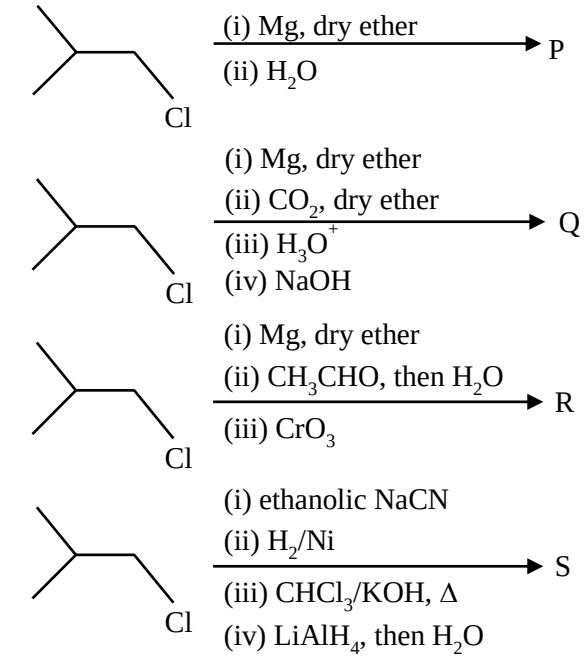
ORGANIC CHEMISTRY

AMINE DERIVATIVE

1. In the following reactions, **P**, **Q**, **R**, and **S** are the major products. **[JEE(Advanced) 2023]**



The correct statement about **P**, **Q**, **R**, and **S** is

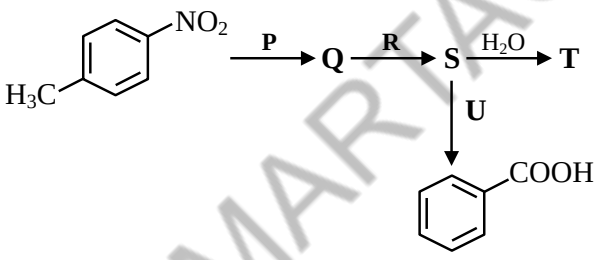
(A) **P** is a primary alcohol with four carbons.

(B) **Q** undergoes Kolbe's electrolysis to give an eight-carbon product.

(C) **R** has six carbons and it undergoes Cannizzaro reaction.

(D) **S** is a primary amine with six carbons.

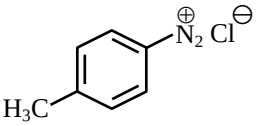
2. Consider the following reaction sequence,



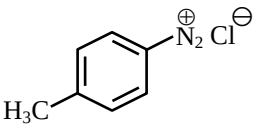
the correct option(s) is(are) **[JEE(Advanced) 2022]**

(A) **P** = H_2/Pd, ethanol **R** = $NaNO_2$/HCl **U** = 1. H_3PO_2 2. $KMnO_4$ - KOH, heat

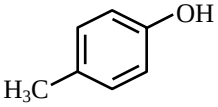
(B) **P** = Sn/HCl **R** = HNO_2 **S** =



(C) **S** =

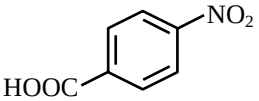


T =

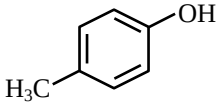


U = 1. CH_3CH_2OH 2. $KMnO_4$ - KOH, heat

(D) **Q** =

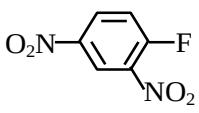


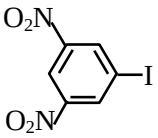
R = H_2/Pd, ethanol **T** =

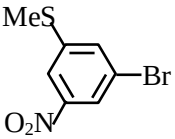


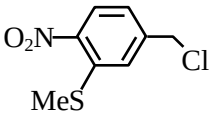
3. The reaction of **Q** with PhSNa yields an organic compound (major product) that gives positive Carius test on treatment with Na_2O_2 followed by addition of $BaCl_2$. The correct option(s) for **Q** is (are).

[JEE(Advanced) 2021]

(A) 

(B) 

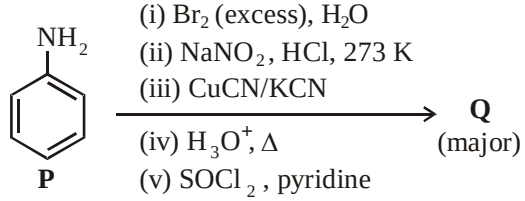
(C) 

(D) 

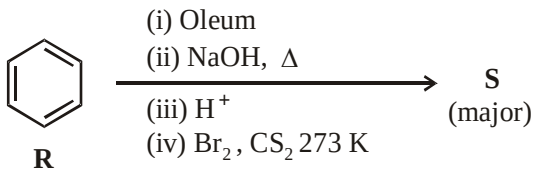
4. Scheme 1 and 2 describe the conversion of **P** to **Q** and **R** to **S**, respectively. Scheme 3 describes the synthesis of **T** from **Q** and **S**. The total number of Br atoms in a molecule of **T** is _____.

