

☐ Aptitude ☒ GATE ☐ Other Misc.

Summary

Advance Search

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Theory of Computation



Finite Automata & Regular Expressions



Any Marks



All Questions



Type: MCQ

Marks: 1

Rating: 4/5 ★★★★★

1) The set $\{a^i b^j \mid i < 100 \text{ and } j < 10000\}$ is

- A) a finite set
- B) a regular set
- C) a null set

Top

D) an infinite set

☐ A ☐ B ☒ C ☐ D ✓

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Explanation

Type: MCQ

Marks: 1

Rating: 4.17/5



2) The minimal finite automata accepting the set of all strings over $\{1, 0\}^*$ that have three consecutive 000's has

A) 6 states

B) 5 states

C) 4 states

D) None of the above

☐ A ☐ B ☒ C ☐ D ✓

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Explanation

Type: MCQ

Marks: 1

Rating: 3.67/5



3) The minimal finite automata accepting the set of all strings over $(0,1)^*$ that do not have the sub-string 0001 has

A) 7 states

B) 6 states

C) 5 states

D) None of the above

☐ A ☐ B ☒ C ☐ D ✓

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Explanation

Type: MCQ

Marks: 1

Rating: 3.71/5



4) The minimal finite automata accepting the set of all strings over $(p + q)^*$ where the fourth symbol from the right is a p has

A) 12 states

Top

- B) 16 states**
C) 20 states
D) None of the above

☐ A ☐ B ☐ C ☒ D ✓

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[Explanation](#)

Type: MCQ

Marks: 1

Rating: 4.4/5



5) The minimal finite automata accepting the set of all strings over $\{0, 1\}^*$ that starting with a 0 and interpreted as the binary representation of an integer are congruent to 2 modulo 5 has

- A) 4 states**
B) 5 states
C) 6 states
D) None of the above

☐ A ☒ B ☐ C ☐ D ✓

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[Explanation](#)

Type: MCQ

Marks: 1

Rating: 4.33/5



6) The minimal finite automata accepting the set of all strings over $(0 + 1)^*$ that end in 000 has

- A) 4 states**
B) 5 states
C) 6 states
D) None of the above

☒ A ☐ B ☐ C ☐ D ✓

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[Explanation](#)

Type: MCQ

Marks: 1

Rating: 5/5 ★★★★★

7) The minimal finite automata accepting the set of all strings over $(a + b)^*$ where the number of a's is divisible by 3 and the number of b's is divisible by 5 has

Top

- A) 12 states
 B) 15 states
 C) 17 states
 D) None of the above

☐ A ☒ B ☐ C ☐ D ✓

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Explanation

Type: MCQ

Marks: 1

Rating: 4.5/5



8) The regular expression $(00)^* + 0(00)^* + 00(000)^*$ represents

- A) the set 0^*
 B) the set of all even length strings over 0
 C) the set of all strings over 0 divisible by 2 or 3
 D) None of the above

☒ A ☐ B ☐ C ☐ D ✓

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Explanation

Type: MCQ

Marks: 1

Rating: 5/5 ★★★★★

9) Consider the regular expression identities

i) $r^* \mid s^* = (r + s)^*$

ii) $rs^* \mid sr^* = (r^* s^*)^*$

iii) $r^* (r^* s^* r^* r^*)^* = (r + s)^*$

iv) $r (ar)^* = (ra)^* r$

Choose the correct statements

- A) i-iii are false and iv is true
 B) All are true
 C) All are false
 D) $r(ar)^* = (ra)^* r$

☐ A ☐ B ☐ C ☒ D ✓

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Explanation

Type: MCQ

Marks: 1

Rating: 4/5 ★★★★★

Top

10) When a NFA is converted to an equivalent DFA the construction always yields

- A)** the same number of states
B) always more states
C) sometimes less number of states
D) 2^n states in the worst case where 'n' is the number of states of the NFA

☐ A ☐ B ☐ C ☒ D ✓

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[Explanation](#)

Type: MCQ

Marks: 1

Rating: 5/5 ★ ★ ★ ★ ★

11) The minimal finite automata for the empty set has

- A)** No states
B) 1 state
C) 1 accepting state and 1 rejecting state
D) None

☐ A ☐ B ☒ C ☐ D ✓

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[Explanation](#)

Type: MCQ

Marks: 1

Rating: 3.75/5

★ ★ ★ ★ ★

12) The minimal finite automata for the set of all strings over $(0 + 1 + 2)^*$ that interpreted as the representation of a base three number as congruent to 5 modulo 6 has

- A)** 5 states
B) 6 states
C) 7 states
D) None of the above

☐ A ☒ B ☐ C ☐ D ✓

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[Explanation](#)

Type: MCQ

Marks: 1

Rating: 3.5/5

★ ★ ★ ★ ★

13) The regular sets are not closed under the following operations

[Top](#)

- A)** Union, Intersection, Complement
B) Homomorphism, Inverse homomorphism, Substitution
C) Concatenation, Kleene closure, Reversal
D) None of the above

☐ A ☐ B ☐ C ☒ D ✓

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Explanation

Type: MCQ

Marks: 1

Rating: 5/5 ★ ★ ★ ★ ★

14) The set $\{0^n 1^n \mid n > 1\}$ when represented by the state diagram of a finite automata has

- A)** an infinite number of states
B) a finite number of states
C) cannot be represented by a state diagram
D) None of the above

☒ A ☐ B ☐ C ☐ D ✓

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Explanation

Type: MCQ

Marks: 1

★ ★ ★ ★ ★

15) Consider the following languages

- i. $\{a^{2^N} \mid N = 1\}$
 ii. $\{a^p \mid p \text{ prime}\}$
 iii. $\{0^i 1^j \mid i < 1000\}$
 iv. The set of all strings $(0+1)^*$ that do not have the substring

- A)** All are regular sets
B) Only iii and iv are regular sets
C) Only i and ii and iv are regular sets
D) None of them is a regular set

☐ A ☒ B ☐ C ☐ D ✓

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Explanation

Type: MCQ

Marks: 1

Rating: 5/5 ★ ★ ★ ★ ★

Top

16) Consider the following languages

- i) $\{ww^R x \mid w, x \text{ in } (r + s)^*\}$
- ii) $\{wxw^R \mid w, x \text{ in } (t + u)^*\}$
- iii) $\{wwwww \mid w \mid \leq 100, w \text{ in } (0 + 1)^*\}$
- iv) $\{a^n b^n c^n \mid n \geq 1000\}$

- A) None of the above is regular
- B) i and ii are not regular but iii and iv are regular
- C) i and iv are regular but ii and iii are not
- D) All are regular sets

☒ A ☐ B ☐ C ☐ D ✓

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Explanation

Type: MCQ

Marks: 1



17) Let $L = \{\epsilon\}$ and let $L \subseteq \{0, 1\}^*$. The minimal finite automata for L has

- A) 1 state
- B) 2 states
- C) 3 states
- D) None of the above

☐ A ☒ B ☐ C ☐ D ✓

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Explanation

Type: MCQ

Marks: 1

Rating: 4/5 ★★★★★

18) The languages

- i) $\{a^i b^j c^k \mid i, j, k > 1000\}$
- ii) $\{a^i b^j c^k \mid i, j, k < 10000\}$
- iii) $\{a^i b^j c^k \mid i < j < k < 1000\}$
- iv) $\{a^i b^j c^k \mid i + j + k > 200\}$

- A) all are finite sets
- B) all are regular sets
- C) all are infinite sets
- D) None

☐ A ☐ B ☐ C ☒ D ✓

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Explanation

Type: MCQ

Marks: 2

Rating: 4.4/5



19) The grammars

(i) $S \rightarrow 0 \mid 0S \mid 1$ (ii) $S \rightarrow 1 \mid 1S \mid 0$ (iii) $S \rightarrow SS \mid 0S \mid 0$ (iv) $S \rightarrow 0S0 \mid 0$

A) (i) is right linear and (ii) is left linear and represent regular sets

B) All are regular grammars

C) (ii) and (iv) are regular grammars and generate regular sets

D) None of the above

☐ A ☐ B ☒ C ☐ D

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Explanation

Type: MCQ

Marks: 1

Rating: 5/5 ★★★★★

20) Consider the minimal finite automata for the set of all strings over $\{0, 1\}^*$ where

(i) the fifth symbol from the right end is a 1

(ii) the fifth symbol from the left end is a 1

A) Both have 6 states

B) (i) has 64 states and (ii) has 6 states

C) Both have 64 states

D) None of the above

☐ A ☐ B ☐ C ☒ D

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Explanation

Type: MCQ

Marks: 1

21) The grammar for 0^* which is a regular set is given by $S \rightarrow 0S \mid S0 \mid 0S0 \mid 0 \mid \epsilon$

A) the grammar is a left linear grammar

B) the grammar is a right linear grammar

C) the grammar is not a regular grammar

D) None of the above

Top

☐ A ☐ B ☐ C ☒ D ✓

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Explanation

Type: MCQ

Marks: 1

★★★★★

22) The set of all strings over $\{a, b, c\}^*$ that have an equal number of a's b's and c's is

- A) a regular set
 B) a finite automata with a very large number of states
 C) not a regular set
 D) a regular set when the reversal of the language is considered

☐ A ☐ B ☒ C ☐ D ✓

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Explanation

Type: MCQ

Marks: 1

★★★★★

23) Consider the sets

- i) $a^i b^j \mid \gcd(i, j) = 1$
 ii) $\{0^m 1^n 0^w + n \mid m, n > 10\}$
 iii) $\{ww \mid w \text{ in } (c + d)^*\}$
 iv) $\{a^i b^j \mid j = \max(i, j)\}$

- A) None of them is a regular set
 B) All are regular sets
 C) Only ii is a regular set the others are not
 D) Only iii is a regular set the rest are not

☒ A ☐ B ☐ C ☐ D ✓

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Explanation

Type: MCQ

Marks: 1

★★★★★

24) Let L_D be the set of all languages accepted by a PDA by final state and L_E the set of all languages accepted by empty stack. Which of the following is true?

- A) $L_D = L_E$
 B) $L_D \subset L_E$
 C) $L_D \supset L_E$

[Top](#)

D) None of the above

☒ A ☐ B ☐ C ☐ D ✓

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Explanation

Type: MCQ

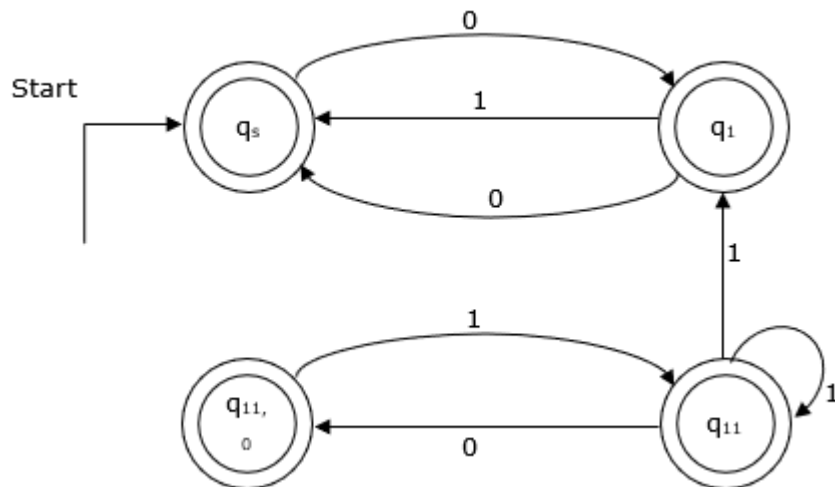
Marks: 2

Rating: 3.67/5

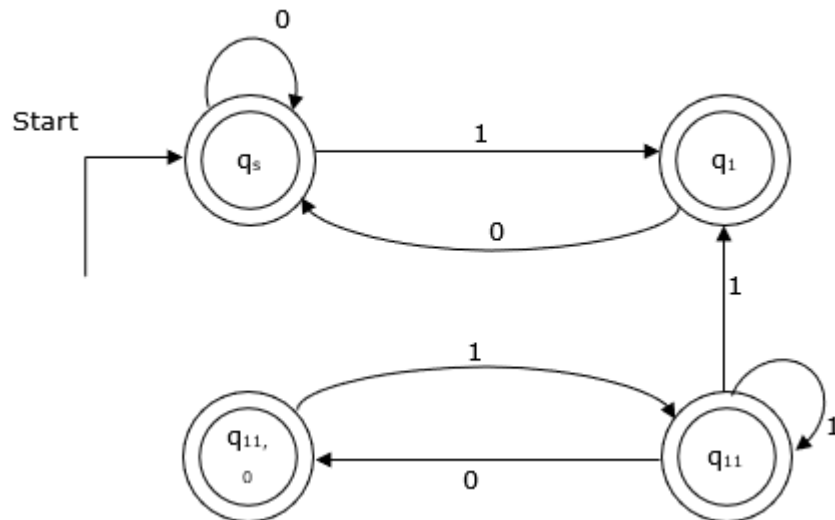
★★★★★

25) Design a DFA accepting set of all strings are $\{0, 1\}$ where, every pair of constitutive 0's occurs before any pair of adjacent 1's.

