Assignment - 01

Name: Amit Sutradhar

ID: 22201054

Section: 11
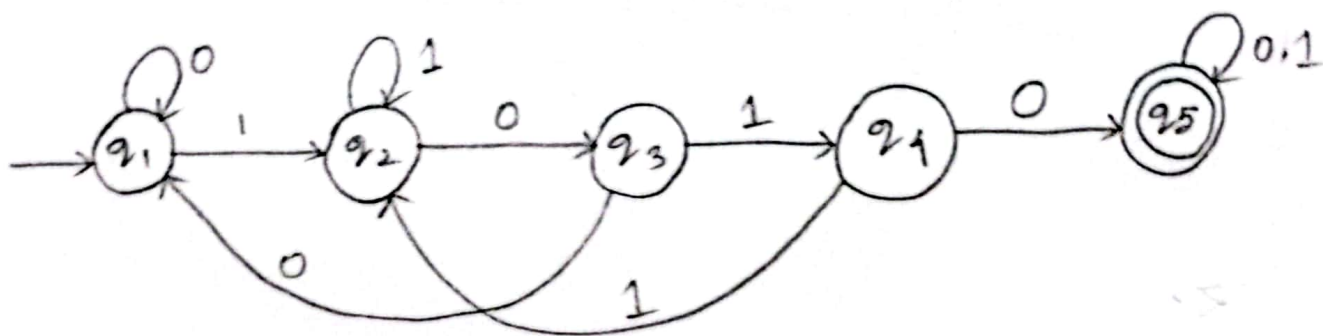
CSE 331

Date: 21.11.2024
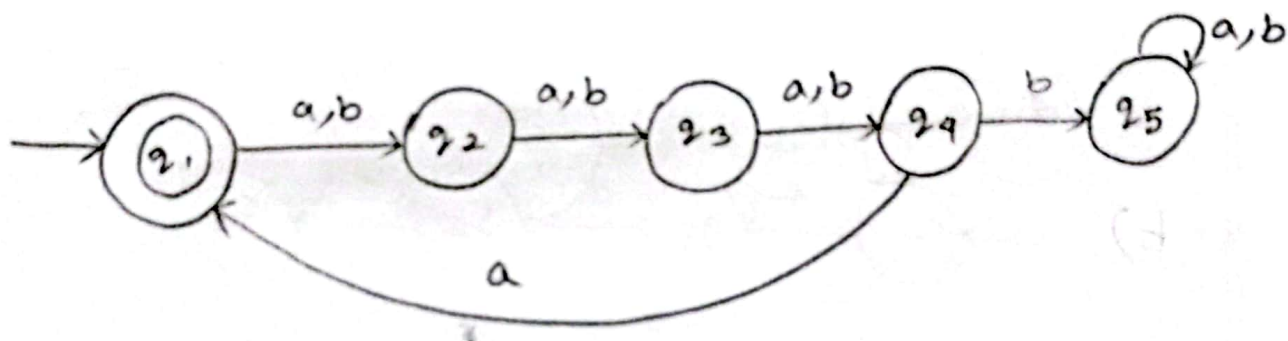
1.

a)

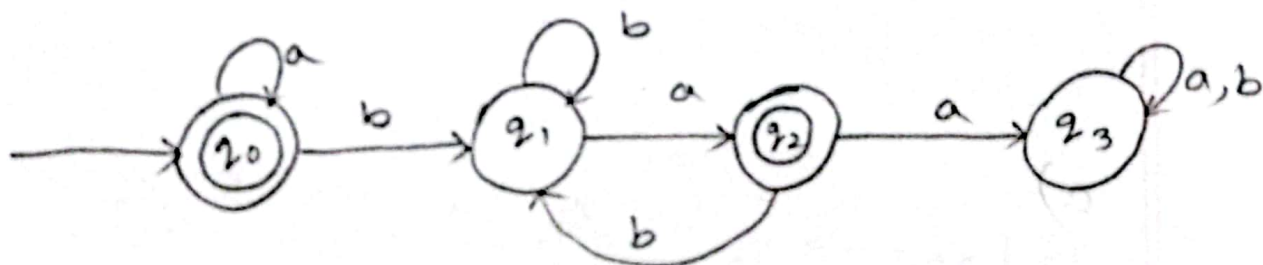
b)
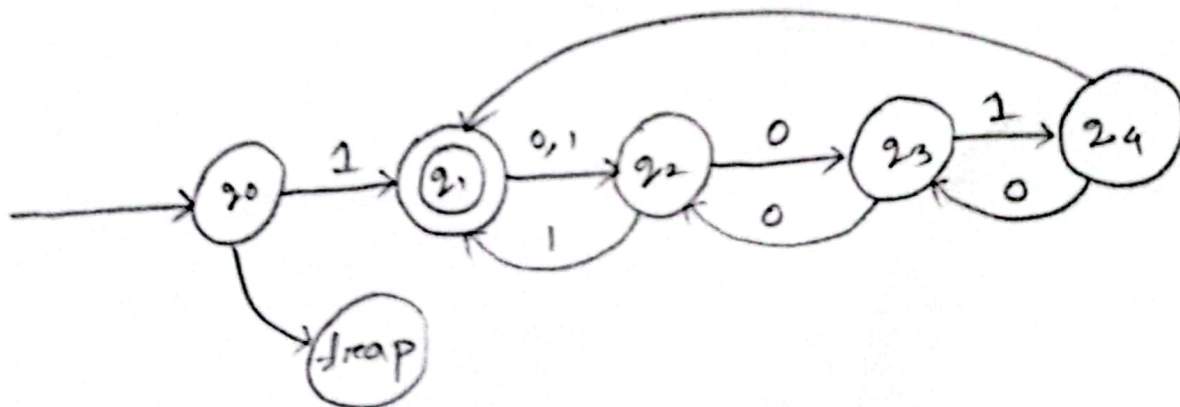

