Q3. A reaction between ammonia and boron trifluoride is given below:
$:NH_3 + BF_3 \rightarrow H_3N : BF_3$
Identify the acid and base in this reaction. Which theory explains it? What is the hybridization of B and N in the reactants?
Sol: Although BF_3 does not have a proton but acts as Lewis acid as it is an electron deficient compound. It reacts with NH_3 by accepting the lone pair of electrons from NH_3 and completes its octet. The reaction can be represented by
$BF_3 + :NH_3 \rightarrow BF_3 \leftarrow :NH_3$
Lewis electronic theory of acids and bases can explain it. Boron in BF_3 is sp^2 hybridised, whereas N in NH_3 is sp^3 hybridised.