

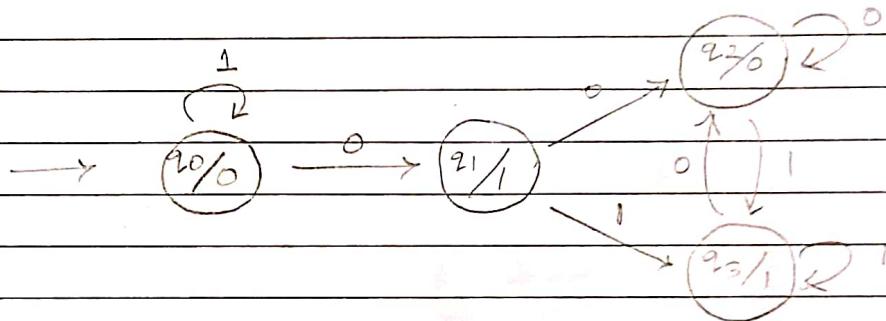
Q.1) Design Moore Machine :

a) $Q = \{ q_0, q_1, q_2, q_3 \}$

$$q_0 = \{ q_0 \}$$

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

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



ST Table:

		0	1		
		Q	QP	Q	QP
Q	QP	q0	q1	q0	0
q0	q1	1	0	q0	0
q1	q2	0	1	q3	1
q2	q2	0	1	q3	1
q3	q2	0	1	q3	1

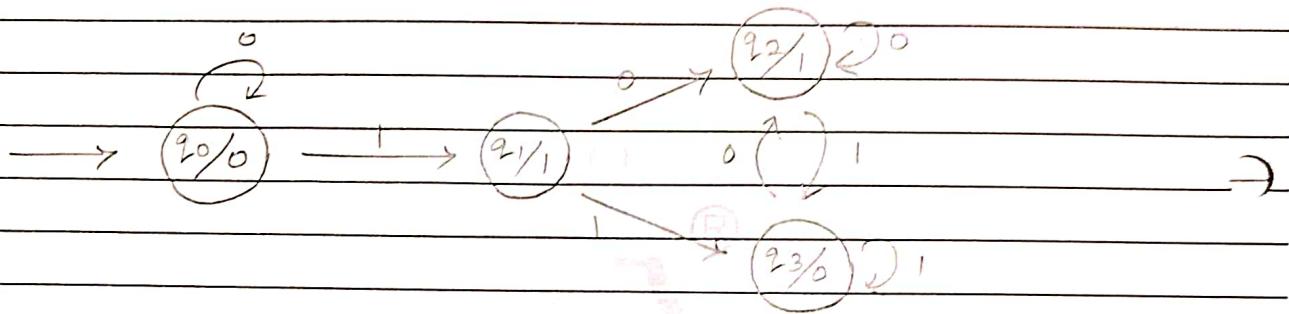
Q. 1.6)

$$Q = \{q_0, q_1, q_2, q_3\}$$

$$q_0 = \{q_0\}$$

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

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



ST Table :

	0	1		
Q	O/P	Q	O/P	
q0	q0	0	q1	1
q1	q2	1	q3	0
q2	q2	1	q3	0
q3	q2	1	q3	0

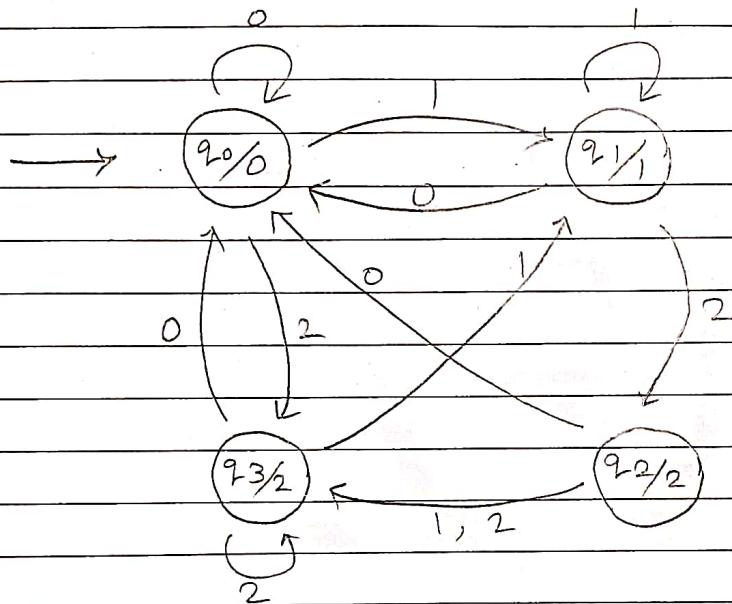
(Q1.c)

$$Q = \{q_0, q_1, q_2, q_3\}$$

$$q_0 = \{q_0\}$$

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

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



ST Table :

