

## Theory of Computation

## Finite Automata

DPP-09

## FA with output

[MSQ]

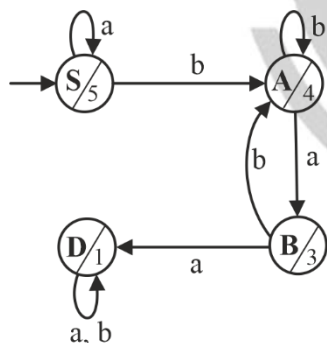
1. Which of the following is/are correct?

- (a) Transition function ( $\delta$ ) in mealy machine and moore machine is same.
- (b) Output function ( $\lambda$ ) in moore machine is  $\lambda: Q \rightarrow \Delta$ .
- (c) Output function ( $\lambda$ ) in mealy machine is  $\lambda: Q \times \Sigma \rightarrow \Delta$ .
- (d) Output is associated with state in mealy machine.

[NAT]

2. Consider the following moore machine:

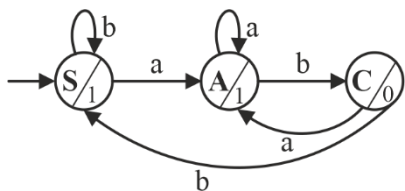
Moore machine:



On input “abbabb” the output will be \_\_\_\_.

[MCQ]

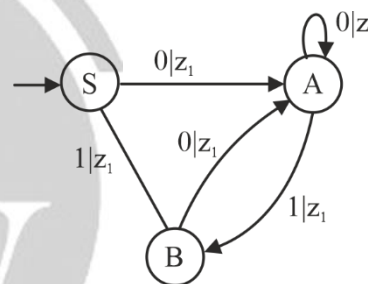
3. Consider the following moore machine:



The above moore machine will produce

- (a) 0 output for every occurrence of bab.
- (b) 1 output for every occurrence of aa.
- (c) 0 output for ever occurrence of ab.
- (d) None of these.

[MCQ]

4. Consider the following mealy machine on  $\Sigma = \{0, 1\}$ 

For input “010100” what will be the output?

- (a)  $z_1 z_1 z_1 z_1 z_1 z_2$ .
- (b)  $z_1 z_2 z_1 z_2 z_1 z_2$ .
- (c)  $z_1 z_2 z_1 z_2 z_1 z_2$ .
- (d) None of these.

[MCQ]

5. Consider the following statements:

**S<sub>1</sub>:** Mealy machine and moore machine both are equivalent.

**S<sub>2</sub>:** For n length input moore machine produces (n + 1) length output.

Which of the following is correct?

- (a)  $S_1$  only.
- (b)  $S_2$  only.
- (c) Both  $S_1$  and  $S_2$  are correct.
- (d) None of these.

## Answer Key

- |              |        |
|--------------|--------|
| 1. (a, b, c) | 4. (a) |
| 2. (5544344) | 5. (c) |
| 3. (c)       |        |



## Hints and Solutions

1. (a, b, c)

- (a) True:  $\delta: Q \times \Sigma \rightarrow Q$  Moore machine  
 $\delta: Q \times \Sigma \rightarrow Q$  Mealy machine  
 (b) True:  $\lambda: Q \rightarrow \Delta$  Moore machine  
 (c) True:  $\lambda: Q \times \Sigma \rightarrow \Delta$  Mealy machine  
 (d) False: In moore machine output is associated with state.  
 In mealy machine output is associated with transition.

2. (5544344)

Input: a b b a b b  
 ↓ ↓ ↓ ↓ ↓ ↓  
 Output: 5 5 4 4 3 4 4  
 ↓  
 start state

Hence, (5544344) is correct.

3. (c)

Input: ab b ab  
 ↓ ↓ ↓  
 Output: 1 1 0 1 1 0

Hence, option (c) is correct.

4. (a)

Input: 0 1 0 1 0 0  
 Output:  $z_1 z_1 z_1 z_1 z_1 z_1$

5. (c)

$S_1$ : Both are equivalent.

$S_2$ : Moore machine generates 1 extra output.



Any issue with DPP, please report by clicking here:- <https://forms.gle/t2SzQVvQcs638c4r5>

For more questions, kindly visit the library section: Link for web: <https://smart.link/sdfez8ejd80if>



PW Mobile APP: <https://smart.link/7wwosivoicgd4>