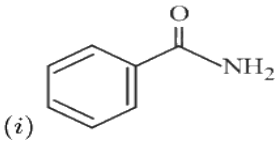
(i) *(see the figure above)*

(ii) *(see the figure above)*

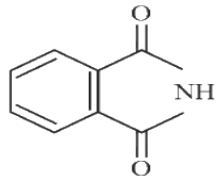
(iii) *(see the figure above)*

(iv) *(see the figure above)*

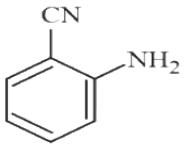
Q58. The increasing order of reactivity of the following compounds towards reaction with alkyl halides directly is:



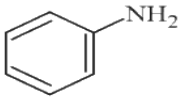
(i)



(ii)



(iii)



(iv)

(1) $(i) < (ii) < (iii) < (iv)$
(2) $(ii) < (i) < (iii) < (iv)$
(3) $(ii) < (i) < (iv) < (iii)$
(4) $(i) < (iii) < (iv) < (ii)$

(A) $(i) < (ii) < (iii) < (iv)$
(B) $(ii) < (i) < (iii) < (iv)$
(C) $(ii) < (i) < (iv) < (iii)$
(D) $(i) < (iii) < (iv) < (ii)$

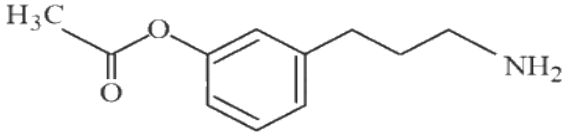
Answer: (B) $(ii) < (i) < (iii) < (iv)$ · Key from source paper

Q178 JEE Main 2019 · 12 Jan · Shift 2 MCQ

The major product of the following reaction is:

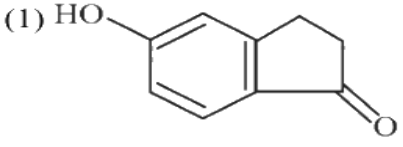
(see the figure above)

Q57. The major product of the following reaction is:

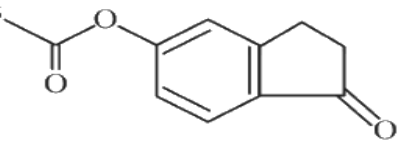


(i) $NaNO_2 / H^+$
(ii) CrO_3 / H^+
(iii) H_2SO_4 (concentrated), Δ

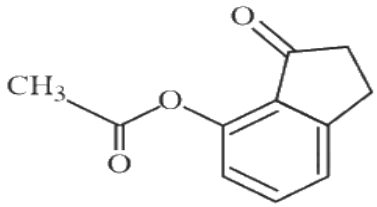
(1)



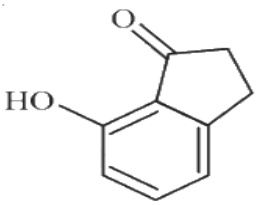
(2)



(3)



(4)



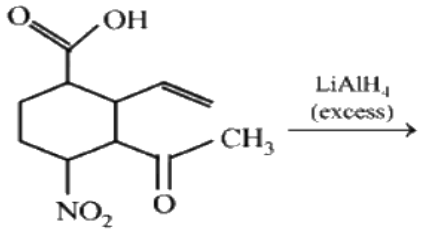
(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (A) · Key from source paper

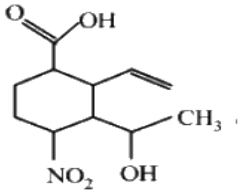
Q179 JEE Main 2019 · 11 Jan · Shift 2 MCQ

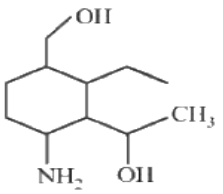
see figure

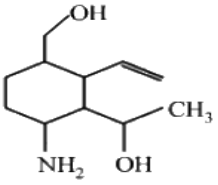
Q55.

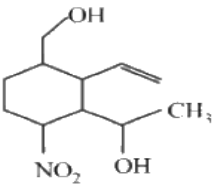


The major product obtained in the following reaction is:

(1) 

(2) 

(3) 

(4) 

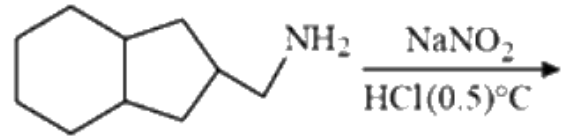
(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

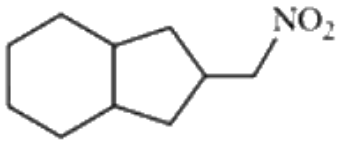
Answer: (C) · Key from source paper

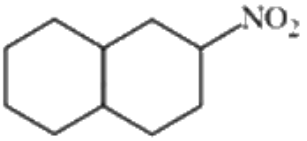
Q180 JEE Main 2019 · 10 Jan · Shift 1 MCQ

