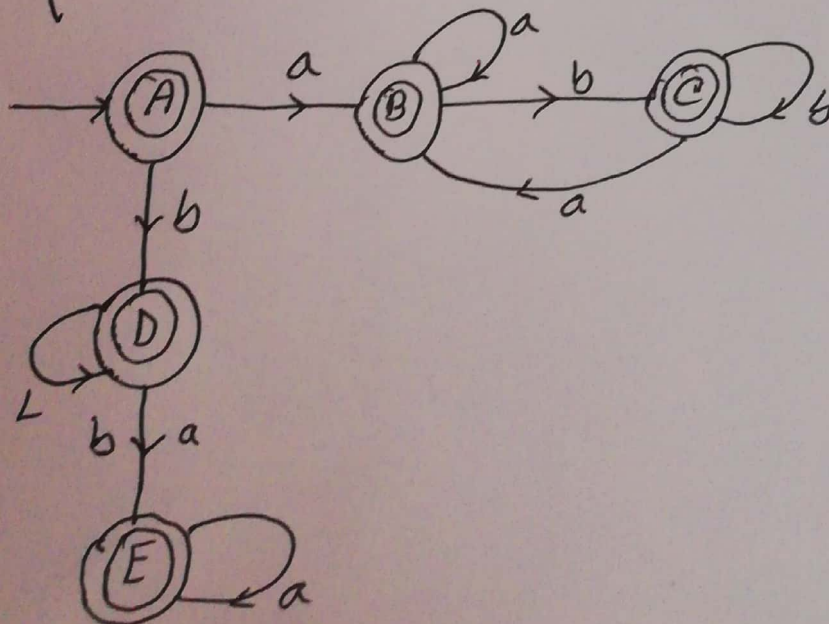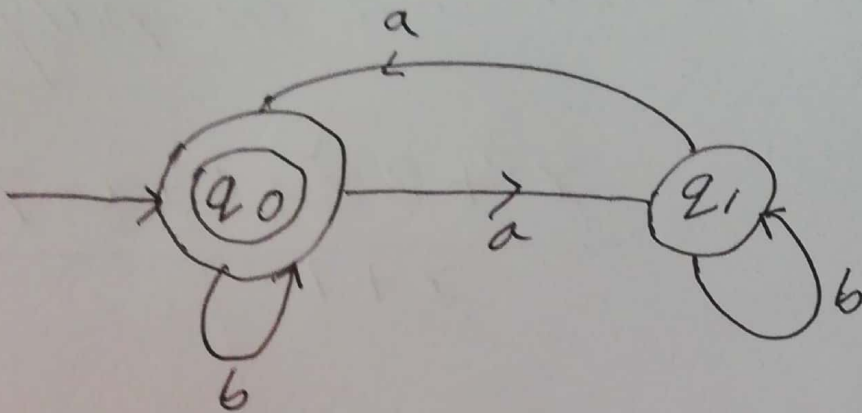**Ans no – 1 ⓐ**

We know that, DFA stands for Deter Deterministic Finite Automata. The process of reducing a given DFA to its minimal form is called as minimization of DFA It contains the minimum number of States. The DFA in its minimal form is called as minimal DFA.
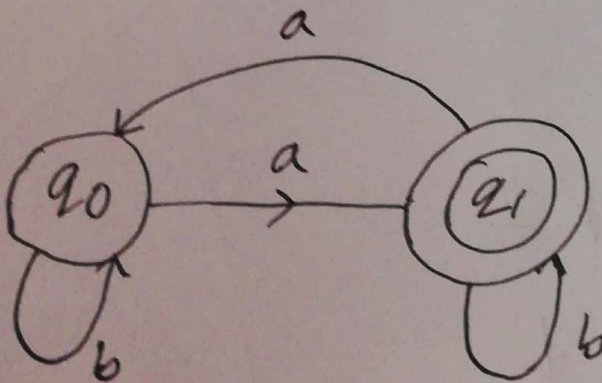
Ans no 1 b

$L = \{ \varepsilon, a, b, aa, bb, aba, bab, \cdots \}$

Ans no 2 (a)