	0	1	2
Q	O/P	O/P	O/P
q0	q0	0	q1
q1	q0	0	q1
q2	q0	0	q3
q3	q0	0	q1

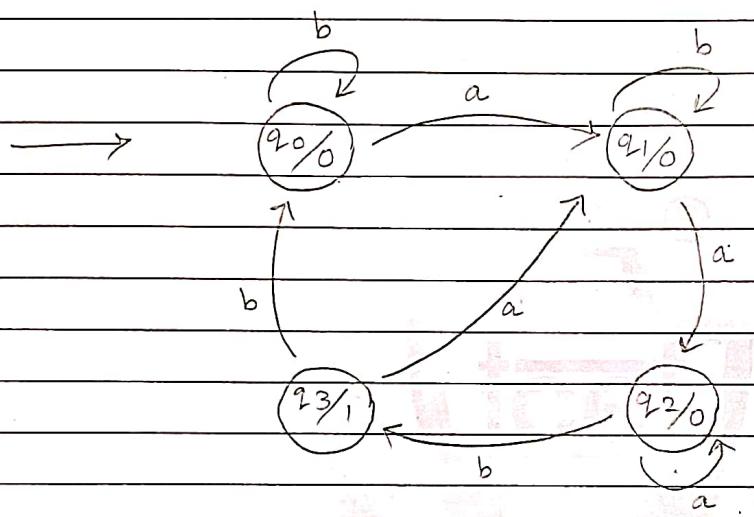
a.1.c)

$$Q = \{q_0, q_1, q_2, q_3\}$$

$$q_0 = \{q_0\}$$

$$\Sigma = \{a, b\}$$

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



ST Table:

		a	b			
		Q	O/P	Q	O/P	
q0	q1	0	q0	0)
q1	q2	0	q1	0)
q2	q2	0	q3	1)
q3	q1	0	q0	0)

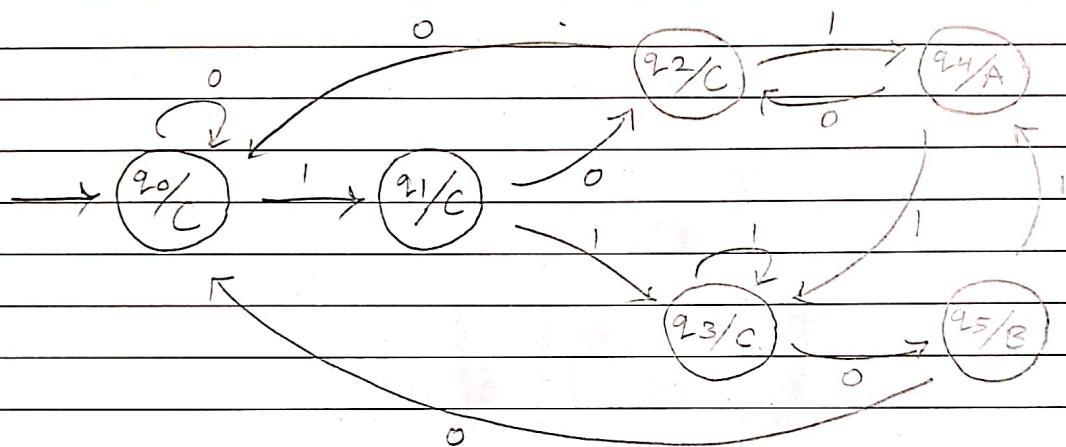
1.e)

$$Q = \{q_0, q_1, q_2, q_3, q_4, q_5\}$$

$$q_0 = \{q_0\}$$

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

$$\Delta = \{A, B, C\}$$



ST Table:

