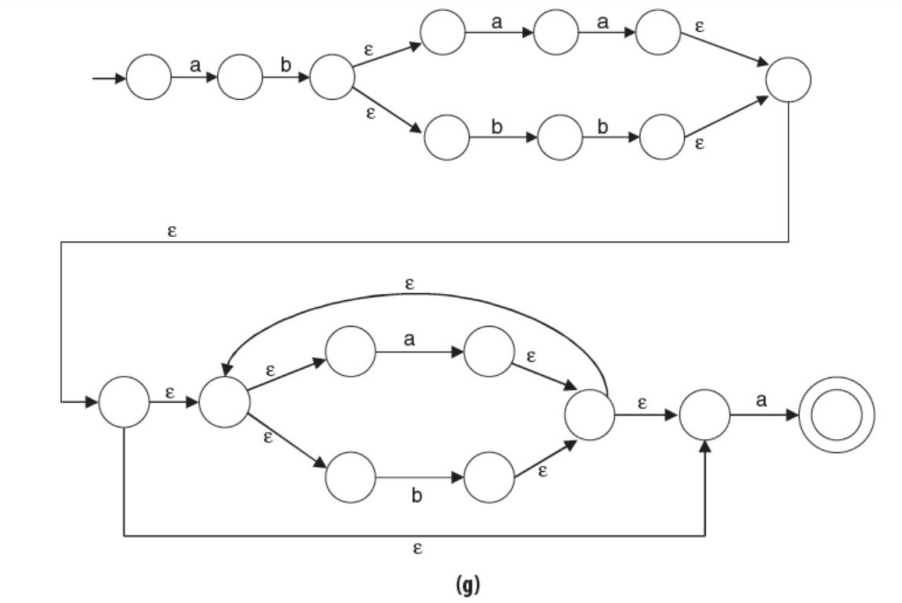
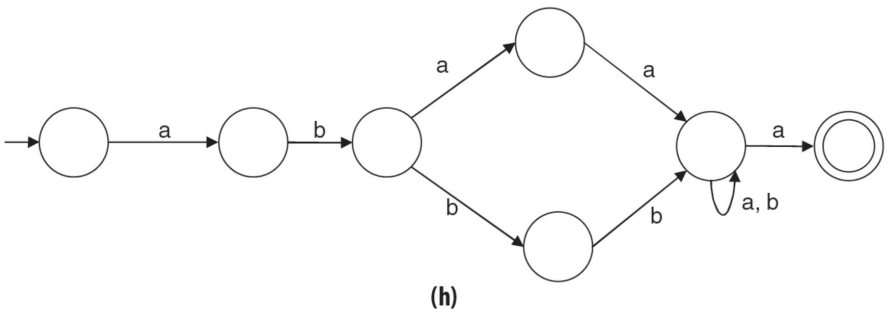
Step VII:The constructed transitional diagram for$ab(aa + bb)(a + b)^*a$ is given in Fig.5.13(g).



(g)

This can be simplifi ed to Fig. 5.13 (h) by removing ε transitions.



(h)

Figs. 5.13 (a − h) *Construction of FA from RE by Thomson Construction*

Kleene' s Theorem: If R is an RE, then there exists an NDFA, M_{NFA} with ε transition, which accepts the language generated by R.

5.5.2 Direct Conversion of RE to DFA

Using this method, a given RE is converted to a DFA without the construction of an NFA. Before describing the process, we need to know a few defi nitions such as 'fi rstpos', 'followpos', 'nullable', and the construction processes of those.

fi rstpos: It is the abbreviation of first position. It is defined as the set of the positions of the first symbols of strings generated by the sub-expression rooted by n.

followpos: It is the abbreviation of follow position. It is defined as the set of the positions of the last symbols of strings generated by the sub-expression rooted by n.