A)

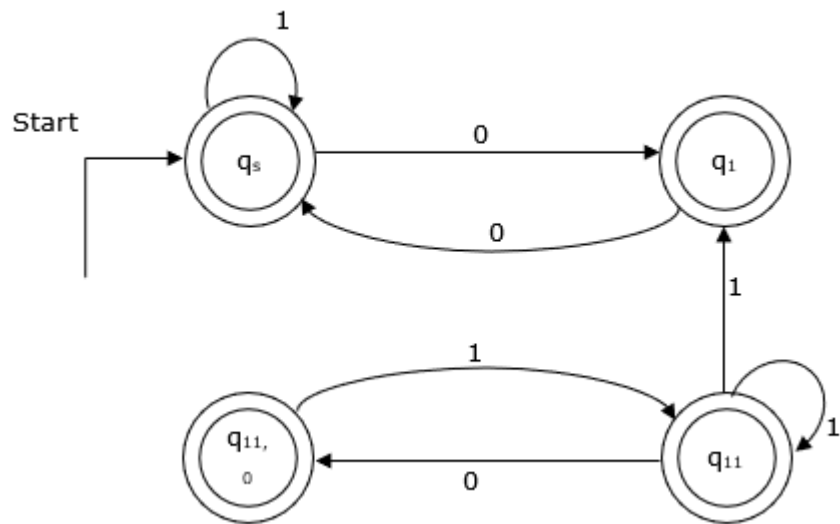


B)



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C)



D) None of the above

☐ A
 ☒ B
 ☐ C
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Type: MCQ

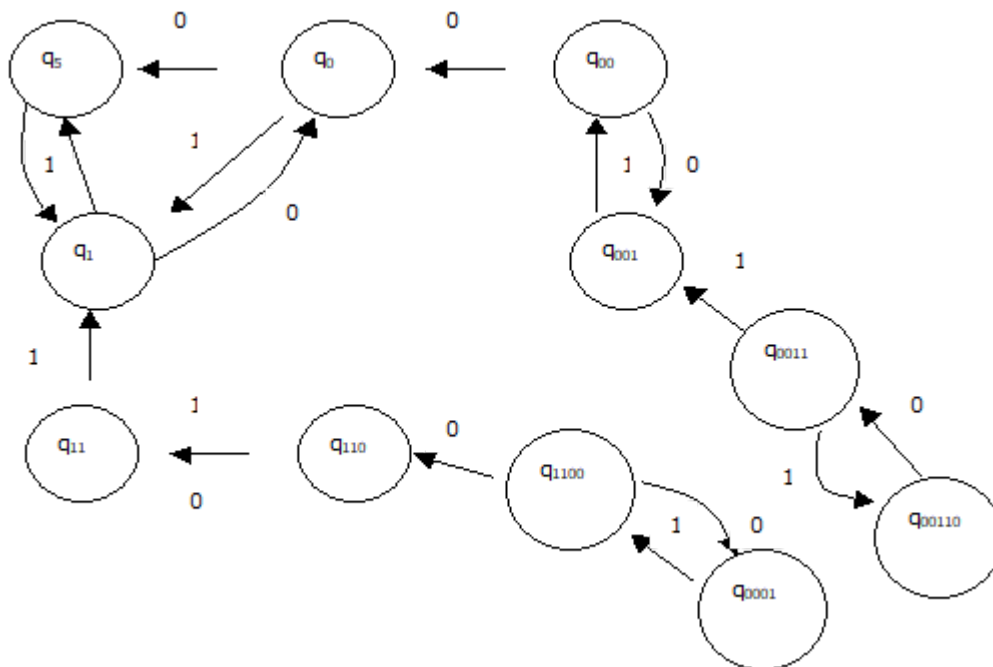
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Rating: 3.67/5

★★★★★

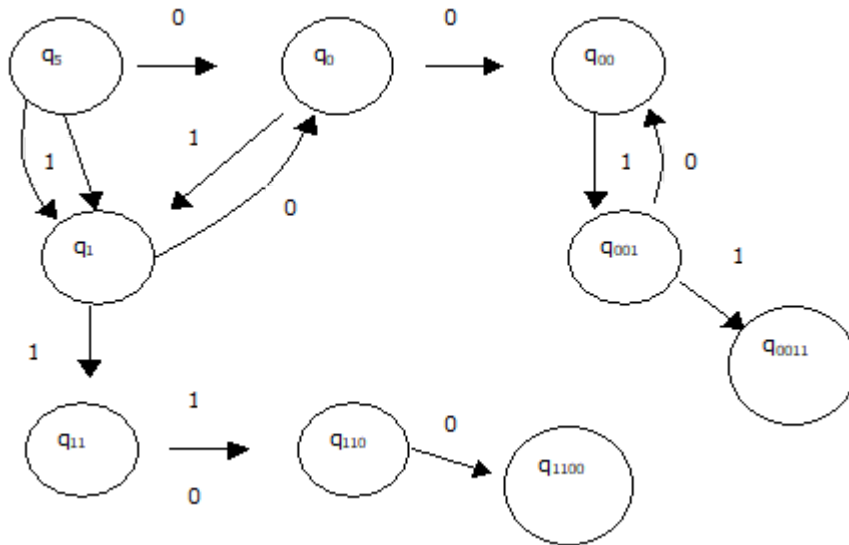
26) Design a DFA accepting set of all strings are $\{0, 1\}$ Containing at most one pair of consecutive 0's and at most one pair of consecutive 1's.

A)



Top

B)



C) Both A and B possible.

D) None of the above.

☒ A
 ☐ B
 ☐ C
 ☐ D
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Explanation

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Type: MCQ

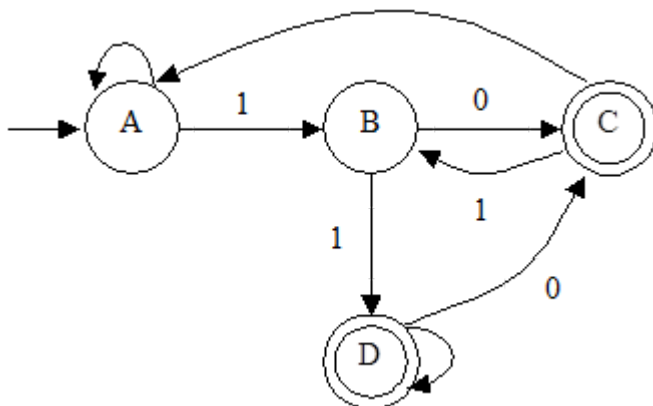
Marks: 1

★★★★★

27) One fine day I draw a DFA for a language, which I know very well and placed, in the house.

On that night, my house was robbed. The robber did the following:

He just removed one of non-starting state from my DFA and removed all edges associated with it, and redrawn it on another paper and robbed my original paper. Next day morning I found that my paper was robbed and saw another FA there. From that day I am thinking that what could be the language accepted by that FA. My original DFA is shown below.



Can you help me in finding out the language of that FA? If you got it choose one of the following.

A) The finite automata accepts all strings whose last but one symbol is 1

B) The finite automata accept all strings, which end with 11

C) The finite automata accepts any length of zeros

D) The finite automata accept all strings "which end with 10 and does not contain two consecutive ones"

Top

☐ A ☐ B ☐ C ☒ D ✓

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Explanation

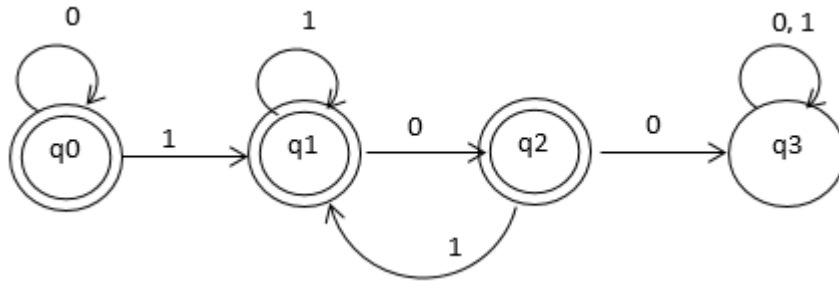
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Marks: 1

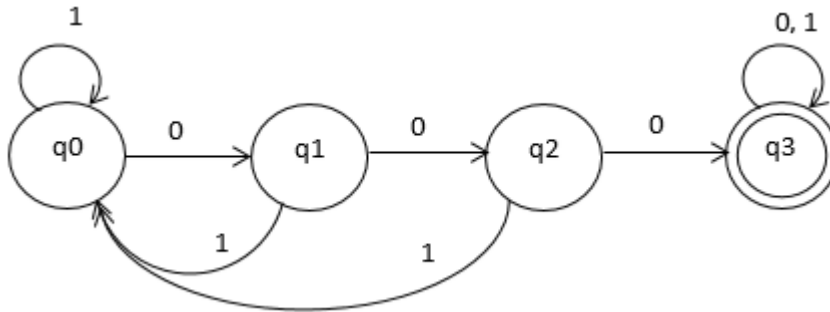
★★★★★

28) Give DFA accepting set of all strings are $\{0, 1\}$ not containing 100 as a substring

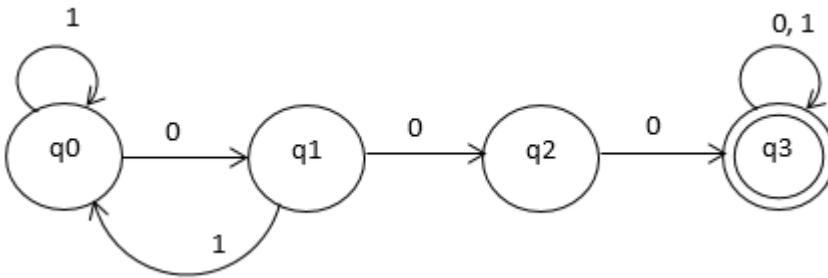
A)



B)



C)



D) None of the above.

☒ A ☐ B ☐ C ☐ D ✓

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Explanation

Type: MCQ

Marks: 1

★★★★★

Top

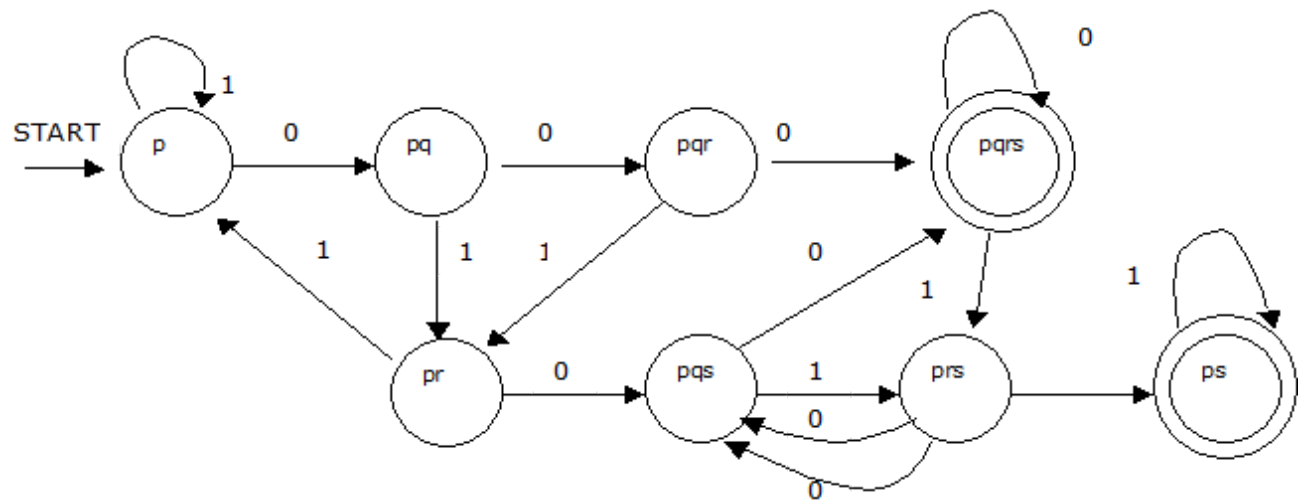
$(\{p, q, r, s\}, \{0, 1\}, \delta_1, r, \{s\})$

δ_1	0	1
p	pq	p
q	r	r
r	s	-
*s	s	s

```

graph LR
    START((START)) --> p((p))
    p -- 1 --> p
    p -- 0 --> pq((pq))
    pq -- 0 --> pqr((pqr))
    pq -- 1 --> pr((pr))
    pqr -- 0 --> pqrs(((pqrs)))
    pr -- 1 --> p
    pr -- 0 --> pqs((pqs))
    pqrs -- 0 --> pqrs
    pqrs -- 1 --> prs((prs))
    pqs -- 1 --> prs
    pqs -- 0 --> pr
    prs -- 0 --> pqs
    prs -- 1 --> ps(((ps)))
    ps -- 1 --> ps
    ps -- 0 --> prs
  
```

C)



D) None of the above.

☒ A
 ☐ B
 ☐ C
 ☐ D
 ☒

Explanation

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Type: MCQ

Marks: 1

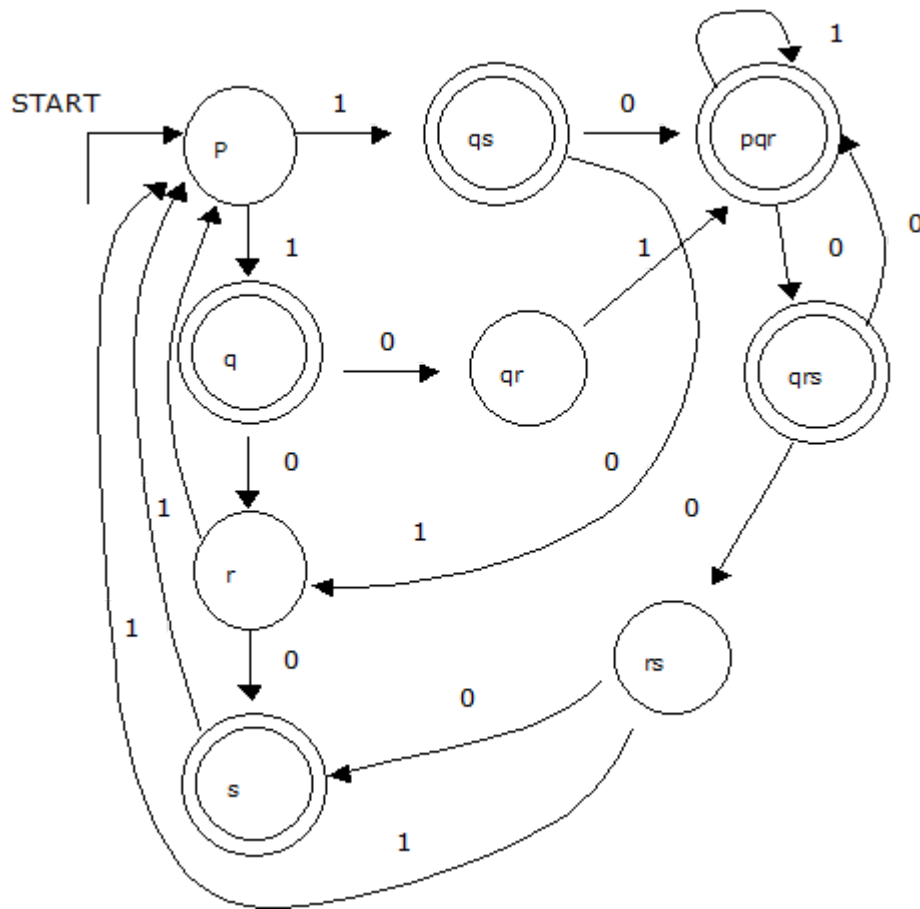
★★★★★

30) Construct DFA's equivalent to NFA's
 $(\{p, q, r, s\}, \{0, 1\}, \delta_2, P, \{q, s\})$