States: q_0 (start, accepting), q_1

- $q_0 \xrightarrow{a} q_1$
- $q_1 \xrightarrow{a} q_0$
- $q_0 \xrightarrow{b} q_0$
- $q_1 \xrightarrow{b} q_1$

Ans no 2 (b)

States: q_0 (start), q_1 (accepting)

- $q_1 \xrightarrow{a} q_0$
- $q_0 \xrightarrow{a} q_1$
- $q_0 \xrightarrow{b} q_0$
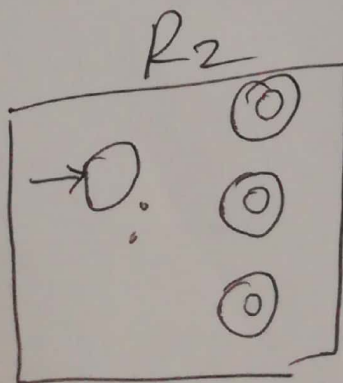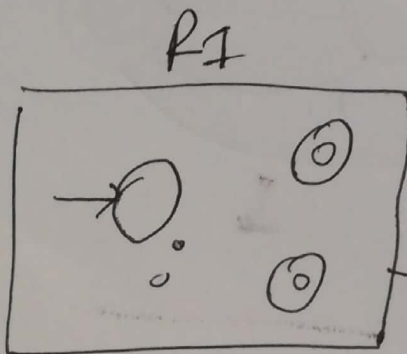- $q_1 \xrightarrow{b} q_1$

Ans no-2[c]

R_1 is the remainder of polynomial of
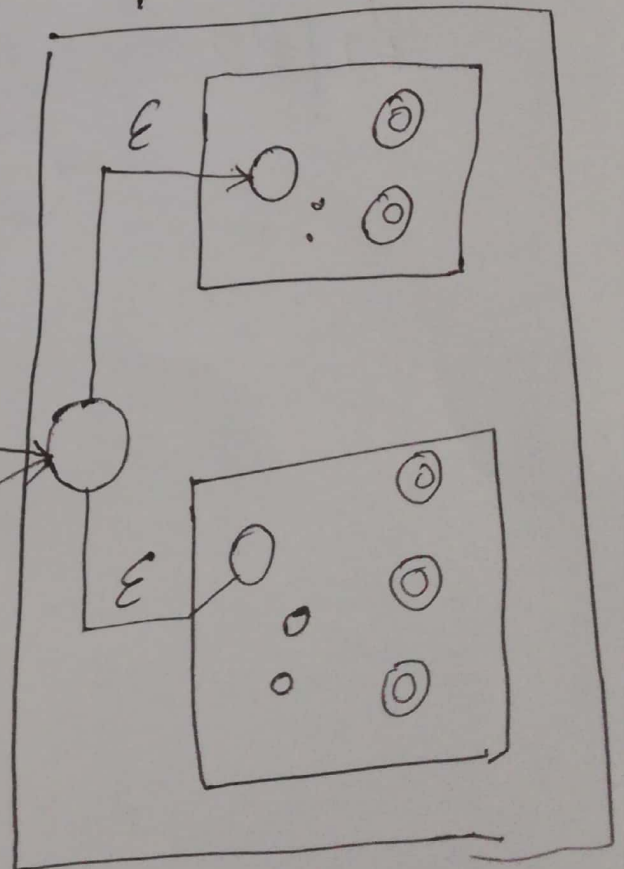
$$\frac{x^3 + 2x^2 + 5ax - 7}{x + 1}$$

R_2 is the remainder of polynomial of

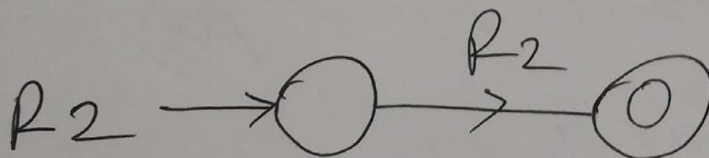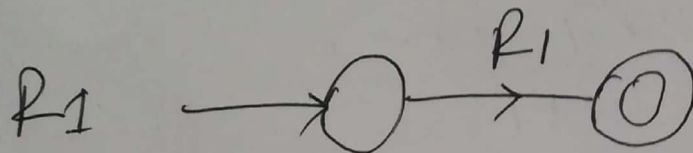$$\frac{x^3 + ax^2 - 12x + 6}{x - 6}$$

