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Ans No 1

DFA consists of 5 tuples $\{Q, \Sigma, q, F, \delta\}$

Q : finite set of states

Σ : set of Input symbols.

q : Initial state

F : set of final States.

δ : Transition function.

DFA stands for Deterministic finite Automata.

NFA stands for Nondeterministic finite Automata.

ϵ - NFA : The NFA with epsilon - transition is a finite state machine in which the transition form one state to another state is allowed without empty symbol. empty string ϵ

Ans NO 4

(b)

Convert DFA to equivalent NFA:

Suppose we have DFA "P", we want to construct NFA "O"

$L(P) = L(O)$.

Now, set $Q = \{q_0, q_1, \cdots q_n\}$

1) Start with the DFA "P"

2) Add an additional accepting state for the NFA "O", such that "O" will have $n+1$, total number state.

Now calling new accepting state q_{n+1}

(3) add an epsilon ϵ transition from all accepting states to the new accepting state q_{n+1} and make all the original accepting states just normal states.

Now, we have NFA "O"

$L(\text{"O"}) = L(\text{"P"})$

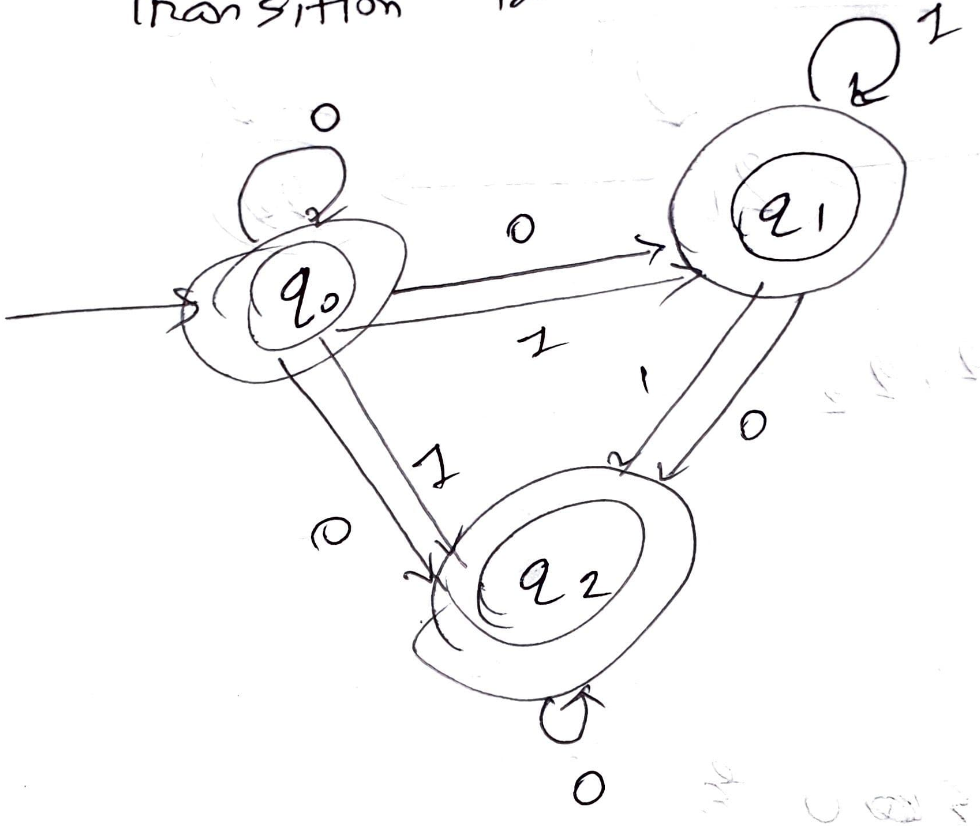
— φ —

4(c)

Yes, It is possible for a DFA to have ~~more~~ more than one final state.

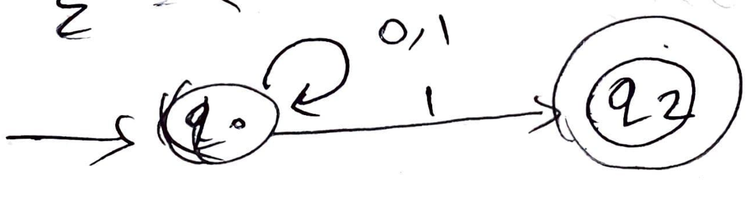
Ans NO 4 (a)

Transition table of NFA

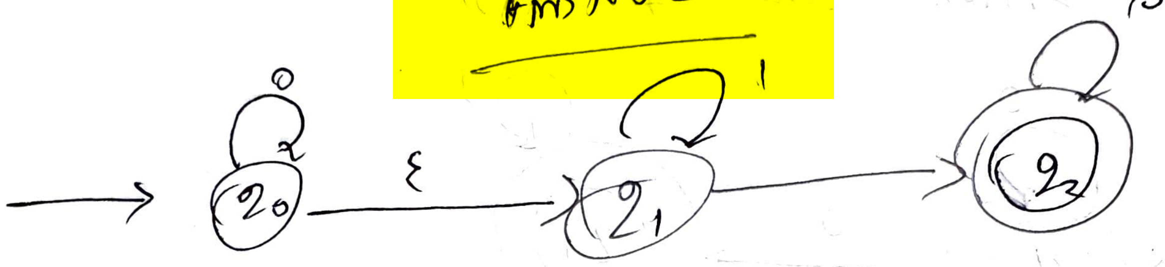


NFA to DFA

$\Sigma = \{0, 1\}$



Ans NO 2



$Q = q_0, q, q_2$

$\Sigma = 0, 1$

$q_0 = q_0$

$F = q_1$

$\delta = Q \times \Sigma \cup \varepsilon$

$\Sigma \cup \varepsilon = 0, 1, \cup \varepsilon$

$= \{\varepsilon, 0, 1\}$

$Q \times \Sigma \cup \varepsilon$

$q_0, \varepsilon \rightarrow q, q_1$

$q_0, 0 \rightarrow q_1$

$q_0, 1 \rightarrow \emptyset$

$q_1, \epsilon \rightarrow q_1$

$q_1, 0 \rightarrow q_2$

$q_1, 1 \rightarrow q_1$

$q_2, \epsilon \rightarrow q_2$

$q_2, 0 \rightarrow q_2$

$q_2, 01 \rightarrow q_0$

ϵ^* of $q_0 \rightarrow q_0, q_1$

ϵ^* of $q_1 \rightarrow q_1$

ϵ^* of $q_2 \rightarrow q_2$