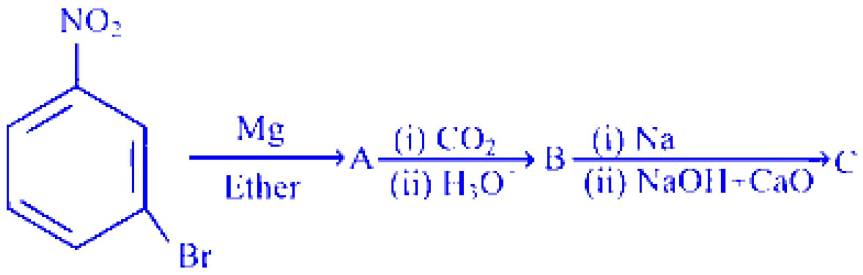
Compounds Containing Nitrogen

Question1

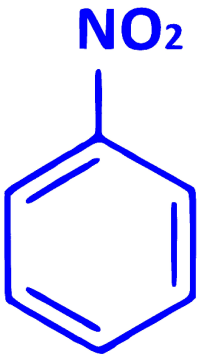
The product ' C ' in the given reaction sequence is



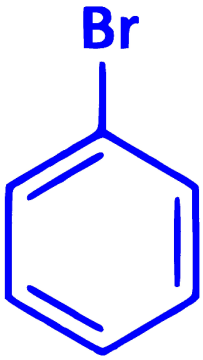
TG EAPCET 2025 (Online) 2nd May Evening Shift

Options:

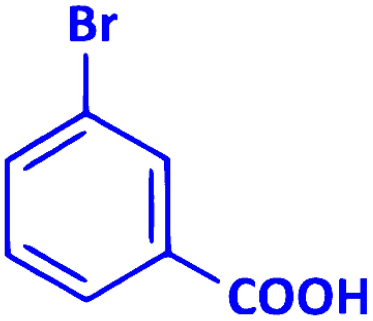
A.



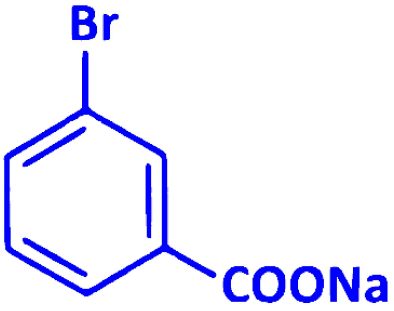
B.



C.



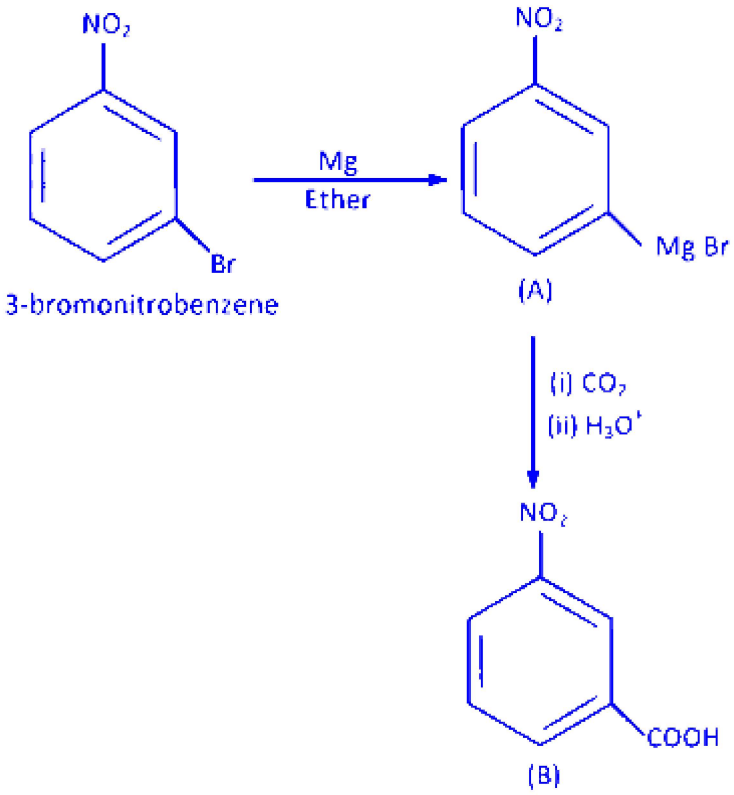
D.

