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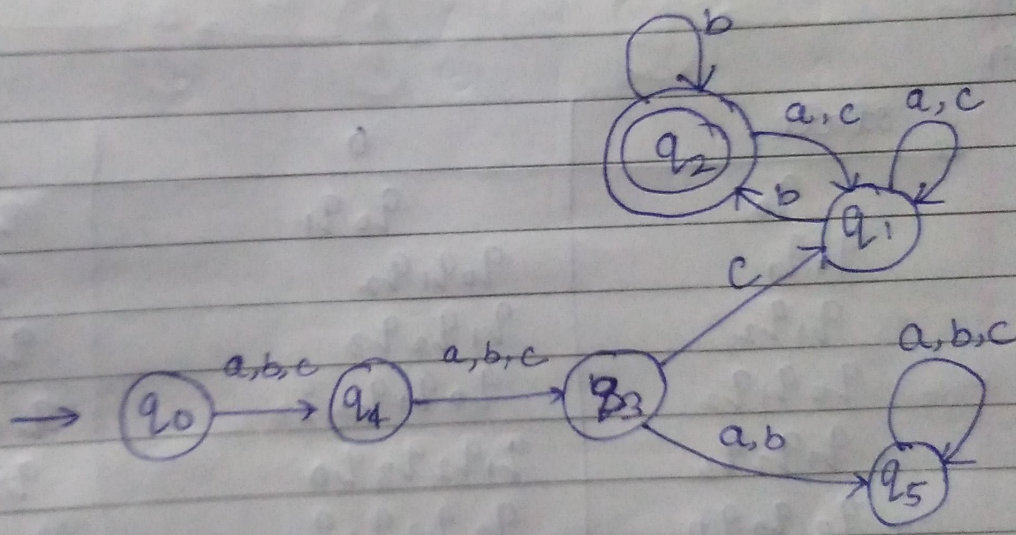
set 3

CSE 322

Ques 1:- Design DFA for the strings, in which the third character of the strings should be 'c' and also last character of the strig should be 'b' over the $\Sigma = \{a, b, c\}$.

Solution



Ques 2:- Convert the following NFA to DFA.

P.S	N.S	
	0	1
→ q_0	q_0, q_1	$q_1 q_2$
q_1	$q_1 q_2$	$q_2 q_3$
q_2	$q_2 q_2$	$q_3 q_0$
(q_3)	$q_0 q_1$	$q_0 q_1$

Solution

state	0	1
q_0	$q_0 q_1$	$q_1 q_2$
$q_0 q_1$	$q_0 q_1 q_2$	$q_1 q_2 q_3$
$q_1 q_2$	$q_1 q_2 q_3$	$q_2 q_3 q_0$
$q_0 q_1 q_2$	$q_0 q_1 q_2 q_3$	$q_1 q_2 q_3 q_0$
$q_1 q_2 q_3$	$q_1 q_2 q_3 q_0$	$q_2 q_3 q_0 q_1$
$q_2 q_3 q_0$	$q_2 q_3 q_0 q_1$	$q_3 q_0 q_1 q_2$
$q_0 q_1 q_2 q_3$	$q_0 q_1 q_2 q_3$	$q_1 q_2 q_3 q_0$
q_1	$q_1 q_2$	$q_2 q_3$
$q_2 q_3$	$q_2 q_3 q_0 q_1$	$q_3 q_0 q_1$
$q_0 q_1 q_3$	$q_2 q_3 q_0 q_1$	$q_2 q_3 q_0 q_1$
q_2	$q_2 q_3$	$q_3 q_0$
$q_3 q_0$	$q_0 q_1$	$q_0 q_1 q_2$
q_3	$q_0 q_1$	$q_0 q_1$

Ques3:- Minimize the following DFA

P.S	a	b
→ q_0	q_1	q_2
q_1	q_2	q_3
q_2	q_1	q_2
q_3	q_1	q_2
(*q_4)	q_4	q_1

Solution:-

S_1 S_2

$\{q_4\}$ $\{q_0 q_1 q_2 q_3\}$

Two step

$q_0 \xrightarrow{a} S_2$, $q_0 \xrightarrow{b} S_2$

$q_1 \xrightarrow{a} S_2$, $q_1 \xrightarrow{b} S_2$

$q_2 \xrightarrow{a} S_2$, $q_2 \xrightarrow{b} S_2$

$q_3 \xrightarrow{a} S_2$, $q_3 \xrightarrow{b} S_2$

$q_4 \xrightarrow{a} S_1$, $q_4 \xrightarrow{b} S_2$

$\Rightarrow$ $\{q_4\}$ $\{q_0 q_1 q_2 q_3\}$

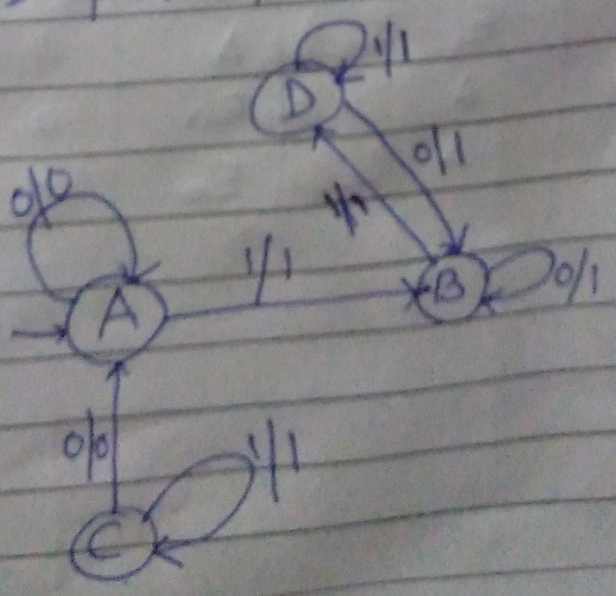
Ques 4:- Convert the following moore machine to mealy machine.

Present state	Next state a	Next state b	output
→ A	A	B	0
B	B	D	1
C	A	C	1
D	B	D	1

Solution:-

Mealy Table

state	a	b
A	A, 0	B, 1
B	B, 1	D, 1
C	A, 0	C, 1
D	B, 1	D, 1



Ques:- Convert the following machine to moore machine.

Present state	input = a		input = b	
	N.S	output	N.S	output
→ A	B	0	A	1
B	C	0	D	1
C	D	1	B	0
D	E	1	A	1
E	A	1	E	0

Solution

state	a	b	output
A	B	A	1
B	C	D	0
C	D	B	0
D	E_1	A	1
E_0	A	E_0	0
E_1	A	E_0	1

- Design NFA for the binary strings, which accepts the strings in which third character of the string should be '1', over the $\Sigma = \{0, 1\}$.

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