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Summary

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Theory of Computation



Turing Machines



Any Marks



All Questions



Type: MCQ

Marks: 1

Rating: 4.67/5

**1)** Algorithms and Procedures are modeled by**A)** Turing Machines that may or may not halt on some inputs**B)** Turing Machines that always halt

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- C)** Algorithms are modeled by general Turing Machines and procedures by Turing Machines that always halt
- D)** None of the above

☐ A ☐ B ☒ C ☐ D ✓

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Explanation

Type: MCQ

Marks: 1

Rating: 4.33/5



- 2)** Consider the class of all assemble language programs on the Pentium computer and the class of all functions computed by Turing Machines with a two way infinite tape and only three heads

- A)** Both classes are the same by Church's Thesis
- B)** The Turing Machines will describe a richer set of functions than those computable by assembly language programs on the Pentium Computer
- C)** The assembly language programs on the Pentium computer describe a richer set of functions
- D)** None of the above

☐ A ☒ B ☐ C ☐ D ✓

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Explanation

Type: MCQ

Marks: 1



- 3)** The following properties are valid for recursive and r.e. sets

- A)** Both classes are closed under union, intersection and complement
- B)** The recursive sets are closed under union, intersection and complement but the r.e. sets are not closed under complement
- C)** Neither the recursive or the r.e. sets are closed under union, intersection and complement
- D)** None of the above

☐ A ☒ B ☐ C ☐ D ✓

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Explanation

Type: MCQ

Marks: 1

Rating: 4.33/5

Top



4) For the class of Turing Machines and Turing Machines that always halt

- A) the nondeterministic models are more powerful than the deterministic model
- B) we can obtain the deterministic machines by constructing the subset machine
- C) Nondeterminism does not add any power to the Turing Machines even if they halt on all inputs
- D) None of the above

☐ A ☐ B ☒ C ☐ D ✓

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Type: MCQ

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5) The Universal Turing Machine

- A) does not exist for Turing Machines that halt on all inputs
- B) does not exist for Turing Machines that may or may not halt but exists for Turing Machines that halt on all inputs
- C) does not exist for Turing Machines that have three purshdown tapes
- D) none of the above

☐ A ☒ B ☐ C ☐ D ✓

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[Explanation](#)

Type: MCQ

Marks: 1



6) Consider the language of extended regular expressions whose complement is empty

- A) the set if not a CSL but is recursive
- B) the set if a regular set
- C) the set is a CFL but not regular
- D) the set is r.e. but not recursive

☐ A ☐ B ☐ C ☒ D ✓

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[Explanation](#)

Type: MCQ

Marks: 1



7) Hyper-computers accept

A) sets that may not be r.e.

B) only r.e. sets

C) only recursive sets

D) only CSLs

☐ A ☐ B ☒ C ☐ D [Share](#) [Mark IMP](#) [Raise Query](#)[Explanation](#)

Type: MCQ

Marks: 1



8) Turing machines that do not leave their input

A) accept all the r.e. sets

B) accept only the CSLs

C) accept all the recursive sets

D) accept languages that are not r.e.

☒ A ☐ B ☐ C ☐ D [Share](#) [Mark IMP](#) [Raise Query](#)[Explanation](#)

Type: MCQ

Marks: 1

Rating: 3/5

9) A Type 0 or unrestricted grammar

A) generates all the sets that are accepted by Halting Turing Machines but not by all Turing machines

B) generates all the sets accepted by the class of Turing Machines

C) generates sets that are not regular expression

D) None of the above

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Explanation

Type: MCQ

Marks: 1

Rating: 4/5 ★★★★★

10) A Type 1 or context sensitive grammar

- A) generates all the sets accepted by halting Turing Machines
- B) generates all the sets that are r.e.
- C) generates only the sets accepted by Turing Machines that do not leave their input
- D) generates all the sets accepted by Linear Bounded Automata

☐ A ☐ B ☐ C ☒ D ✓[Share](#) [Mark IMP](#) [Raise Query](#)

Explanation

Type: MCQ

Marks: 1

★★★★★

11) The language $\{www|w \text{ in } (a+b+c)^*\}$

- A) is a recursive set but not a CFL
- B) is a r.e. set but not regular
- C) is context free but not regular
- D) is context sensitive but not context free

☐ A ☒ B ☐ C ☐ D ✓[Share](#) [Mark IMP](#) [Raise Query](#)

Explanation

Type: MCQ

Marks: 1

★★★★★

12) The language $\{a^n b^n c^n | n > 1\}$

- A) is a r.e. set but not regular
- B) is recursive but not CFL
- C) is a context is sensitive language but not context free
- D) is recursive but not context sensitive

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Explanation

Type: MCQ

Marks: 1



13) The language $\{ww^Rww^R \mid w \text{ in } (a+b)^*\}$

- A) is r.e. but not recursive
- B) is recursive but not context sensitive
- C) is context sensitive but not context free
- D) is context free but not regular

☒ A ☐ B ☐ C ☐ D

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Type: MCQ

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14) The set of all natural numbers that are powers of 16, represented in base 16

- A) is r.e. but not recursive
- B) is recursive but not context sensitive
- C) is context sensitive but not context free
- D) is context free and regular

☒ A ☐ B ☐ C ☐ D

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Type: MCQ

Marks: 1



15) The set of all natural numbers that are powers of 47 represented in unary

- A) is r.e. but not recursive
- B) is recursive but not context sensitive
- C) is context sensitive but not context free
- D) is neither context free or regular or context sensitive

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☒ A ☐ B ☐ C ☐ D ✓

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Explanation

Type: MCQ

Marks: 1

★★★★★

16) The recursive and r.e. sets are

- A) closed under homomorphism, inverse homomorphism, complement
- B) closed under substitution, reversal and concatenation
- C) closed under union, intersection, quotient with a regular set and complement
- D) none of the above

☐ A ☐ B ☒ C ☐ D ✓

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Explanation

Type: MCQ

Marks: 1

★★★★★

17) Any NTM N with time complexity $t(n)$ can be simulated by a DTM M in time ____.

