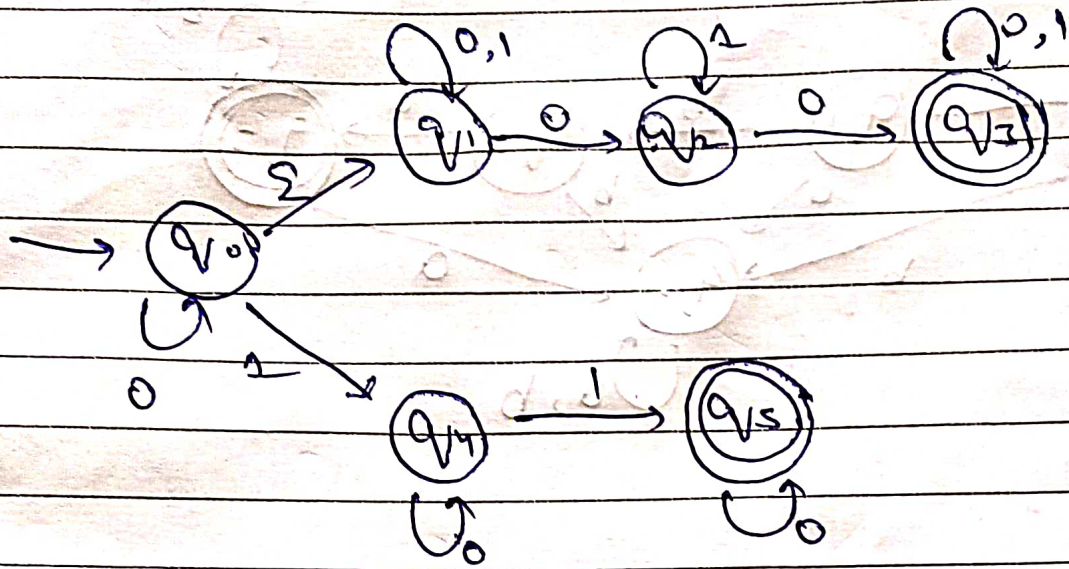


Q.1.
(a)



