Noida Institute of Engineering & Technology, Greater Noida

Department of Computer Science & Engineering

Assignment 2

Subject Name : Theory of Automata & Formal Languages

Subject Code : ACSE0404 **Unit - 1**

Q.1 Obtain an NFA for a language consisting of all strings over {0,1} containing a 1 in the third position from the end.

Q.2 Obtain an NFA which should accept a language L_A, given by

L_A = {x ε {a, b}* : |x| >=3 and and third symbol of x from the right is {'a'}.

Q.3 Design an NFA with no more than five states for the set {abab^n: n>=0 }U {aba^n : n>=0} .

Q.4 Given the NDA as shown in Fig. (a)

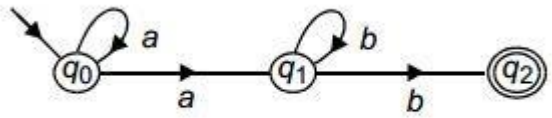
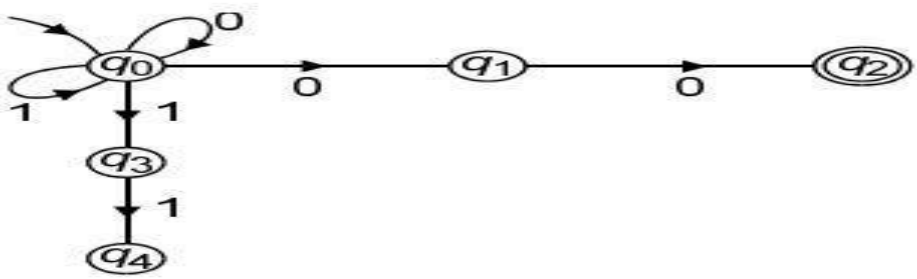


Fig. (a)

Determine the equivalent DFA for the above given NDA.

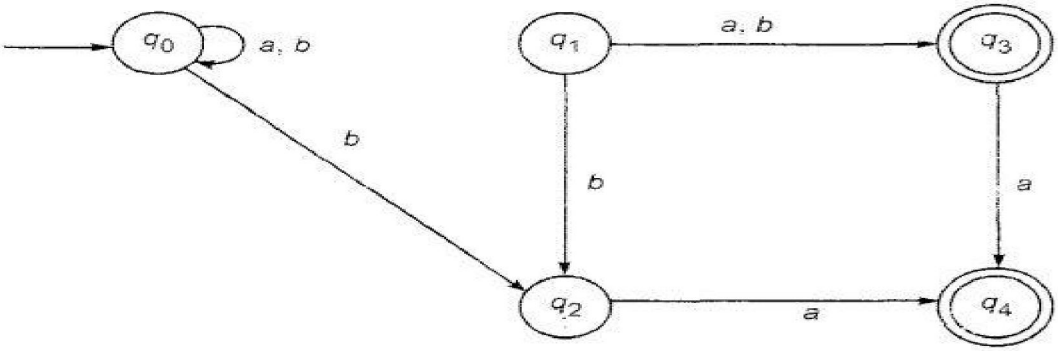
Q.5 Given the NDA as shown in fig. below, determine the equivalent DFA



Q.6 Construct a DFA equivalent to an NDFA whose transition table is defined by Table

State	a	b
q_0	q_1, q_3	q_2, q_3
q_1	q_1	q_3
q_2	q_3	q_2
(q_3)	—	—

Q.7 Construct a DFA equivalent to the NDFA M whose transition diagram is given by Fig



Q.8 The transition table of a nondeterministic finite automaton M is defined by Table. Construct a deterministic finite automaton equivalent to M.

State	0	1	2
$\rightarrow q_0$	q_1q_4	q_4	q_2q_3
q_1		q_4	
q_2			q_2q_3
(q_3)		q_4	
q_4			

Q.9 M=({q1, q2, q3}, {0, 1}, δ, ql , {q3}) is a nondeterministic finite automaton. Where δ is given by

$$\delta(q_1, 0) = \{q_2, q_3\}, \qquad \delta(q_1, 1) = \{q_1\}$$
$$\delta(q_2, 0) = \{q_1, q_2\}, \qquad \delta(q_2, 1) = \emptyset$$
$$\delta(q_3, 0) = \{q_2\}, \qquad \delta(q_3, 1) = \{q_1, q_2\}$$

Construct an equivalent DFA.