- A) $T(n)^4$
- B) $c(N)^{t(n)}$
- C) $T(n)!$
- D) Cannot be simulated by a deterministic Turing machine

☐ A ☒ B ☐ C ☐ D ✓

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Explanation

Type: MCQ

Marks: 1

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18) A Turing Machine is an accepting device which accepts the languages generated by

- A) type 0 grammars
- B) type 1 grammars

Top

C) type 2 grammars

D) type 3 grammars

☒ A ☐ B ☐ C ☐ D ✓

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Type: MCQ

Marks: 1

★★★★★

19) Time and Space complexity of a Turing machine:

A) $O(n)$, $O(n \log n)$

B) $O(n^2)$, $O(n^2)$

C) $O(n \log n)$, $O(n \log n)$

D) $O(n \log n)$, $O(n)$

☐ A ☐ B ☐ C ☒ D ✓

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[Explanation](#)

Type: MCQ

Marks: 2

★★★★★

20) $L = \{M \mid M \text{ is a TM and there exists an input on which } M \text{ halts in less than } |M| \text{ steps}\}$.

State whether the given language is

A) Recursive

B) Recursively enumerable

C) Recursively enumerable but not recursive

D) Not Recursively enumerable

☒ A ☐ B ☐ C ☐ D ✓

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[Explanation](#)

Type: MCQ

Marks: 2

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★★★★★

21) $L = \{M \mid M \text{ is a TM and } |L(M)| \geq 3\}$

- A) Recursive
- B) Recursively enumerable
- C) Recursively enumerable but not recursive
- D) Not Recursively enumerable

☐ A ☐ B ☒ C ☐ D ✓

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Type: MCQ

Marks: 1



22) $L = \{M \mid M \text{ is a TM that accepts all even numbers}\}$.

- A) Recursive
- B) Recursively enumerable
- C) Recursively enumerable but not recursive
- D) Not Recursively enumerable

☐ A ☐ B ☐ C ☒ D ✓

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Type: MCQ

Marks: 1



23) $L = \{M \mid M \text{ is a TM and } L(M) \text{ is countable}\}$.

- A) Recursive
- B) Not Recursive
- C) Recursively enumerable but not recursive
- D) Not Recursively enumerable

☒ A ☐ B ☐ C ☐ D ✓

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Type: MCQ

Marks: 2



24) Which of the following is true for the language $\{a^p \mid p \text{ is a prime}\}$.

- A) It is not accepted by a Turing machine
- B) It is regular but not context-free
- C) It is context-free but not regular
- D) It is neither regular nor context-free, but accepted by a Turing machine

☐ A ☐ B ☐ C ☒ D ✓

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Type: MCQ

Marks: 1



25) I. Halting problem of (halting) turing machine of recursive language is decidable.
II. Halting problem of turing machine of recursive enumerable language is decidable.
Which of the above statement is/are true?

- A) Only I
- B) Only II
- C) Both I and II
- D) Neither I nor II

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Type: MCQ

Marks: 2



26) $L = \{(M, w) \mid M \text{ is a TM that accepts } w \text{ using at most } 2^{|w|} \text{ squares of its tape}\}$.

- A) RE
- B) Not recursive

[Top](#)

C) CFL

D) Recursive

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[Explanation](#)

Type: MCQ

Marks: 1

★★★★★

27) An arbitrary single-tape Turing machine can be simulated by a

A) Counter machine

B) Two-stack machine

C) One-stack machine

D) None of the machine

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Type: MCQ

Marks: 1

★★★★★

28) Turing machine (TM) is more powerful than FMS (Finite State Machine) because

A) tape movement is confined to one direction

B) it has no finite state

C) it has the capability to remember arbitrarily long sequences of input symbols

D) none of these

☐ A ☐ B ☒ C ☐ D ✓

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Type: MCQ

Marks: 1

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29) Universal TM influenced the concept of

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- A)** stored program computers
- B)** interpretative implementation of programming language
- C)** computability
- D)** all of these

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Explanation

Type: NAT

Marks: 1



30) Number of external states of a UTM should be at least

2

Backspace

7

8

9

4

5

6

1

2

3

0

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Clear All

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Explanation

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Summary

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Theory of Computation



Push Down Automata



Any Marks



All Questions



Type: MCQ

Marks: 1

Rating: 4/5 ★★★★★

1) The language accepted by a push down automaton in which the stack is limited to 10 items is best described as

A) Context Free

B) Regular

Top

C) Deterministic Context free

D) Recursive

☐ A ☒ B ☐ C ☐ D ✓

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[Explanation](#)

Type: MCQ

Marks: 1

Rating: 4.5/5



2) The following Grammar

$S \rightarrow bS$

$S \rightarrow b$

$S \rightarrow aA$

$A \rightarrow bA$

is

A) Type-3 grammar

B) Type-2 grammar

C) Type-1 grammar

D) Type-0 grammar

☒ A ☐ B ☐ C ☐ D ✓

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[Explanation](#)

Type: MCQ

Marks: 1

Rating: 5/5 ★★★★★

3) $L = \{a^n, b^n, c^n \mid n > 1\}$ check for CFL's

A) Given grammar is CFL

B) Given grammar is not CFL

C) Given grammar is CSL

D) None of these

☐ A ☒ B ☐ C ☐ D ✓

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[Explanation](#)

Type: MCQ

Marks: 1

Rating: 4.5/5



[Top](#)