NFA

q_0
 q_1
 q_2
 q_3
 q_4
 q_5

0

q_0
 q_1, q_2
 q_2
 q_3
 q_4
 q_5

1

q_4
 q_1
 q_2
 q_3
 q_5
-

Σ

q_1
-
-
-
-
-

DFA

0

1

0

q_0, q_1

q_0, q_1, q_2

q_1, q_4

1

q_0, q_1, q_2

q_0, q_1, q_2, q_3

q_1, q_2, q_4

2

q_1, q_4

q_1, q_2, q_4

q_1, q_5

3 *

q_0, q_1, q_2, q_3

q_0, q_1, q_2, q_3

q_1, q_2, q_3, q_4

4

q_1, q_2, q_4

q_1, q_2, q_3, q_4

q_1, q_2, q_5

5 *

q_1, q_5

q_1, q_2, q_5

q_1

6 *

q_1, q_2, q_3, q_4

q_1, q_2, q_3, q_4

q_1, q_2, q_3, q_5

7 *

q_1, q_2, q_5

q_1, q_2, q_3, q_5

q_1, q_2

8

q_1

q_1, q_2

q_1

9 *

q_1, q_2, q_3, q_5

q_1, q_2, q_3, q_5

q_1, q_2, q_3

10

q_1, q_2

q_0, q_1, q_2, q_3

q_1, q_2

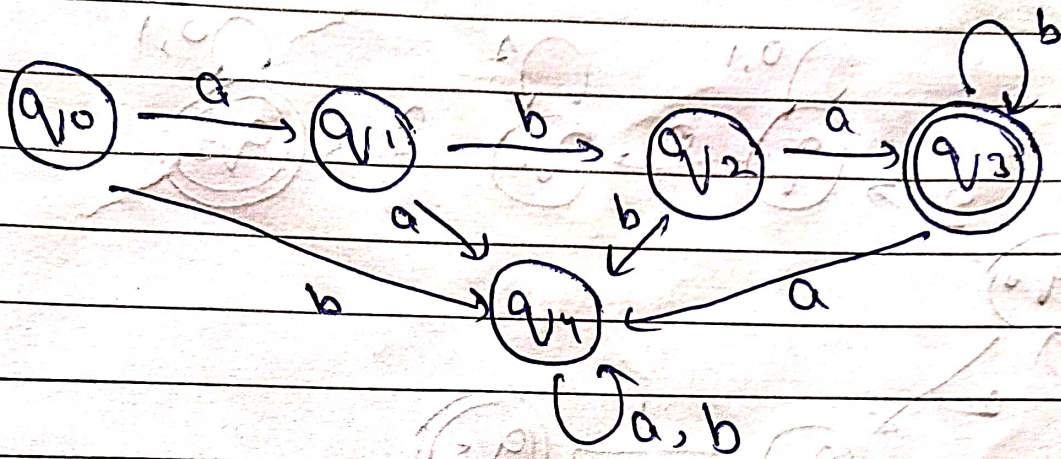
11 *

q_1, q_2, q_3

q_1, q_2, q_3

q_1, q_2, q_3

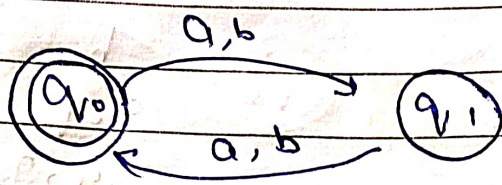
(b)



DFA

	a	b
q_0	q_1	q_4
q_1	q_4	q_2
q_2	q_4	q_4
* q_3	q_4	q_2
q_4	q_4	q_4

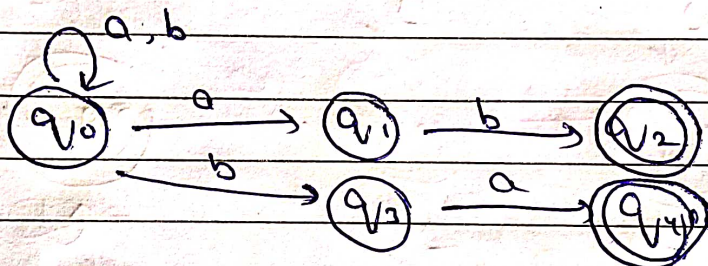
Q.2.
(b)



	a	b
q/0	1	1
q/1	0	0

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

(a) $(a+b)^*(ab+ba)$



NFA

	a	b
q/0	q0, q1	q0, q3
q/1	-	q2
q/2	-	-
q/3	q4	-
q/4	-	-

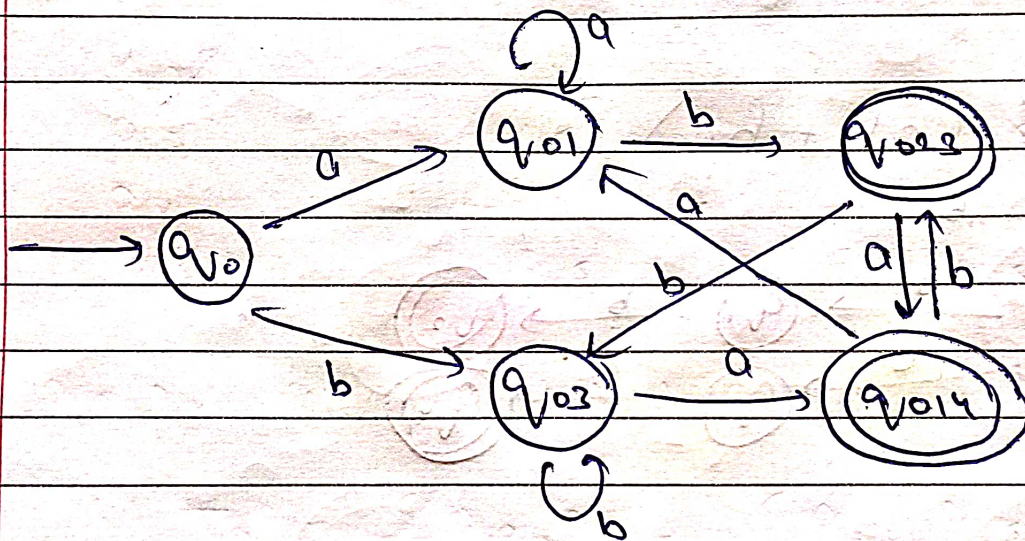
~~Q1~~
(Q)