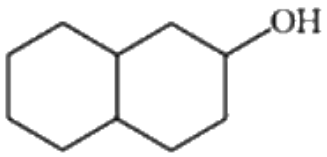
The major product formed in the reaction given below will be :
(see the figure above)

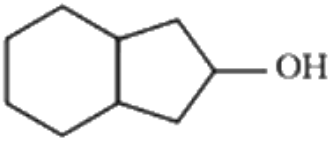
Q59. The major product formed in the reaction given below will be :



(1) 

(2) 

(3) 

(4) 

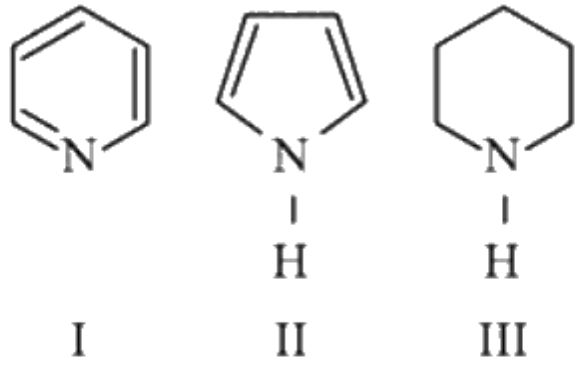
(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (C) · Key from source paper

Q181 JEE Main 2019 · 9 Jan · Shift 1 MCQ

Arrange the following amines in the decreasing order of basicity.
(see the figure above)

Q41. Arrange the following amines in the decreasing order of basicity.



I II III

(1) III > I > II
(2) I > III > II
(3) III > II > I
(4) I > II > III

(A) III > I > II

(B) I > III > II

(C) III > II > I

(D) I > II > III

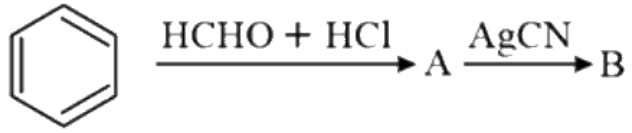
Answer: (A) III > I > II · Key from source paper

Q182 JEE Main 2019 · 9 Jan · Shift 1 MCQ

The compounds A and B in the following reaction are, respectively:

(see the figure above)

Q43. The compounds A and B in the following reaction are, respectively:



(1) $A =$ Benzyl alcohol, $B =$ Benzyl isocyanide

(2) $A =$ Benzyl chloride, $B =$ Benzyl isocyanide

(3) $A =$ Benzyl alcohol, $B =$ Benzyl cyanide

(4) $A =$ Benzyl chloride, $B =$ Benzyl cyanide

(A) $A =$ Benzyl alcohol, $B =$ Benzyl isocyanide

(B) $A =$ Benzyl chloride, $B =$ Benzyl isocyanide

(C) $A =$ Benzyl alcohol, $B =$ Benzyl cyanide

(D) $A =$ Benzyl chloride, $B =$ Benzyl cyanide

Answer: (B) $A =$ Benzyl chloride, $B =$ Benzyl isocyanide · Key from source paper

Q183 JEE Main 2019 · 9 Jan · Shift 2 MCQ

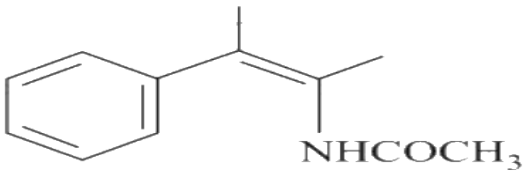
The major product obtained in the following reaction is:

(see the figure above)

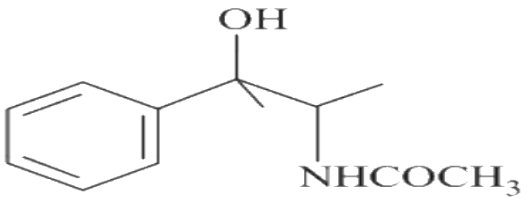
Q57. The major product obtained in the following reaction is:



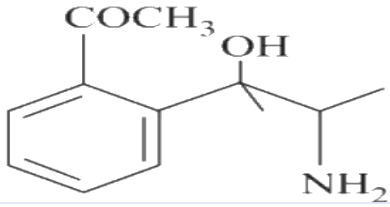
(1)



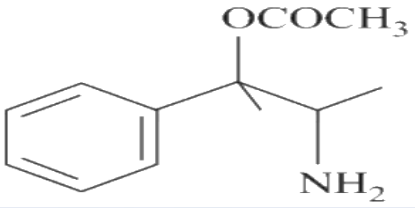
(2)



(3)



(4)



(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (B) · Key from source paper

Q184 JEE Main 2019 · 9 Jan · Shift 2 MCQ

The increasing basicity order of the following compounds is:
(A) $CH_3CH_2NH_2$
(B) $CH_3 - CH_2 - NH - CH_2 - CH_3$
(C) $H_3C - N - CH_3$ with a CH_3 group on the N (drawn above the N, so $(CH_3)_3N$)
(D) $Ph - N - H$ with a CH_3 group on the N (drawn above the N, so $PhNHCH_3$)

