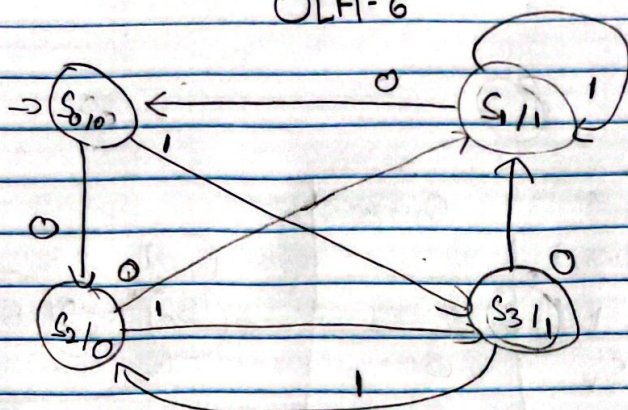


OLA-6

1. a.

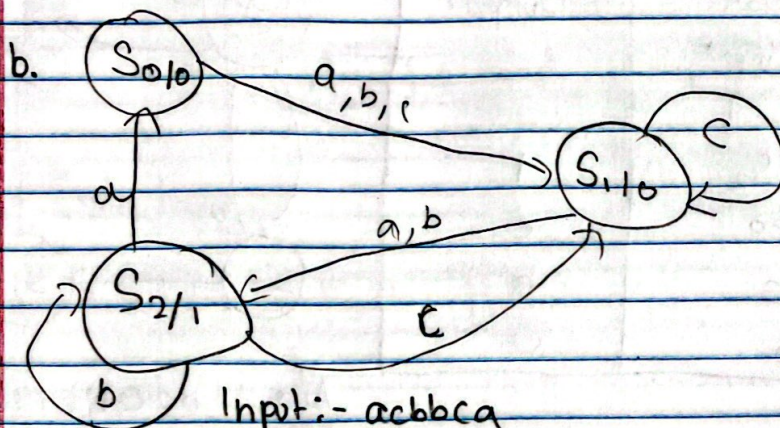


Present state	Next state		Output
	0	1	
S ₀	S ₂	S ₃	0
S ₁	S ₀	S ₁	1
S ₂	S ₁	S ₃	0
S ₃	S ₁	S ₂	1

Input:- 0011

Output:- 0111

2.



Present state	Next state			Output
	Present input			
	a	b	c	
S ₀	S ₁	S ₁	S ₁	0
S ₁	S ₂	S ₂	S ₁	0
S ₂	S ₀	S ₂	S ₁	1

Input:- acbbca

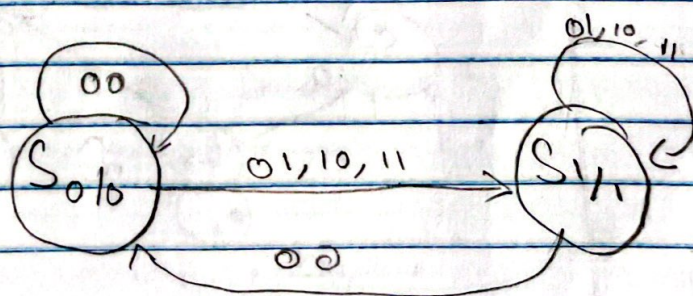
Output:- 001101

2.

Bitwise OR

a.

A	B	x = A + B
1	1	1
1	0	1
0	1	1
0	0	0



b. 11011 and 10010

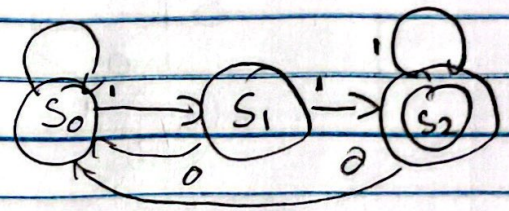
Output is 11011

$1+1=1$ $1+1=1$
 $1+0=1$ $1+0=1$
 $0+0=0$

3.

a.

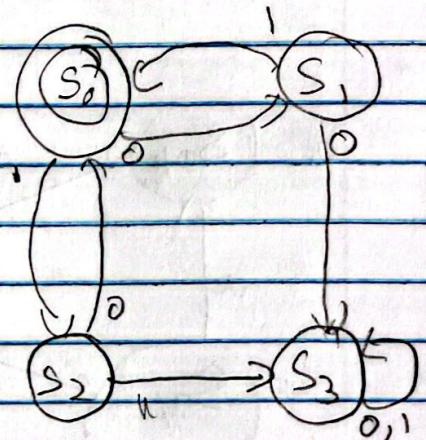
Present State	Next state Present input		Output
	0	1	
S ₀	S ₀	S ₁	0
S ₁	S ₀	S ₂	0
S ₂	S ₀	S ₂	1



Yes, this recognizes input

b.

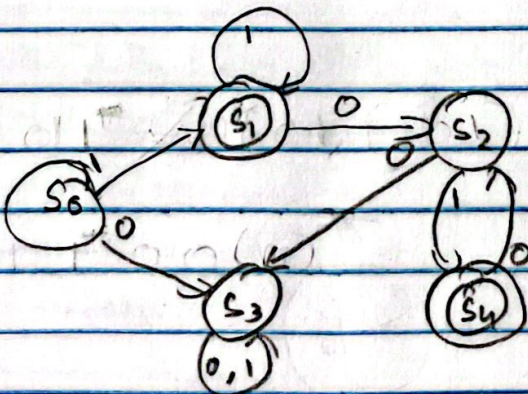
Present state	Next state Present input		Output
	0	1	
S ₀	S ₁	S ₂	1
S ₁	S ₃	S ₀	0
S ₂	S ₀	S ₃	0
S ₃	S ₃	S ₃	0



No, it doesn't recognize input

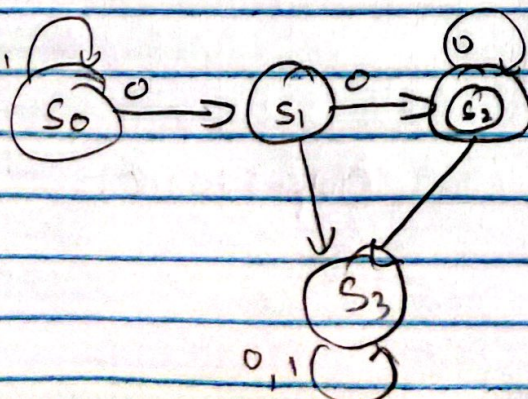
4.

a.



Regular expression:- $11^*(01)^*$

b.



Regular expression:- $1^*00(01)^*$

5.

a.

... | b | 1 | 0 | 1 | 0 | b | ...

$(0, 1, 1, 0, R)$

↑
0

... | b | 1 | 0 | 1 | 0 | b | ...

$(0, 0, 0, 1, R)$

↑
0

... | b | 1 | 0 | 1 | 0 | b | ...

$(1, 1, 1, 1, R)$

↑
1

... | b | 1 | 0 | 1 | 0 | b | ...

$(1, 0) \times$

↑
1

Ends here

(b)

... | b | 1 | 0 | 1 | b | ...

$(0, 1, 1, 0, R)$

↑
0

... | b | 1 | 0 | 1 | b | ...

$(0, 0, 0, 1, R)$

↑
0

... | b | 1 | 0 | 1 | b | ...

$(1, 1, 1, 1, R)$

↑
1

... | b | 1 | 0 | 1 | b | ...

$(1, b, 1, 2, L)$

↑
1

... | b | 1 | 0 | 1 | 1 | b | ...

$(2, 1, 1, 2, L)$

↑
2

... | b | 1 | 0 | 1 | 1 | b | ...

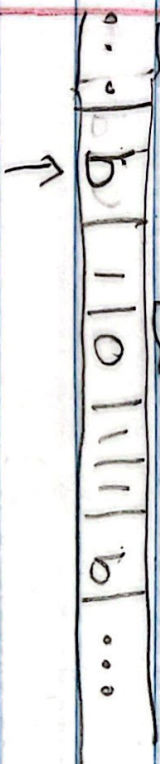
$(2, 0, 0, 2, L)$

↑
2

5 (b)



(2, 1, 1, 2, L)

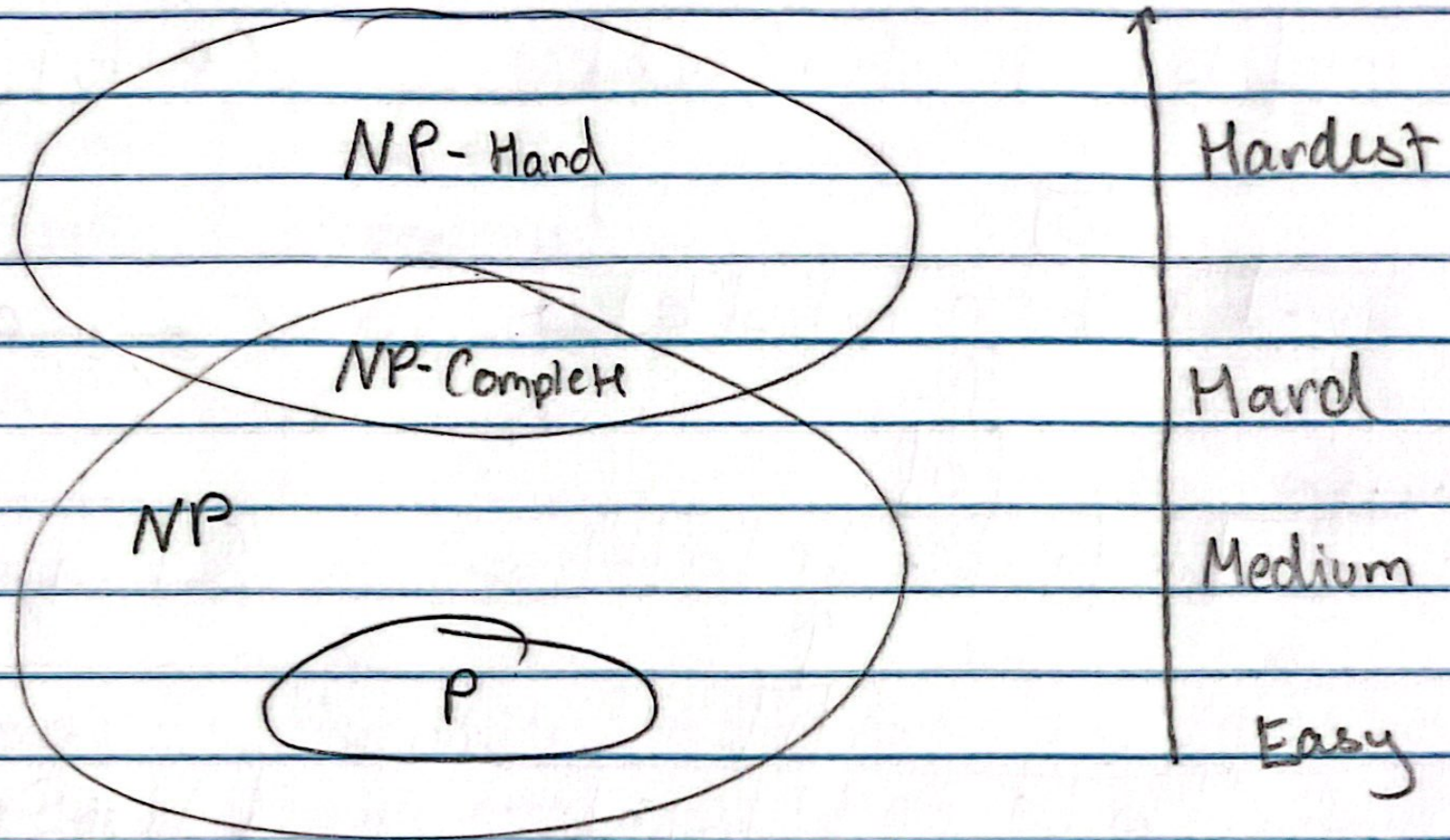


(2, b, 1, 0, R)



It is adding 1 both side and b is shifting its position to the next one on both side, given the turning machine, it will go on indefinite times and never end.

6.



7. Pos 1 2 3 4 5 6 7

1. Message 0 0 0 0 1 1 0

4567 Paritycheck 0 1 1 0 $\Rightarrow C_1 = 0$

2367 Paritycheck 0 0 1 0 $\Rightarrow C_2 = 1$

1357 Paritycheck 0 0 1 0 $\Rightarrow C_3 = 1$

$C_1 C_2 C_3 = 011 = 3^{\text{rd}}$ position error occurred

2. No error on position 3

3. 0010110 (Transmitted code word)

4. 0110

5. 6