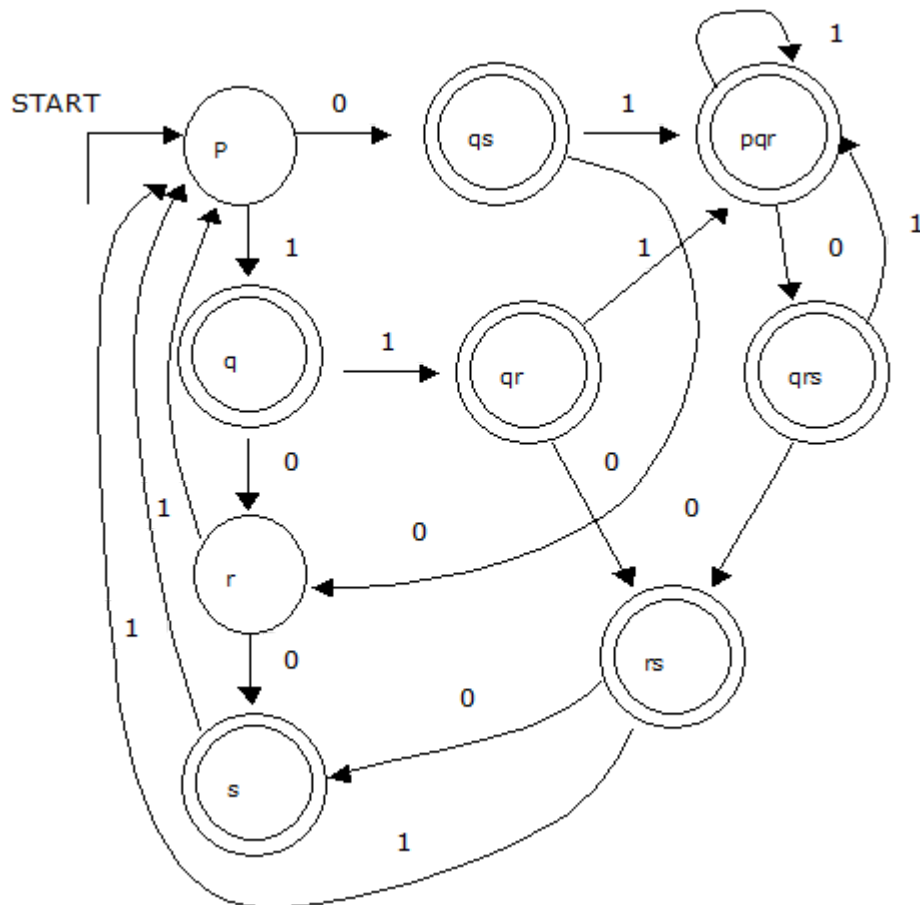
δ_2	0	1
→ p	q,s	q
*q	r	q,r
r	s	p
*s	-	p

Top

A)



B)



C) Both are Possible

D) None of above

Top

☐ A ☒ B ☐ C ☐ D ✓

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Explanation

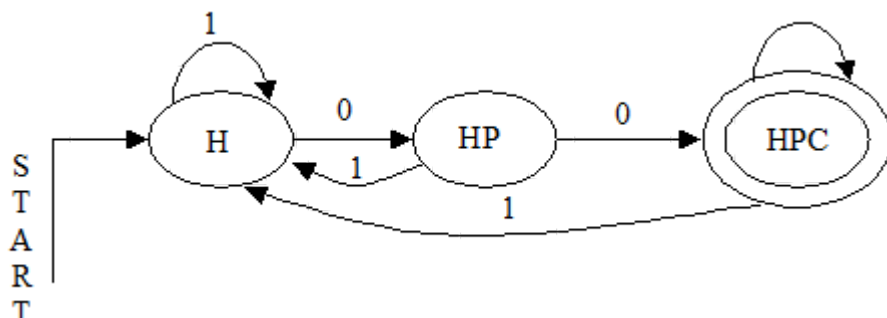
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Marks: 1

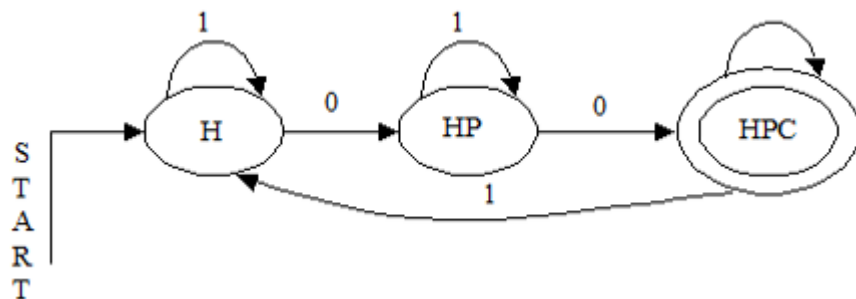
★★★★★

31) Give DFA accepting the following language are $\{0, 1\}$ The set of all strings ending in 00

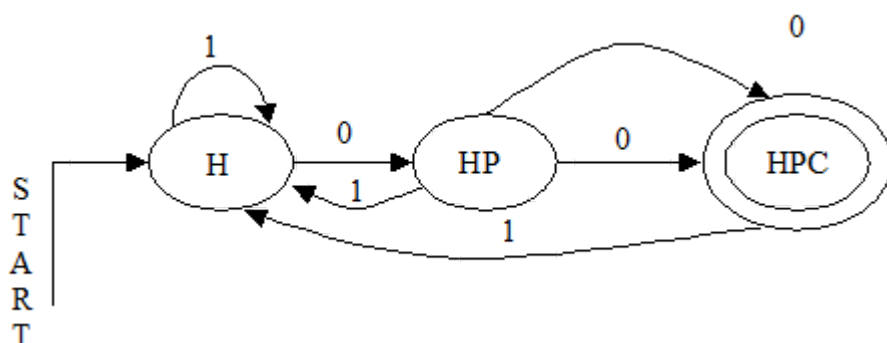
A)



B)



C)



D) None of the above

☒ A ☐ B ☐ C ☐ D ✓

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Explanation

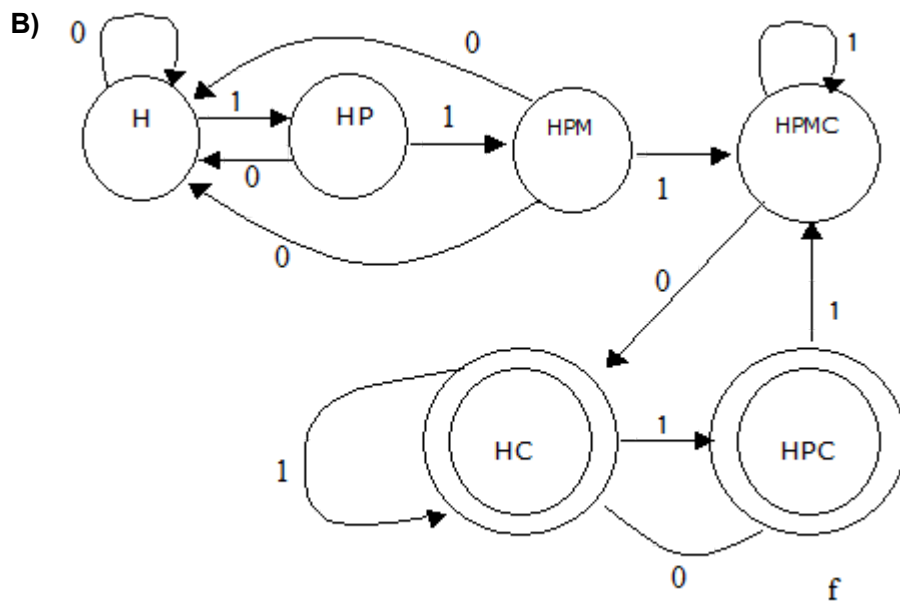
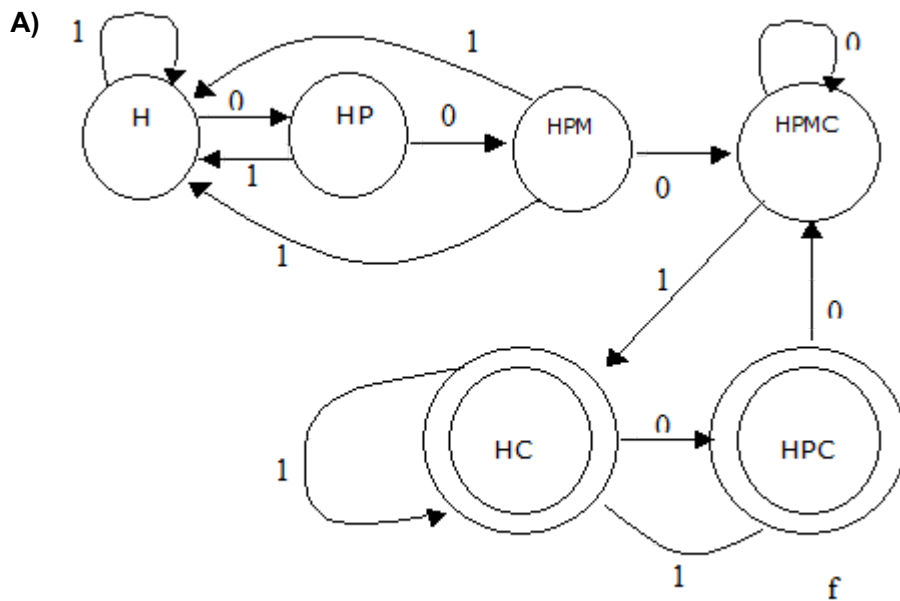
Type: MCQ

Marks: 1

Rating: 3.67/5

★★★★★

32) Give DFA accepting the following languages are $\{0, 1\}$ The set of all things containing three consecutive 0's Top



C) Both are correct

D) None of above

☒ A ☐ B ☐ C ☐ D ✓

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Explanation

Type: MCQ

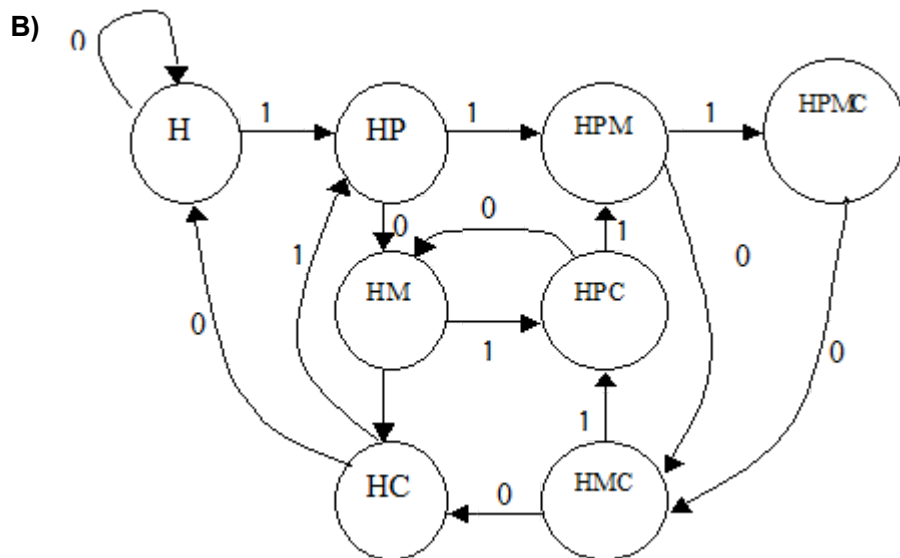
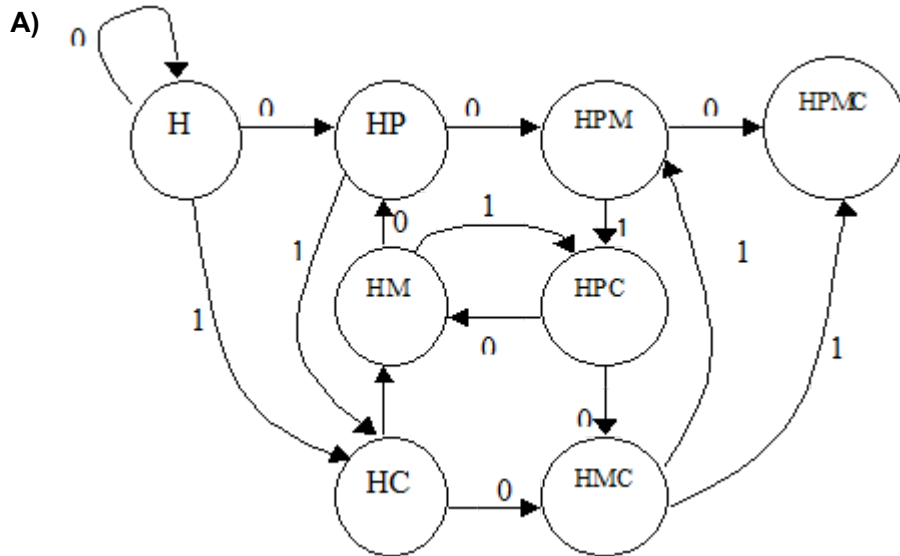
Marks: 1

Rating: 3.25/5

★★★★★

33) Give DFA accepting the following languages are $\{0, 1\}$ The set of all strings where the third symbol from the right end is a 1.