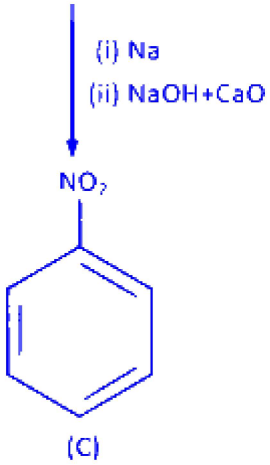


Answer: A

Solution:

The complete reaction sequence involved is as follows





(C)

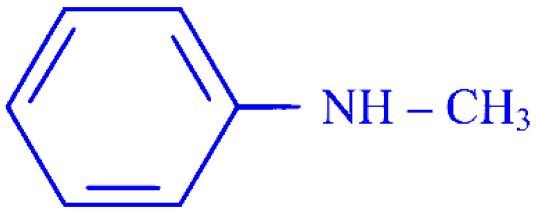
Question2

The amine/salt of amine which gives positive test with a mixture of chloroform and alcoholic KOH solution is

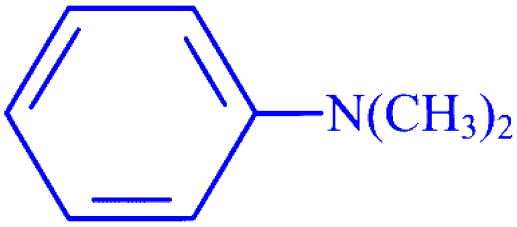
TG EAPCET 2025 (Online) 2nd May Evening Shift

Options:

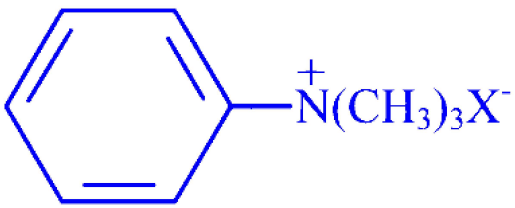
A.



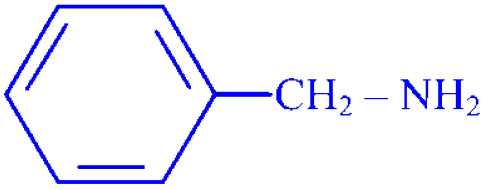
B.



C.



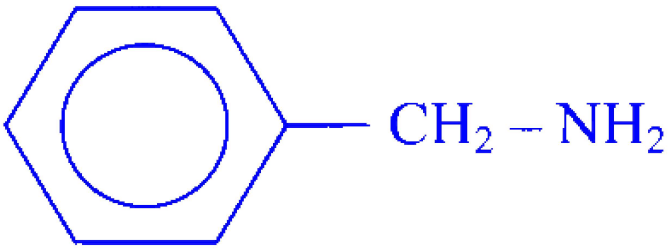
D.



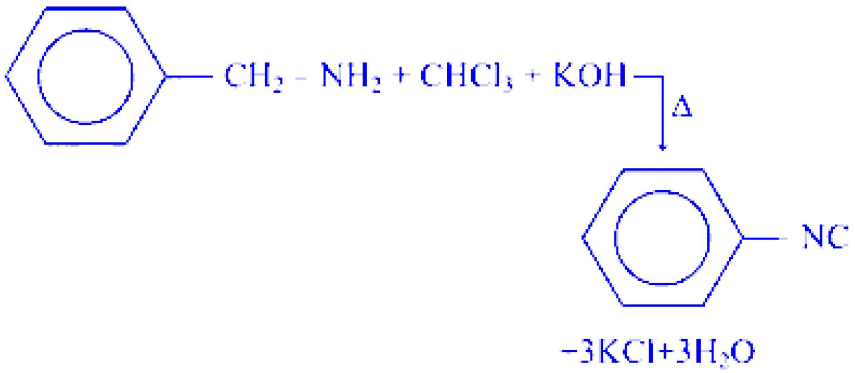
Answer: D

Solution:

Aliphatic and aromatic primary amines give positive carbylamine reaction. Thus, among the given options,



will give positive test with a mixture of chloroform and alc. KOH solution.



