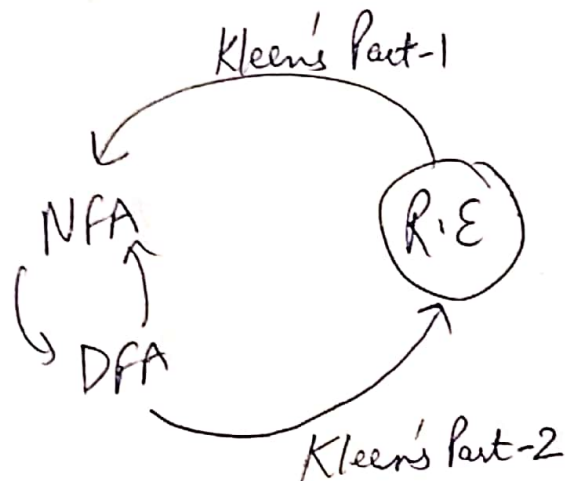



* Kleen's Theorem :-

Part 1:- for any R.E 'x' that represents language $L(x)$ there is a finite automata that accepts same language.

Proof:- $R.E \Rightarrow a^*$ $L = \{a^*\}$

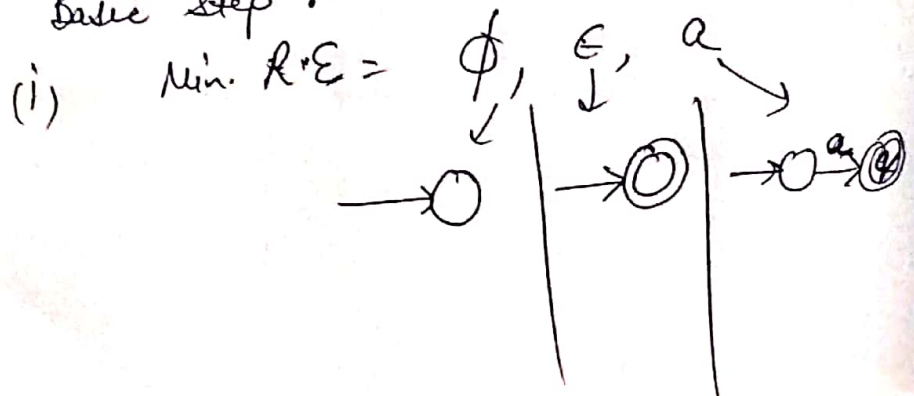
Sir



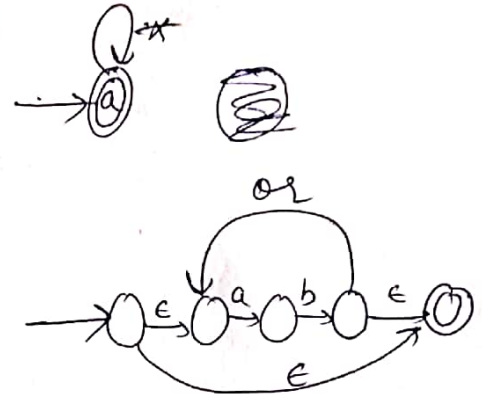
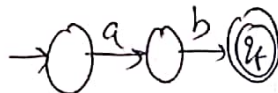
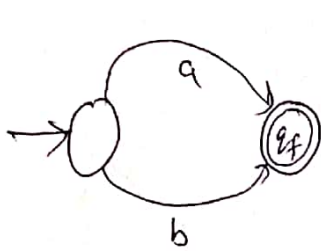
→ for any R.E we show how to construct an equivalent NFA.

→ Use Induction method:-

Basic step :-



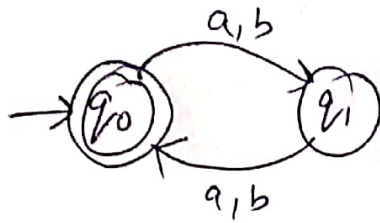
(ii) Union, $a+b$ Concatenation, ab *, a^* or $(ab)^*$



Proved

Part 2:- For any FA 'M' that accepts language $L(M)$, there is a regular expression that represents the same language.

Proof:- Ex: DFA accepts even no. of string over $\Sigma (a,b)$.
i.e. $L = \text{even no. of strings over } \{a,b\}$



$$\Rightarrow (a+b)(a+b)^*$$

\Uparrow
Equivalent R.E.

Hence Proved.