Question 3.Identify the compound Y in the following reaction:

$$(a) \qquad (b) \qquad (c) \qquad (d) \qquad (d)$$

$$NH_2 \xrightarrow{NaNO_2 + HCl} \xrightarrow{273-278 \text{ K}} \qquad V + N_2$$

$$Cl \qquad (d) \qquad Cl \qquad (d) \qquad (d)$$

Solution: (a) When a primary aromatic amine, dissolved or suspended in cold aqueous mineral acid and treated with sodium nitrite, a diazonium salt is formed. When this freshly prepared diazonium salt is mixed with cuprous chloride, diazonium group is replaced by -Cl.

Then chlorobenzene is formed which is Y in this reaction.

$$\begin{array}{c|c}
NH_3 & Na NO_2 + HCI \\
\hline
273-278 K
\end{array}$$

$$\begin{array}{c|c}
N_2\overline{C}I \\
\hline
Cu_2CI_2 \\
\hline
(Sandmeyer reaction)
\end{array}$$

$$\begin{array}{c}
CI \\
+ N_2
\end{array}$$