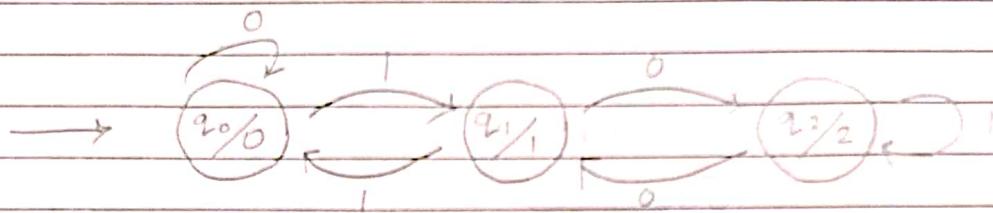
	S0		S1		
	Q	O/P	Q	O/P	O/P
q0	q0	C	q1	C	
q1	q2	C	q3	C	
q2	q0	C	q4	A	
q3	q5	B	q3	C	
q4	q2	C	q3	C	
q5	q0	C	q4	B	

$$1.f) Q = \{q_0, q_1, q_2\}$$

$$q_0 = \{q_0\}$$

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

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



ST Table:

	0	1		
Q	Q/P	Q	Q/P	
q0	q0	0	q1	1
q1	q2	2	q0	0
q2	q1	1	q2	2

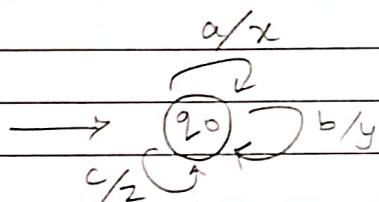
a-2) Design Mealy Machine :

a) $Q = \{q_0\}$

$q_0 = \{q_0\}$

$\Sigma = \{a, b, c\}$

$\Delta = \{x, y, z\}$



ST Table:

	a	b	c
a	0 O/P	0 O/P	0 O/P
b	q_0	q_0	q_0
c	x	y	z

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2.b)

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2.c) Let vowels $\equiv V = \{a, e, i, o, u\}$

consonants $\equiv C = \{b, c, d, \dots, z\}$

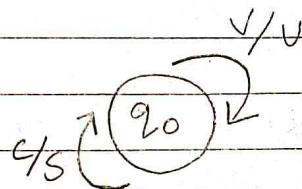
V : uppercase S: same (ie. as it is)

$$\Omega = \{q_0, \dots\}$$

$$q_0 = \{q_0\}$$

$$\Sigma = \{V, C\}$$

$$\Delta = \{V, S\}$$



ST Table:

	V		C		
	Q	O/P	Q	O/P	
q0	q0	U	q0	S	

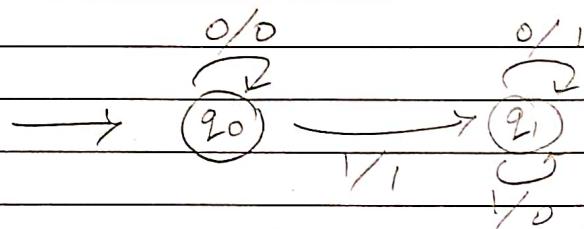
2.d)

$$\mathcal{Q} = \{ q_0, q_1 \}$$

$$q_0 = \{ q_0 \}$$

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

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



ST Table:

		0	1
		Q	O/P
Q	q0	0	q1
	q1	1	0

Q.3)

Convert Moore into Mealy:

3(a)

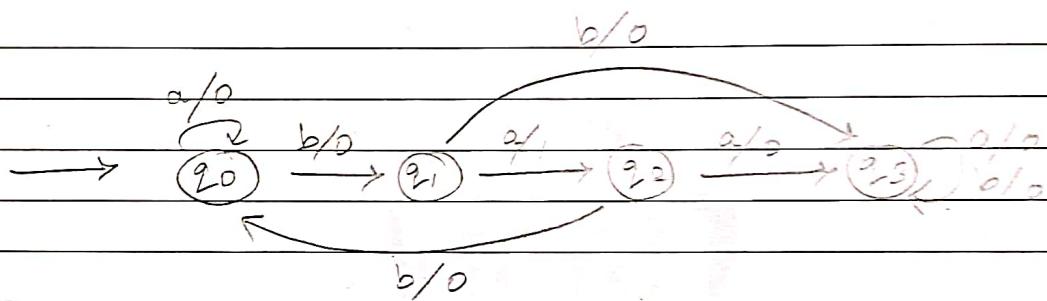
$$Q = \{ q_0, q_1, q_2, q_3 \}$$

$$q_0 = \{ q_0 \}$$

$$\Sigma = \{ a, b \}$$

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

D)



