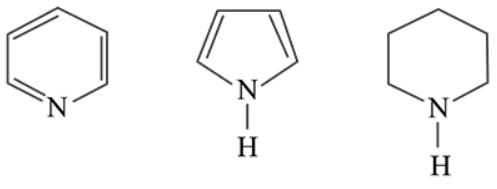
JEE Mains 2019 Chapter wise Question Bank

Amines - Questions

Q1

Arrange the following amines in the decreasing order of basicity :



I II III

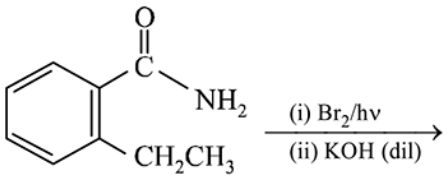
(1) I > II > III (2) III > I > II

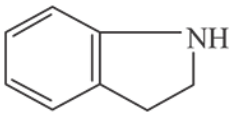
(3) III > II > I (4) I > III > II

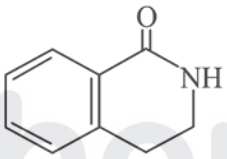
9 Jan Morning

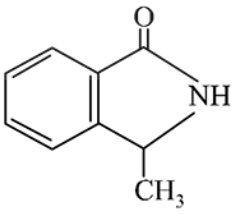
Q2

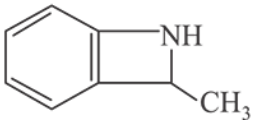
The major product of the following reaction is:



(1) 

(2) 

(3) 

(4) 

9 Jan Evening

Q3

The increasing basicity order of the following compounds is:

(A) $CH_3CH_2NH_2$ (B) $CH_3CH_2\underset{\displaystyle CH_2CH_3}{\underset{|}{N}}H$

(C) $H_3C-\underset{\displaystyle CH_3}{\underset{|}{N}}-CH_3$ (D) $Ph-\underset{\displaystyle CH_3}{\underset{|}{N}}-H$

(1) (D) < (C) < (B) < (A)

(2) (D) < (C) < (A) < (B)

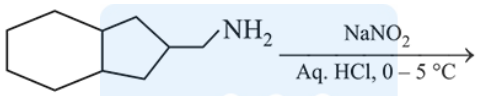
(3) (A) < (B) < (C) < (D)

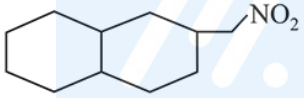
(4) (A) < (B) < (D) < (C)

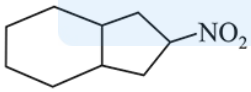
9 Jan Evening

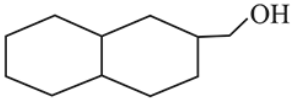
Q4

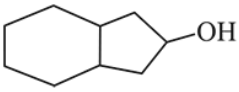
The major product formed in the reaction given below will be:



(1) 

(2) 

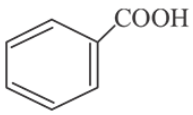
(3) 

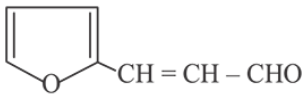
(4) 

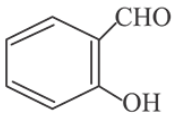
10 Jan Morning

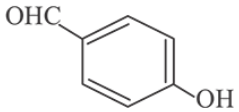
Q5

An aromatic compound 'A' having molecular formula $C_7H_6O_2$ on treating with aqueous ammonia and heating forms compound 'B'. The compound 'B' on reaction with molecular bromine and potassium hydroxide provides compound 'C' having molecular formula C_6H_7N. The structure of 'A' is:

(1) 

(2) 

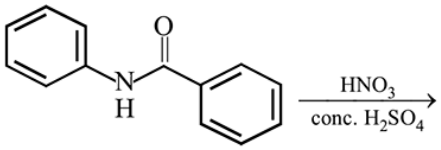
(3) 

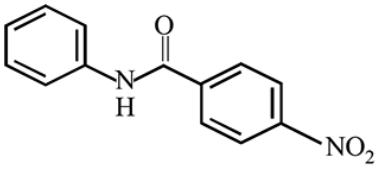
(4) 

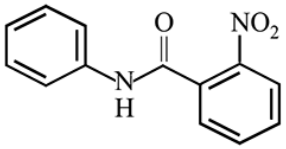
10 Jan Evening

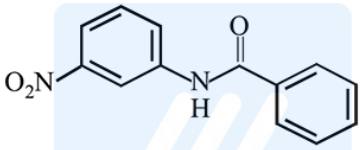
Q6

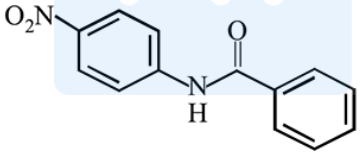
What will be the major product in the following mononitration reaction?



