

Azmani Sultana

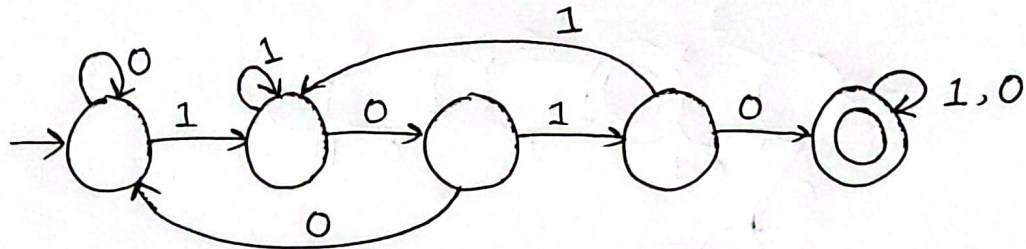
Id: 22201949

CSE331

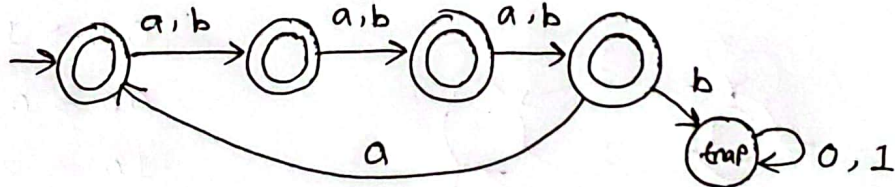
Section 11

Ans no 1

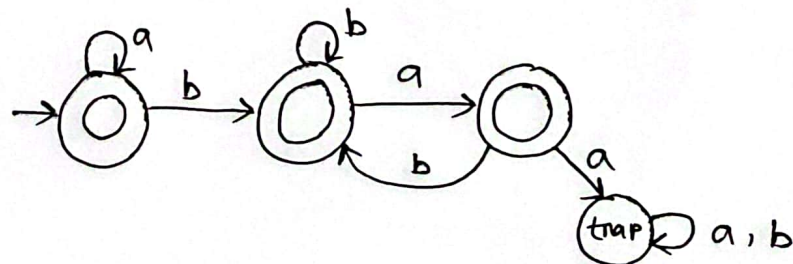
a)  $L = \{w \in \{0,1\}^* : w \text{ contains '1010' as a substring}\}$



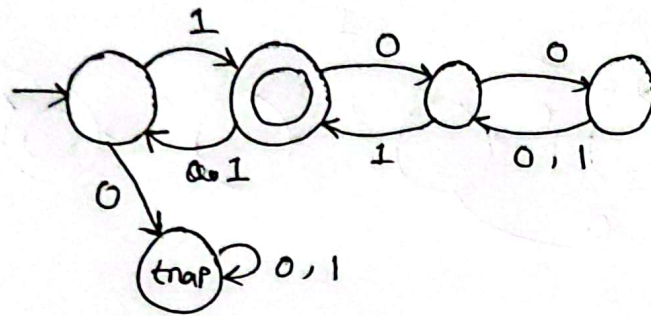
b)  $L = \{w \in \{a,b\}^* : 'a' \text{ occurs in every 4th position}\}$



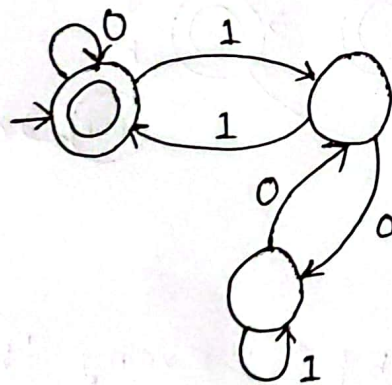
c)  $L = \{w \in \{a,b\}^* : \text{every 'b' is followed by at most one 'a'}\}$



d)  $L = \{w \in \{0,1\}^* : w \text{ starts and ends with 1 and length of } w \text{ is odd}\}$



e)  $L = \{w \in \{0,1\}^+ : \text{the binary equivalent string is divisible by 3}\}$

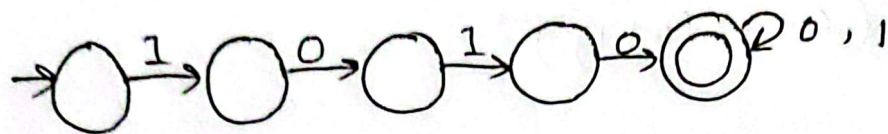


01	→ 1 % 3	→ 1
00	→ 0 % 3	→ 0
10	→ 2 % 3	→ 2
11	→ 3 % 3	→ 0
100	→ 4 % 3	→ 1
101	→ 5 % 3	→ 2

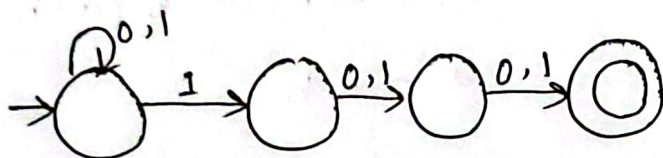


Ans no 2

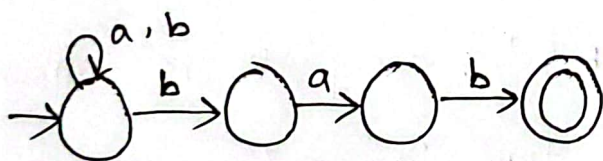
a)  $L = \{ w \in \{0,1\}^* : w \text{ starts with '1010'} \}$



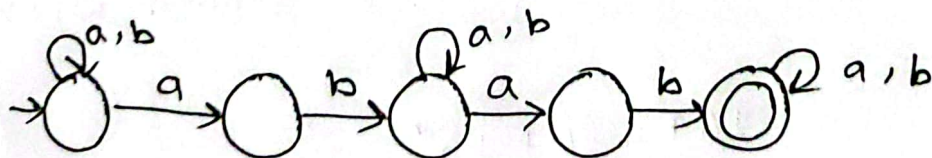
b)  $L = \{ w \in \{0,1\}^* : \text{3rd last symbol in } w \text{ is } 1 \}$



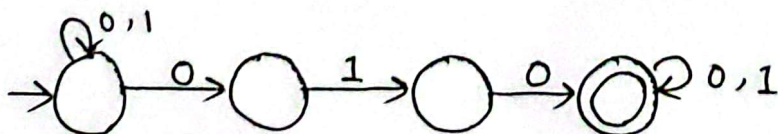
c)  $L = \{ w \in \{a,b\}^* : w \text{ ends with 'bab'} \}$



d)  $L = \{ w \in \{a,b\}^* : \text{the count of substring 'ab' in } w \text{ is at least two} \}$



e)  $L = \{ w \in \{0,1\}^* : w \text{ contains '010' as a substring} \}$



Ans no 3

a)  $L = \{w \in \{0,1\}^* : \text{length of } w \text{ is even}\}$

$$((0+1)(0+1))^*$$

b)  $L = \{w \in \{a,b\}^* : w \text{ starts and ends with same symbol and the length of } w \text{ is odd}\}$

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

c)  $L = \{w \in \{0,1\}^* : w \text{ contains exactly one '01'}\}$

$$1^*0^*011^*0^*$$

d)  $L = \{w \in \{a,b\}^* : \text{every 'b' is followed by at least two 'a's'}\}$

$$a^*(baa^*)^*$$

e)  $L = \{w \in \{0,1\}^* : w \text{ starts with '1011'}\}$

$$1011(0+1)^*$$