DFA

0 $\rightarrow q_0$
1 $q_0 q_1$
2 $q_0 q_2$
3 * $q_0 q_2 q_3$
4 * $q_0 q_1 q_4$

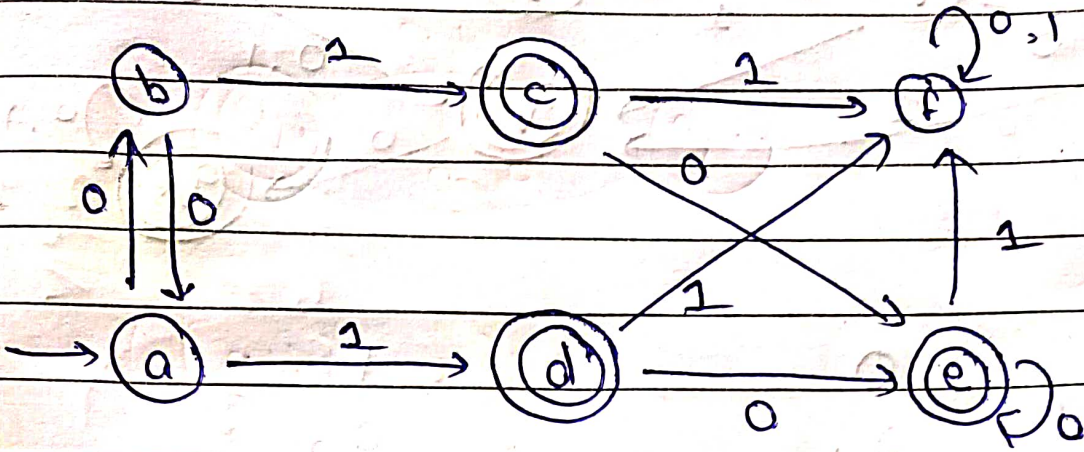
a
 $q_0 q_1$
 $q_0 q_1$
 $q_0 q_1 q_4$
 $q_0 q_1 q_4$
 $q_0 q_1$

b
 $q_0 q_2$
 $q_0 q_2 q_3$
 $q_0 q_2$
 $q_0 q_2$
 $q_0 q_2 q_3$



Q.3.

(a)