ST Table:

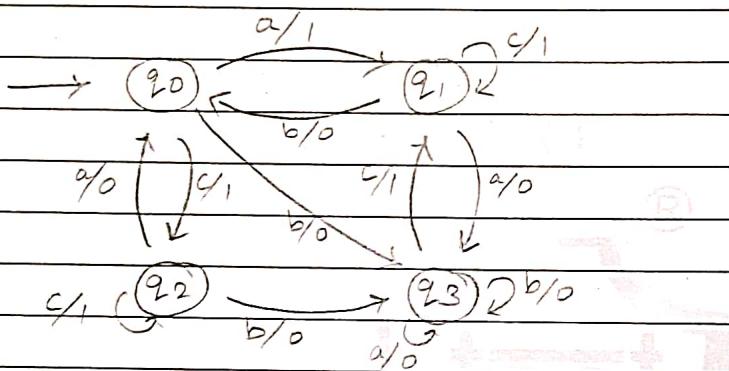
	a	b		
	Q	O/P	Q	O/P
q0	q0	0	q1	0
q1	q2	1	q3	0
q2	q3	0	q0	0
q3	q3	0	q3	0

$$3.b) Q = \{ q_0, q_1, q_2, q_3 \}$$

$$q_0 = \{ q_0 \}$$

$$\Sigma = \{ a, b, c \}$$

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



ST Table:

	A		B		C	
	Q	O/P	Q	O/P	Q	O/P
q0	q1	1	q3	0	q2	1
q1	q3	0	q0	0	q1	0
q2	q0	0	q3	0	q2	1
q3	q3	0	q3	0	q1	1

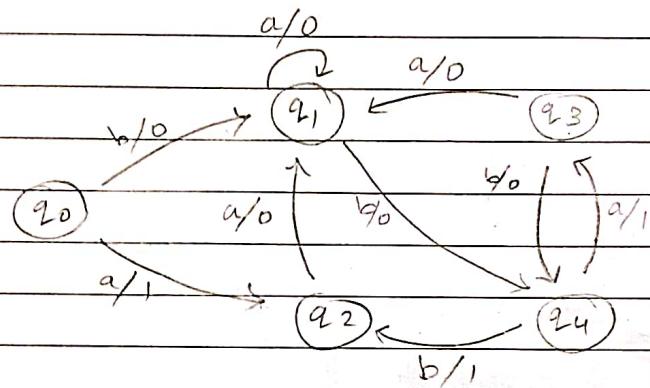
3.4)

$$Q = \{ q_0, q_1, q_2, q_3, q_4 \}$$

$$q_0 = \{ q_0 \}$$

$$\Sigma = \{ a, b \}$$

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



ST Table:

	a	b		
	Q	O/P	Q	O/P
q0	q2	1	q1	0
q1	q1	0	q4	0
q2	q1	0	q2	1
q3	q1	0	q4	0
q4	q3	1	q2	1

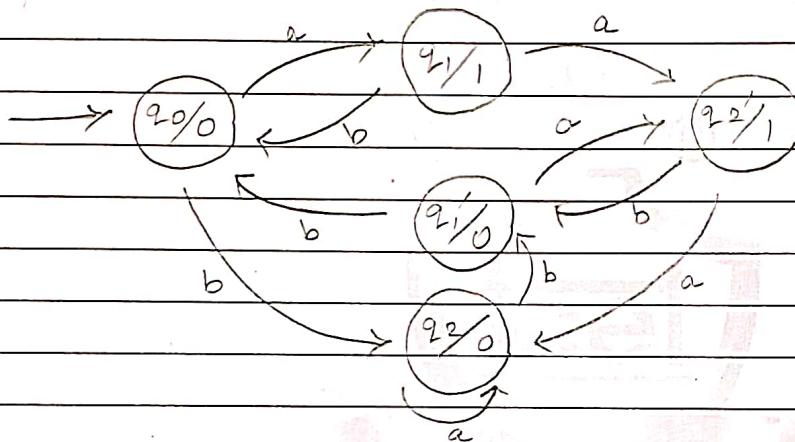
a.4) Convert Mealy to Moore :

$$4.a) Q = \{ q_0, q_1, q'_1, q_2, q'_2 \}$$

$$q_0 = \{ q_0 \}$$

$$\Sigma = \{ a, b \}$$

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



ST Table :

	a		b		
	Q	O/P	Q	O/P	
q0	q1	1	q2	0	
q1	q2	1	q0	0	
q1'	q2	1	q0	0	
q2	q2	0	q1'	0	
q2'	q2	0	q1'	0	