$RE = R_1 / R_2$

$RE = R_1 / R_2$

R_1

R_2

ε

ε

Ans no 2-(d)

R1 | R2

R1 $\longrightarrow$ ◯ $\xrightarrow{R1}$ ⊙

R2 $\longrightarrow$ ◯ $\xrightarrow{R2}$ ⊙

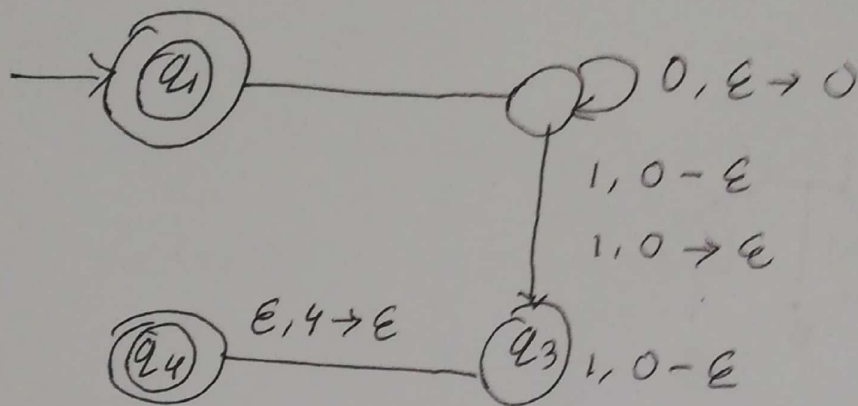R1 | R2 =

$R2$ (self-loop), $R1$, $R1$ (self-loop), $R2$, $R1$, $R2$
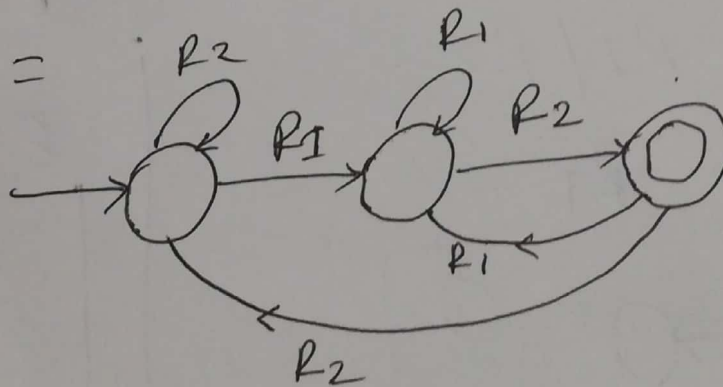
The only difference is that a pushdown automata can only access stored data in a last-in-first-out sequence, whereas a Turing machine can scan through memory ~~arbitrea~~ arbitrarily.

00001111

CFG

$L = \{0^n, 1^n \mid n \geq 0\}$

$S = 01 \mid 0S1$

$S = S$

$V = 01 \mid 0S1$

$L = \{01, 0011, 000111, 00001111 \cdots \text{for } 0\}$

for 01

$S \rightarrow 01$

for 0011

$S \rightarrow 0S1 \rightarrow 0011$

for 000111

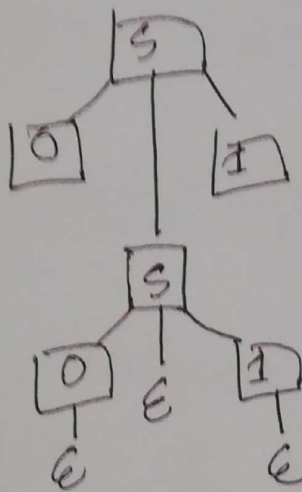$S \rightarrow 0S1 \rightarrow 00S11 \rightarrow 000111$

for 00001111

$S \to 0S1 \to 00S11 \to 00S111 \to 00$

Parse tree

01

0011

000111 :

