Example 6.33 Remove the $\in$ production from the following grammar.

$$S \rightarrow aS/A$$
$$A \rightarrow aA/ \in$$

Solution: In the previous grammar, there is a null production $A \rightarrow \in$. But in the language set generated by the grammar, there is a null string which can be generated by the following way $S \rightarrow A \rightarrow \in$. As null string is in the language set, and so the null production cannot be removed from the grammar.

Example 6.34 Convert the following linear grammar into Regular Grammar.

$$S \rightarrow \text{baS/aA}$$
$$A \rightarrow \text{bbA/bb}$$

Solution: Consider two non-terminals B and C with production $B \rightarrow aS$ and $C \rightarrow bA$. The grammar becomes

$$S \rightarrow bB/aA$$
$$A \rightarrow bC/bb$$
$$B \rightarrow aS$$
$$C \rightarrow bA$$

Still the production $A \rightarrow bb$ is not a regular grammar. Replace b by a non-terminal D with production $D \rightarrow b$. The grammar becomes

$$S \rightarrow bB/aA$$
$$A \rightarrow bC/bD$$
$$B \rightarrow aS$$
$$C \rightarrow bA$$
$$D \rightarrow b$$

Now the grammar is regular. For a left linear grammar, there exists a right linear grammar and vice versa. Grammar in one form can be converted into another form. The following section describes the process of conversion.