4) $L = \{\omega\omega \mid \omega \in (a + b)^+\}$ Check for CFL's

- A) It is CFL
- B) It is not CFL
- C) It is CSL not CFL
- D) None

☐ A ☒ B ☐ C ☐ D ☒

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Explanation

Type: MCQ

Marks: 1

Rating: 4.5/5



5) $L = \{a^i b^j c^k \mid i < j < k\}$ check for CFL by using Pumping Lemma

- A) Not CFL
- B) It is CFL
- C) Given grammar is CSL
- D) None

☒ A ☐ B ☐ C ☐ D ☒

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Explanation

Type: MCQ

Marks: 2



6) $L = \{a^i b^j \mid i = j^2\}$ check for CFL using pumping lemma

- A) L is not CFL
- B) It satisfying Pumping lemma
- C) It is CFL
- D) None

☒ A ☐ B ☐ C ☐ D ☒

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Explanation

Type: MCQ

Marks: 2

Top

Rating: 5/5

7) L = all strings are {a, b, c} with an equal nos. of a's, b's, and c's

- A) L is CFL
- B) It is CSL
- C) L is not CFL
- D) None of the above

☐ A ☐ B ☒ C ☐ D ✓

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Type: MCQ

Marks: 2



8) What is the final accessible ID of PDA that accepts $\{\omega\omega^R \mid \omega \text{ in } (0 + 1)^*\}$ with input string as 001100?

- A) $(q_2, \epsilon, \epsilon)$
- B) (q_2, ϵ, R)
- C) $(q_1, \epsilon, \epsilon)$
- D) (q_1, ϵ, R)

☒ A ☐ B ☐ C ☐ D ✓

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Type: MCQ

Marks: 1



9) If L is N(M) for some PDA M, then L is a

- A) Not Context-Free Language
- B) Context-Free Language
- C) CSL
- D) NPDA

☐ A ☒ B ☐ C ☐ D ✓

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Type: MCQ

Marks: 1



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10) Construct a PDA from the following CFG.

$G = (\{S, X\}, \{a, b\}, P, S)$

where the productions are:

$S \rightarrow XS \mid \epsilon, A \rightarrow aXb \mid Ab \mid ab$

A) $P = (\{q\}, \{b, a\}, \{a, b, X, S\}, \delta, q, S)$

B) $P = (\{q\}, \{a, b\}, \{b, a, X, S\}, \delta, q, S)$

C) $P = (\{q\}, \{a, b\}, \{a, b, X, S\}, \delta, q, S)$

D) $P = (\{q\}, \{b, a\}, \{b, a, X, S\}, \delta, q, S)$

☐ A ☐ B ☒ C ☐ D ☒

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Explanation

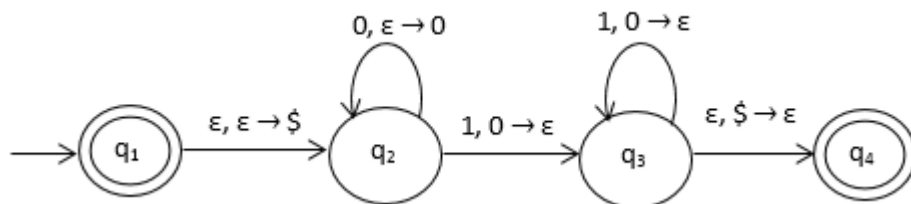
Type: MCQ

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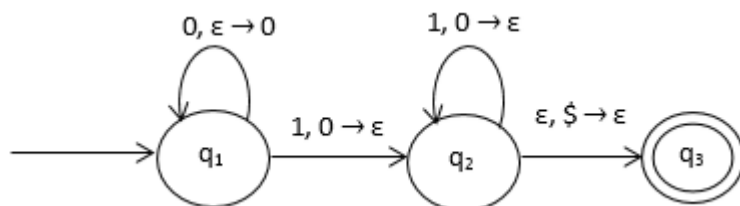
★★★★★

11) Construct a PDA that accepts $L = \{0^n 1^n \mid n \geq 0\}$.

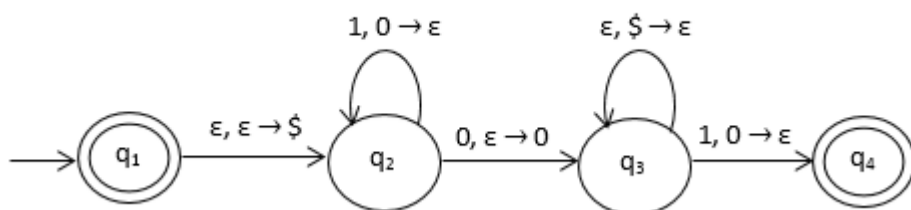
A)



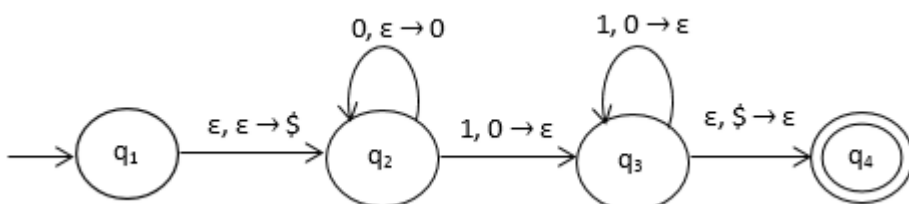
B)



C)



D)