c)

d)

e)

A finite automaton with states q_0 (start/accepting), q_1, q_2. Transition from q_0 to q_1 on 1, from q_1 to q_0 on 1, from q_1 to q_2 on 0, from q_2 to q_1 on 0, and a self-loop on q_2 labeled 1.

z.

a)

States q_0 (start), q_1, q_2, q_3, q_4 (accepting). Transitions: $q_0 \to q_1$ on 1, $q_1 \to q_2$ on 0, $q_2 \to q_3$ on 1, $q_3 \to q_4$ on 0, self-loop on q_4 labeled 1,0.

b)

States q_0 (start) with self-loop labeled 0,1; $q_0 \to q_1$ on 1; $q_1 \to q_2$ on 0,1; $q_2 \to q_3$ on 0,1; q_3 accepting.

c)

States q_0 (start) with self-loop labeled a,b; $q_0 \to q_1$ on b; $q_1 \to q_2$ on a; $q_2 \to q_3$ on b; q_3 accepting.
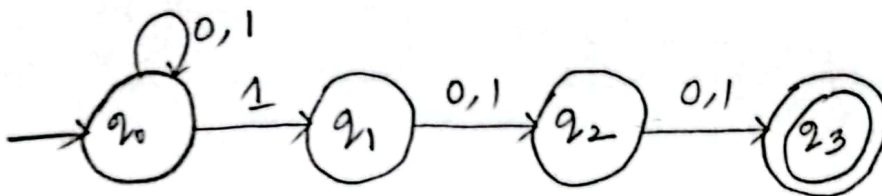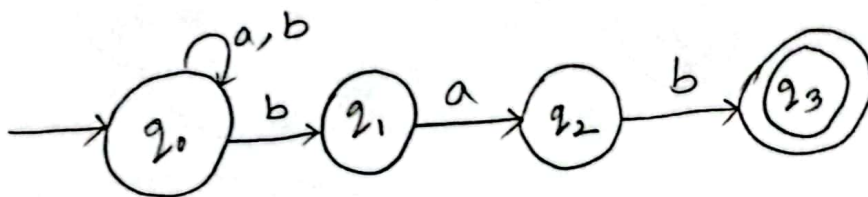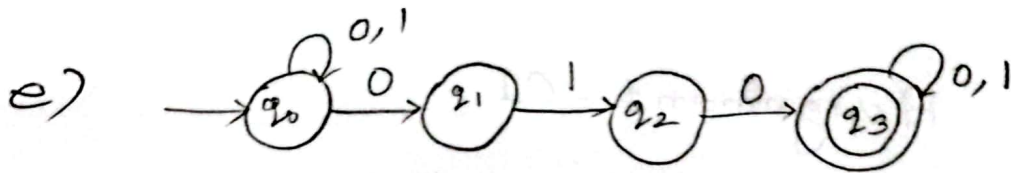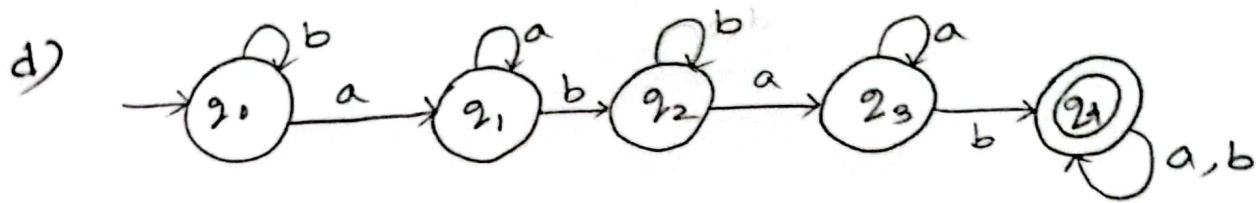
d)

e)

3.

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

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

c) $01(0+1)^* + (0+1)^*01 + (0+1)^*01(0+1)^*$

d) $a^*(b(aa)a)^*$

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

b) $a(aa|ab|ba|bb)^*a + b(aa|ab|ba|bb)b$

$+ a + b$