Top



C) Both are correct

D) None of above

☐ A ☒ B ☐ C ☐ D ✓

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Explanation

Type: NAT

Marks: 2

★★★★★

34) The set of all strings where the tenth symbol from the right end is a 1. How many no. of states in DFA

1024

Backspace

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7	8	9
4	5	6
1	2	3
0	.	-

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Explanation

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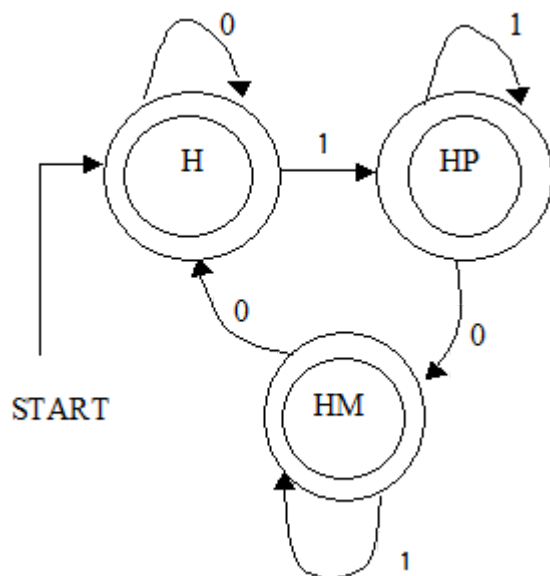
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Marks: 1



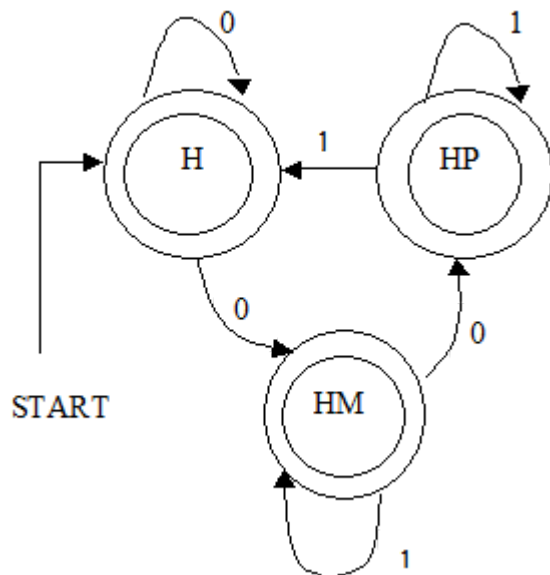
35) Give DFA accepting the following languages are (0, 1) The set of all strings not containing 101 as a substring

A)



Top

B)



C) Either A or B

D) None of the above

☒ A
 ☐ B
 ☐ C
 ☐ D
 ☒

Explanation

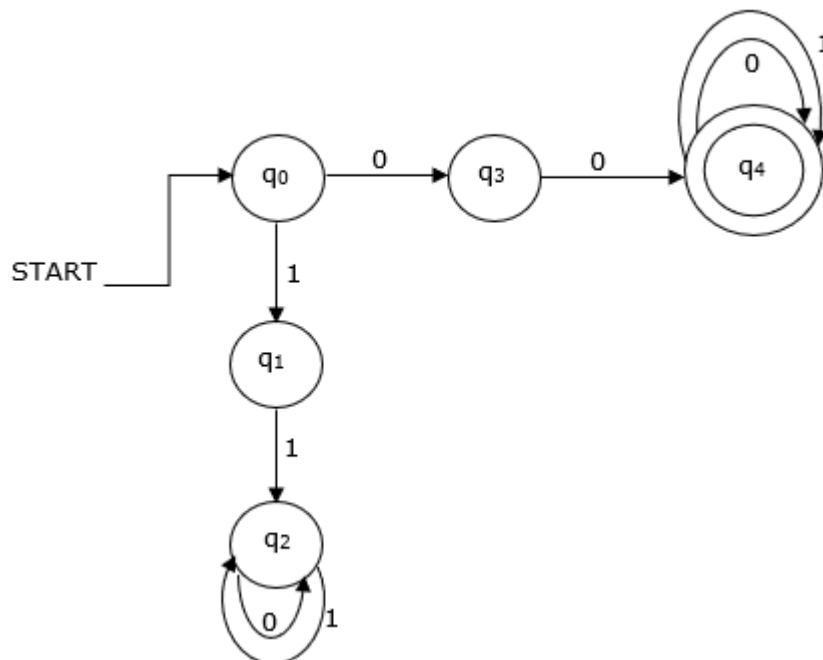
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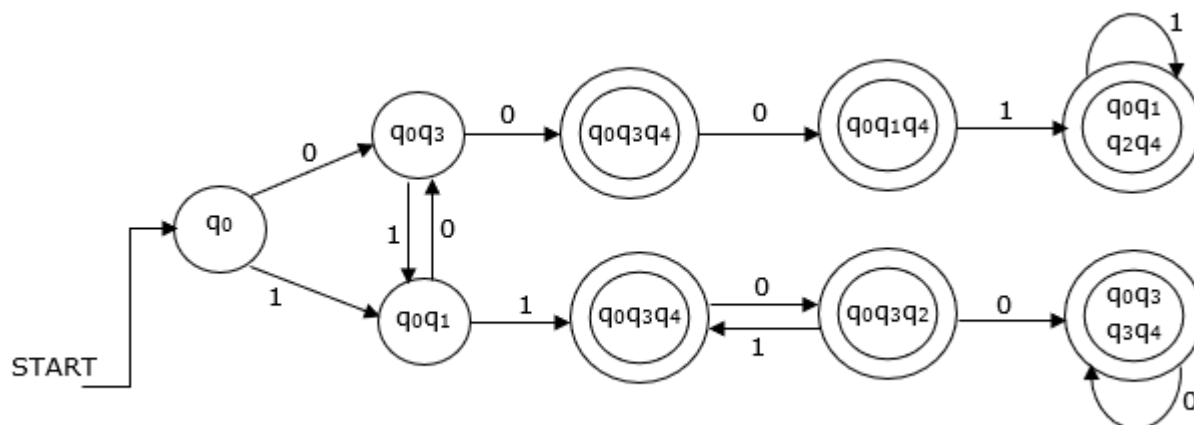
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Rating: 5/5 ★★★★★

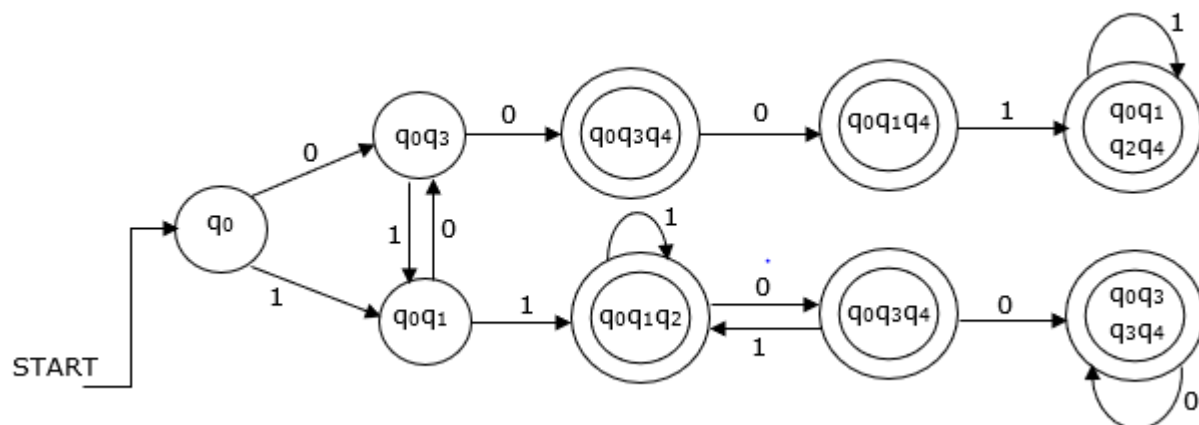
36) Convert following NFA to DFA:

[Top](#)

A)



B)



C) Either A or B

D) None of above

☐ A
 ☒ B
 ☐ C
 ☐ D
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Explanation

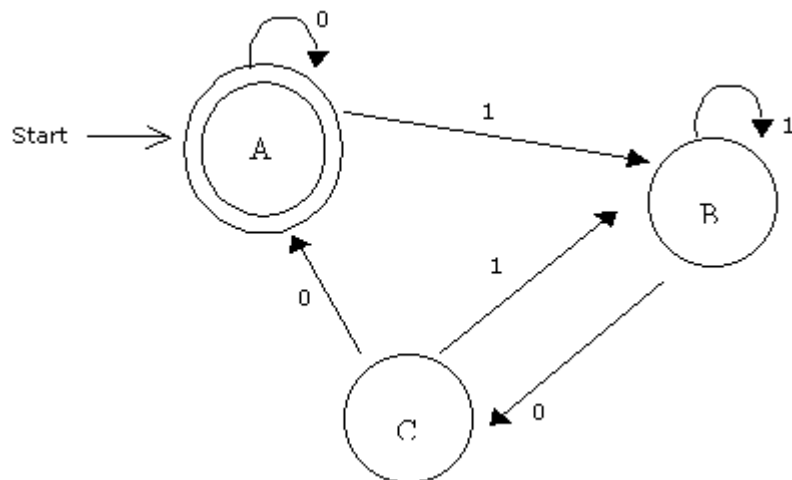
Type: MCQ

Marks: 1

★★★★★

Top

37) Construct regular expression corresponding to the state diagram



- A) $1^* + (0^*1)^*10^*$
 B) $0^* + (0^*1)^*000^*$
 C) $0^* + (0^*1)^*010^*$
 D) None of the above

☐ A ☒ B ☐ C ☐ D ✓

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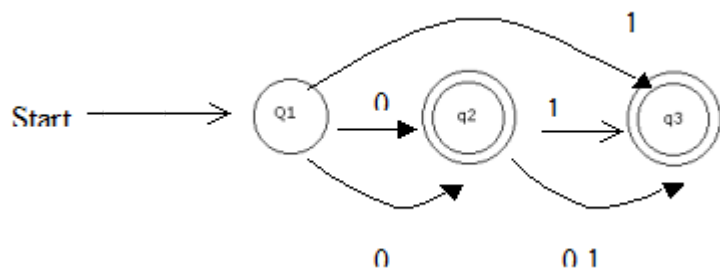
Explanation

Type: MCQ

Marks: 1

★★★★★

38) Construct regular expression corresponding to the state diagram



- A) $0 + (0 + 01 + 11) [00 + (01 + 1) (0 + 1)^*]^* [1 + 01]$
 B) $1 + (0 + 10 + 11) [00 + (01 + 1) (0 + 1)^*]^* [\epsilon + 1 + 01]$
 C) $1 + (1 + 10 + 00) [00 + (01 + 1) (0 + 1)^*]^* [\epsilon + 1 + 11]$
 D) None of the above

☐ A ☒ B ☐ C ☐ D ✓

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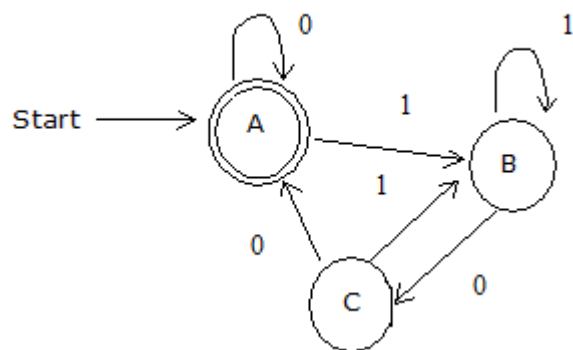
Type: MCQ

Marks: 1

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★★★★★

39) Construct regular expression corresponding to the state diagram.



- A) $[0 + 1 (1 + 01)^* 00]^*$
 B) $[1 + 0 (0 + 10)^* 11]^*$
 C) $[0 + 1 (01 + 0)^* 00]^*$
 D) None of the above

☒ A ☐ B ☐ C ☐ D ☒

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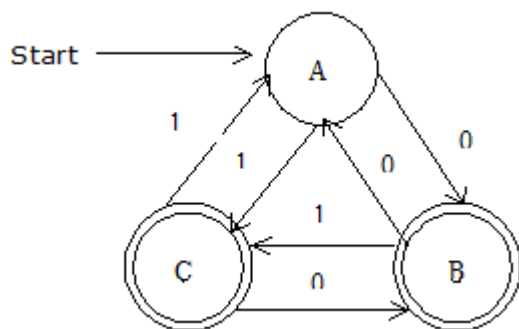
Explanation

Type: MCQ

Marks: 1

★★★★★

40) Construct regular expression corresponding to the state diagram.