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Explanation

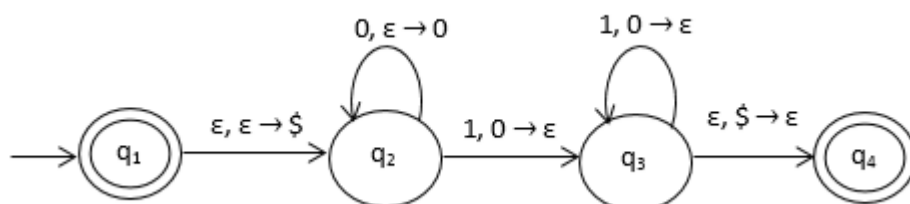
Type: MCQ

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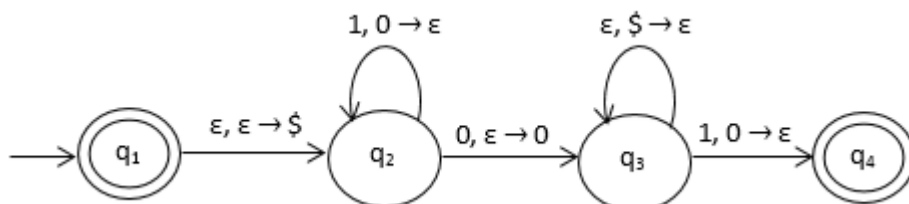
★★★★★

12) Construct a PDA that accepts $L = \{ \omega \omega^R \mid \omega = (a+b)^* \}$

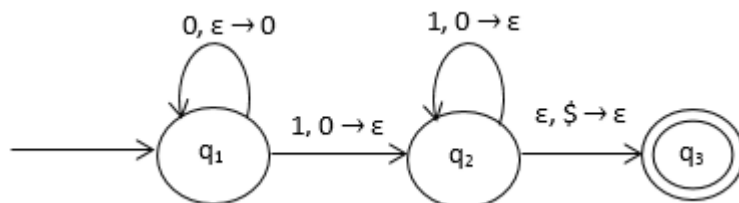
A)



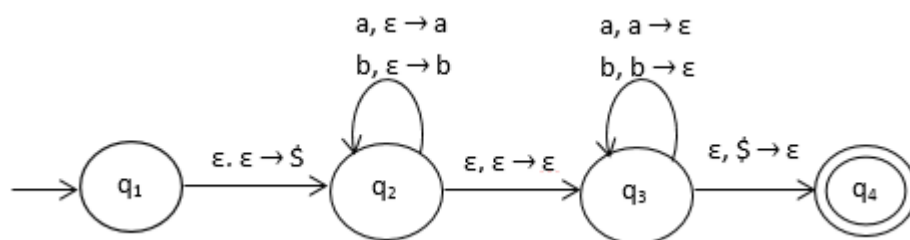
B)



C)



D)


☐ A ☐ B ☐ C ☒ D ✓

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Explanation

Type: MCQ

Marks: 1

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13) If a grammar G is context-free, we can build an equivalent _____ which accepts the language that is produced by the context-free grammar G . A parser can be built for the grammar G .

A) CFG

[Top](#)

B) Nondeterministic PDA

C) CSL

D) CFL

☐ A ☒ B ☐ C ☐ D ✓

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[Explanation](#)

Type: MCQ

Marks: 1

★★★★★

14) If a grammar G is context-free, we can build an equivalent

A) Turing Machine

B) CSL

C) RE

D) Nondeterministic PDA

☐ A ☐ B ☐ C ☒ D ✓

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[Explanation](#)

Type: MCQ

Marks: 1

★★★★★

15) The language accepted by A Pushdown Automaton in which the stack is limited to 10 items is best described as

A) Context free

B) Regular

C) Deterministic Context free

D) Recursive

☐ A ☒ B ☐ C ☐ D ✓

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Type: MCQ

Marks: 1

★★★★★

16) Let $G = (\{S\}, \{a, b\}R, S)$ be a context free grammar where the rule set R is
 $S \rightarrow aSb \mid SS \mid \epsilon$
Which of the following is true?

[Top](#)

- A)** G is not ambiguous
- B)** There exists $x, y \in L(G)$ such that $xy \notin L(G)$
- C)** There is a deterministic pushdown automaton that accepts $L(G)$
- D)** We can find a deterministic finite state automaton that accepts $L(G)$

☐ A ☐ B ☒ C ☐ D ✓

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Explanation

Type: MCQ

Marks: 1



17) Which of the following is FALSE?

- A)** There is a unique minimal DFA for every regular language.
- B)** Every NFA can be converted to an equivalent PDA.
- C)** Complement of every context-free language is recursive.
- D)** Every nondeterministic PDA can be converted to an equivalent deterministic PDA.

☐ A ☐ B ☐ C ☒ D ✓

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Explanation

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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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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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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 ✓