[JEE(Advanced) 2019]

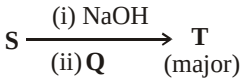
Scheme 1 :



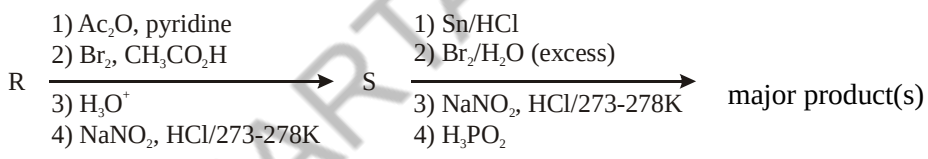
Scheme 2 :

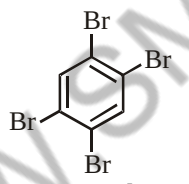


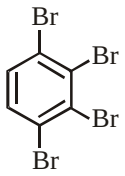
Scheme 3 :

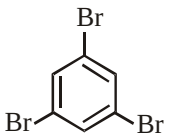


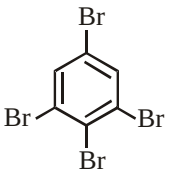
5. Aniline reacts with mixed acid (conc. HNO_3 and conc. H_2SO_4) at 288 K to give P (51%), Q (47%) and R (2%). The major product(s) the following reaction sequence is (are) :- **[JEE(Advanced) 2018]**



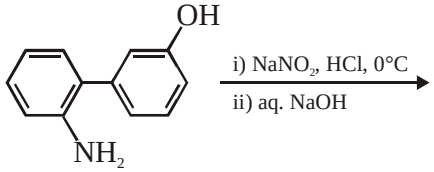
(A) 

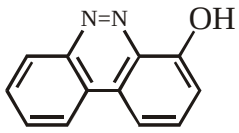
(B) 

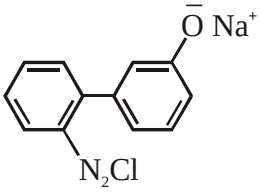
(C) 

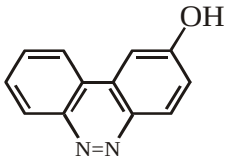
(D) 

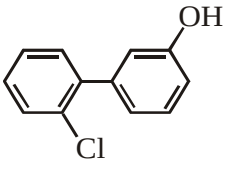
6. The major product of the following reaction is **[JEE(Advanced) 2017]**



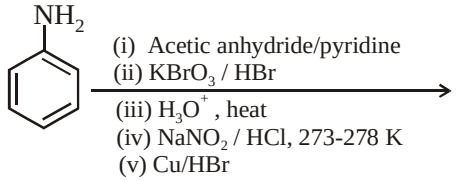
(A) 

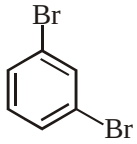
(B) 

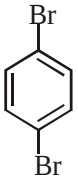
(C) 

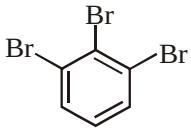
(D) 

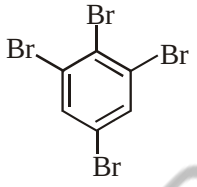
7. The product(s) of the following reaction sequence is(are) **[JEE(Advanced) 2016]**



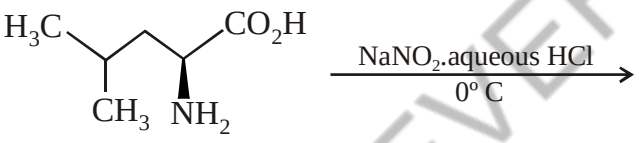
(A) 

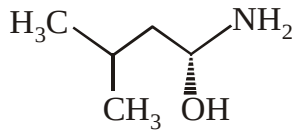
(B) 

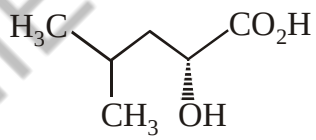
(C) 

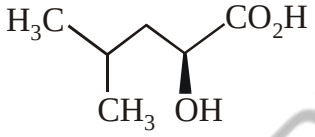
(D) 

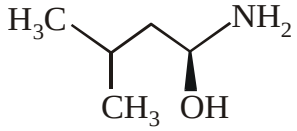
8. The major product of the reaction is : **[JEE(Advanced) 2015]**



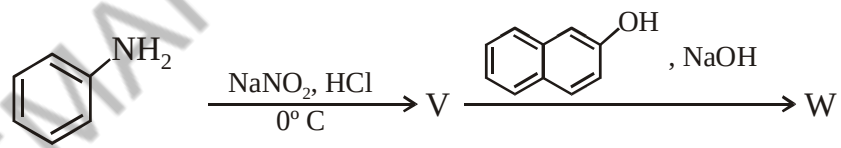
(A) 