- A) $0^*1(11)^*[(10+0)0^*1(11)^*]^* + 1^*0(00)^*[(01+1)1^*0(00)^*]^*$
 B) $0^*1(11)^*[(11+0)0^*1(11)^*]^* + 1^*0(00)^*[(00+1)1^*1(00)^*]^*$
 C) $0^*(10)^*[(11+1)0^*1(11)^*]^* + 1^*0(00)^*[(01+1)1^*0(00)^*]^*$
 D) None of the above

☒ A ☐ B ☐ C ☐ D ☒

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Explanation

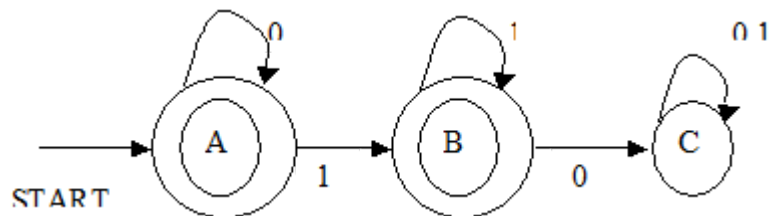
Type: MCQ

Marks: 1

Top



41) Construct regular expression corresponding to the state diagram



- A) 0^*10
 B) 0^*1
 C) 10^*111
 D) None

☐ A ☒ B ☐ C ☐ D ✓

Explanation

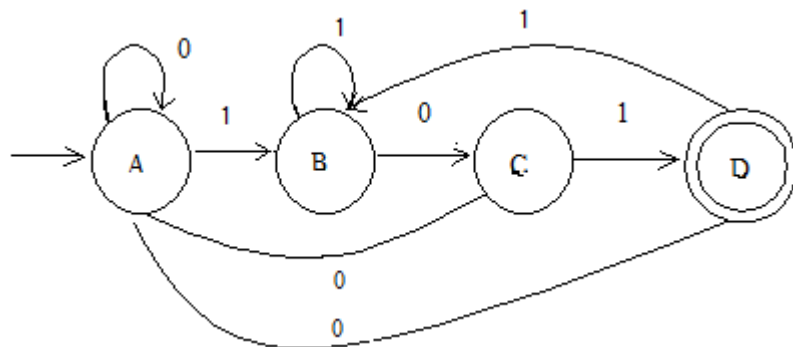
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Type: MCQ

Marks: 1



42) Construct regular expression corresponding to the state diagram



- A) $0^*1[(11 + 010)0^*1(1 + 001)]^*10$
 B) $0^*1[(00 + 010)0^*1(1 + 011)]^*01$
 C) $0^*1[(11 + 010)0^*1(1 + 011)]^*01$
 D) None of the above

☐ A ☒ B ☐ C ☐ D ✓

Explanation

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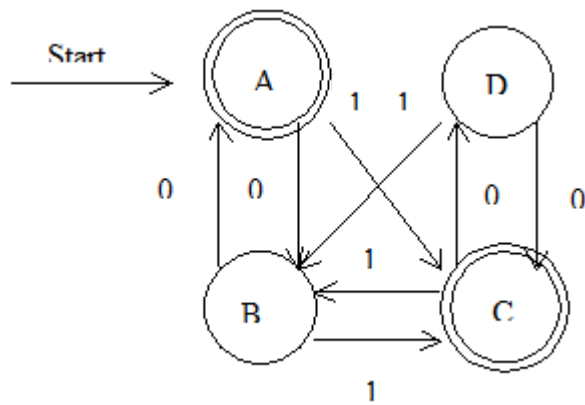
Type: MCQ

Marks: 1



[Top](#)

43) Construct regular expression corresponding to the state diagram



- A) $[11 + (1 + 10) (11 + 00 + 100)^* (0 + 10) 1]^* [\epsilon (0 + 10) \cdot (11 + 00 + 100)^*]$
 B) $[00 + (1 + 01) (00 + 11 + 011)^* (1 + 01) 0]^* [\epsilon (1 + 01) \cdot (00 + 11 + 011)^*]$
 C) $[11 + (1 + 01) (11 + 00 + 011)^* (1 + 01) 0]^* [\epsilon (1 + 01) \cdot (00 + 11 + 011)^*]$
 D) None of above

☐ A ☒ B ☐ C ☐ D ☒

Explanation

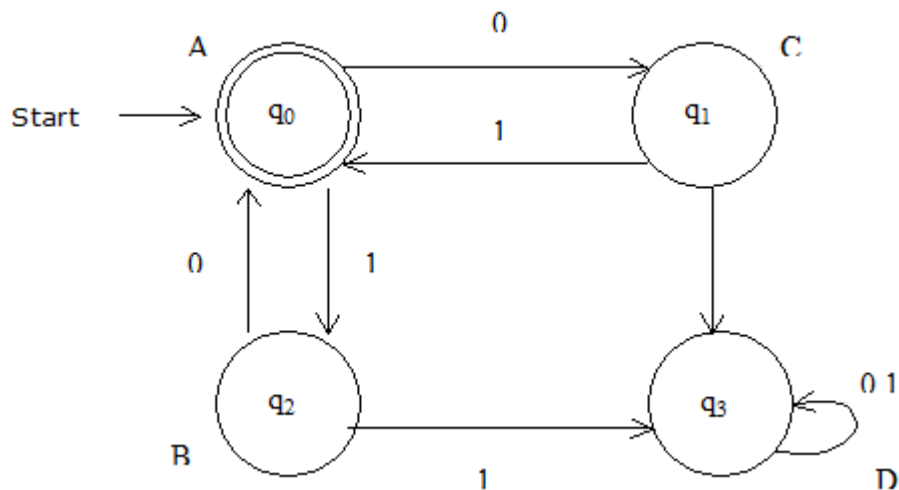
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Type: MCQ

Marks: 1

★★★★★

44) Construct regular expression corresponding to the state diagram



- A) $(11 + 00)^*$
 B) $(01 + 10)^*$
 C) $(10 + 01)^*$
 D) None of the above

[Top](#)

☐ A
 ☐ B
 ☒ C
 ☐ D
 ✓

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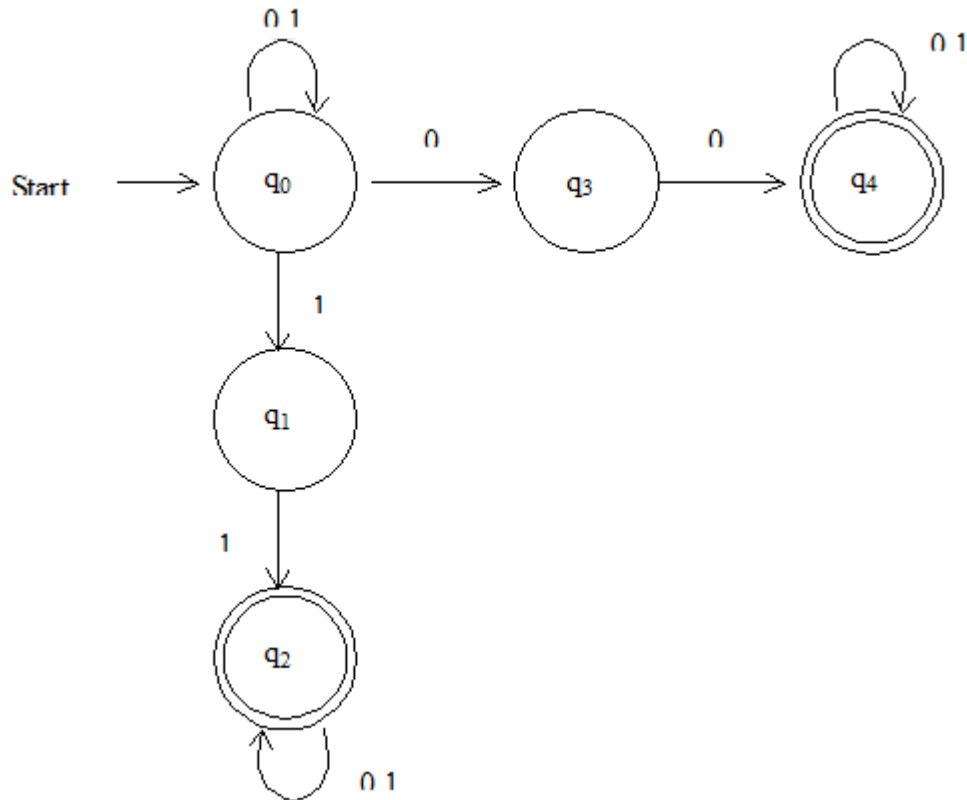
Explanation

Type: MCQ

Marks: 1

★★★★★

45) Construct regular expression corresponding to the state diagram



- A)** $(0 + 1)^* 11 (0 + 1)^* + (0 + 1) 11 (0 + 1)^*$
B) $(0 + 1)^* 00 (0 + 1)^* + (0 + 1) 00 (0 + 1)^*$
C) $(0 + 1)^* 00 (0 + 1)^* + (0 + 1) 00 (0 + 1)^*$
D) $(0 + 1)^* 00 (0 + 1)^* + (0 + 1) 11 (0 + 1)^*$

☐ A
 ☐ B
 ☐ C
 ☒ D
 ✓

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Explanation

Type: MCQ

Marks: 1

★★★★★

46) Give regular expression for the following language over $\{0, 1\}$.

The set of all strings ending in 00

- A)** $(0 + 1)^* 00 (0 + 1)^*$
B) $(0^* + 1^*)^* 00$

Top

C) $(0 + 1)^* 00$

D) $(01)^* 00$

☐ A ☐ B ☒ C ☐ D ☒

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Explanation

Type: MCQ

Marks: 1

★★★★★

47) Give regular expression for the following language over $\{0, 1\}$ The set of all strings containing three consecutive 0's

A) $(0 + 1)^* 000 (0 + 1)^* 00$

B) $(0 + 1)^* 000 (0 + 1)^*$

C) $111(0 + 1)^* 000 (0 + 1)^*$

D) $(0 + 1)^* 000 (01)^*$

☐ A ☒ B ☐ C ☐ D ☒

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Explanation

Type: MCQ

Marks: 1

★★★★★

48) Give regular expression for the following language over $\{0, 1\}$. The set of all strings where the 10th symbol from the right end is a 1

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

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

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

D) None of above

☒ A ☐ B ☐ C ☐ D ☒

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Explanation

Type: MCQ

Marks: 1

★★★★★

49) Give regular expression for the following language over $\{0, 1\}$. The set of all strings not containing 101 as a string

A) $(1 + 1^+00)^* (0^* + 1^+0)$

B) $(0 + 1^+00)^* (1^* + 1^+0)$

C) $(0 + 1^+00)^* (1^* + 1^+0)$

[Top](#)

D) $(0 + 0^+01)^* (0^* + 01^+)$

☒ A ☐ B ☐ C ☐ D ✓

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[Explanation](#)

Type: MCQ

Marks: 1



50) Give Regular expression for the following languages over $\{0, 1\}$. The set of all strings where every pair of adjacent 0's occurs before any pair of adjacent 1's

A) $(0 + 11)^* (0 + 10)^*$

B) $(0 + 10)^* (1 + 10)^*$

C) $(0 + 10)^* (0 + 11)^*$

D) $(1 + 00)^* (1 + 10)^*$

☐ A ☒ B ☐ C ☐ D ✓

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[Explanation](#)

Type: MCQ

Marks: 1



51) Give Regular expression for the following languages over $\{0, 1\}$. The set of all strings with an equal number of 0's and 1's such that no prefix has two more 0's than 1's nor two more 1's than 0's

A) $(01 + 10)^*$

B) $(10 + 01)^*$

C) $(01 + 10)^*111$

D) None of above

☒ A ☐ B ☐ C ☐ D ✓

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[Explanation](#)

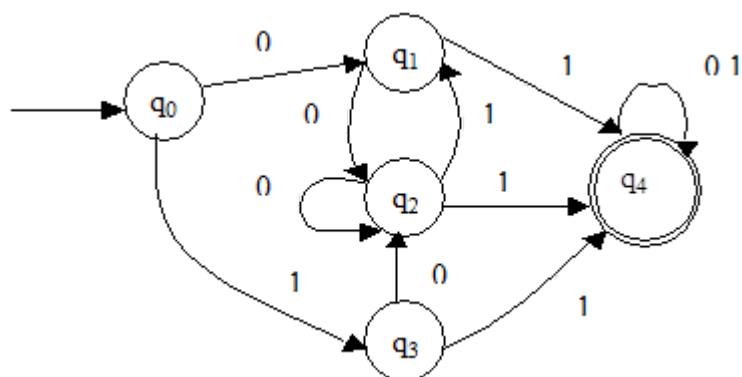
Type: NAT

Marks: 2



[Top](#)

52) How many states are there are in minimized DFA of the following DFA.



3

Backspace

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Clear All

Submit



Explanation

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Type: MCQ

Marks: 1



53) Describe in English the sets accepted by the following regular expressions (11)*

- A) Even no. of 1's
- B) Odd no of 1's
- C) Both are possible odd & even
- D) None of above

☒ A

☐ B

☐ C

☐ D


Explanation

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Type: MCQ

Marks: 1



54) Describe in English the sets accepted by the following regular expressions

$(1 + 01) (001)^* (\epsilon + 0 + 00)$

A) The set of all string over $\{0, 1\}$ containing three consecutive 0's

$(0 + 1)^* 000 (0 + 1)^*$

B) The set of all string over $\{0, 1\}$ not containing three consecutive 0's

$(0 + 1)^* 000 (0 + 1)^*$

C) The set of all string over $\{0, 1\}$ not containing three consecutive 1's

$(0 + 1)^* 000 (0 + 1)^*$

D) None of the above.

☐ A ☒ B ☐ C ☐ D ☒

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[Explanation](#)

Type: MCQ

Marks: 1



55) Describe in English the sets accepted by the following regular expressions

$[00 + 11 + (01 + 10) (00 + 11)^* (01 + 10)]^*$

A) Set of all strings over $\{0, 1\}$ with an even no. of 0's and an even no. of 1's

B) Set of all strings over $\{0, 1\}$ with an odd no. of 0's and an odd no. of 1's

C) Set of all strings over $\{0, 1\}$ with an odd no. of 0's and an even no. of 1's

D) None of above

☒ A ☐ B ☐ C ☐ D ☒

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[Explanation](#)

Type: MCQ

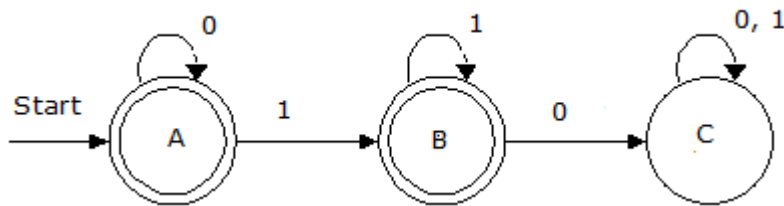
Marks: 1

Rating: 4.67/5



[Top](#)

56) Describe in English the sets acceptable by the fig. Where dia. are given



- A) The set of all strings over $\{0, 1\}$ with avg. no. of 0's followed by avg. no. of 1's
 B) The set of all strings over $\{0, 1\}$ with any no. of 0's followed by any no. of 1's
 C) The set of all strings over $\{0, 1\}$ with any no. of 0's followed by avg no. of 1's
 D) The set of all strings over $\{0, 1\}$ with avg. no. of 0's followed by any no. of 1's

☐ A ☐ B ☐ C ☒ D ✓

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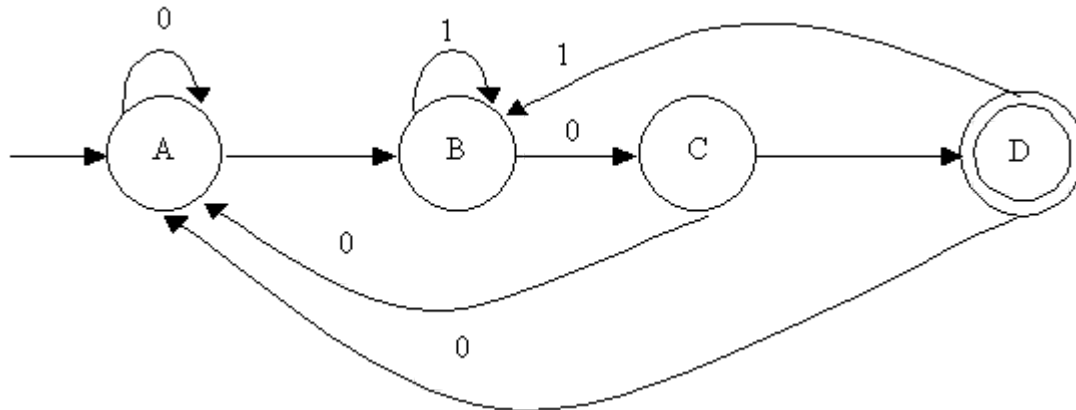
Explanation

Type: MCQ

Marks: 1

★★★★★

57) Describe in English the sets acceptable by the fig. Where dia. are given



- A) The set of all strings containing one or more repetition of set of all strings ending in 111 and having only one Occurrence of 101
 B) The set of all strings containing one or more repetition of set of all strings ending in 101 and having only one Occurrence of 101
 C) The set of all strings containing one or more repetition of set of all strings ending in 101 and having only one Occurrence of 110
 D) None of the above

☐ A ☒ B ☐ C ☐ D ✓

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Explanation

Type: MCQ

Marks: 1



58) Write a regular expression for the following set

The set of all strings with at most one pair of consecutive 0's and of most one pair of consecutive 1's

A)
$$\frac{(0+1)^* 00 (0+1)^* 00 (0+1)^*}{01 (0+1)^* 11 (0+1)^* 11 (0+1)^*}$$

B)
$$\frac{(0+1)^* 00 (0+1)^* 11 (0+1)^*}{01 (0+1)^* 11 (0+1)^* 00 (0+1)^*}$$

C)
$$\frac{(0+1)^* 11 (0+1)^* 11 (0+1)^*}{01 (0+1)^* 00 (0+1)^* 00 (0+1)^*}$$

D) None of the above.

☒ A ☐ B ☐ C ☐ D

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[Explanation](#)

Type: MCQ

Marks: 1



59) Write a regular expression for the following set

The set of all strings are {0, 1} where every block of five consecutive symbols contains at least 2 0's

A)
$$\frac{[(0+1)(0+1)(0+1)(0+1)(0+1)]^*}{[(0+1)(0+1)(0+1)(0+1)(0+1)]^*}$$

B)
$$\frac{[(0+1)(0+1)(0+1)(0+1)(0+1)]^* r}{[(0+1)(0+1)(0+1)(0+1)(0+1)]^*}$$

C)
$$\frac{[(0+1)(0+1)(0+1)(0+1)(0+1)]^* rrr}{[(0+1)(0+1)(0+1)(0+1)(0+1)]^*}$$

D) None of above.

☐ A ☒ B ☐ C ☐ D

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[Explanation](#)

Type: MCQ

Marks: 1



[Top](#)

60) Write a regular expression for the following set. The set of all strings over $\{0, 1\}$ beginning with 01. which interpreted the binary representation of an integer is congruent to zero module 5

- A)** $1 (1 (11^* 0^*)^* 11^* 11 10^*$
- B)** $1 (0 (11^* 0^*)^* 11^* 10 10^*$
- C)** $1 (0 (11^* 0^*)^* 00^* 11 10^*$
- D)** None of the above

☒ A ☐ B ☐ C ☐ D 

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[Explanation](#)

Type: MCQ

Marks: 1



61) Time spent for FA minimization is

- A)** $O(kn^3)$
- B)** $O(kn^2)$
- C)** $O(n^2)$
- D)** None of the above

☐ A ☒ B ☐ C ☐ D 

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[Explanation](#)

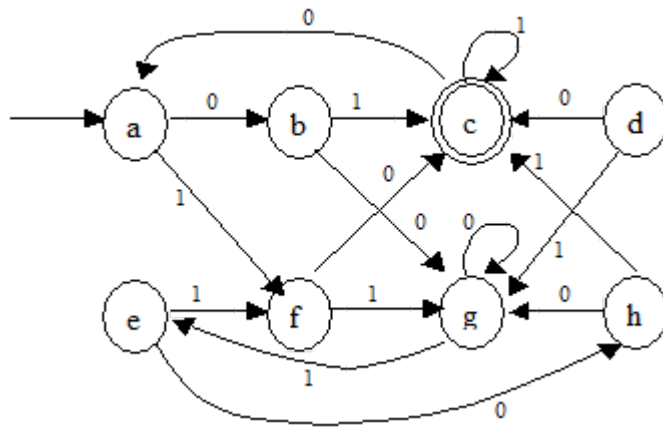
Type: NAT

Marks: 2



[Top](#)

62) State the minimum no of states in minimal DFA for following DFA



5

Backspace

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Clear All

Submit



Explanation

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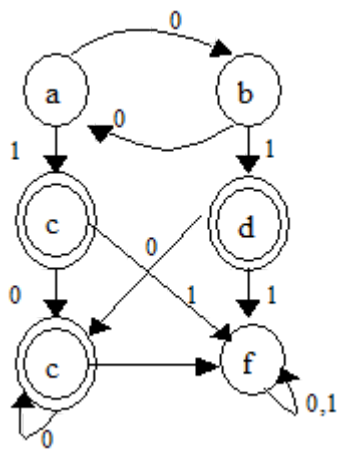
Type: NAT

Marks: 2



Top

63) Find the minimum no of states in minimal states in for following DFA.



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Backspace

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Clear All

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Explanation

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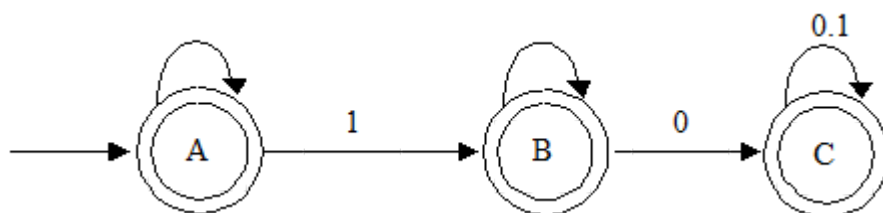
Type: NAT

Marks: 2

Rating: 3.5/5



64) Find the minimum no. of states in minimal states DFA for following DFA.



Top

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Backspace

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Clear All

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Explanation

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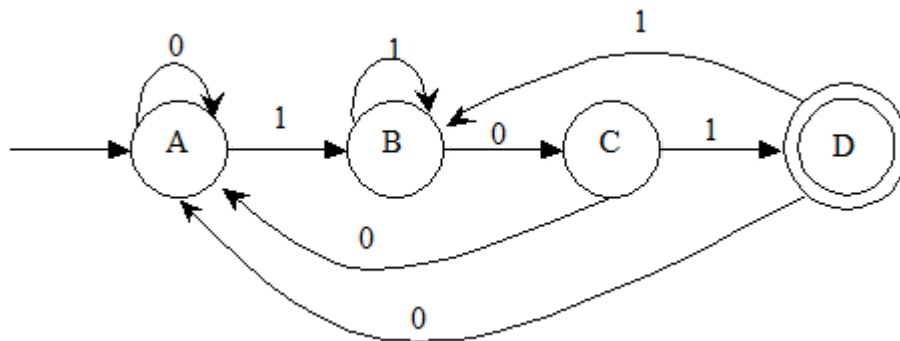
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Type: NAT

Marks: 2

Rating: 4/5 ★★★★★

65) Find the minimum no. of states in minimal states DFA for following DFA.

4

Backspace

7

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Clear All		

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Explanation

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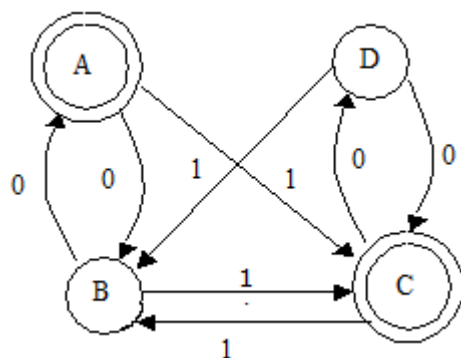
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Type: NAT

Marks: 2



66) Find the minimum no. of states in minimal states DFA for following DFA.



4		
Backspace		
7	8	9
4	5	6
1	2	3
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Clear All		

Submit



Explanation

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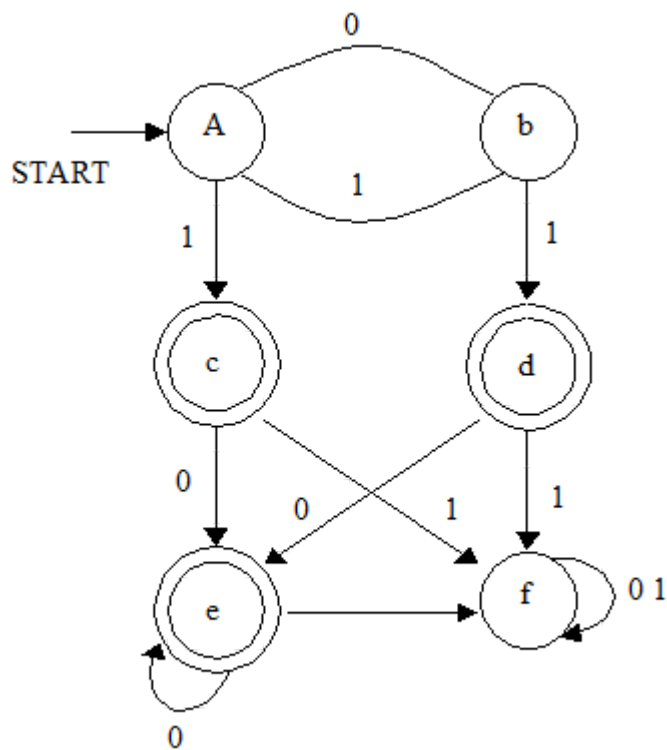
Top

Type: NAT

Marks: 2



67) Find the minimum no. of states in minimal states DFA for following DFA.



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Backspace

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Clear All

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Explanation

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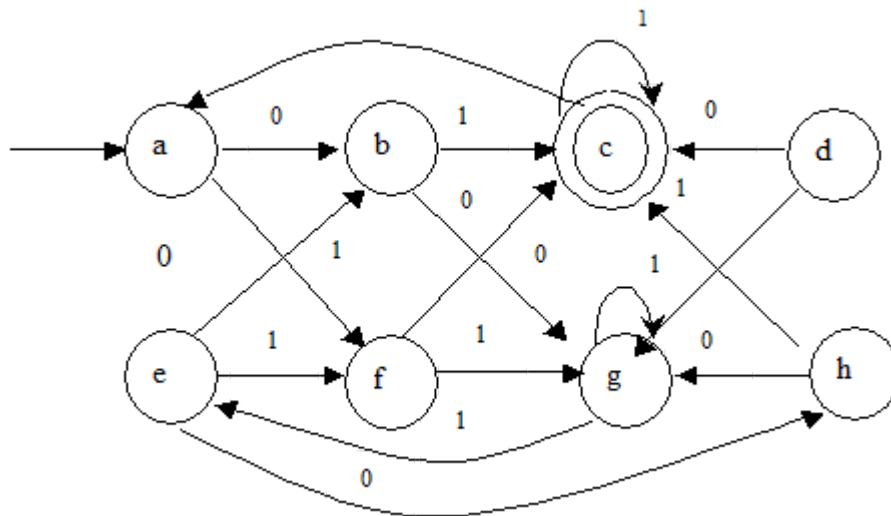
Type: NAT

Marks: 2

Top



68) Find the minimum no. of states in minimal states DFA for following DFA.



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Backspace

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Clear All

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Explanation

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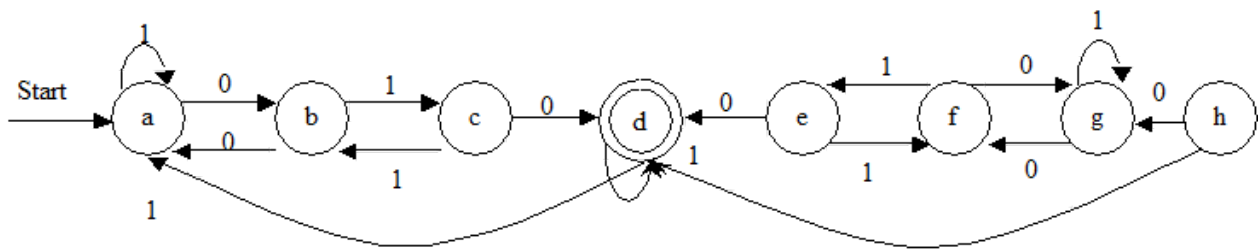
Type: NAT

Marks: 2



Top

69) Find the minimum no. of states in minimal states DFA for following DFA.



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Backspace

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Clear All

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Explanation

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Type: NAT

Marks: 1



70) The minimal FA accepting set of all strings over $\{0, 1\}$ that end in 00 has

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Backspace

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Top

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Clear All		

Submit ✓
Explanation

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Type: MCQ

Marks: 1



71) The minimal FA accepting Set of all strings over {0, 1} containing 3 consecutive 0's

A) 3 states

B) 5 states

C) 4 states

D) None

☐ A ☐ B ☒ C ☐ D ✓

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Explanation

Type: MCQ

Marks: 1



72) The smaller FA that accept the language {x| length of x divisible by 3} how many states?

A) 2 states

B) 4 states

C) 3 states

D) 5 states

☐ A ☐ B ☒ C ☐ D ✓

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Explanation

Type: MCQ

Marks: 1



Top

73) Given an arbitrary NFA with N states, the maximum number of states in an equivalent minimized DFA is at least

- A) N^2
- B) 2^N
- C) N
- D) $N!$

☐ A ☒ B ☐ C ☐ D ✓

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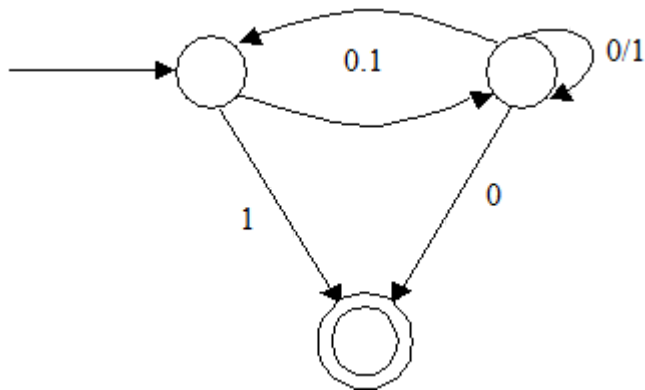
Explanation

Type: MCQ

Marks: 1

★★★★★

74) Consider the NFA M shown below



Language accepted by M be L . Let L_1 be the language accepted by the NFA M_1 , obtained by changing non-accepting states of M to accepting states. Which of the following statements is true?

- A) $L_1 = \{0, 1\}^* - L$
- B) $L_1 = \{0, 1\}^*$
- C) $L_1 \subseteq L$
- D) $L_1 = L$

☐ A ☒ B ☐ C ☐ D ✓

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Explanation

Type: MCQ

Marks: 1

★★★★★

75) The word 'formal' in formal languages means

Top

- A)** The symbols used have well-defined meaning
- B)** Only the form of the string of symbols is significant
- C)** They are unnecessary, in reality
- D)** None of the above

☐ A ☒ B ☐ C ☐ D ✓

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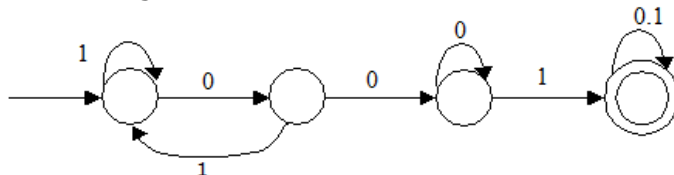
Explanation

Type: NAT

Marks: 2

★★★★★

76) Consider the following Deterministic finite state automaton M.



Let S denote the set of seven bit binary strings in which the first, the fourth, and the last bits are 1, The number of strings in S that are accepted by M is

7

Backspace

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Clear All

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Explanation

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Type: NAT

Marks: 1

★★★★★

Top

77) How many two state FA can be drawn over alphabet $\{0, 1\}$, which accepts empty language?

20		
Backspace		
7	8	9
4	5	6
1	2	3
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Clear All		



Explanation

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Type: NAT

Marks: 1



78) How many two state FA can be drawn over alphabet $\{0, 1\}$, which accepts $(0 + 1)^*$

20		
Backspace		
7	8	9
4	5	6
1	2	3
0	.	-
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Clear All		



Explanation

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[Top](#)

Type: NAT

Marks: 1



79) How many DFA's exist with two states over the input alphabet $\{0, 1\}$.

64		
Backspace		
7	8	9
4	5	6
1	2	3
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Clear All		



Explanation

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Type: NAT

Marks: 2



80) How many DFA's exist with three states over the input alphabet $\{0, 1\}$.

5832		
Backspace		
7	8	9
4	5	6
1	2	3
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Clear All		

[Top](#)

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Explanation

Type: MCQ

Marks: 1



81) The recognizing capabilities of NDFSM and DFSM

- A) may be different
- B) must be same
- C) must be different
- D) none of the above

☐ A☒ B☐ C☐ D

Share

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Explanation

Type: NAT

Marks: 1

82) What is the minimum number of states of the NFA which accepts the language $\{ab : ab^n : n \geq 0\} \cup \{a b a^n : n \geq 0\}$

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Clear All

Submit

Explanation

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Top

Type: NAT

Marks: 2



83) What are the minimum number of states in the NFA accepting the language $\{ab, abc\}^*$?

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Backspace		
7	8	9
4	5	6
1	2	3
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Clear All		



Explanation

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Type: MCQ

Marks: 1



84) The basic limitation of FSM is that

- A) It can't remember arbitrary large amount of information
- B) It sometimes fails to recognize grammars that are regular
- C) It sometimes recognizes grammars that are not regular
- D) All of the above comments are true

☒ A

☐ B

☐ C

☐ D


Explanation

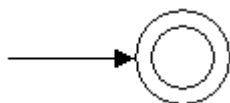
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Type: MCQ

Marks: 1



85) The FSM pictured below recognizes



Top

- A)** all strings
- B)** no string
- C)** ϵ - alone
- D)** None of the above

☐ A ☐ B ☒ C ☐ D ✓

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[Explanation](#)

Type: MCQ

Marks: 1



86) The number of states of the FSM, required to simulate the behaviour of a computer, with a memory capable of storing 'm' words, each of length 'n' bits is

- A)** $m \times 2^n$
- B)** 2^{mn}
- C)** 2^{m+n}
- D)** None of the above

☐ A ☒ B ☐ C ☐ D ✓

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Type: MCQ

Marks: 1



87) Which of the following regular expression identities are true?

- A)** $r^* = r^*$
- B)** $(r^*s^*)^* = (r + s)^*$
- C)** $(r + s)^* = r^* + s^*$
- D)** $r^*s^* = r^* + s^*$

☐ A ☒ B ☐ C ☐ D ✓

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Type: MCQ

Marks: 1



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88) Which of the following regular expressions over $\{0, 1\}$ denotes the set of all strings not containing 100 as a substring?

- A) $0^*(1 + 0)^*$
- B) 0^*1^*01
- C) 0^*1010^*
- D) $0^*(10 + 1)^*$

☐ A ☐ B ☐ C ☒ D ✓

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Type: MCQ

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89) The string 1101 does not belong to the set represented by

- A) $110^*(0 + 1)$
- B) $(10)^*(01)^*(00 + 11)^*$
- C) $1(0 + 1)^*101$
- D) $(00 + (11)^*0)^*$

☐ A ☒ B ☐ C ☐ D ✓

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Type: MCQ

Marks: 1



90) Let $r = 1(1 + 0)^*$, $s = 11^*0$ and $t = 1^*0$ be three regular expressions. Which one of the following is true?

- A) $L(s) \subseteq L(r)$ and $L(s) \subseteq L(t)$
- B) $L(s) \subseteq L(r)$ and $L(s) \subseteq L(t)$
- C) $L(r) \subseteq L(s)$ and $L(s) \subseteq L(t)$
- D) $L(t) \subseteq L(s)$ and $L(s) \subseteq L(r)$

☒ A ☐ B ☐ C ☐ D ✓

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Type: MCQ

Marks: 1



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91) Two of the following four regular expression are equivalent which of two? (ϵ is the empty string)

- i) $(00)^*(\epsilon + 0)$ ii) $(00)^*$ iii) 0^* iv) $0(00)^*$

- A) i and ii
B) i and iii
C) ii and iii
D) iii and iv

☐ A ☒ B ☐ C ☐ D 

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Type: MCQ

Marks: 1

★★★★★

92) If the regular set 'A' represented by $A = (01 + 1)^*$ and the regular set 'B' is represented by $B = ((01)^*1^*)^*$ which of the following is true?

- A) $A \subseteq B$
B) A and B are in comparable
C) $B \subseteq A$
D) $A = B$

☐ A ☐ B ☐ C ☒ D 

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Type: MCQ

Marks: 1

★★★★★

93) Let 'S' and 'T' be languages over $\Sigma = \{a, b\}$ represented by the regular expression $(a + b^*)^*$ and $(a + b)^*$

- A) $S \subset T$
B) $S = T$
C) $T \subset S$
D) $S \cap T = \emptyset$

☐ A ☒ B ☐ C ☐ D 

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Type: MCQ

Marks: 1

★★★★★

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94) The regular expression $0^*(10^*)^*$ denotes the same set as

- A)** $(1^*0)^*1^*$
B) $0 + (0 + 10)^*$
C) $(0 + 1)^*10(0 + 1)^*$
D) none of the above

☒ A ☐ B ☐ C ☐ D ✓

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Explanation

Type: MCQ

Marks: 1



95) Consider the following regular expressions

- i) $(a/b)^*$ ii) $(a^*/b^*)^*$ iii) $((\epsilon/a)b^*)^*$

Which of the following statements is correct?

- A)** (i), (ii) are equal and (ii), (iii) are not
B) (i), (ii) are equal and (i), (iii) are not
C) (ii), (iii) are equal and (i), (ii) are not
D) all are equal

☐ A ☐ B ☐ C ☒ D ✓

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Explanation

Type: NAT

Marks: 2



96) How many strings of length less than 4 contains the language described by the regular expression $(a + b)^*b(a + ab)^*$.

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Clear All

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Type: MCQ

Marks: 1



97) Which of the following is true ?

A) $(ab)^*a = a(ba)^*$ and $(P^*Q^*)^* = (p^* + Q^*)^*$ B) $(a + b)^*ab[(a + b)^*ab(a + b)^* + b^*a^*] + b^*a^* = (a + b)^*$ C) $(a + b)^*ab(a + b)^* + b^*a^* = (a + b)^*$

D) all of the above

☐ A

☐ B

☐ C

☒ D

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Type: MCQ

Marks: 1



98) Which of the following is false?

A) $(a^*b)^*a^* = a^*(ba^*)^*$ B) $(a^*bbb)^*a^* = a^*(bbba^*)^*$ C) $(a)^*(\epsilon + a) = a^*a$ D) Let R, S and T be three languages and assume that ϵ is not in S. Then from the premise $R = SR + T$ we can conclude that $R = S^*T$ and from the premise $R = S^*T$ we can conclude that $R = SR + T$
☐ A

☐ B

☒ C

☐ D

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Type: MCQ

Marks: 1


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99) Consider the following 2-DFA $(\{q_0, \dots, q_5\}, \{0,1\}, \delta, q_0, \{q_2\})$, where δ is

	0	1
q_0	(q_0, R)	(q_1, R)
q_1	(q_1, R)	(q_2, R)
q_2	(q_2, R)	(q_3, L)
q_3	(q_4, L)	(q_3, L)
q_4	(q_0, R)	(q_4, L)

Which of the following strings is accepted by the above FA?

- A) 1100011001000
- B) 1000001110000
- C) 1100000000111
- D) 1100001100110

☐ A ☐ B ☐ C ☒ D ✓

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Explanation

Type: MCQ

Marks: 1



100) Choose the incorrect statement

- A) Moore and Melay machines are FSM 's with output capability
- B) Any given Melay machine has an equivalent Moore machine.
- C) Any given Moore machine has an equivalent Melay machine
- D) Moore machine is not a FSM.

☐ A ☐ B ☐ C ☒ D ✓

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Explanation

Type: MCQ

Marks: 1



101) The major difference between a Moore and Melay machine is that

- A) The output of the former depends on the present state and present input
- B) The output of the former depends only on the present state
- C) The output of the former depends only on the present input
- D) None of the above

Top

☐ A
 ☒ B
 ☐ C
 ☐ D
 ☒

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Explanation

Type: MCQ

Marks: 1

★★★★★

102) An FSM with output capability can be used to add two given integers in binary representation. This is

- A) True
- B) False
- C) May be true
- D) None of the above

☒ A
 ☐ B
 ☐ C
 ☐ D
 ☒

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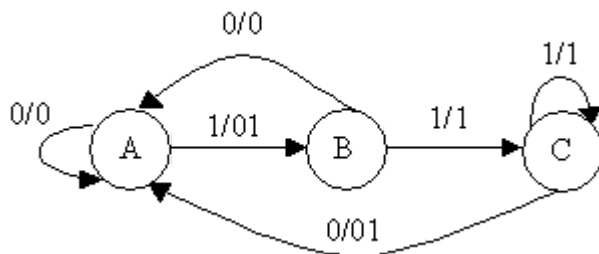
Explanation

Type: MCQ

Marks: 1

★★★★★

103) The finite state machine described by the following state diagram with A as starting state, where an arc label is x/y and x stands for 1-bit input and y stands for 2-bit output.



- A) outputs the sum of the present previous bits of the input.
- B) outputs 00 whenever input sequence contains 10.
- C) outputs 01 whenever input sequence contains 11
- D) none of the above

☒ A
 ☐ B
 ☐ C
 ☐ D
 ☒

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Explanation

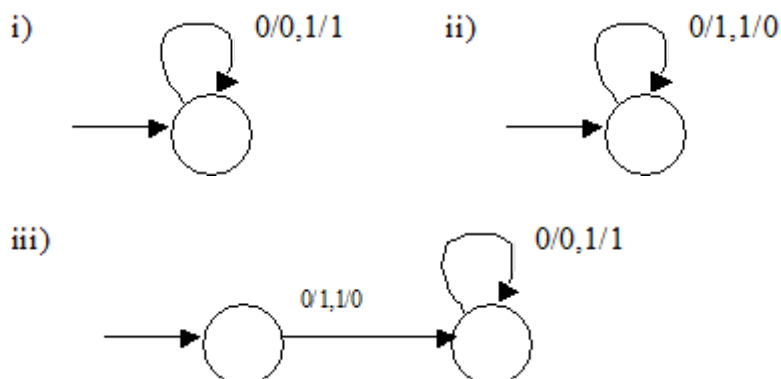
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Type: MCQ

Marks: 1

★★★★★

104) Let $(Me)^2$ mean that given a Mealy machine, an input string is processed and then the output string is immediately fed into the machine (as input) and reprocessed. Only this second resultant output is considered the final output of $(Me)^2$. If the final output string is the same as the original input string, we say that $(Me)^2$ has an identity property. Symbolically, we write $(Me)^2 = \text{identity}$. Consider the following machines.



Which of the above machines have identity property

- A) i) and iii) but not ii)
 B) i) and ii) but not iii)
 C) i) only
 D) All have identity property

☐ A ☒ B ☐ C ☐ D ☒

Explanation

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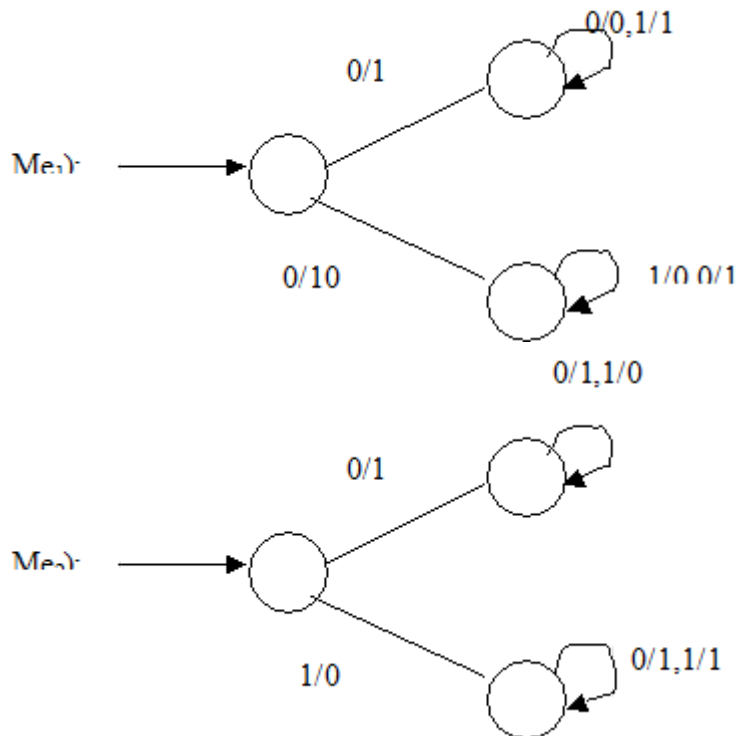
Type: MCQ

Marks: 1

★★★★★

Top

105) Let $(Me_1)(Me_2)$ mean that an input string is processed on Me_1 and then the output string is immediately fed in to Me_2 (as input) and reprocessed. Only this second resultant output is considered the final output of $(Me_1)(Me_2)$. If the output string is the same as the original input string, we say that $(Me_2)(Me_2Me_2)$ has the identity property, symbolically written $(Me_2)(Me_2) = \text{identity}$, consider following machines.



Which of the following is most appropriate?

- A) $(Me_1 Me_2) = (Me_2)(Me_1)$
- B) (Me_2) is the inverse machine of (Me_1)
- C) (Me_1) is the inverse machine of (Me_2)
- D) All the above is true

☐ A ☐ B ☐ C ☒ D ☒

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Explanation

Type: MCQ

Marks: 1

★★★★★

106) Which of the following definitions below generates the same language as L , where

$$L = \{ x^n y^n \text{ such that } n > 1 \}$$

- I. $E \rightarrow xEy/xy$
- II. $xy / (x^+xyy^+)$
- III. x^+y^+

- A) I only
- B) I and II
- C) II and III
- D) II only

Top

☒ A ☐ B ☐ C ☐ D ✓

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Explanation

Type: MCQ

Marks: 1

★★★★★

107) Choose the correct statements

- A) A class of languages that is closed under union and complementation has to be closed under intersection
- B) Union and intersection has to be closed under complementation
- C) Intersection and complementation has to be closed under union
- D) All of the above

☒ A ☐ B ☐ C ☐ D ✓

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Explanation

Type: MCQ

Marks: 2

★★★★★

108) Read the following statements

- I. For every NFA with an arbitrary number of final states there is an equivalent NFA with only one final state
- II. Regular sets are closed under infinite union.
- III. Regular sets are closed under inverse substitution.

Which of the following is true?

- A) I and III are the only correct statements
- B) I, II, and III are correct statements
- C) I is the only correct statement
- D) None of the above is correct

☐ A ☐ B ☒ C ☐ D ✓

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Explanation

Type: MCQ

Marks: 1

★★★★★

Top

109) Which of the following statement is false?

- A)** if R is regular and N is non-regular there exist $R + N$, which is regular
- B)** if R is regular and N is non-regular there exist $R + N$, which is non-regular
- C)** $\{a^n / n \text{ is not a prime}\}$ is regular.
- D)** if we add a finite set of words to a regular language, the result is regular language

☐ A ☐ B ☒ C ☐ D 

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[Explanation](#)

Type: MCQ

Marks: 1



110) Let R_1 and R_2 be regular sets defined over the alphabet Σ then

- A)** $R_1 \cap R_2$ is not regular
- B)** $\Sigma^* - R_1$ is regular
- C)** $R_1 \cup R_2$ is not regular
- D)** R_1^* is not regular

☐ A ☒ B ☐ C ☐ D 

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[Explanation](#)

Type: MCQ

Marks: 1



111) Let $\Sigma = \{0, 1\}$, $L = \Sigma^*$ and $R = \{0^n 1^n \text{ such that } n > 0\}$ then the language $L \cup R$ and R are respectively?

- A)** Regular, Regular
- B)** Not Regular, Regular
- C)** Regular, Not Regular
- D)** Not Regular, Not Regular

☐ A ☐ B ☒ C ☐ D 

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[Explanation](#)

Type: MCQ

Marks: 1



112) Which of the following statements is false?

[Top](#)

- A) Every finite subset of a non-regular set is regular
- B) Every finite subset of a regular set is regular
- C) Every subset of a regular set is regular
- D) The intersection of two regular sets is regular

☐ A ☐ B ☒ C ☐ D ✓

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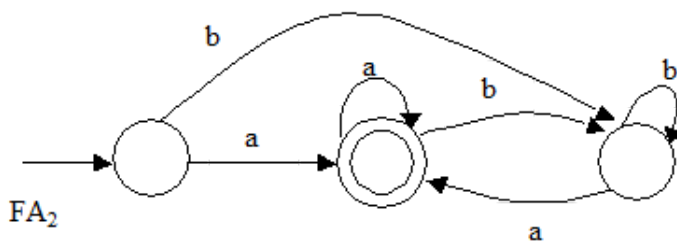
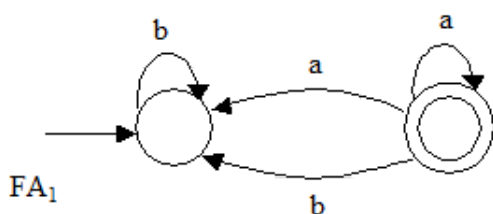
Explanation

Type: MCQ

Marks: 1

★★★★★

113) Consider the following FA's



Which of the following is true

- A) $FA1 \subset FA2$
- B) $FA2 \subset FA1$
- C) $FA1 = FA2$
- D) none of the above

☐ A ☐ B ☒ C ☐ D ✓

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Explanation

Type: MCQ

Marks: 1

★★★★★

114) Which of the following is regular?

- A) Strings of 0's whose length is a perfect square
- B) Set of all palindromes made up of 0's and 1's
- C) Strings of 0's, whose length is a prime number
- D) Strings of odd number of zeros

Top

☐ A
 ☐ B
 ☐ C
 ☒ D
 ☒

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Explanation

Type: MCQ

Marks: 1

★★★★★

115) Consider the following statements

$S_1: \{0^{2n} / n \geq 1\}$ is a regular language

$S_2: \{0^m 1^n 0^{m+n} / m \geq 1, n \geq 1\}$ is a regular language

- A) Only S_1 is correct
- B) Only S_2 is correct
- C) both S_1 and S_2 are correct
- D) None of S_1 and S_2 are correct

☒ A
 ☐ B
 ☐ C
 ☐ D
 ☒

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Explanation

Type: MCQ

Marks: 1

★★★★★

116) Which of the following set can be recognized by a DFS Automata?

- A) The numbers 1,2,4, ..., 2^n , written in binary
- B) The set of binary strings in which the number of 0's is same as the number of 1's
- C) The set $\{1, 101, 11011, 1110111, \dots\}$
- D) The numbers 1, 2, 4, ..., 2^n , written in unary

☒ A
 ☐ B
 ☐ C
 ☐ D
 ☒

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Explanation

Type: MCQ

Marks: 1

★★★★★

117) Let $L \subseteq \Sigma^*$ where $\Sigma = \{a, b\}$. Which of the following is true?

- A) $L = \{x/x \text{ has an equal number of } a\text{'s and } b\text{'s}\}$ is regular
- B) $L = \{a^n b^n / n \geq 1\}$ is regular
- C) $L = \{x/x \text{ has more } a\text{'s than } b\text{'s}\}$ is regular
- D) $L = \{a^m b^n / m \geq 1, n \geq 1\}$ is regular

Top

☐ A
 ☐ B
 ☐ C
 ☒ D
 ✓

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Explanation

Type: MCQ

Marks: 1

★★★★★

118) Consider the following languages

$$L_1 = \{ww/w \in \{a, b\}^*\}$$

$$L_2 = \{ww^R / w \in \{a, b\}^*, w^R \text{ is the reverse of } w\}$$

$$L_3 = \{a^n b^n / n=0, 1 \dots 10^{20\text{lakh}}\}$$

$$L_4 = \{0^i / i \text{ is an integer}\}$$

Which of the languages are regular?

A) Only L_1 and L_2

B) Only L_3 and L_4

C) Only L_2, L_3, L_4

D) Only L_3

☐ A
 ☐ B
 ☐ C
 ☒ D
 ✓

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Explanation

Type: MCQ

Marks: 1

★★★★★

119) Which of the following statement is true?

A) The language $\{a^n: n \geq 0, n \neq 4\}$ is regular

B) The language $\{a^n: n = i + jk; i, k \text{ fixed}, j = 0, 1, 2, \dots\}$ is regular

C) The set of all pascal real numbers is a regular language

D) all of the above

☐ A
 ☐ B
 ☐ C
 ☒ D
 ✓

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Explanation

Type: MCQ

Marks: 1

★★★★★

Top

120) Read the following statements

- I. $L = \{vwv : v, w \in \{a, b\}^*, |v| = 2\}$ is regular
- II. Let us define an operation truncate, which remains right most symbol from any string.
Truncated $(L) = (\text{truncate}(w) : w \in L)$ is regular
- III. Let $x = a_0a_1 \dots a_n$, $y = b_0b_1 \dots b_n$, $z = c_0c_1 \dots c_n$ be binary numbers. The set of strings of triplets

a_0	a_1	a_n
b_0	b_1	b_n
c_0	c_1	c_n

where, the a_i, b_i, c_i are such that $x + y = z$ is a regular language.
Which of the following is true?

- A)** I and II are the only correct statements
- B)** I and III are the only correct statements
- C)** II is the only correct statement
- D)** I, II and III are correct statements

☐ A ☐ B ☐ C ☒ D

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Explanation

Type: MCQ

Marks: 1

★★★★★

121) Consider the following languages

- i) $\{a^n b^m : (n + m) \text{ is even}\}$
- ii) $\{a^n b^m : n \geq 1, m \geq 1, nm \geq 3\}$
- iii) The complement of $\{a^n b^m : n \geq 4, m \leq 3\}$

Which of the following is true?

- A)** i) and ii) are regular but not (iii)
- B)** ii) and iii) are regular but not (i)
- C)** All are regular sets
- D)** (i) and iii) are regular but not (ii)

☐ A ☐ B ☒ C ☐ D

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Explanation

Type: MCQ

Marks: 1

★★★★★

122) Consider the following languages

- i) $\{uv : u \in L, v \in L^R\}$ where 'L' is regular
- ii) $\{a^n b^l a^k : k \geq n + 1\}$
- iii) $\{a^n b^l a^k : n = l \text{ or } l \neq k\}$

Which of the following is true?

Top

- A)** ii) and (iii) are regular but not (i)
B) i) is regular but not (ii) and (iii)
C) all are regular sets
D) None of them is regular

☐ A ☒ B ☐ C ☐ D ✓

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Type: MCQ

Marks: 1

★★★★★

123) Consider the regular expression $(0 + 1)^n$. The minimum state finite automata that recognizes the language represented by this regular expression contains

- A)** n states
B) n + 1 states
C) n + 2 states
D) none

☐ A ☐ B ☒ C ☐ D ✓

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Type: MCQ

Marks: 1

★★★★★

124) What can be said about a regular language L over {a} whose minimal finite state automata has two states

- A)** L must be $\{a^n \mid n \text{ is odd}\}$
B) L must be $\{a^n \mid n \geq 0\}$
C) L must be $\{a^n \mid n \text{ is even}\}$
D) Either L must be $\{a^n \mid n \text{ is odd}\}$ or L must be $\{a^n \mid n \text{ is even}\}$

☐ A ☐ B ☐ C ☒ D ✓

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[Explanation](#)

Type: NAT

Marks: 2

★★★★★

125) Consider a DFA over $\Sigma = \{a, b\}$ accepting all strings which have number of a's divisible by 4 and number of b's divisible by 8. What is the minimum number of states that the DFA will have?

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Type: NAT

Marks: 1



126) What is the number of states in the minimized DFA, which accepts all strings whose 8th symbol from Right end is 1?

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Type: MCQ

Marks: 1

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127) Which of the following statements is true?

- A) The union of two equivalence relations is also an equivalence relation.
- B) All subsets of regular sets are regular
- C) Regularity is preserved under the operation of string reversal
- D) A minimal DFA that is equivalent to an NFA with 'n' nodes has always 2^n states

☐ A ☐ B ☒ C ☐ D ✓

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Explanation

Type: MCQ

Marks: 1



128) Consider the following statements

I. A FSM can be designed to add two integers of any arbitrary length (arbitrary number of digits)

II. Every subset of a countable set is countable.

Which of the following statements is correct?

- A) I only
- B) Neither I nor II
- C) II only
- D) I and II

☐ A ☐ B ☐ C ☒ D ✓

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Explanation

Type: MCQ

Marks: 1



129) Choose the correct statements

- A) $A = \{a^n b^n / n = 0, 1, 2, 3, \dots\}$ is a regular language
- B) $L(A^* B^*) \cap B$ gives the set A
- C) The set B, of all strings of equal number of a's and b's defines a regular language
- D) None of the above

☐ A ☒ B ☐ C ☐ D ✓

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Explanation

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