Share Mark IMP Raise Query

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

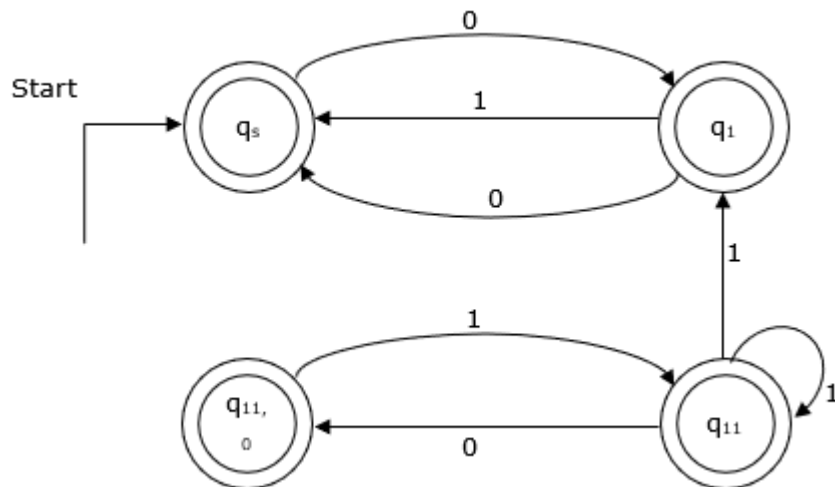
Marks: 2

Rating: 3.67/5

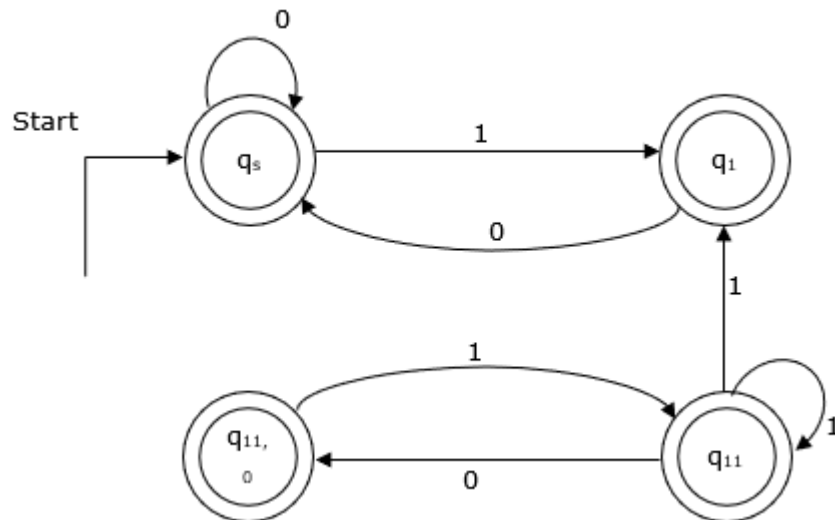
★★★★★

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)

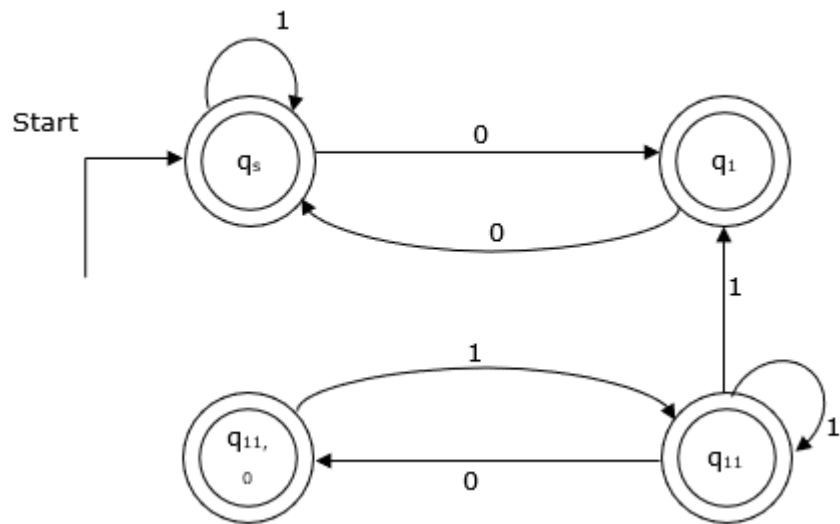


B)



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C)



D) None of the above

☐ A
 ☒ B
 ☐ C
 ☐ D
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Type: MCQ

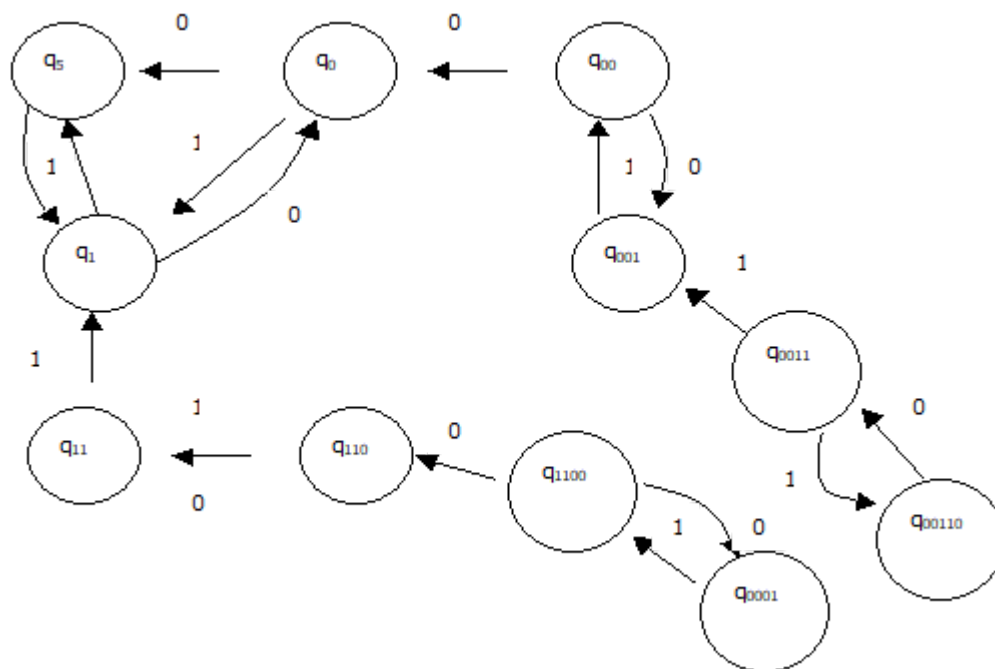
Marks: 1

Rating: 3.67/5

★★★★★

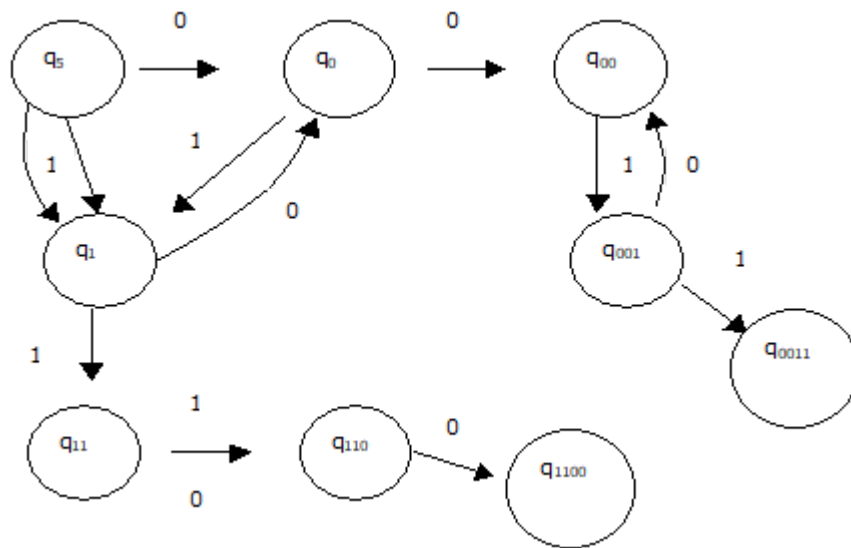
26) Design a DFA accepting set of all strings are $\{0, 1\}$ Containing at most one pair of consecutive 0's and at most one pair of consecutive 1's.