P-T·O

00601111

S
0 S 1
0 1
S
0 1
S
0 1
E E

0000IIII

$0, \varepsilon \rightarrow 0$

$1, 0 - \varepsilon$

$1, 0 \rightarrow \varepsilon$

$1, 0 - \varepsilon$

$\varepsilon, 4 \rightarrow \varepsilon$

CFG

$L = \{ 0^n, n \mid n \geq 0 \}$

$S = 01 \mid 0S1$

$S = S$

$V = 01 \mid 0S1$

$L = \{ 01, 0011, 000111, 00001111 \cdots \text{ for } 0$

for 01

$S \rightarrow 01$

for 0011

$S \rightarrow 0S1 \rightarrow 0011$

for 000111

$S \rightarrow 0S1 \rightarrow 00S11 \rightarrow 000111$

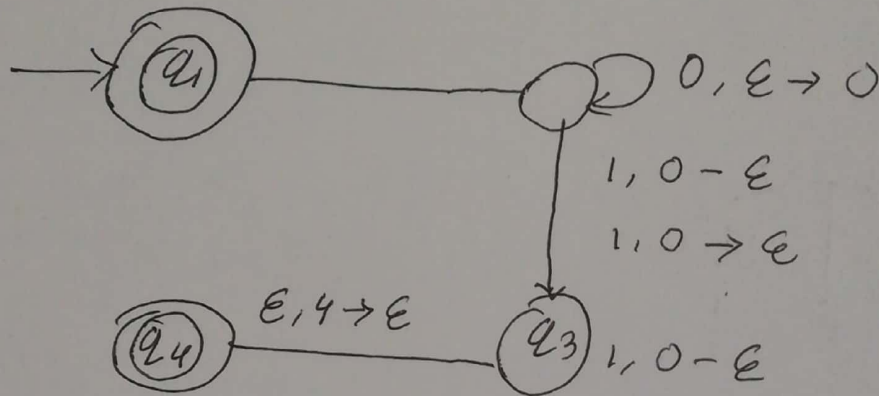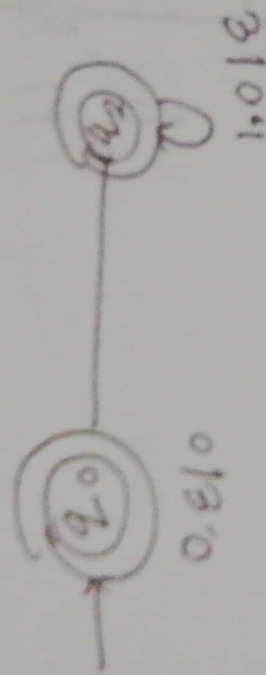Base 10 The decimal number 233_{10} and its Corresponding binary equivalent 11101001_2 are interpreted respectively as.
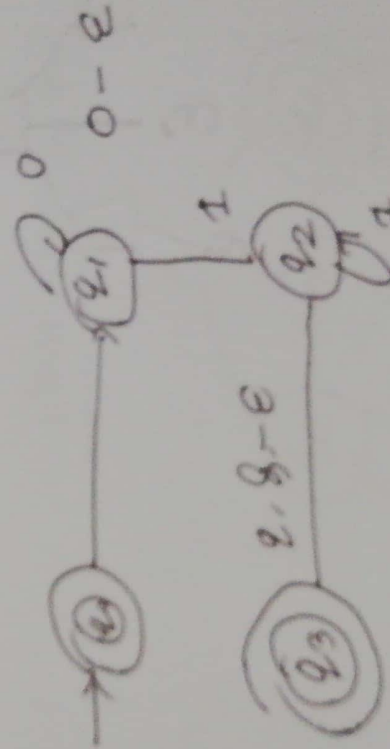
$$2 \times 10^2 + 3 \times 10^1 + 3 \times 10^0$$

and

$$1 \times 2^7 + 1 \times 2^6 + 1 \times 2^5 + 0 \times 2^4 + 1 \times 2^3 + 0 \times 2^1$$
$$+ 1 \times 2^0$$

Ans no - 3 (c)

For PAD: 01

For: 0011

For: 000111