

Ans Q 1

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

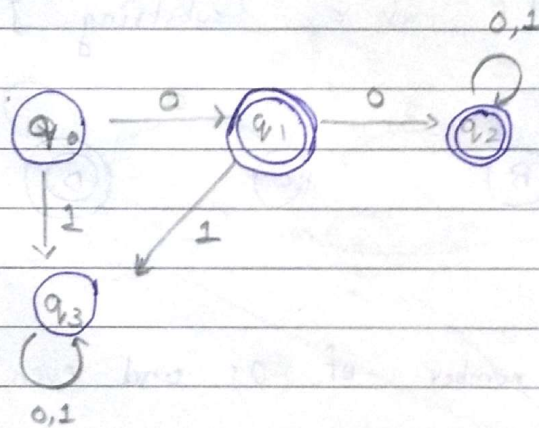
Thus 4 states

$$\text{Final states: } \{q_1, q_2\}$$

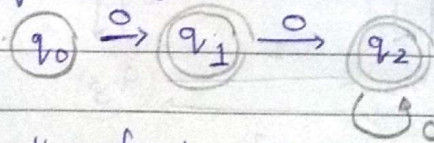
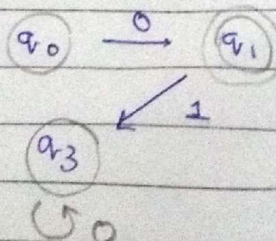
 $\Sigma = \{0, 1\}$ are Input Alphabets

δ	0	1
q_0	q_1	q_3
q_1	q_2	q_3
q_2	q_2	q_2
q_3	q_3	q_3

Thus the state transition DFA is



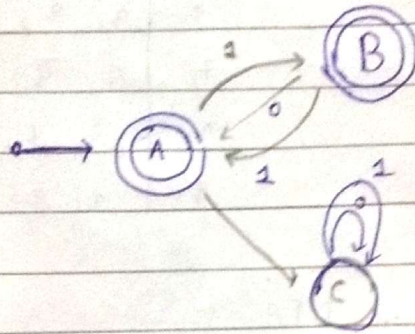
Thus To Determine if A accepts

i. 000 : The sequence of transition starting at q_0 isThus as the final state is q_2 , the DFA accepts 000ii 010 : The sequence of transition starting at q_0 isAs the final state is q_3 which is not the state accepted Thus DFA does not Accept 010

Ans a-2

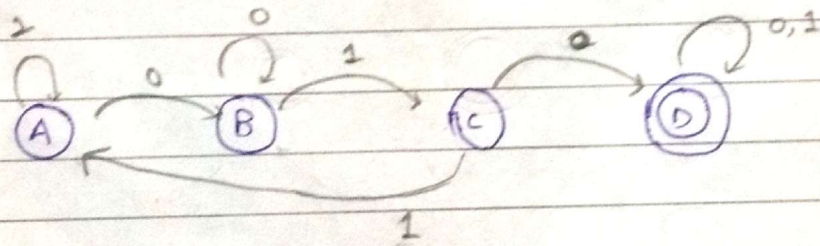
i. $\{w \mid \text{every odd position of } w \text{ is } 1\}$

Ans



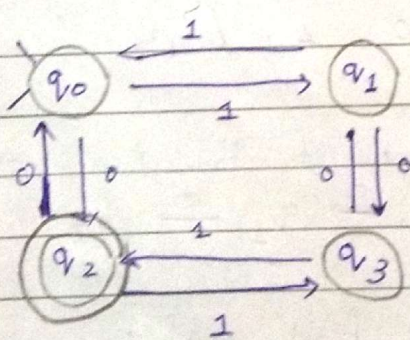
ii. $\{w \mid w \text{ has } 010 \text{ as a substring}\}$

Ans.



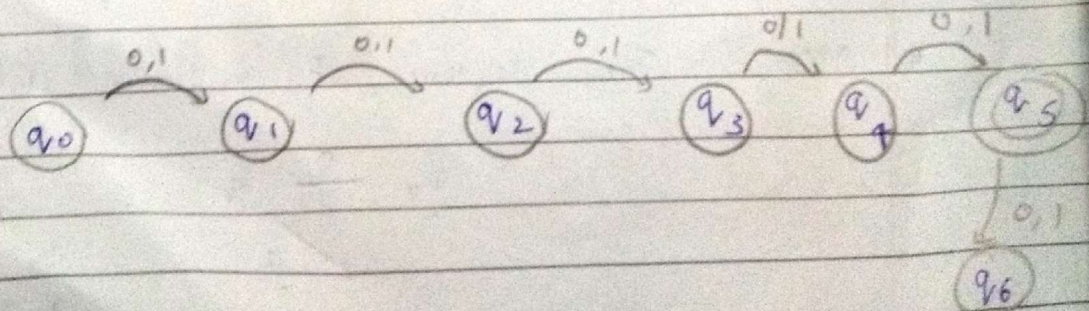
iii. $\{w \mid w \text{ has odd number of 0s and even number of 1s}\}$

