Take $S_2 = \{1, 2, 3, 4\}$.

$\delta(S_2, a)$ = followpos(1)∪followpos(3) = $\{1, 2, 3, 4\} = S_2$
$\delta(S_2, b)$ = followpos(2)∪followpos(4) = $\{1, 2, 3, 5\}$ = New state. Mark it as S_3
$\delta(S_3, a)$ = followpos(1)∪followpos(3) = $\{1, 2, 3, 4\} = S_2$
$\delta(S_3, b)$ = followpos(2)∪followpos(5) = $\{1, 2, 3, 6\}$ = New state. Mark it as S_4
$\delta(S_4, a)$ = followpos(1)∪followpos(3) = $\{1, 2, 3, 4\} = S_2$
$\delta(S_4, b)$ = followpos(2) = $\{1, 2, 3\} = S_1$

All the states are traversed, and no new state appears. Therefore, it is the final DFA. The transitional diagram of the DFA is given is Fig. 5.15.

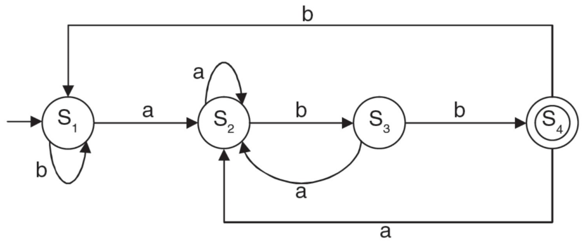

Fig. 5.15

5.6 NFA with e Move and Conversion to DFA by e-Closure Method

If any FA contains any $\varepsilon(null)$ move or transaction, then that FA is called an NFA with ε moves. An example is shown in Fig. 5.16.

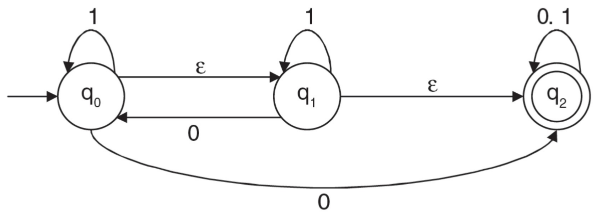

Fig. 5.16

The previous FAin Fig.5.16contains two null moves. So, the previous FAis an NFA with null move.
From the defi nition of an NFA, we know that for an NFA from a single state for a single input the machine can go to more than one state, $i.e., Q * \Sigma \to 2^Q$, where 2Q is the power set of Q.
From a state by getting ε input , the machine is confined into that state . An FA with null move must contain at least one ε move. For this type of FA for input ε, the machine can go to more than one state.(One is that same state and the another is the ε-transaction next state). So, an FA with ε move can be called as an NFA.
For the previous FA,

$$\delta(q_0, \varepsilon) \to q_0 \quad and \quad \delta(q_0, \varepsilon) \to q_1$$

$$\delta(q_1, \varepsilon) \to q_1 \quad and \quad \delta(q_1, \varepsilon) \to q_2$$