(1) 

(2) 

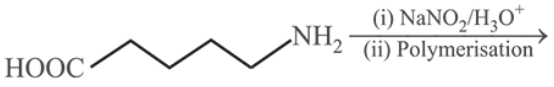
(3) 

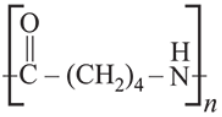
(4) 

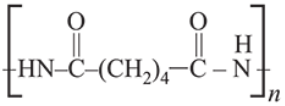
10 Jan Evening

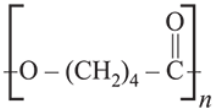
Q7

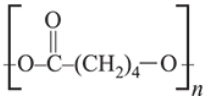
The polymer obtained from the following reactions is



(1) 

(2) 

(3) 

(4) 

11 Jan Morning

Q8

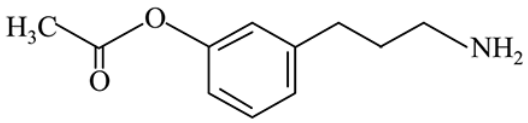
A compound 'X' on treatment with Br_2/NaOH, provided C_3H_9N, which gives positive carbylamine test. Compound 'X' is :

(1) $CH_3COCH_2NHCH_3$
(2) $CH_3CH_2COCH_2NH_2$
(3) $CH_3CH_2CH_2CONH_2$
(4) $CH_3CON(CH_3)_2$

11 Jan Evening

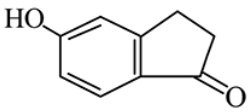
Q9

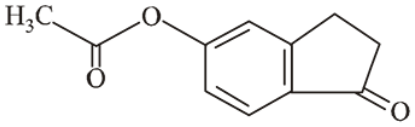
The major product of the following reaction is :

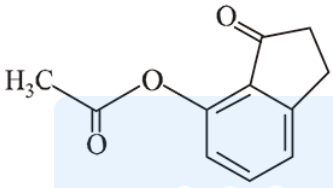


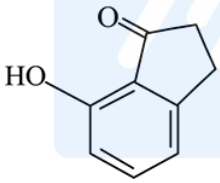
$\xrightarrow[\text{(ii) } CrO_3/H^+]{\text{(i) } NaNO_2/H^+}$

(iii) H_2SO_4 (conc.), Δ

(1) 

(2) 

(3) 

(4) 

12 Jan Evening

Q10

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

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

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

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

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

8 April Morning

Q11

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

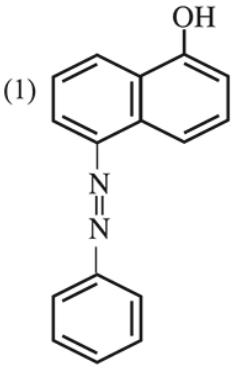
(1) *n*-butylamine (2) triethylamine

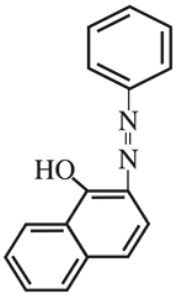
(3) *t*-butylamine (4) neo-pentylamine

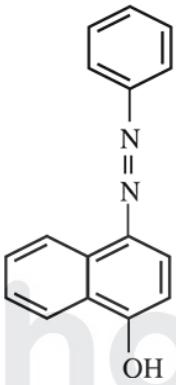
8 April Morning

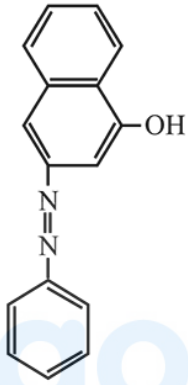
Q12

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

(1) 

(2) 

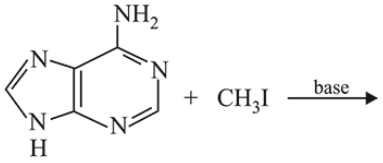
(3) 

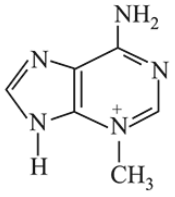
(4) 

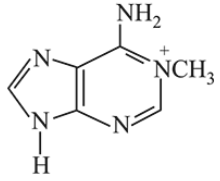
8 April Morning

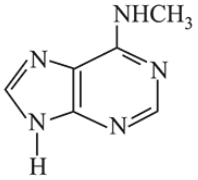
Q13

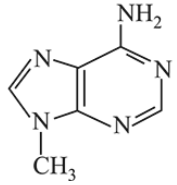
The major product in the following reaction is:



(1) 

(2) 

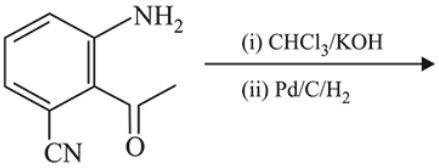
(3) 

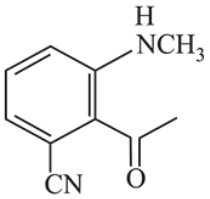
(4) 

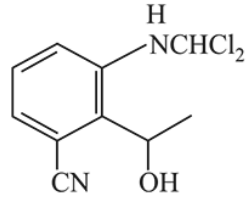
8 April Evening

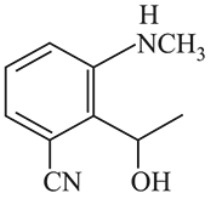
Q14

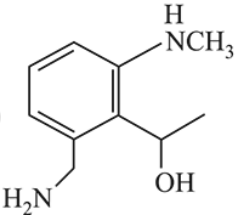
The major product obtained in the following reaction is :



(1) 

(2) 

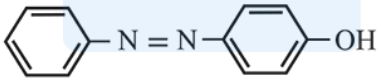
(3) 

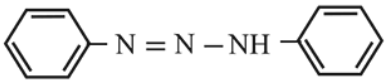
(d) 

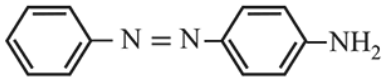
8 April Evening

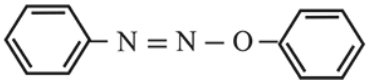
Q15

Aniline dissolved in dilute HCl is reacted with sodium nitrate at 0°C. This solution was added dropwise to a solution containing equimolar mixture of aniline and phenol in dil. HCl. The structure of the major product is:

(1) 

(2) 

(3) 

(4) 

9 April Morning

Q16

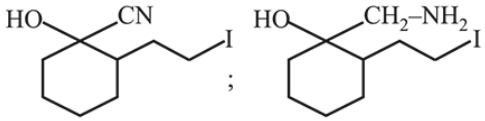
Hinsberg's reagent is:

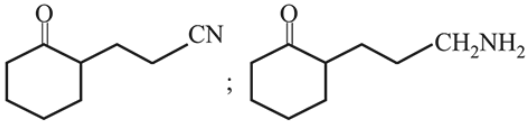
(1) C_6H_5COCl (2) $SOCl_2$
(3) $C_6H_5SO_2Cl$ (4) $(COCl)_2$

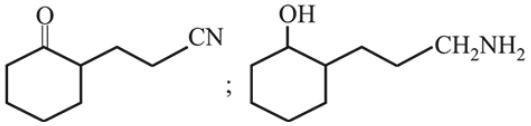
9 April Evening

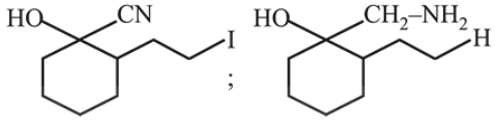
Q17

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

(1) 

(2) 

(3) 

(4) 

9 April Evening

Q18

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

(1) NH_2NH_2 (2) CaH_2 (3) $NaBH_4$ (4) H_2O

10 April Morning

Q19

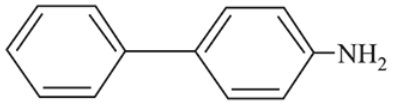
Which of the following is NOT a correct method of the preparation of benzylamine from cyanobenzene ?

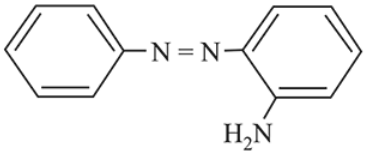
(1) H_2/Ni
(2) (i) $LiAlH_4$ (ii) H_3O^+
(3) (i) $SnCl_2 + HCl(gas)$ (ii) $NaBH_4$
(4) (i) HCl/H_2O (ii) $NaBH_4$

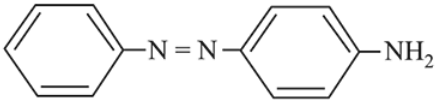
10 April Evening

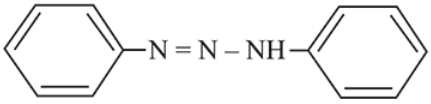
Q20

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

(1) 

(2) 

(3) 

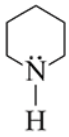
(4) 

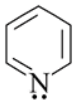
12 April Evening

JEE Mains 2019 Chapter wise Question Bank

Amines - Questions

Q1

(2) Compound, III  is most basic as the lone pair of nitrogen is easily available for the donation.

In case of compound (I)  lone pair is not involved in resonance but nitrogen atom is sp^2 hybridsed whereas in compound II the lone pair of nitrogen is involved in aromaticity which makes it least basic.

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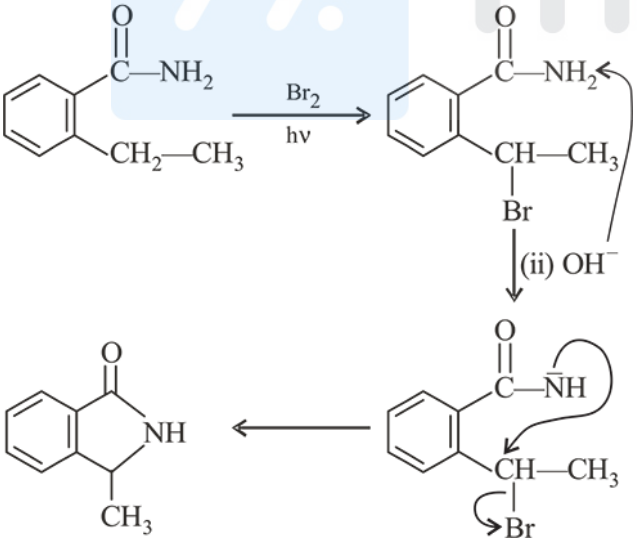
Q2

(3) Reaction involved for the given reaction:



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Q3

(2)

	pK_b
(A) $EtNH_2$	3.29
(B) $(Et)_2NH$	3.00
(C) Me_3N	4.22
(D) Ph – NH – Me	4.7

So, order of basic strength is:

$C_2H_5 \rightarrow NH \leftarrow C_2H_5$

$C_2H_5 \rightarrow NH \leftarrow C_2H_5$ ($2C_2H_5$ groups) > $C_2H_5NH_2$ ($1C_2H_5$ group) > Me_3N (steric factor) > PhNH–Me (e^- pair delocalised over Ph - ring)

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

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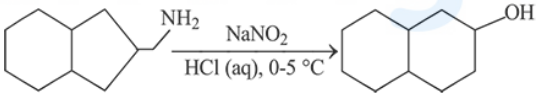
Q4

(Bonus)



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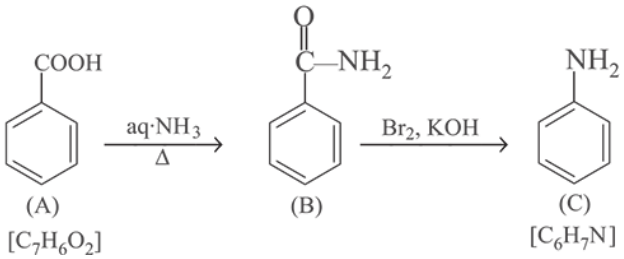
Q5

(1) Reaction involved:



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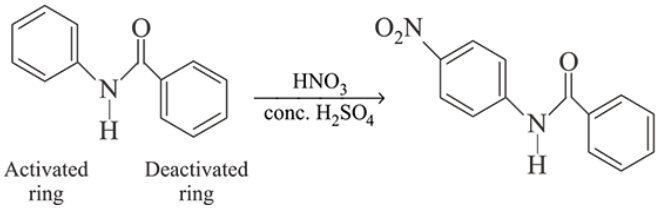
Q6

(4) In the given nitration reaction, major product will be formed as per the activating group, –NH part of —NH—C(=O)— is activating while, —C(=O)— part is deactivating group.



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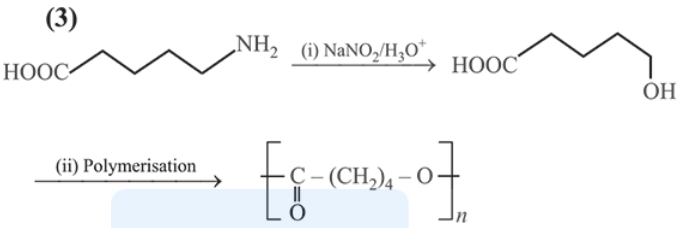
Q7

(3)



11 Jan Morning

Q8

(3)

$CH_3CH_2CH_2CONH_2 \xrightarrow[\text{(Hofmann rearrangement)}]{Br_2/NaOH} CH_3CH_2CH_2NH_2$

(X) (C_3H_9N)

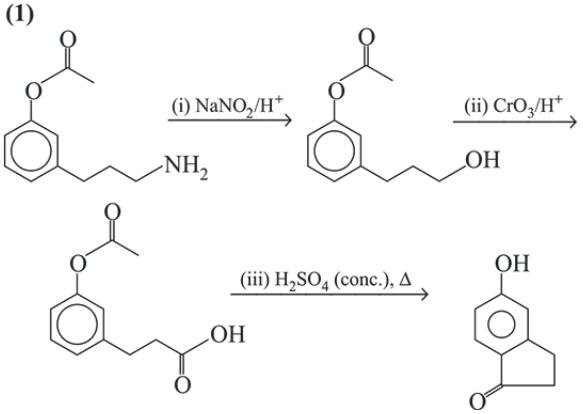
$CH_3CH_2CH_2NH_2 \xrightarrow[KOH]{CHCl_3} CH_3CH_2CH_2NC$

(Carbylamine reaction)

11 Jan Evening

Q9

(1)



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Q10

(3) $(C_2H_5)_2NH$ > $C_2H_5NH_2$ > NH_4

Two +I gp. one + I gp. No + I gp.

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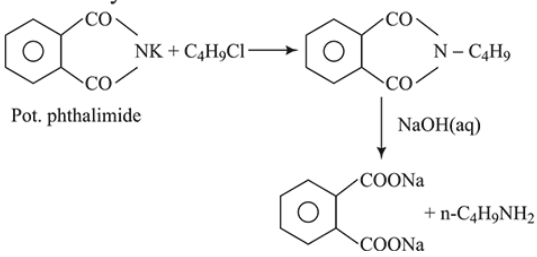
Q11

(1) Primary amines are prepared by Gabriel phthalimide synthesis



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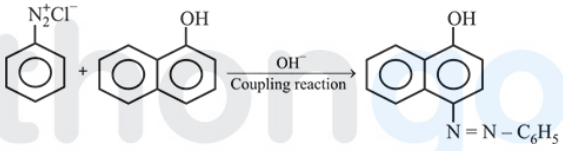
Q12

(3)



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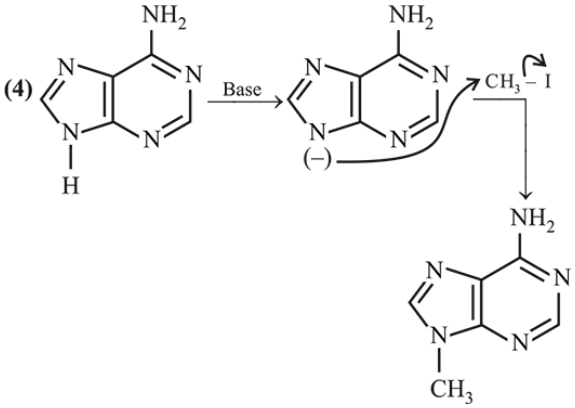
Q13

(4)



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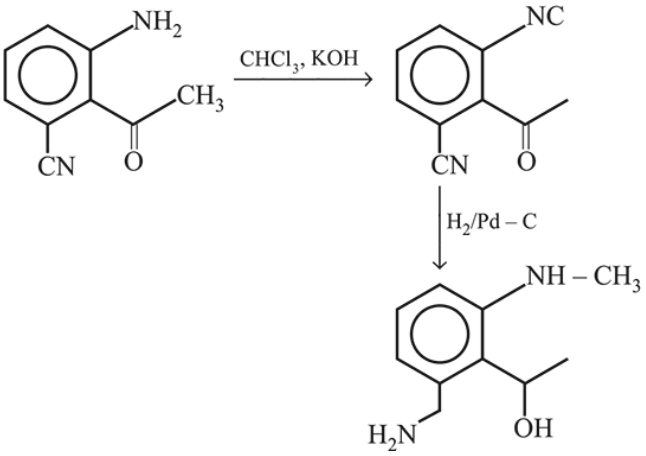
Q14

(4)



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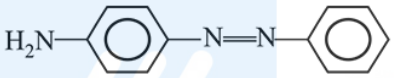
Q15

(3) In acidic medium aniline is more reactive than phenol that's why electrophilic aromatic substitution of $Ph-\overset{+}{N}_2$ takes place with aniline.



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Q16

(3) Hinsberg's reagent is benzenesulphonyl chloride. It is used for detection of primary, secondary and tertiary amines.

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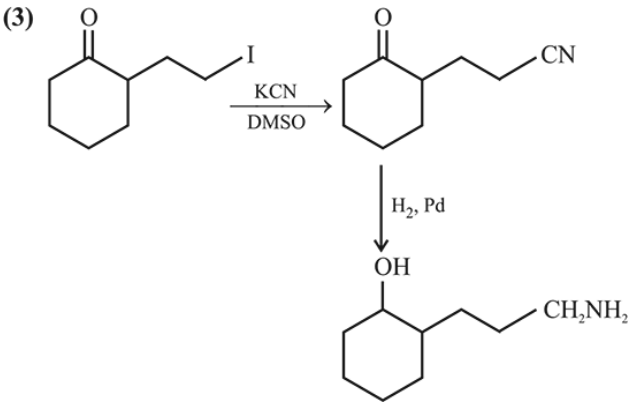
Q17

(3)



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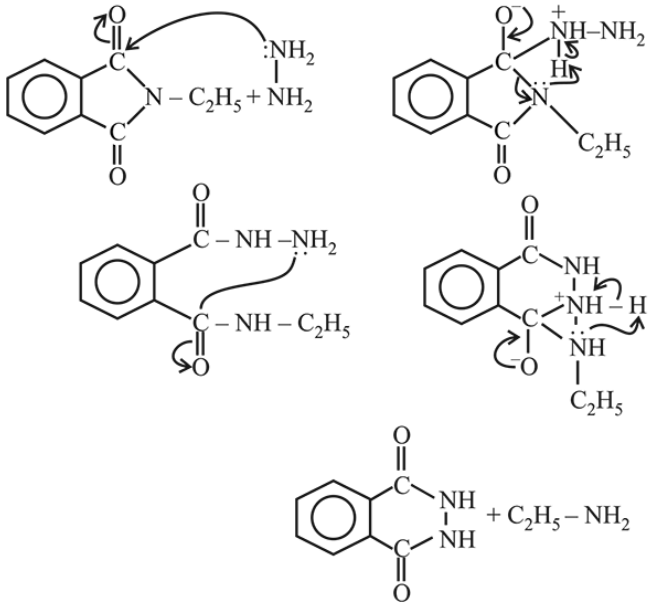
Q18

(1) N-Ethyl phthalimide on treatment with $NH_2–NH_2$ gives ethylamine.



In place of NH_2NH_2, we can also use H_2O in presence of H^+ or OH^- as a catalyst.

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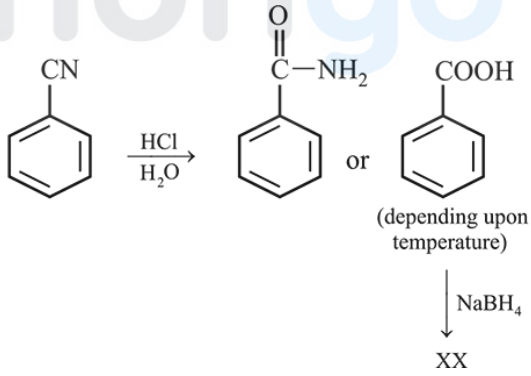
Q19

(4)



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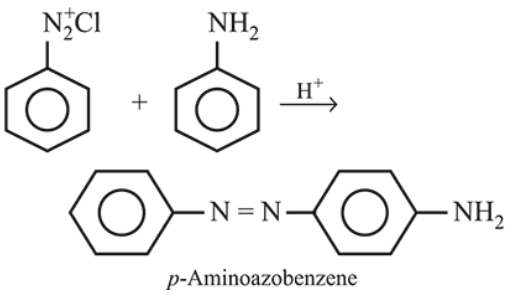
Q20

(3)



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