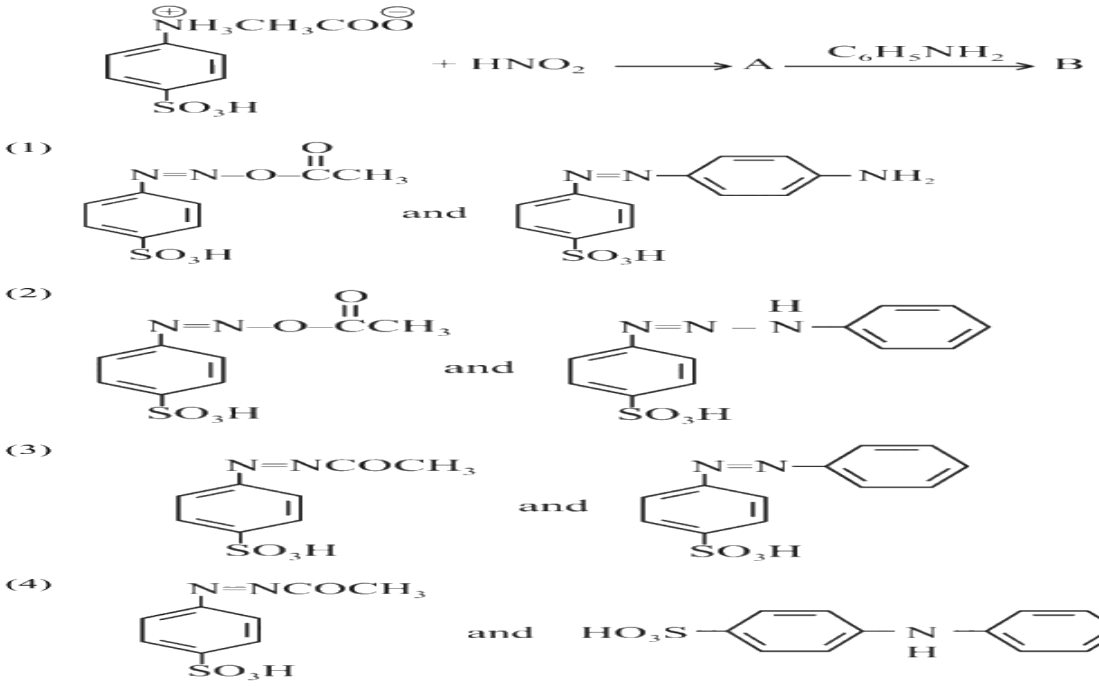
(A) $(D) < (C) < (B) < (A)$
(B) $(D) < (C) < (A) < (B)$
(C) $(A) < (B) < (C) < (D)$
(D) $(A) < (B) < (D) < (C)$

Answer: (B) $(D) < (C) < (A) < (B)$ · Key from source paper

Q185 JEE Main 2018 · 16 Apr · Online MCQ

Products A and B formed in the following reactions are respectively:
(see the figure above)

Q58. Products A and B formed in the following reactions are respectively:



(A) *see figure*

(B) *see figure*

(C) *see figure*

(D) *see figure*

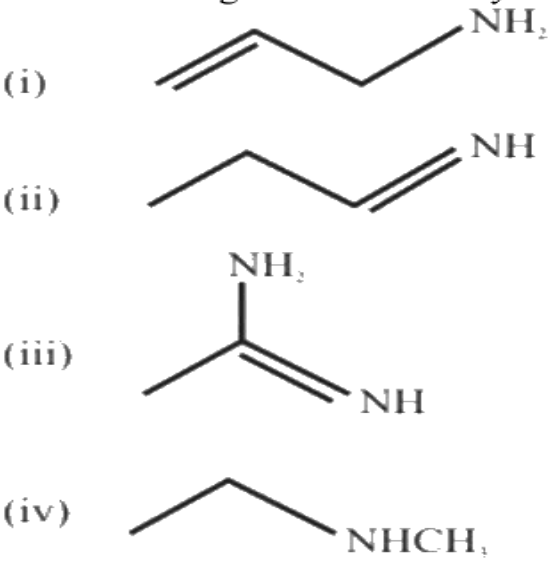
Options (1) or (2) were accepted. More than one answer was accepted. · Key from source paper

Q186 JEE Main 2018 · 8 Apr · Offline MCQ

The increasing order of basicity of the following compounds is :

(see the figure above)

Q58. The increasing order of basicity of the following compounds is :



(1) (iv) < (ii) < (i) <(iii)

(2) (i) < (ii) < (iii) < (iv)

(3) (ii) < (i) < (iii) < (iv)

(4) (ii) < (i) < (iv) < (iii)

(A) (iv) < (ii) < (i) <(iii)

(B) (i) < (ii) < (iii) < (iv)

(C) (ii) < (i) < (iii) < (iv)

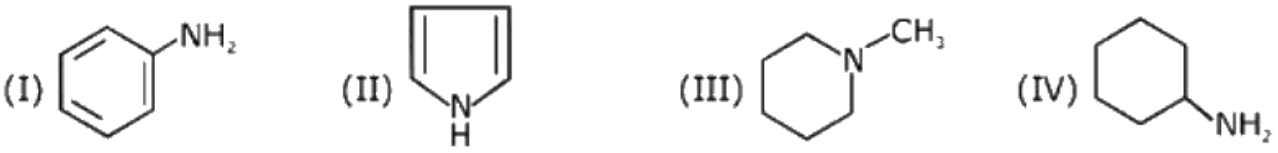
(D) (ii) < (i) < (iv) < (iii)

Answer: (D) (ii) < (i) < (iv) < (iii) · Key from source paper

Q187 JEE Main 2017 · 9 Apr · Online MCQ

Among the following compounds, the increasing order of their basic strength is:
(see the figure above)

Q58. Among the following compounds, the increasing order of their basic strength is:



(1) (II) < (I) < (III) < (IV)
(2) (II) < (I) < (IV) < (III)
(3) (I) < (II) < (IV) < (III)
(4) (I) < (II) < (III) < (IV)

(A) (II) < (I) < (III) < (IV)

(B) (II) < (I) < (IV) < (III)

(C) (I) < (II) < (IV) < (III)

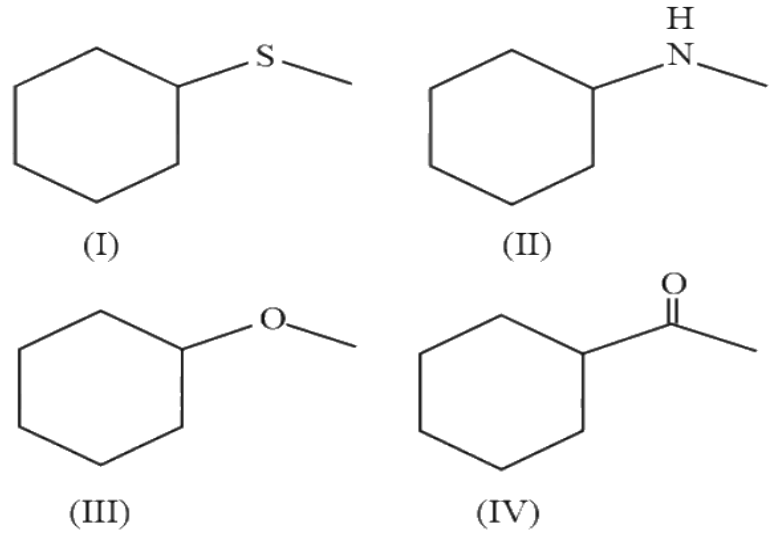
(D) (I) < (II) < (III) < (IV)

Answer: (A) (II) < (I) < (III) < (IV) · Key from source paper

Q188 JEE Main 2017 · 8 Apr · Online MCQ

A mixture containing the following four compounds is extracted with 1 M HCl. The compound that goes to aqueous layer is:
(see the figure above)

Q58. A mixture containing the following four compounds is extracted with 1 M HCl. The compound that goes to aqueous layer is:



(I) (II) (III) (IV)

(1) IV (2) II
(3) I (4) III

(A) IV
(B) II
(C) I
(D) III

Answer: (B) II · Key from source paper

Q189 JEE Main 2016 · 10 Apr · Online MCQ

Fluorination of an aromatic ring is easily accomplished by treating a diazonium salt with HBF_4. Which of the following conditions is correct about this reaction?

(A) NaF/Cu
(B) Cu_2O/H_2O
(C) Only Heat
(D) $NaNO_2/Cu$

Answer: (C) Only Heat · Key from source paper

Q190 JEE Main 2016 · 9 Apr · Online MCQ

The test to distinguish primary, secondary and tertiary amines is:

(A) Sandmeyer's reaction
(B) Carbylamine reaction
(C) Idoform test (sic)
(D) $C_6H_5SO_2Cl$

Answer: (D) $C_6H_5SO_2Cl$ · Key from source paper

Q191 JEE Main 2016 · 3 Apr · Offline MCQ

In the Hoffmann bromamide degradation reaction, the number of moles of NaOH and Br_2 used per mole of amine produced are:

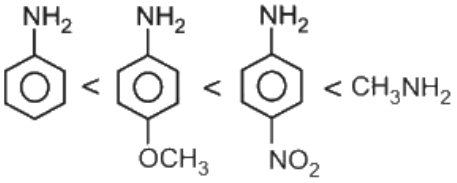
(A) Two moles of NaOH and two moles of Br_2
(B) Four moles of NaOH and one mole of Br_2
(C) One mole of NaOH and one mole of Br_2
(D) Four moles of NaOH and two moles of Br_2

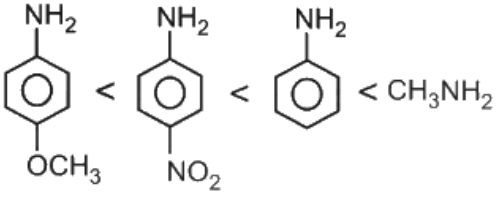
Answer: (B) Four moles of NaOH and one mole of Br_2 · Key from source paper

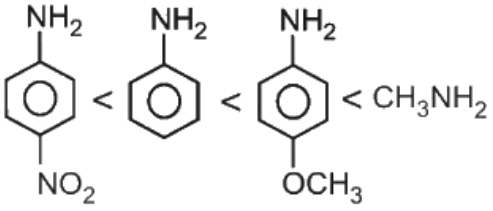
Q192 JEE Main 2015 · 10 Apr · Online MCQ

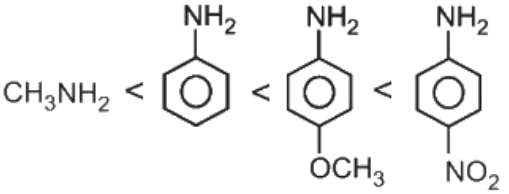
The correct order of basicity is

Q57. The correct order of basicity is

(1) 

(2) 

(3) 

(4) 

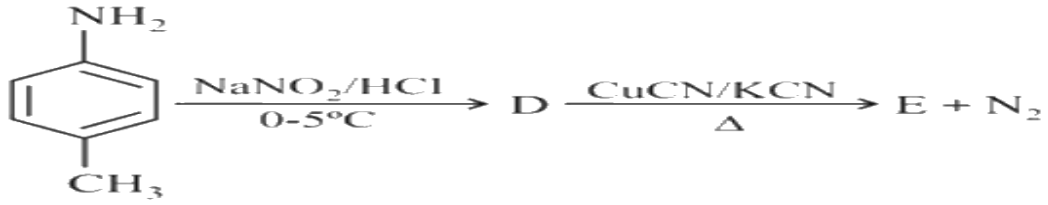
(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (C) · Key from source paper

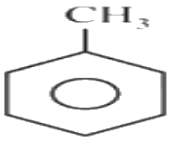
Q193 JEE Main 2015 · 4 Apr · Offline MCQ

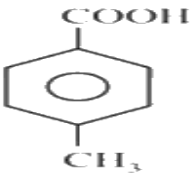
In the reaction,
(see the figure above)
The product E is

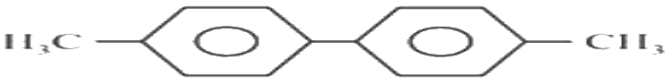
Q57. In the reaction,

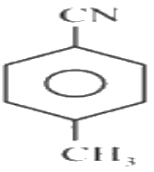


The product E is

(1) 

(2) 

(3) 

(4) 

(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (D) · Key from source paper

Q194 JEE Main 2014 · 19 Apr · Online MCQ

The final product formed when methylamine is treated with $NaNO_2$ and HCl followed by hydrolysis is:

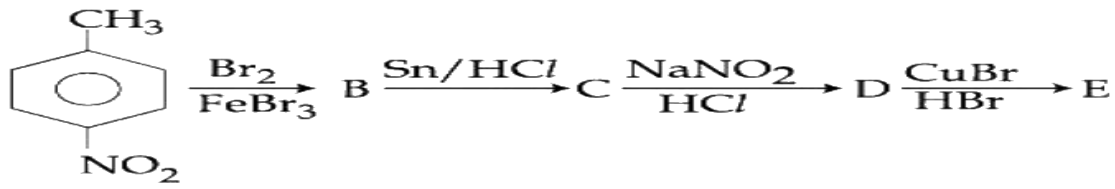
(A) Nitromethane
(B) Methylcyanide
(C) Methyl alcohol
(D) Diazomethane

Answer: (C) Methyl alcohol · Key from source paper

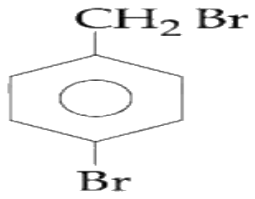
Q195 JEE Main 2014 · 19 Apr · Online MCQ

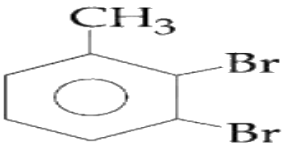
In a set of reactions p - nitrotoluene yielded a product E
(see the figure above)
The product E would be :

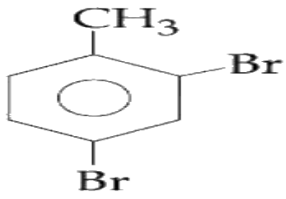
Q57. In a set of reactions p - nitrotoluene yielded a product E

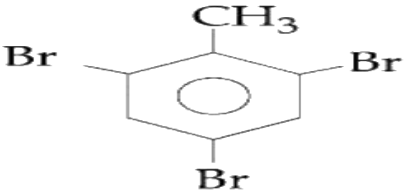


The product E would be :

(1)


(2)


(3)


(4)


(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (C) · Key from source paper

Q196 JEE Main 2014 · 12 Apr · Online MCQ

Conversion of benzene diazonium chloride to chlorobenzene is an example of which of the following reactions?

(A) Claisen
(B) Friedel-craft
(C) Sandmeyer
(D) Wurtz

Answer: (C) Sandmeyer · Key from source paper

Q197 JEE Main 2014 · 11 Apr · Online MCQ

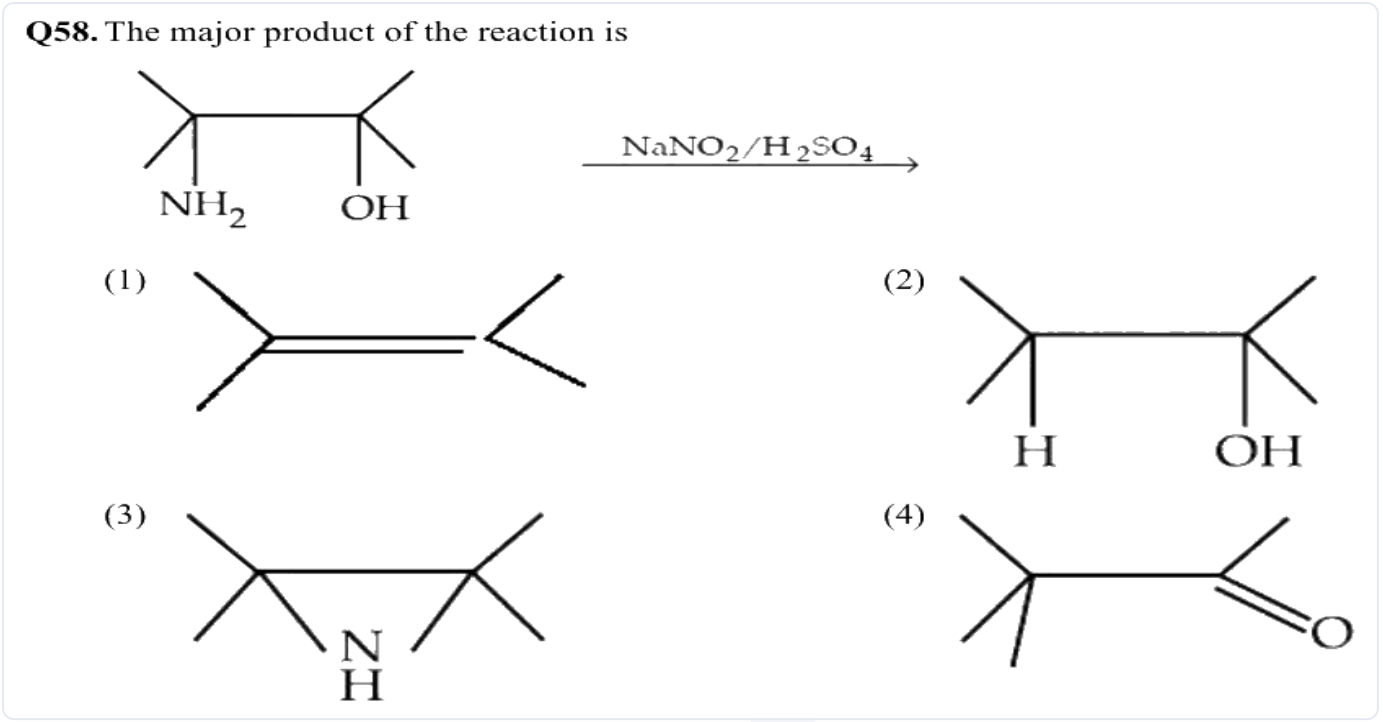
Complete reduction of benzene-diazonium chloride with $\mathrm{Zn/HCl}$ gives:

(A) Aniline
(B) Phenylhydrazine
(C) Azobenzene
(D) Hydrazobenzene

Answer: (A) Aniline · Key from source paper

Q198 JEE Main 2014 · 9 Apr · Online MCQ

The major product of the reaction is
(see the figure above)



(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (D) · Key from source paper

Q199 JEE Main 2014 · 6 Apr · Offline MCQ

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

(A) (CH_3) NH
(B) CH_3 NH_2
(C) $(CH_3)_3N$
(D) C_6H_5 NH_2

Answer: (A) (CH_3) NH · Key from source paper

Q200 JEE Main 2014 · 6 Apr · Offline MCQ

On heating an aliphatic primary amine with chloroform and ethanolic potassium hydroxide, the organic compound formed is :

(A) An alkanol
(B) An alkanediol
(C) An alkyl cyanide
(D) An alkyl isocyanide

Answer: (D) An alkyl isocyanide · Key from source paper

Q201 JEE Main 2013 · 25 Apr · Online MCQ

Carbylamine forms from aliphatic or aromatic primary amine via which of the following intermediates?

(A) Carbanion
(B) Carbene
(C) Carbocation
(D) Carbon radical

Answer: (B) Carbene · Key from source paper

Q202 JEE Main 2013 · 23 Apr · Online MCQ

The order of basicity of amines in gaseous state is :

(A) $1^{\circ} > 2^{\circ} > 3^{\circ} > \mathrm{NH_3}$
(B) $3^{\circ} > 2^{\circ} > \mathrm{NH_3} > 1^{\circ}$
(C) $3^{\circ} > 2^{\circ} > 1^{\circ} > \mathrm{NH_3}$
(D) $\mathrm{NH_3} > 1^{\circ} > 2^{\circ} > 3^{\circ}$

Answer: (C) $3^{\circ} > 2^{\circ} > 1^{\circ} > \mathrm{NH_3}$ · Key from source paper

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Q203 JEE Main 2013 · 9 Apr · Online MCQ

Aryl fluoride may be prepared from arene diazonium chloride using :

(A) $\mathrm{HBF_4}/\Delta$
(B) $\mathrm{HBF_4}/\mathrm{NaNO_2}$, Cu, Δ
(C) CuF/HF
(D) Cu/HF 0

Answer: (A) $\mathrm{HBF_4}/\Delta$ · Key from source paper

Q204 JEE Main 2013 · 7 Apr · Offline MCQ

A compound with molecular mass 180 is acylated with $\mathrm{CH_3}$ COCl to get a compound with molecular mass 390. The number of amino groups presents per molecule of the former compound is

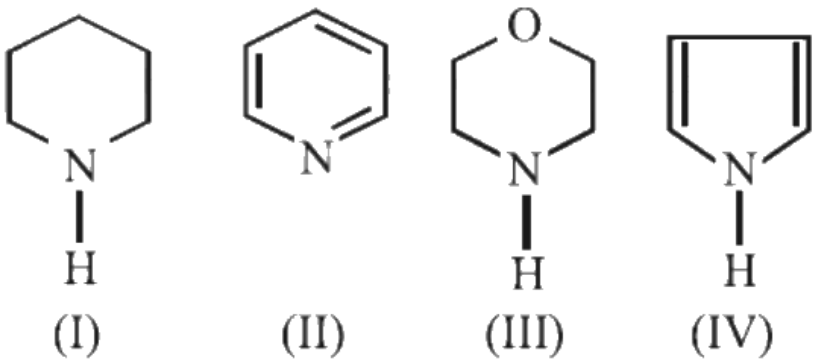
(A) 4
(B) 6
(C) 2
(D) 5

Answer: (D) 5 · Key from source paper

Q205 AIEEE 2012 · 26 May · Online MCQ

see figure

Q41.



(I) (II) (III) (IV)

In the following compounds:
the order of basicity is as follows

(1) IV > III > II > I
(2) III > I > II > IV
(3) II > III > I > IV
(4) I > III > II > IV

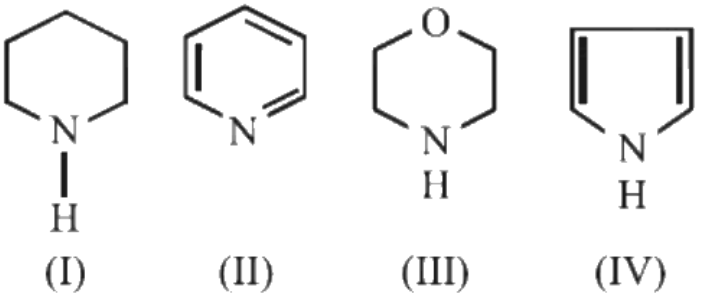
(A) IV > III > II > I
(B) III > I > II > IV
(C) II > III > I > IV
(D) I > III > II > IV

Answer: (D) I > III > II > IV · Key from source paper

Q206 AIEEE 2012 · 19 May · Online MCQ

see figure

Q43.



(I) (II) (III) (IV)

The order of basicity of the compounds is

(1) IV > I > III > II
(2) I > III > II > IV
(3) III > I > IV > II
(4) II > I > III > IV

(A) IV > I > III > II
(B) I > III > II > IV
(C) III > I > IV > II
(D) II > I > III > IV

Answer: (B) I > III > II > IV · Key from source paper

Q207 AIEEE 2012 · 12 May · Online MCQ

The conversion of benzene diazonium chloride to bromobenzene can be accomplished by

(A) Reimer-Tiemann reaction
(B) Friedel-Crafts reaction
(C) Gattermann reaction
(D) Azo-coupling reaction

Answer: (C) Gattermann reaction · Key from source paper

Q208 AIEEE 2012 · 7 May · Online MCQ

The most basic compound among the following is

(A) Acetanilide
(B) Benzylamine
(C) p-Nitro aniline
(D) Aniline

Answer: (B) Benzylamine · Key from source paper

Q209 AIEEE 2012 · 7 May · Online MCQ

$C_2H_5Br \xrightarrow{AgCN} X \xrightarrow[Zn-Hg/HCl]{Reduction} Y$, Here Y is

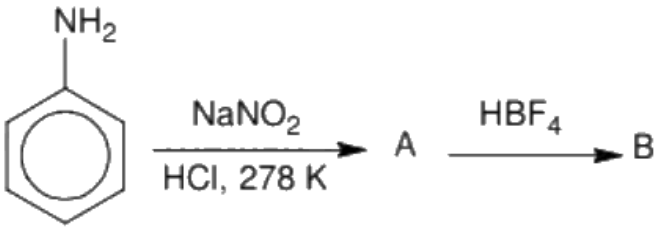
(A) Ethyl methyl amine
(B) n-propylamine
(C) Isopropylamine
(D) Ethylamine

Answer: (A) Ethyl methyl amine · Key from source paper

Q210 AIEEE 2010 MCQ

see figure

Q58.



In the chemical reactions,
the compounds ' A ' and ' B ' respectively are
(1) nitrobenzene and fluorobenzene
(2) phenol and benzene
(3) benzene diazonium chloride and fluorobenzene
(4) nitrobenzene and chlorobenzene

(A) nitrobenzene and fluorobenzene
(B) phenol and benzene
(C) benzene diazonium chloride and fluorobenzene
(D) nitrobenzene and chlorobenzene

Answer: (C) benzene diazonium chloride and fluorobenzene · Key from source paper

Q211 AIEEE 2008 MCQ

Toluene is nitrated and the resulting product is reduced with tin and hydrochloric acid. The product so obtained is diazotised and then heated with cuprous bromide. The reaction mixture so formed contains

(A) mixture of $o-$ and p-bromotoluenes
(B) mixture of $o-$ and p-dibromobenzenes
(C) mixture of o - and p-bromoanilines
(D) mixture of 0 - and m-bromotoluenes

Answer: (A) mixture of $o-$ and p-bromotoluenes · Key from source paper

Q212 AIEEE 2007 MCQ

In the chemical reaction, $CH_3CH_2NH_2 + CHCl_3 + 3KOH \longrightarrow$ (A) + (B) + $3H_2O$, the compound (A) and (B) are respectively

(A) C_2H_5CN and $3KCl$
(B) $CH_3CH_2CONH_2$ and $3KCl$
(C) C_2H_5NC and K_2CO_3
(D) C_2H_5NC and $3KCl$

Answer: (D) C_2H_5NC **and** $3KCl$ · Key from source paper

Q213 AIEEE 2007 MCQ

Which one of the following is the strongest base in aqueous solution?

(A) Trimethylamine
(B) Aniline
(C) Dimethylamine
(D) Methylamine

Answer: (C) Dimethylamine · Key from source paper

Q214 AIEEE 2006 MCQ

Fluorobenzene (C_6H_5F) can be synthesized in the laboratory

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

Answer: (B) from aniline by diazotisation followed by heating the diazonium salt with HBF_4 · Key from source paper

Q215 AIEEE 2005 MCQ

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

(A) Hinsberg method
(B) Hofmann method
(C) Wurtz reaction
(D) Curtius reaction

Answer: (C) Wurtz reaction · Key from source paper

Q216 AIEEE 2005 MCQ

Amongst the following the most basic compound is

(A) benzylamine
(B) aniline
(C) acetanilide
(D) p-nitroaniline

Answer: (A) benzylamine · Key from source paper

Q217 AIEEE 2004 MCQ

Which of the following is the strongest base?

(A) aniline (benzenamine, C6H5-NH2)
(B) benzylamine (phenylmethanamine, C6H5-CH2-NH2)
(C) 2-methylaniline (o-toluidine: a benzene ring with CH3 and NH2 on adjacent ring carbons)
(D) N-methylaniline (C6H5-NH-CH3)

Answer: (B) benzylamine (phenylmethanamine, C6H5-CH2-NH2) · Key from source paper

Q218 AIEEE 2003 MCQ

Ethyl isocyanide on hydrolysis in acidic medium generates

(A) propanoic acid and ammonium salt
(B) ethanoic acid and ammonium salt
(C) methylamine salt and ethanoic acid
(D) ethylamine salt and methanoic acid

Answer: (D) ethylamine salt and methanoic acid · Key from source paper

Q219 AIEEE 2003 MCQ

The correct order of increasing basic nature for the bases NH_3, CH_3NH_2 and $(CH_3)_2NH$ is

(A) $(CH_3)_2NH < NH_3 < CH_3NH_2$
(B) $NH_3 < CH_3NH_2 < (CH_3)_2NH$
(C) $CH_3NH_2 < (CH_3)_2NH < NH_3$
(D) $CH_3NH_2 < NH_3 < (CH_3)_2NH$

Answer: (B) $NH_3 < CH_3NH_2 < (CH_3)_2NH$ · Key from source paper

Q220 AIEEE 2002 MCQ

When primary amine reacts with chloroform in ethanoic KOH then the product is

(A) an isocyanide
(B) an aldehyde
(C) a cyanide
(D) an alcohol

Answer: (A) an isocyanide · Key from source paper

EdLoop JEE