Question3

The major products P and Q from the following reactions are

TG EAPCET 2025 (Online) 2nd May Morning Shift

Options:

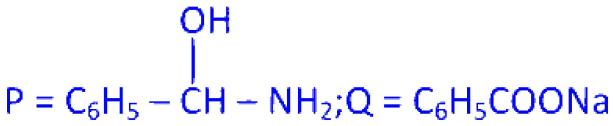
A.

$P = C_6H_5NH_2; Q = C_6H_5CH_2NH_2$

B.

$P = C_6H_5CH_2NH_2; Q = C_6H_5NH_2$

C.



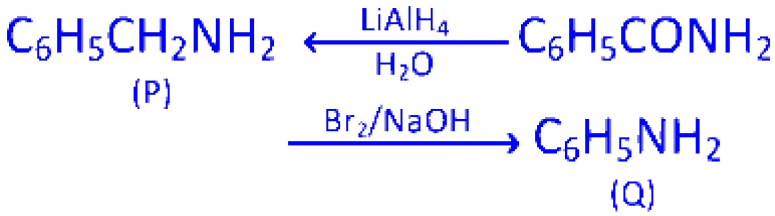
D.

$P = C_6H_5CN; Q = C_6H_5Br$

Answer: B

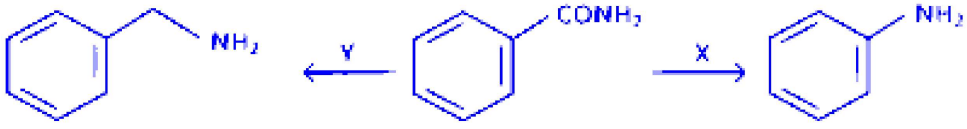
Solution:

The complete reaction is as follows.



Question4

What are X and Y respectively in the following reactions?



TG EAPCET 2024 (Online) 10th May Evening Shift

Options:

A. (i) $LiAlH_4$ (ii) $H_2O : NaOH + Br_2$

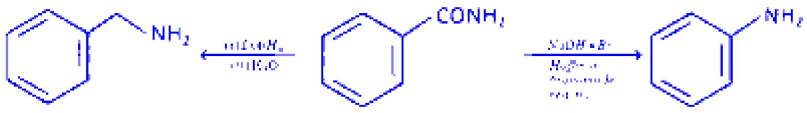
B. $NaOH + Br_2$: (i) $LiAlH_4$ (ii) H_2O

C. $NaOH + Br_2$: (i) $NaBH_4$ (ii) H_2O

D. (i) $NaBH_4$ (ii) H_2O : $NaOH + Br_2$

Answer: B

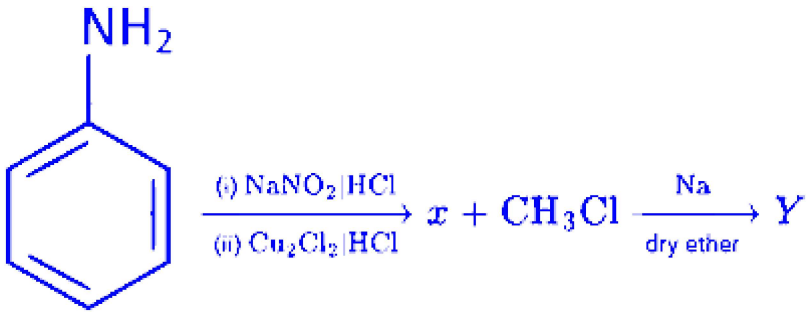
Solution:



Thus, X and Y are $(NaOH + Br_2)$ and [(i) $LiAlH_4$

(ii) H_2O]

Question5



Conversion of X to Y in the above reaction is

TG EAPCET 2024 (Online) 10th May Morning Shift

Options:

A. Wurtz reaction

B. Fittig reaction

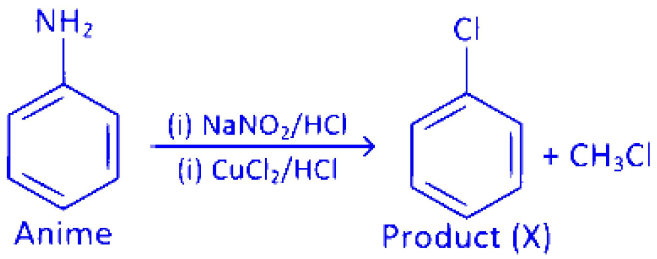
C. Wurtz-Fittig reaction

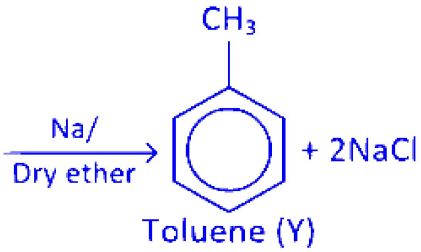
D. Sandmeyer reaction

Answer: C

Solution:

The Wurtz-Fittig reaction is a chemical process that produces substituted aromatic compound from aryl halides, alkyl halide in presence of dry ether and sodium metal. The complete reaction is as follows.





Question6

Identify the correct statements about Z.

$$C_2H_5NH_2 \xrightarrow[0^\circ C]{NaNO_2/HCl} X \xrightarrow{H_2O} Y \xrightarrow{Cu/573\ K} Z$$

I. Z is an aldehyde.
II. Z undergòes Cannizzaro reaction.

III. Z gives iodoform test.

IV. Z does not give, test with Tollens' reagent.

TG EAPCET 2024 (Online) 9th May Evening Shift

Options:

A. I and III

B. I and IV

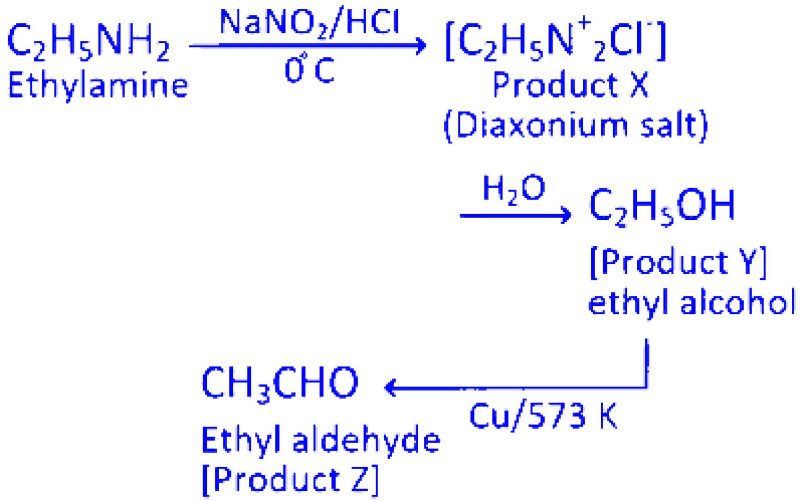
C. II and IV

D. II and III

Answer: A

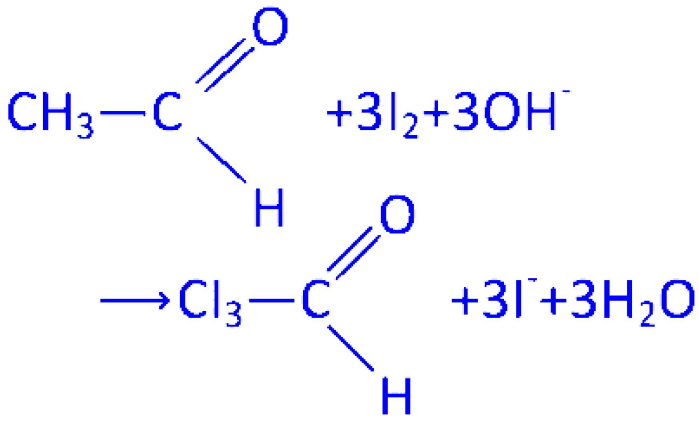
Solution:

The complete reaction is as follows.



Product (Z) is an aldehyde.

Ethyl aldehyde is only aldehyde which gives iodoform test.



Hence, statements I and III are correct.

Question7

Match the following.