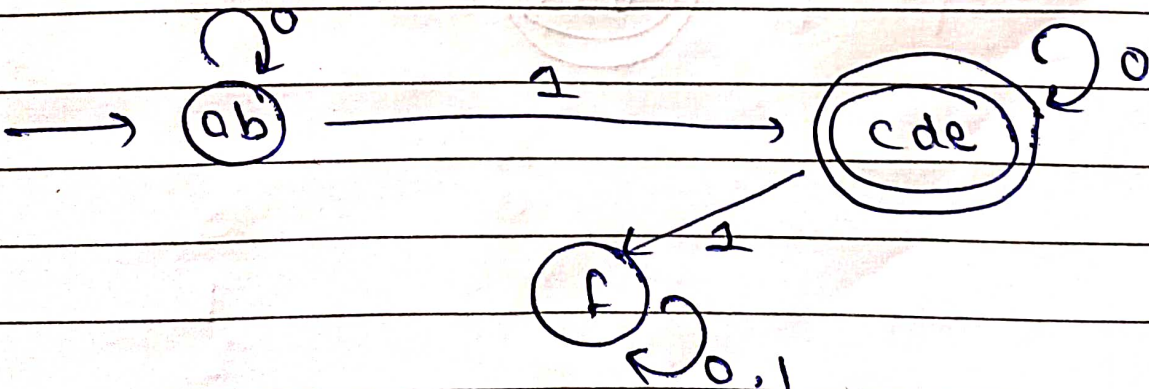


	0	1
a	b	d
b	a	c
c	e	f
d	e	f
e	c	f
f	f	f

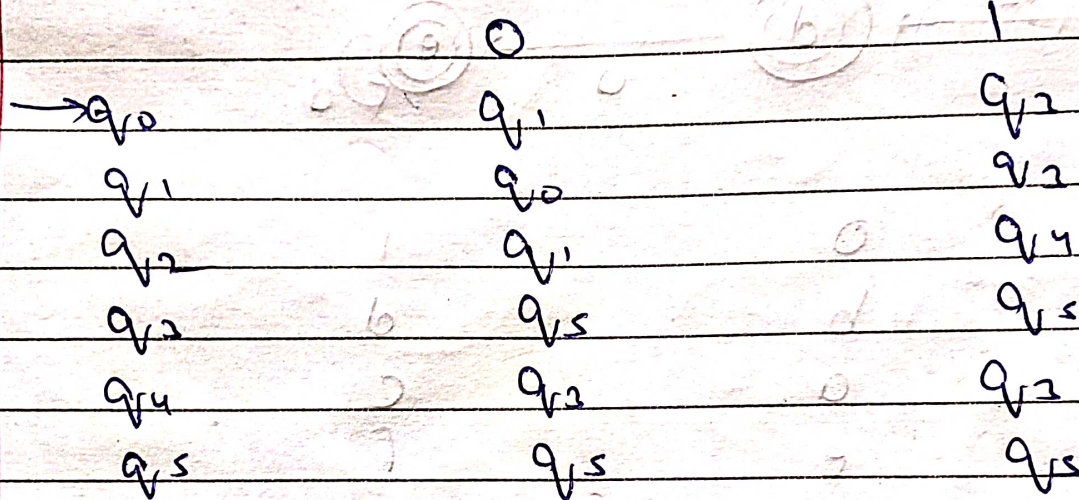
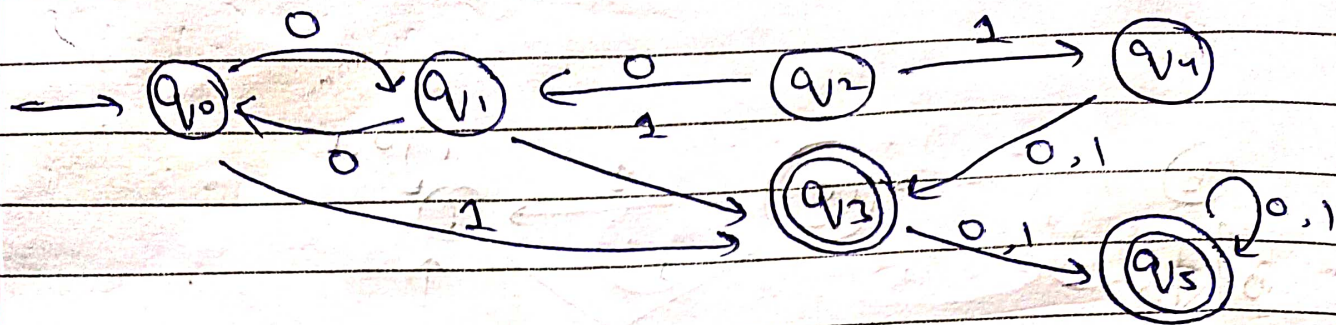
$$\pi_0 = \{a, b, f\} \quad \{c, d, e\}$$

$$\pi_1 = \{a, b\} \quad \{f\} \quad \{c, d, e\}$$

$$\pi_2 = \{a, b\} \quad \{f\} \quad \{c, d, e\}$$



(b)



q_2, q_4 are unreachable.

$$\therefore \Pi_0 = \{q_0, q_1\} \quad \{q_3, q_5\}$$

$$\Pi_1 = \{q_0, q_1\} \quad \{q_3, q_5\}$$