A)



Top

B)



C) Both A and B possible.

D) None of the above.

☒ A
 ☐ B
 ☐ C
 ☐ D
 ✓

Explanation

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Type: MCQ

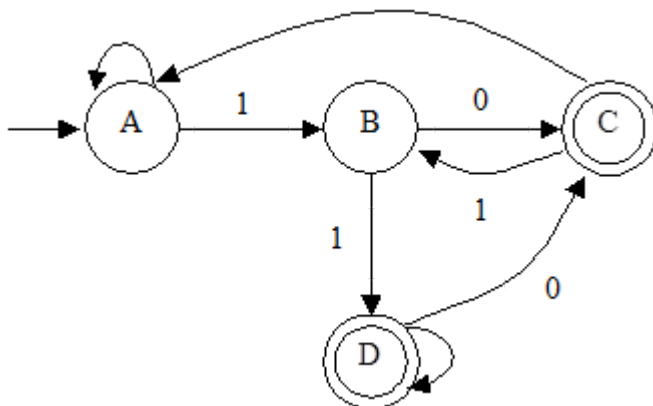
Marks: 1

★★★★★

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"

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☐ A ☐ B ☐ C ☒ D ✓

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Explanation

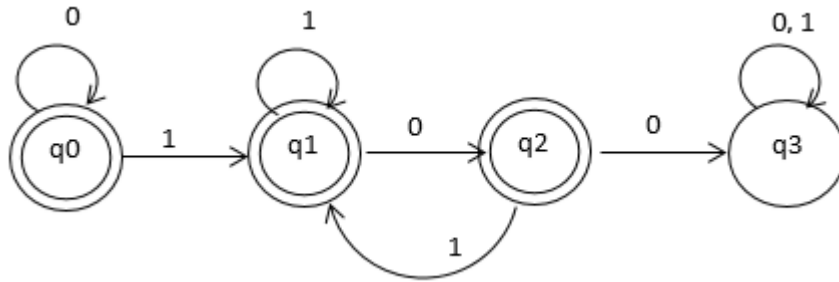
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Marks: 1

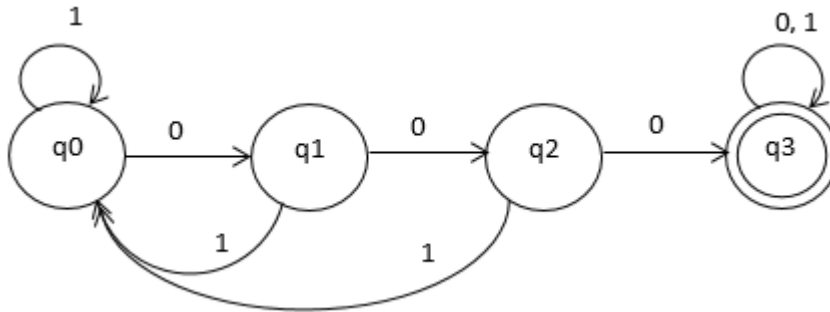
★★★★★

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

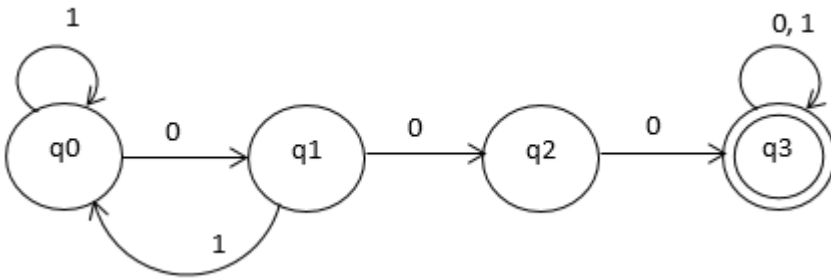
A)



B)



C)



D) None of the above.

☒ A ☐ B ☐ C ☐ D ✓

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Explanation

Type: MCQ

Marks: 1

★★★★★

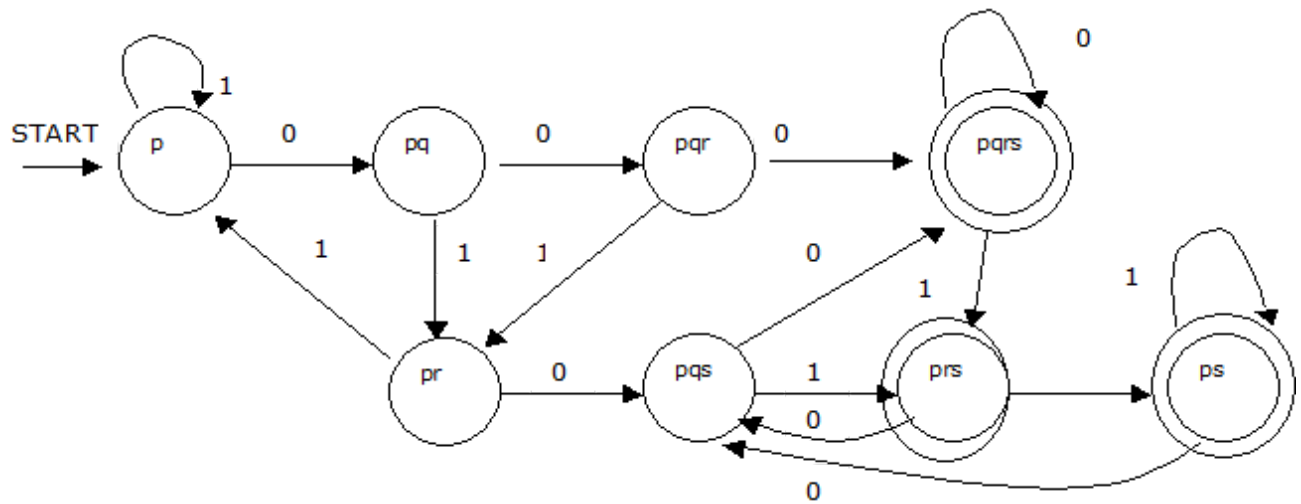
[Top](#)

29) Construct DFA's equivalent to NFA's

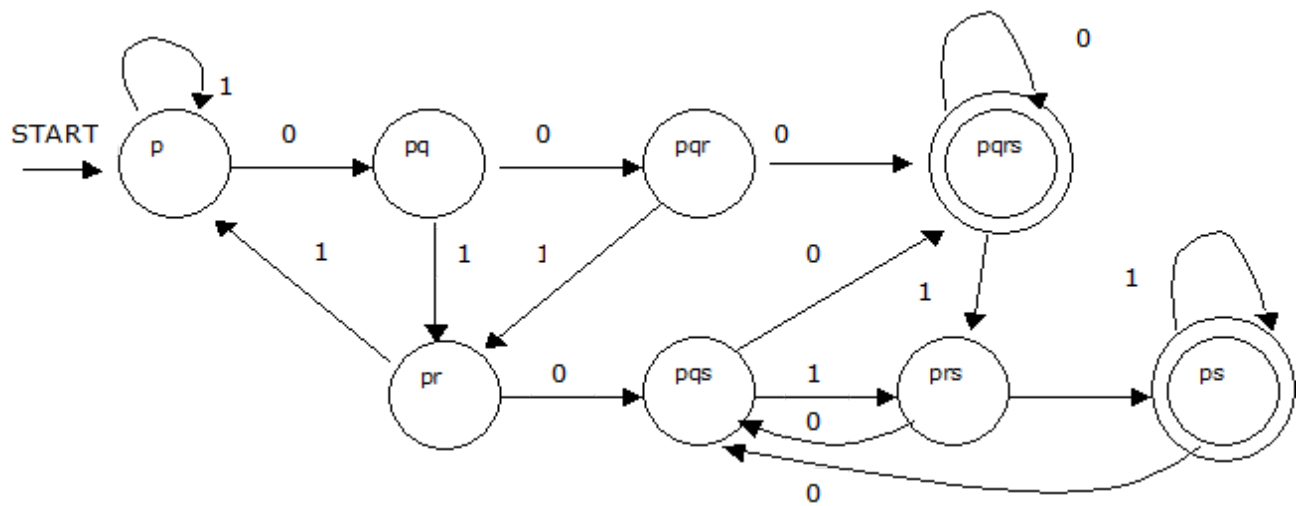
 $(\{p, q, r, s\}, \{0, 1\}, \delta_1, r, \{s\})$

δ_1	0	1
p	pq	p
q	r	r
r	s	-
*s	s	s

A)

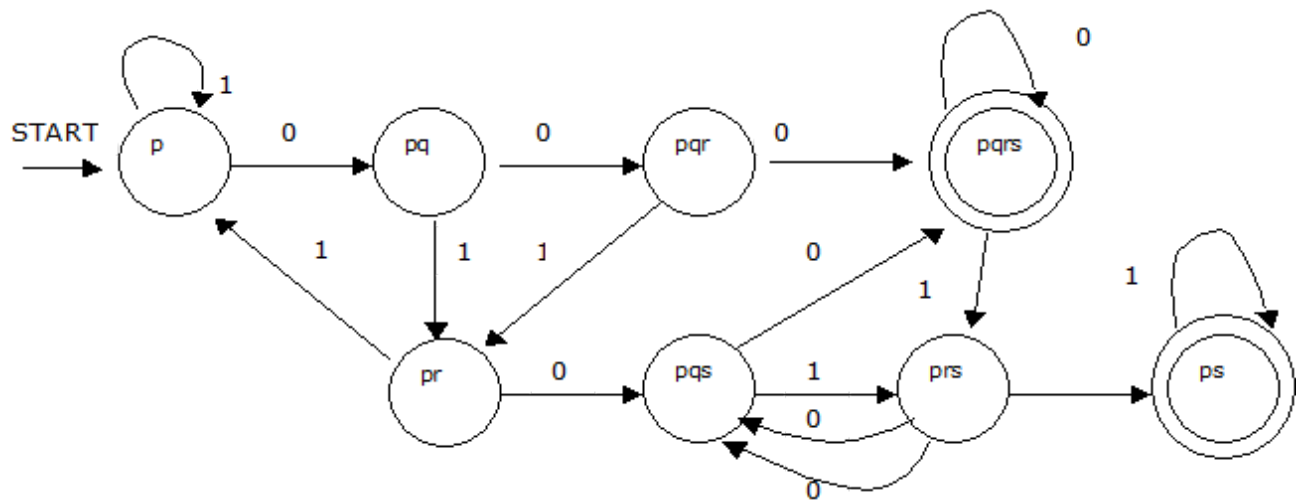


B)



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C)



D) None of the above.