List -I (Amine)	List -II (pKb value)
A. N,N-dimethyl aniline	I. 9.30
B. Aniline	II. 8.92
C. N-ethylethanamine	III. 9.38
D. N-methylaniline	IV. 3.00

The correct answer is

TG EAPCET 2024 (Online) 9th May Evening Shift

Options:

A. A-II, B - III, C - IV, D- I

B. A-II, B - IV, C - III, D-I

C. A-III, B -IV, C -I, D-II

D. A-IV, B - III, C - II, D-I

Answer: A

Solution:

The lesser the pK_b value, more stronger will be the base.

Hence, the correct match is A-II, B-III, C-IV, D-I.

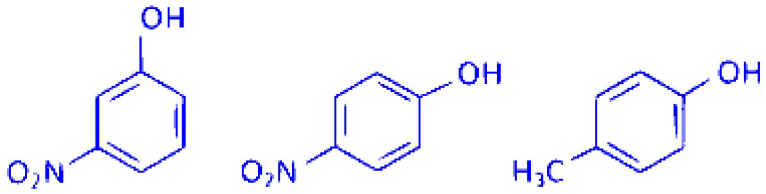
Question8

The pK_a values of X, Y, Z respectively are $8.3, 7.1, 10.2$. What are X, Y, Z ?

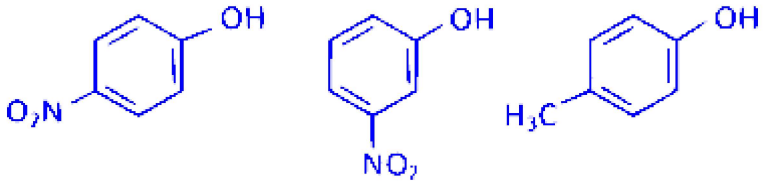
TG EAPCET 2024 (Online) 9th May Morning Shift

Options:

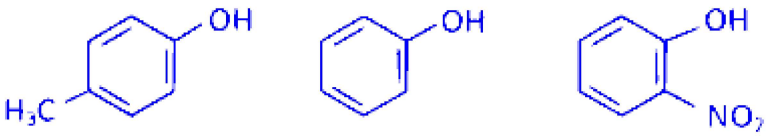
A.



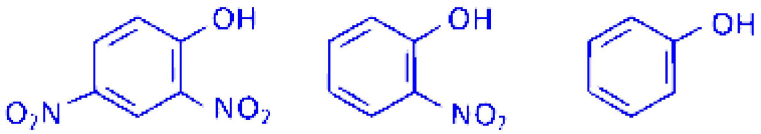
B.



C.



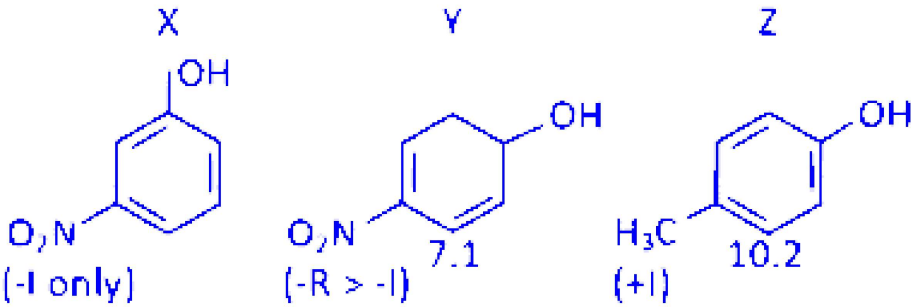
D.



Answer: A

Solution:

More is the pK_a value weaker is the acid. So, the compounds X, Y and Z are



Question9

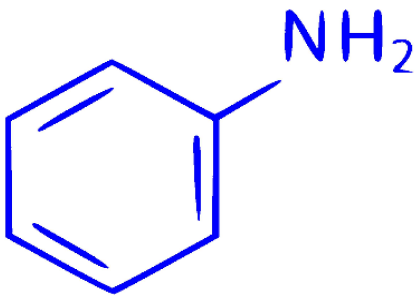
The reagents/ chemicals X and Y that convert cyanobenzene to Schiff's base are

TG EAPCET 2024 (Online) 9th May Morning Shift

Options:

A. (i) DIBAL - H, (ii) $H_2O \cdot NH_2OH$

B. DIBAL- H_1H_2O,



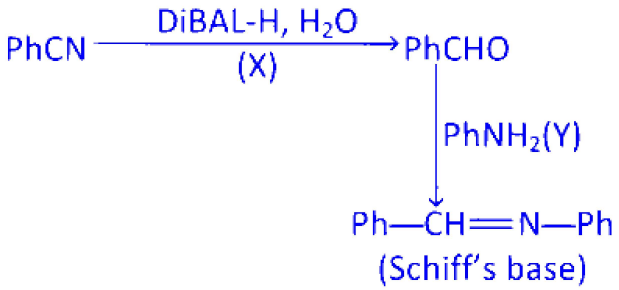
C. LAH, CH_3OH

D. H_3O^+,

Answer: B

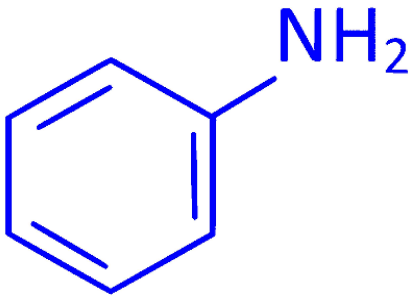
Solution:

The reaction involved is as follows,



Thus, reagent/chemical X and Y are

DIBAL - H, H_2O and



Question10

The correct statement(s) of the following is/are (A) Aniline forms a stable benzene diazonium chloride at 285 K . (B) N - phenylethanamide is less reactive towards nitration than aniline. (C) $p-\mathrm{CH_3C_6H_4COCl}$ **is Hinsberg reagent.**

TG EAPCET 2024 (Online) 9th May Morning Shift

Options:

A. A and B only

B. A and C only

C. B only

D. C only

Answer: C

Solution:

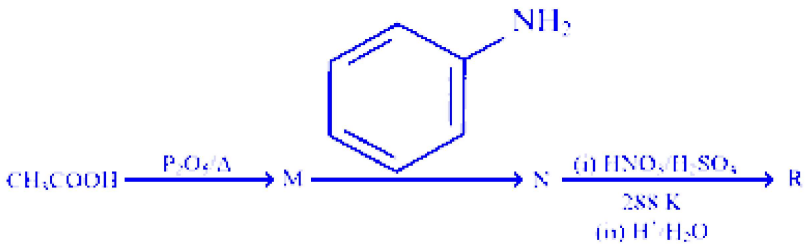
Statement given in B is correct which A and C are incorrect. The correct form of A and C are:

(A) Aniline can form stable diazonium salt at 273-283 K.

(C) Formula of Hinsberg reagent is $C_6H_5SO_2Cl$.

Question11

What is the major product ' R ' in the following reaction sequence?



TS EAMCET 2023 (Online) 12th May Evening Shift

Options:

A. o-nitro aniline

B. m-nitro aniline

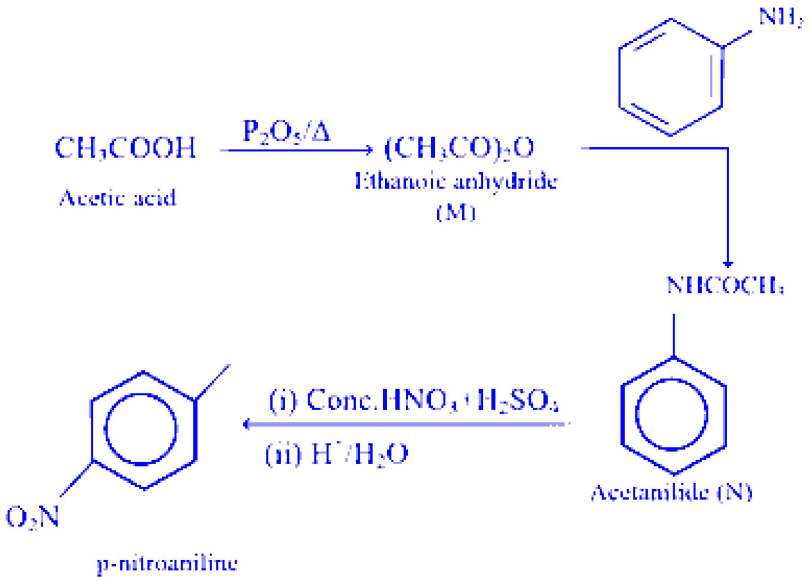
C. p-nitroaniline

D. p-aminobenzene sulphonic acid

Answer: C

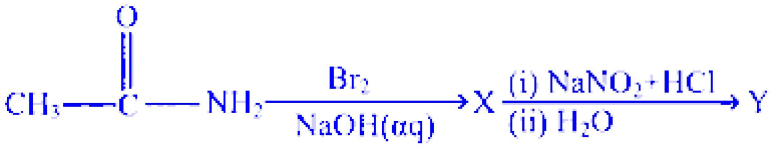
Solution:

Acetic acid is heated with P_2O_5 to give ethanoic anhydride (M). M reacts with aniline to give acetanilide N . At last, (N) undergoes nitration to give *p*-nitroacetanilide which on acidic hydrolysis give *p*-nitroaniline (R) as major product.



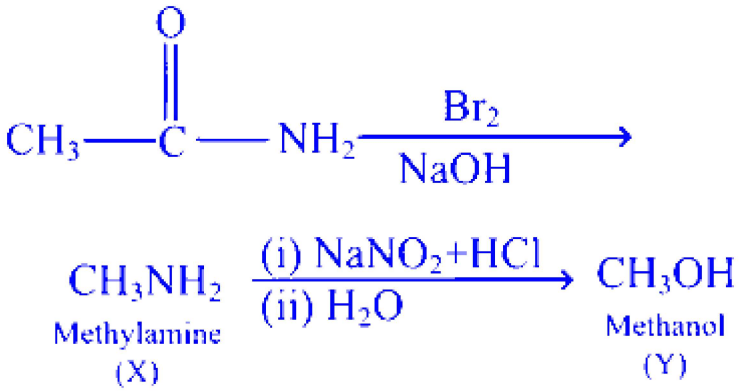
Question12

Identify what is Y in the following reaction sequence?

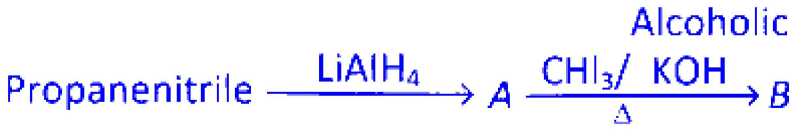


Solution:

Acetamide reacts with NaOH and Br_2 to give methyl amine (X). In next step, methyl amine undergoes diazotisation reaction in presence of $NaNO_2$ and HCl , which on further hydrolysis give methanol (Y) as major product.



Question13



Conversion of A to B is an example of the reaction

TS EAMCET 2023 (Online) 12th May Morning Shift

Options:

A. Reimer-Tiemann reaction

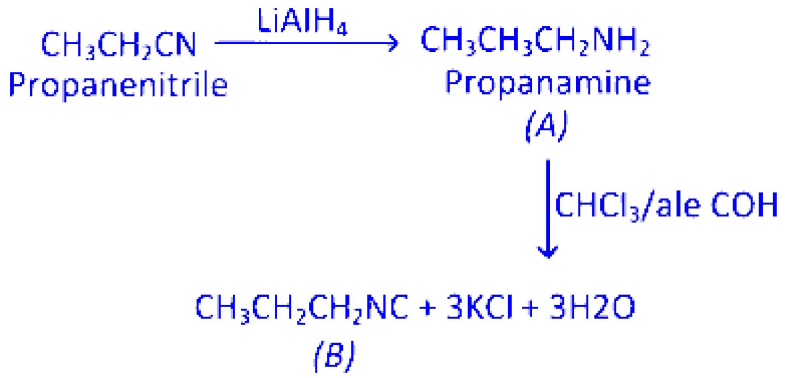
B. Carbylamine reaction

C. Stephen reaction

D. Sandmeyer reaction

Answer: B

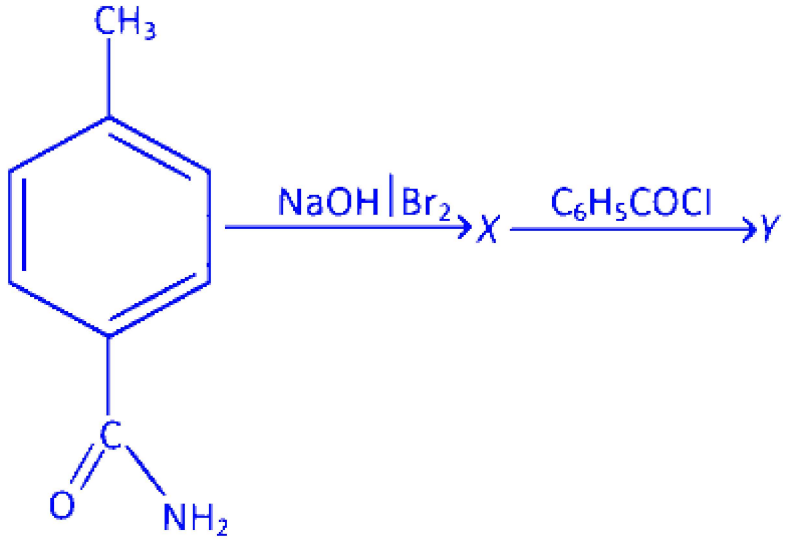
Solution:



In the given reaction propanenitrik undergo reduction on reaction tith $\mathrm{LiAlH_4}$ to give primary amine i. propanamine (A) which reacts with $\mathrm{CHCl_3}$ in alc. KOH to give an isocyanide (B). This conversion d 1Δ B is carbylamine reaction.

Question14

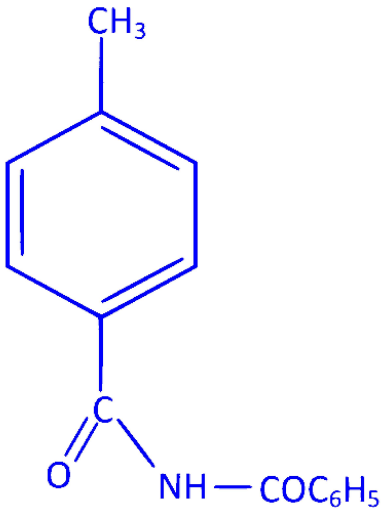
Identify the product ' Y ' in the following sequence of reactions



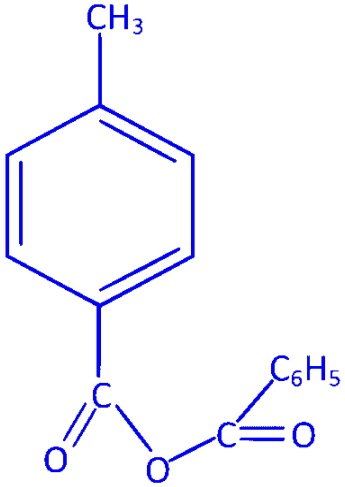
TS EAMCET 2023 (Online) 12th May Morning Shift

Options:

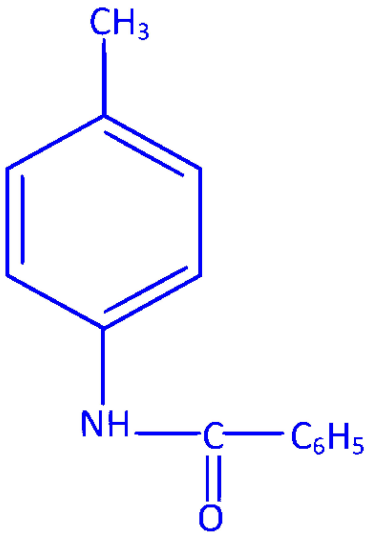
A.



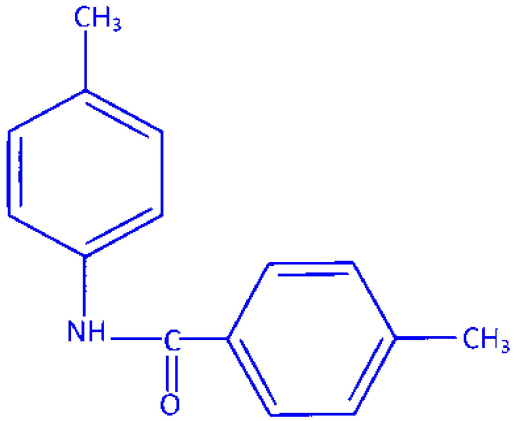
B.



C.



D.



Answer: C

Solution: