Assignment. 01

Course: CSE331

Sec: 03

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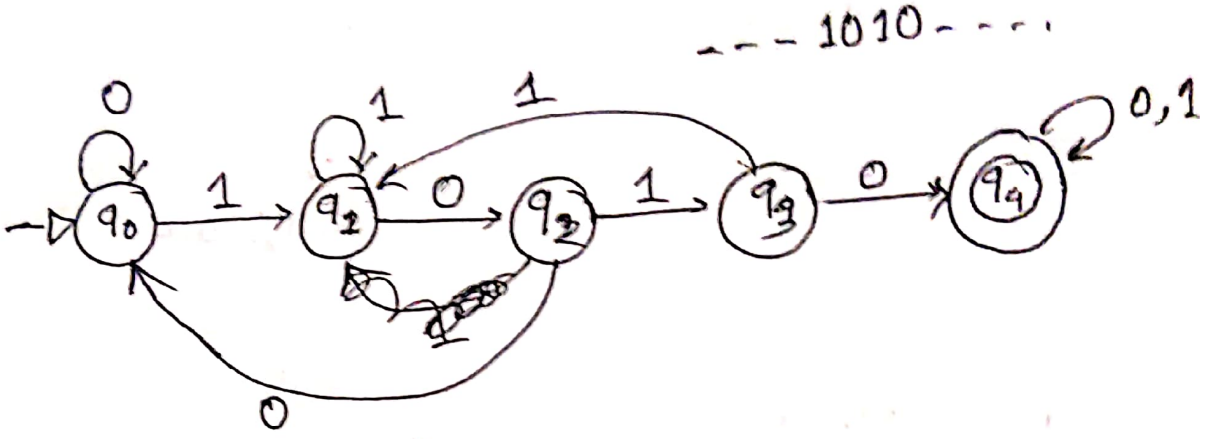
Ans. to the Q. no. 1

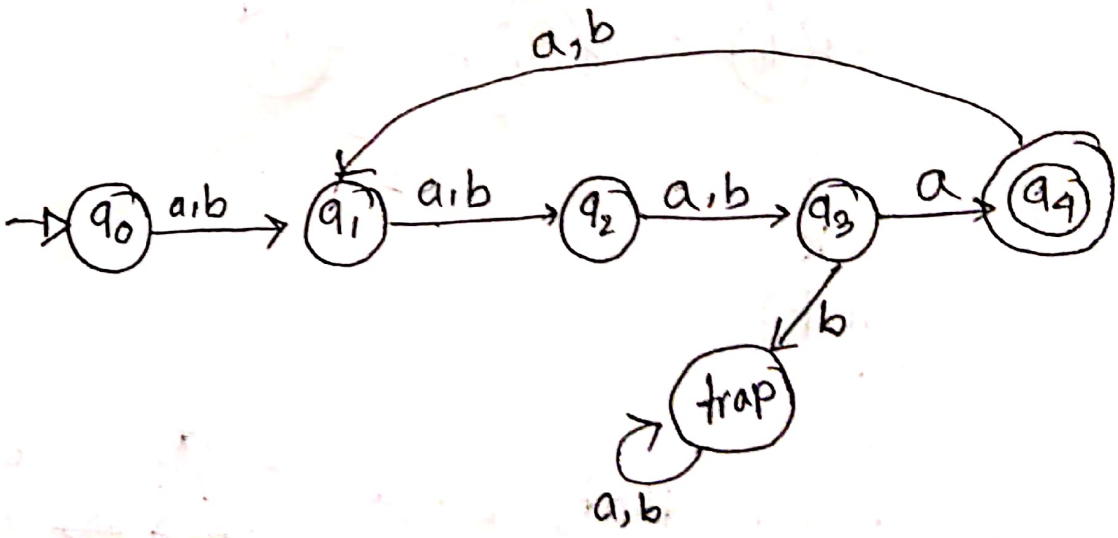
a) given that,

$L = \{\omega \in \{0,1\}^* : \omega$ contains "1010" as a substring$\}$.



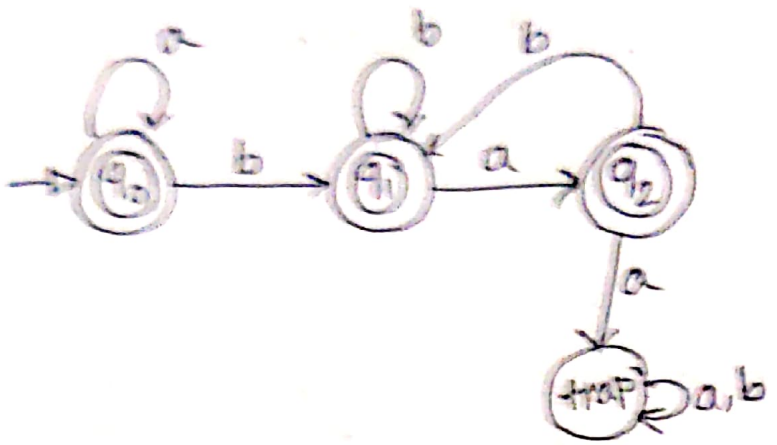
b) given that,

$L = \{\omega \in \{a,b\}^* :$ "a" occurs in every 4th position$\}$

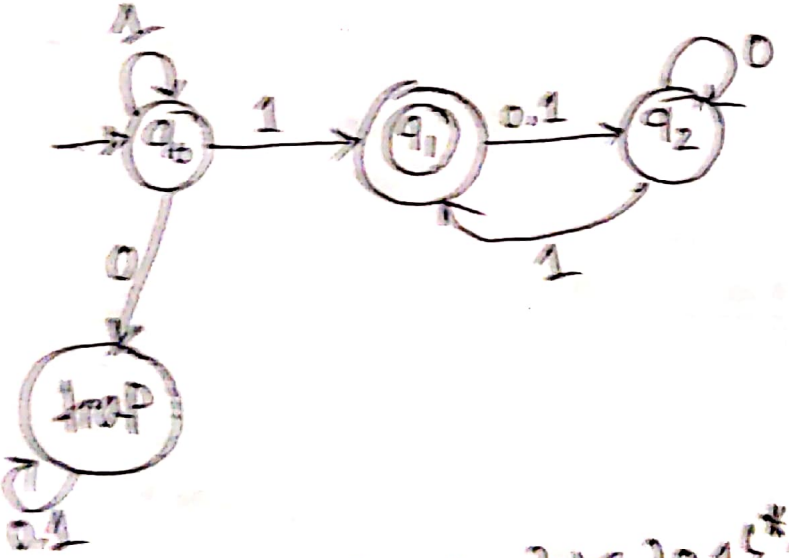


c) given that,
$L = \{w \in \{a,b\}^* :$ every "b" is followed by at most one "a"$\}$

ba
baba
babbla

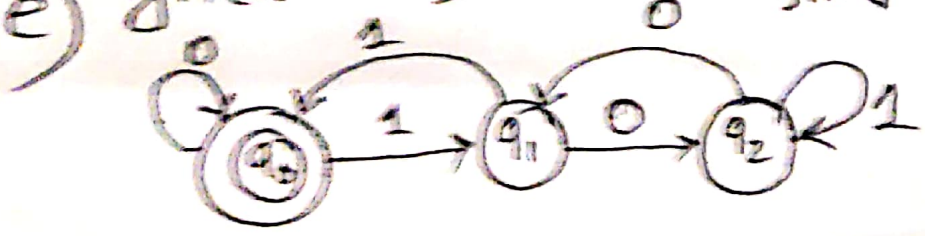


d) given that,
$L = \{w \in \{0,1\}^* :$ w ~~contain~~ starts and ends with 1 and length of w is odd$\}$



1
101
111
10001

e) given that, $L = \{w \in \{0,1\}^* :$ the binary equivalent string ~~as~~ is divisible by 3$\}$

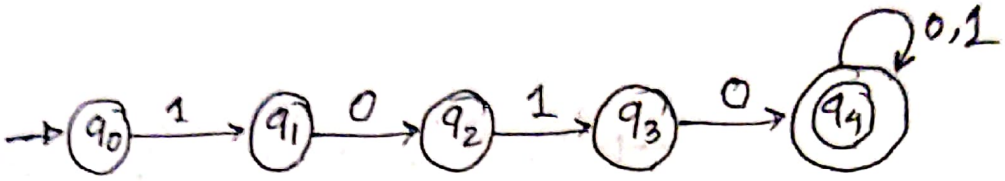


0 — 0
11 — 3
110 — 6
1001 — 9

Ans. to the Q. no. 2

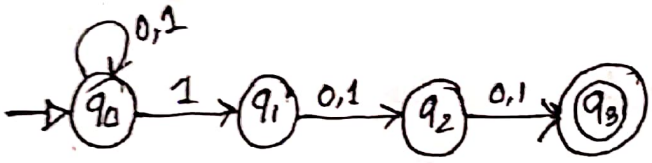
a) given that,

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



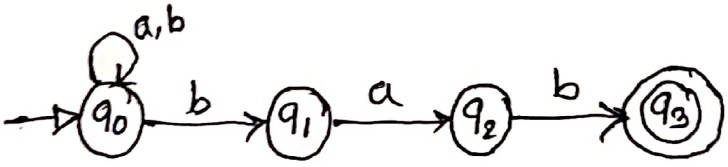
b) given that,

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



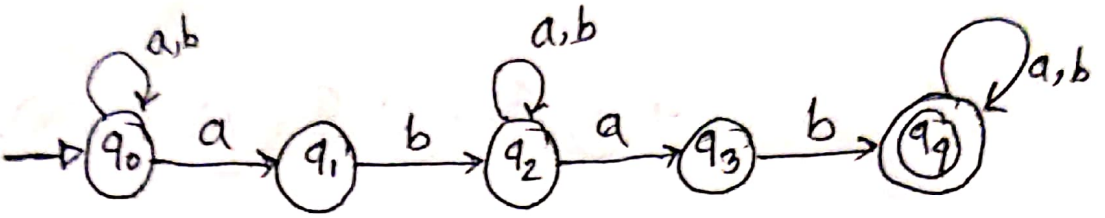
c) given that,

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



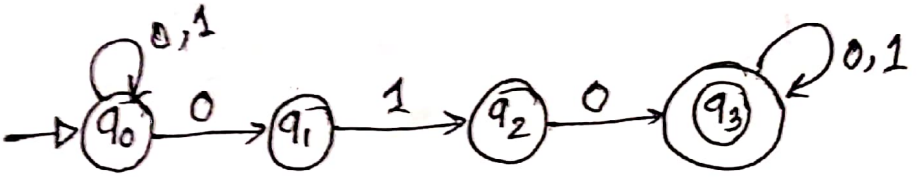
d) given that,

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



e) given that,

$L = \{w \in \{0,1\}^* :$ w contains "010" as a substring$\}$

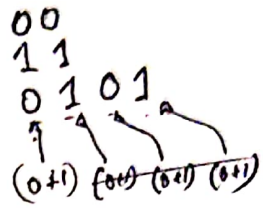


Ans. to the Q. no. 2

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

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

$= (\Sigma\Sigma)^*$



b) given that,

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

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

c) given that, ~~$L = \{w \in \{0,1\}^*$~~

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

$\Rightarrow 1^*0^*011^*0^*$

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

$\rightarrow a^*(baa)^*a^*$

e) Given that,

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

→ $1011\,(0+1)^*$

$= 1011\,\Sigma^*$