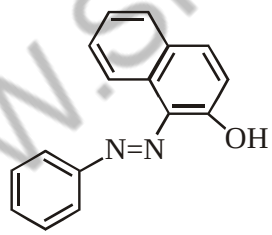
(B) 

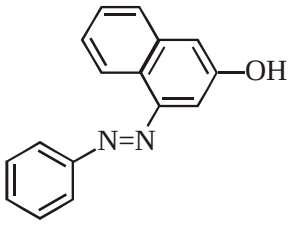
(C) 

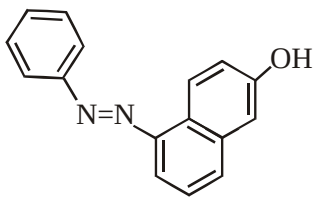
(D) 

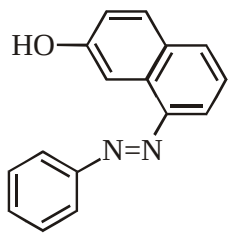
9. In the following reactions, the major product **W** is : **[JEE(Advanced) 2015]**



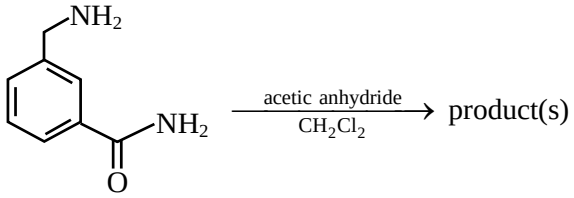
(A) 

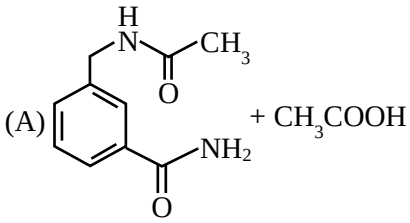
(B) 

(C) 

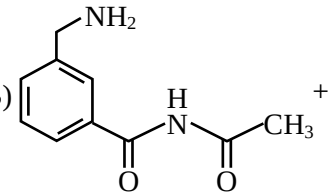
(D) 

10. In the reaction shown below, the major product(s) formed is / are : **[JEE(Advanced) 2014]**

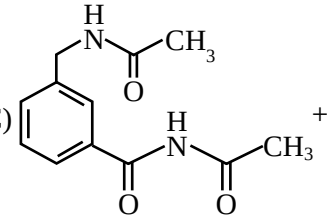


(A) 

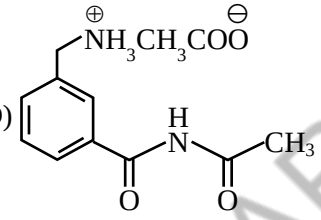
+ CH_3COOH

(B) 

+ CH_3COOH

(C) 

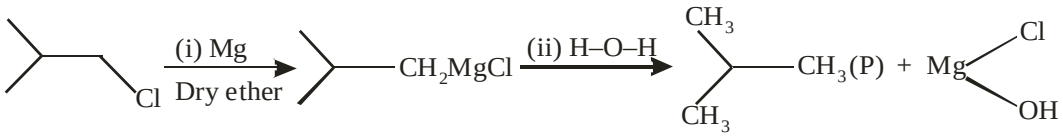
+ H_2O

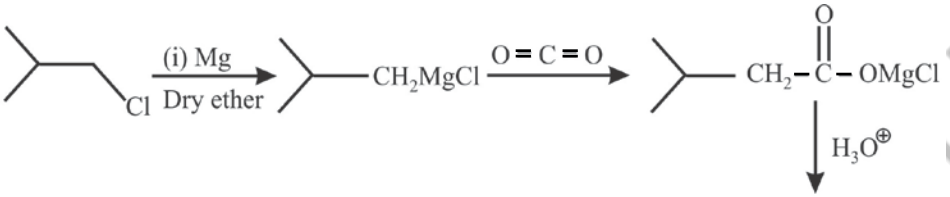
(D) 

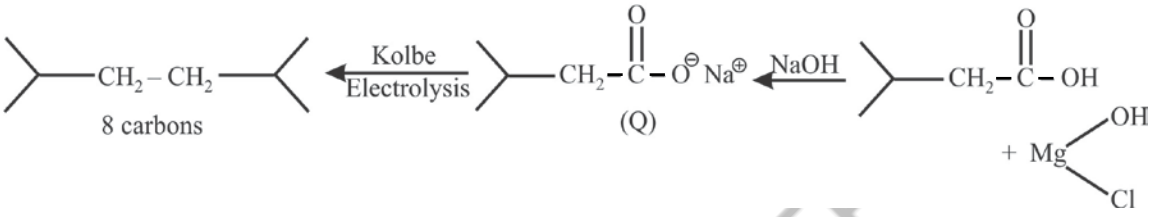
SOLUTIONS

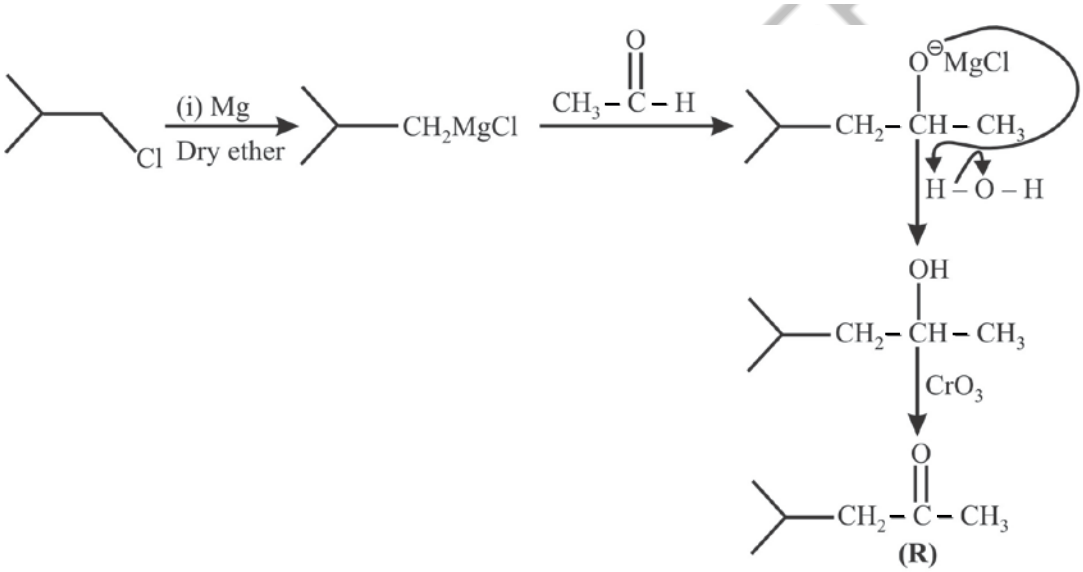
1. Ans. (B)

Sol.

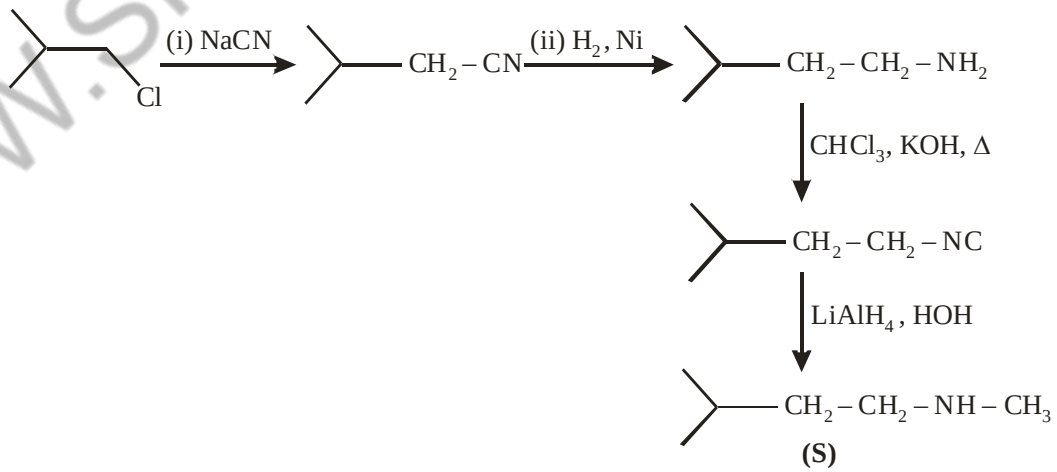








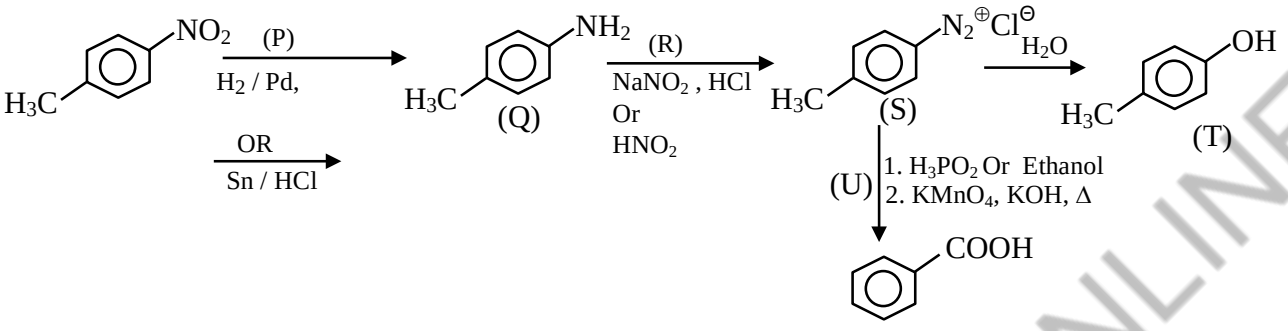
It does not give Cannizaro reaction



It's secondary amine

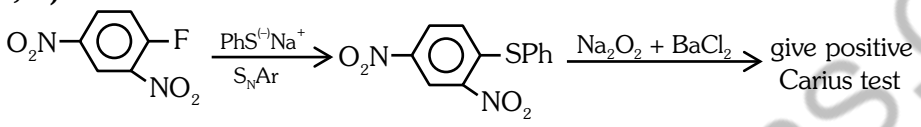
2. Ans. (A, B, C)

Sol.

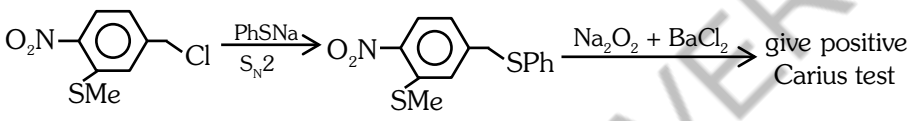


3. Ans. (A, D)

Sol. (A)

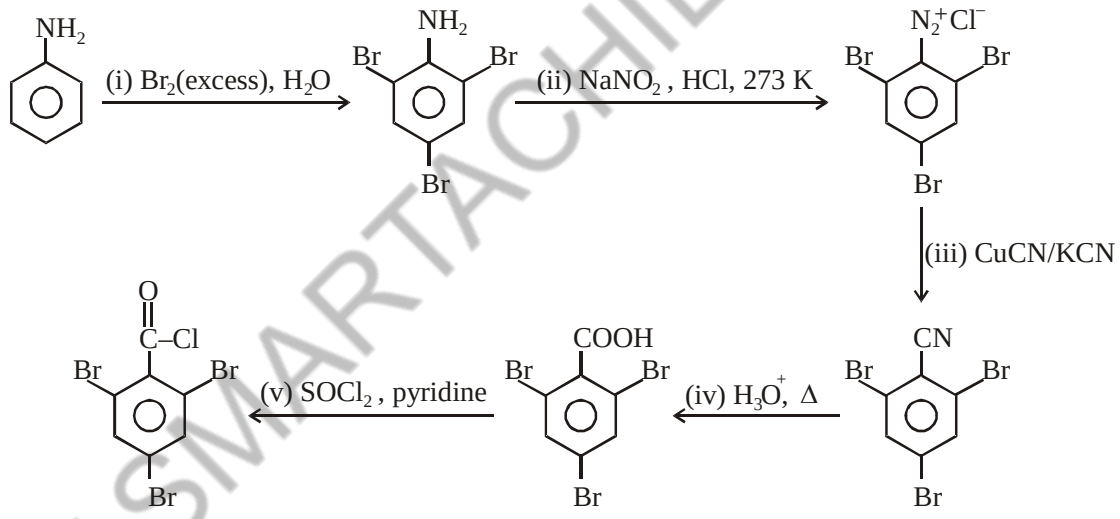


(D)

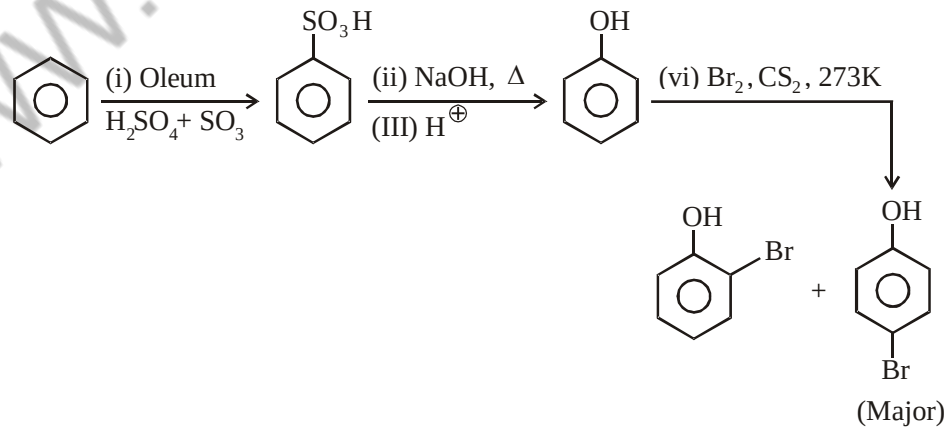


4. Ans. (4.00)

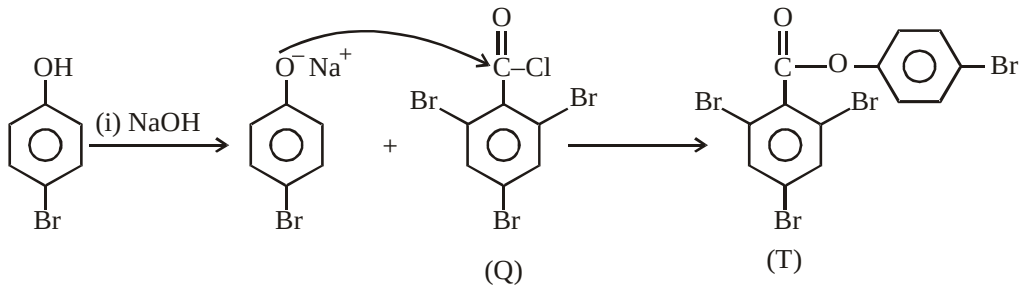
Sol. Scheme 1 :



Scheme 2 :

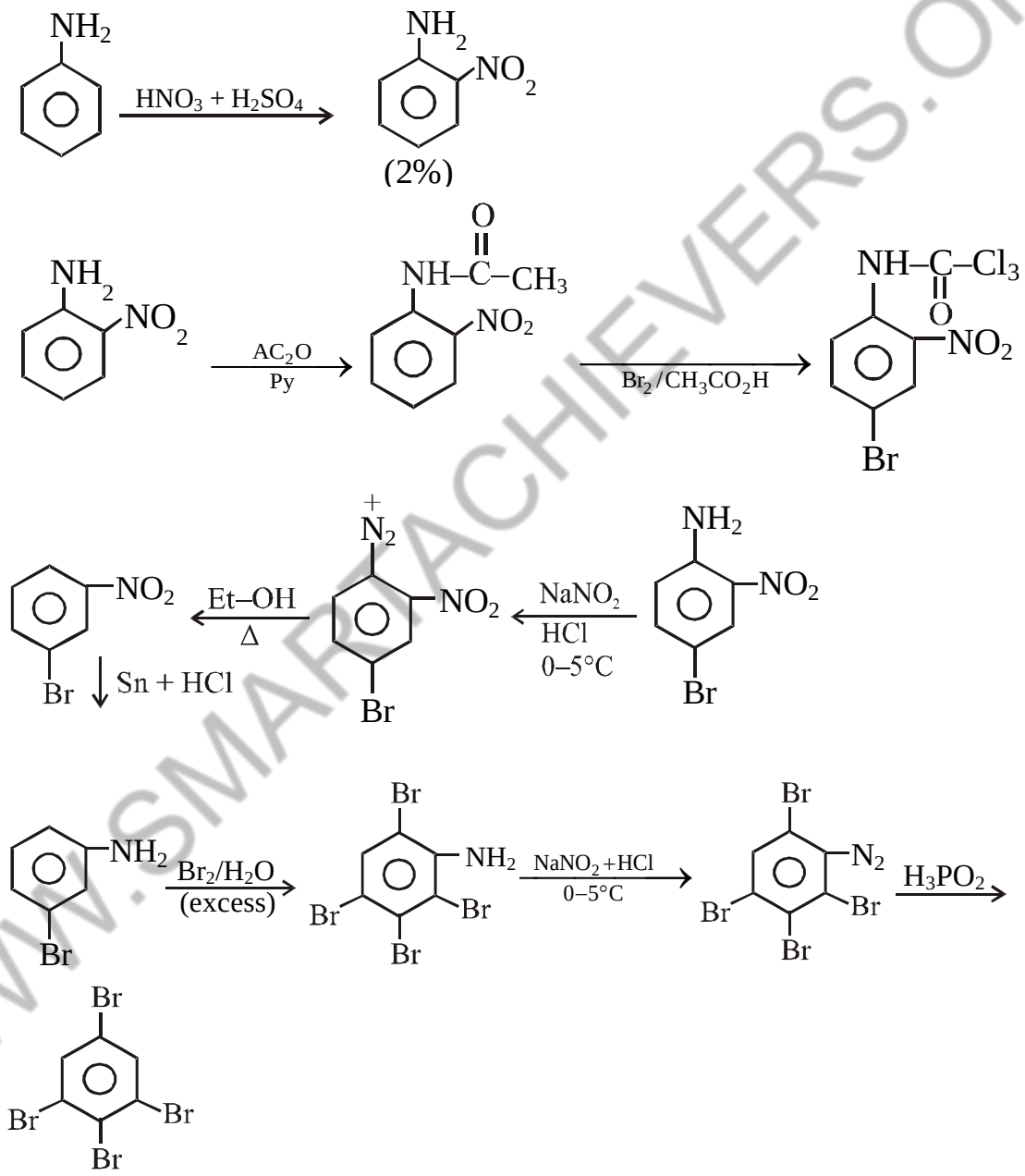


Scheme 3 :



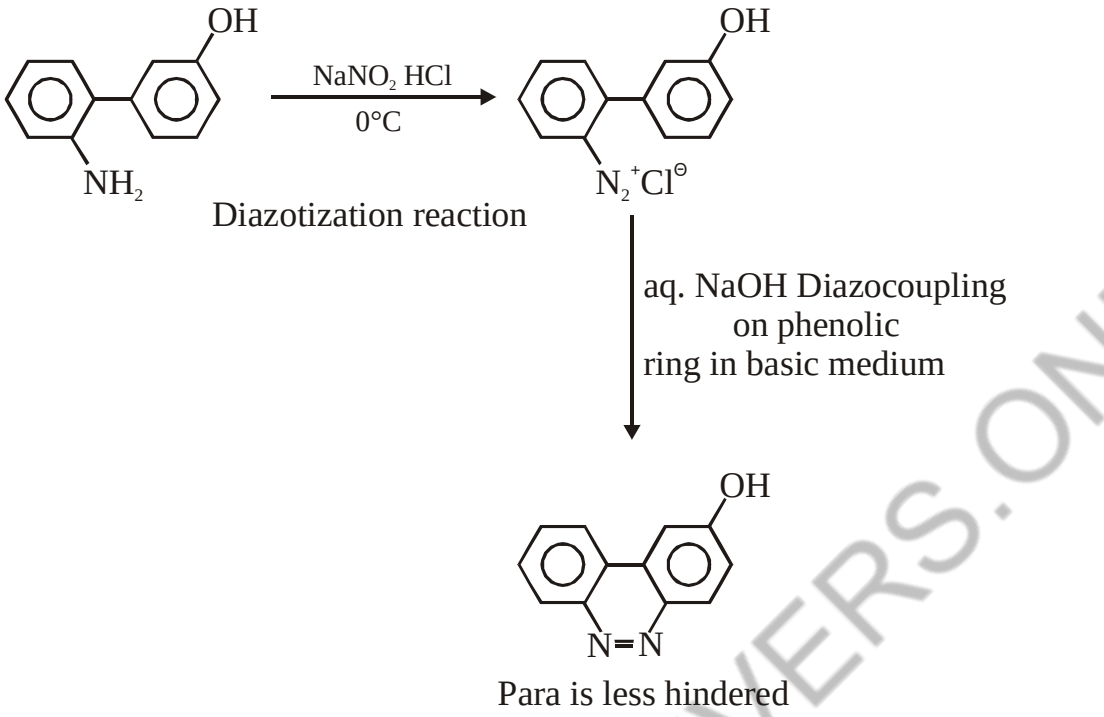
5. Ans. (D)

Sol.



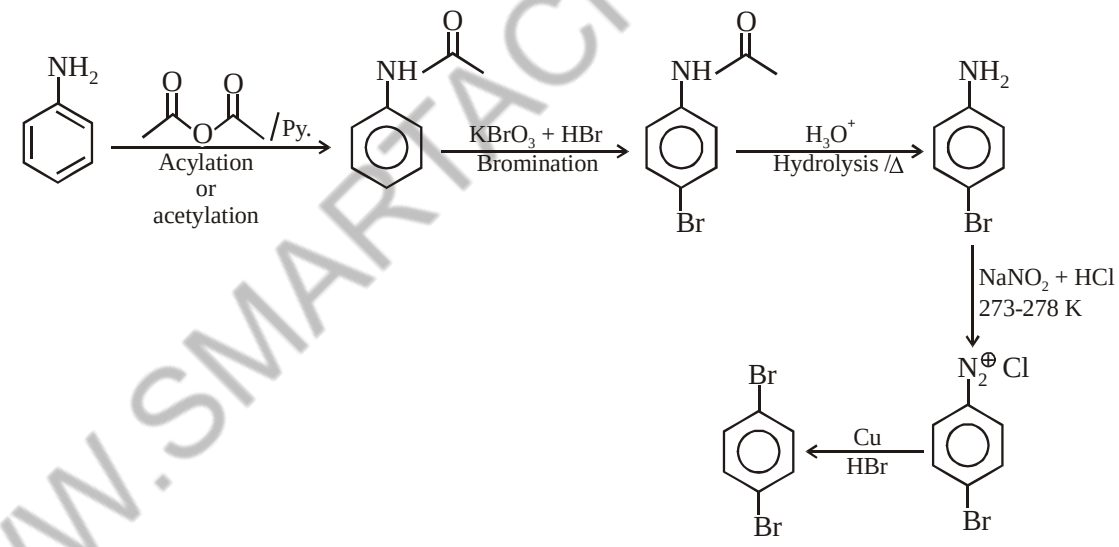
6. Ans. (C)

Sol.



7. Ans. (B)

Sol.

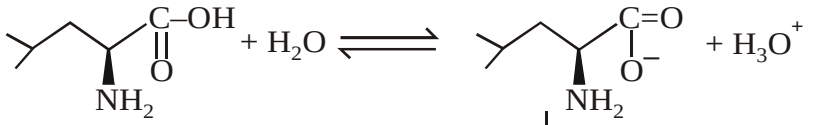


8. Ans. (C)

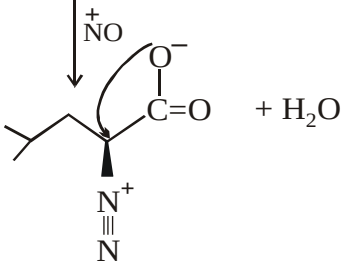
Sol. $NaNO_2 + HCl \rightarrow HNO_2 + NaCl$

$HNO_2 + HCl \rightleftharpoons H_2\overset{\oplus}{O}NO + Cl^-$

$H_2\overset{\oplus}{O}NO \rightarrow H_2O + NO^+$

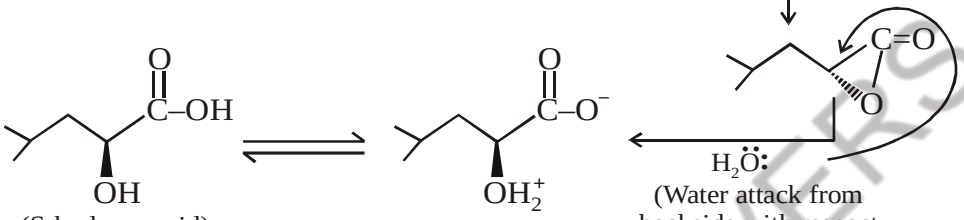


(S-Leucine)



Two times backside attack leads to retention of configuration

(Neighbouring group participation by carboxylate ion)



(S-hydroxy acid)

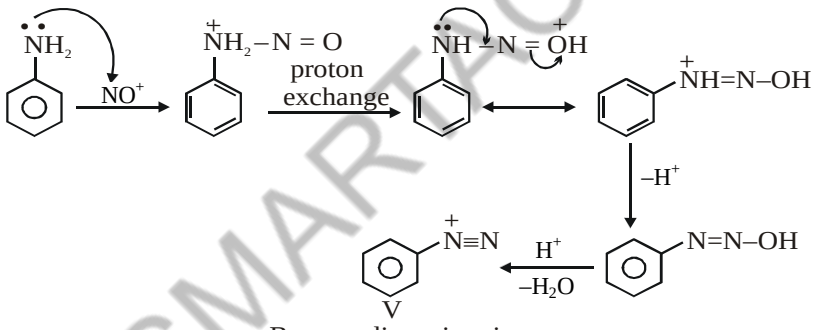
(Water attack from backside with respect two leaving group in cyclic ester)

9. Ans. (A)

Sol. $NaNO_2 + HCl \longrightarrow HNO_2 + NaCl$

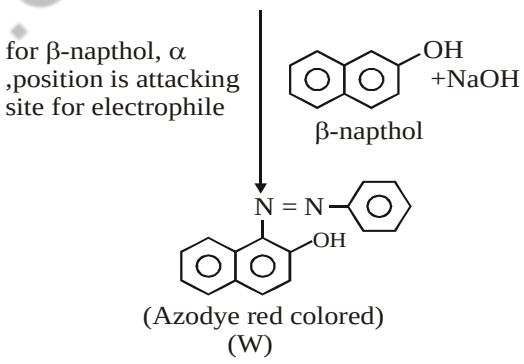
$HNO_2 + HCl \rightleftharpoons H_2NO_2^+ + Cl^-$

$H_2NO_2^+ \longrightarrow H_2O + N$



Benzenediazonium ion

The formation of V is example of diazotisation reaction.

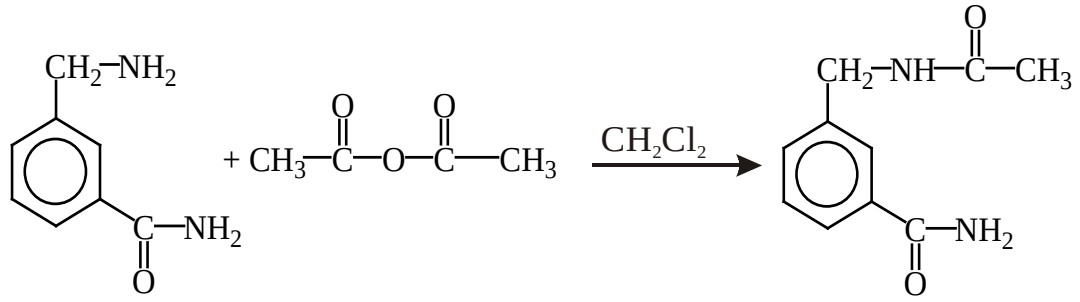


(Azodye red colored)
(W)

The formation of W from V is example of diazocoupling reaction.

10. Ans. (A)

Sol.



$-CH_2-NH_2$ is more nucleophilic then $-\overset{\overset{O}{\|}}{C}-NH_2$