Ans



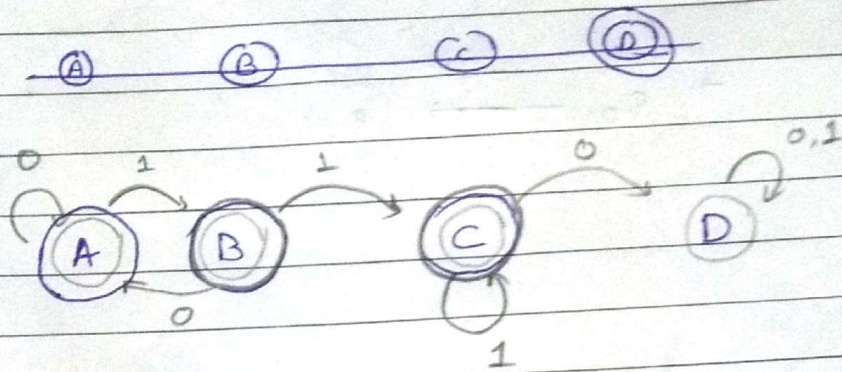
iv. Length of w is at most 5.

Ans.



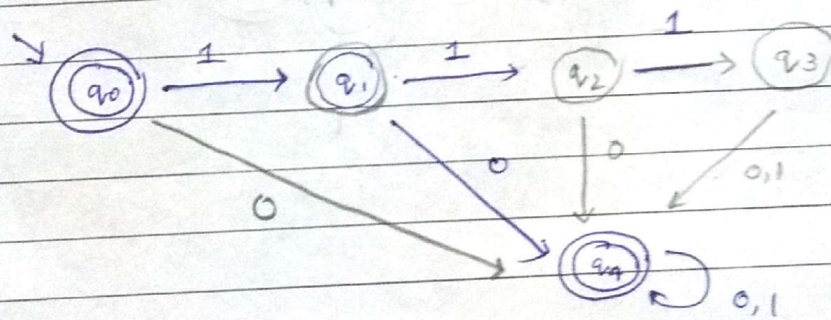
v. $\{w \mid w \text{ does not contain the substring } 110\}$

Ans.



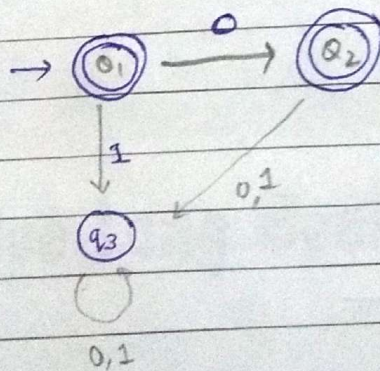
vi. $\{w \mid w \text{ is any string except } 11 \text{ and } 111\}$

Ans.

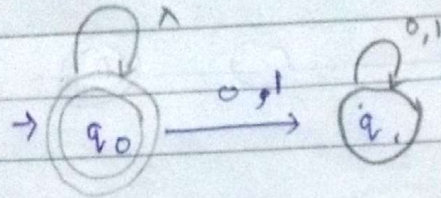


vii. $\{ \epsilon, 0 \}$

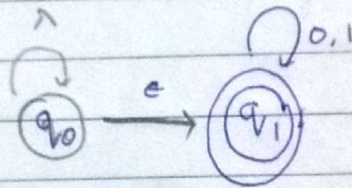
Ans.



viii The empty set



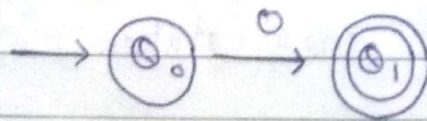
ix All strings except the empty string.



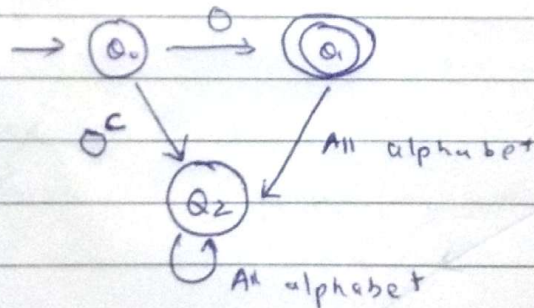
Q.3)

The language $\{0\}$ with 2 states

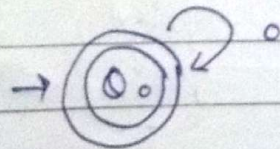
i) NFA



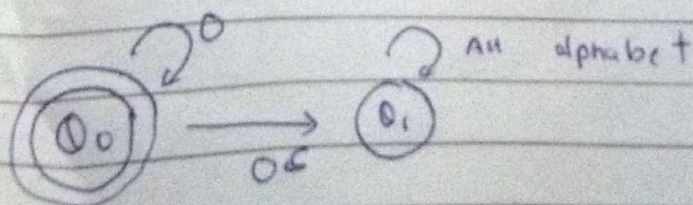
CONVERTED DFA



ii) NFA Language $\{0\}^+$ with one state



CONVERTED DFA :-



Q.4) Find a DFA equivalent to the ϵ NFA

Ans.