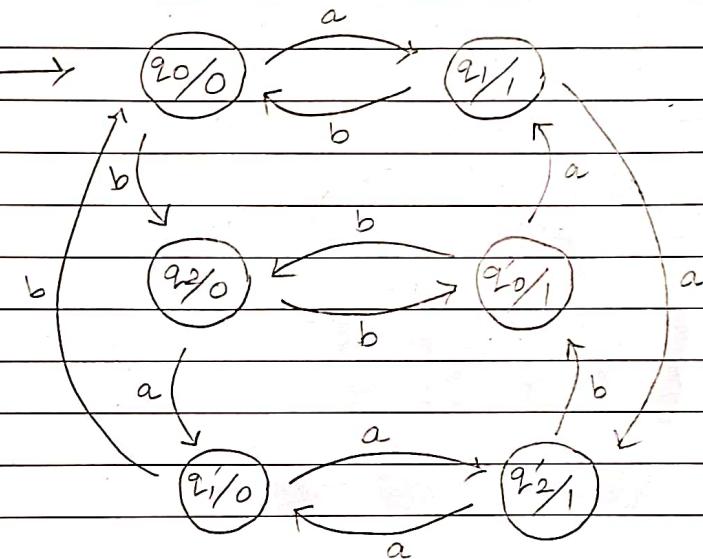
4.b)

$$Q = \{ q_0, q'_0, q_1, q'_1, q_2, q'_2 \}$$

$$q_0 = \{ q_0 \}$$

$$\Sigma = \{ a, b \}$$

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



ST Table :

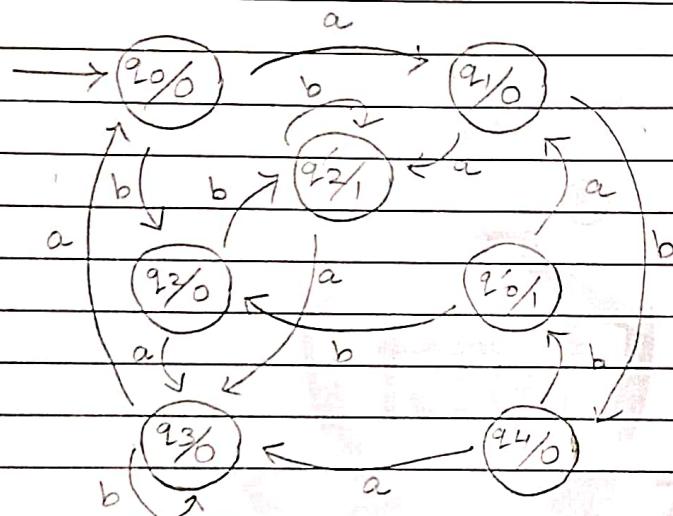
	a	b		
	Q	O/P	Q	O/P
q ₀	q ₁	1	q ₂	0
q' ₀	q ₁	1	q ₂	0
q ₁	q' ₂	1	q ₀	0
q' ₁	q ₂	1	q ₀	0
q ₂	q ₁ '	0	q ₀ '	1
q ₂ '	q ₁	0	q ₀ '	1

$$4.c) Q = \{ q_0, q'_0, q_1, q_2, q'_2, q_3, q_4 \}$$

$$q_0 = \{ q_0 \}$$

$$\Sigma = \{ a, b \}$$

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



ST Table:

	a	b		
	Q	Q/P	Q	Q/P
q0	q1	0	q2	0
q'0	q1	0	q2	0
q1	q'2	1	q4	0
q2	q3	0	q'2	1
q'2	q3	0	q'2	1
q3	q0	0	q3	0
q4	q3	0	q'0	1