☒ A
 ☐ B
 ☐ C
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Type: MCQ

Marks: 1

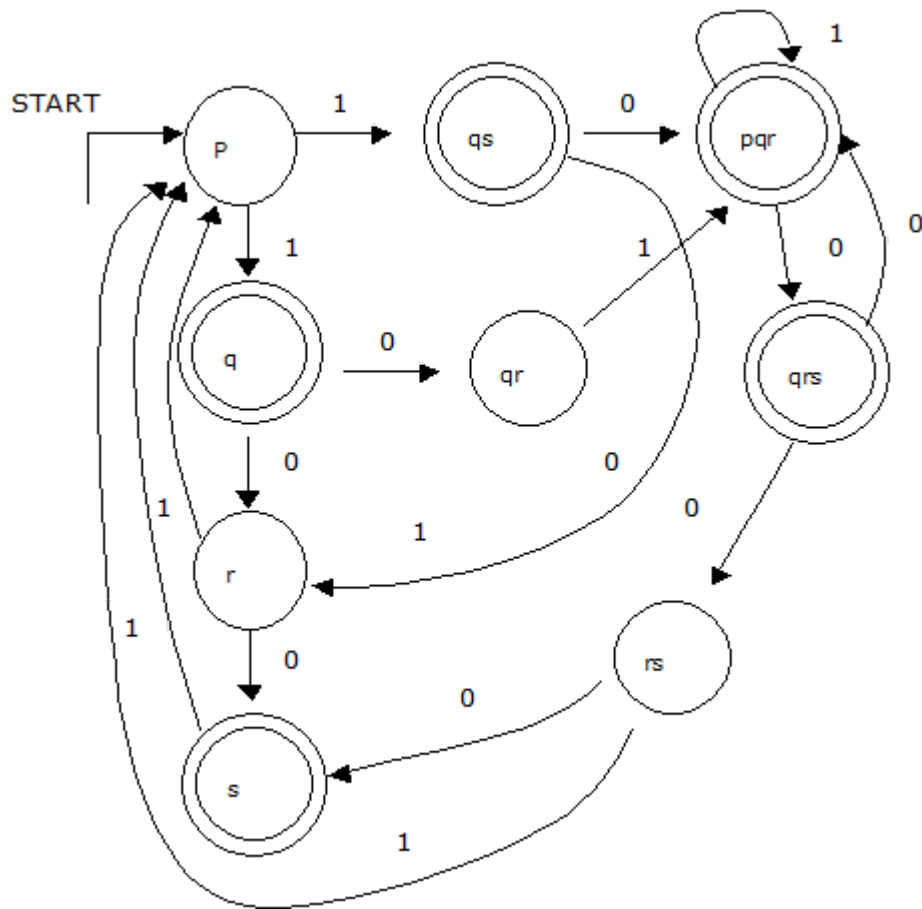
★★★★★

30) Construct DFA's equivalent to NFA's
 ($\{p, q, r, s\}$, $\{0, 1\}$, δ_2 , P , $\{q, s\}$)

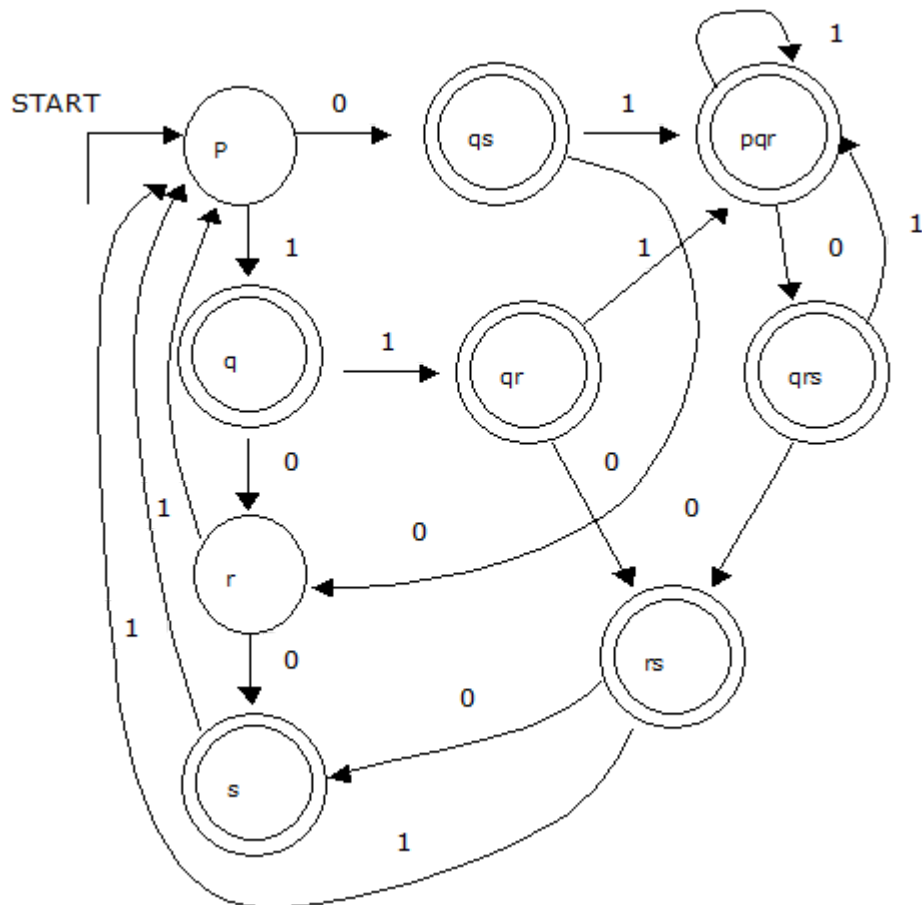
δ_2	0	1
→ p	q, s	q
*q	r	q, r
r	s	p
*s	-	p

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A)



B)



C) Both are Possible

D) None of above

Top

☐ A ☒ B ☐ C ☐ D ✓

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Explanation

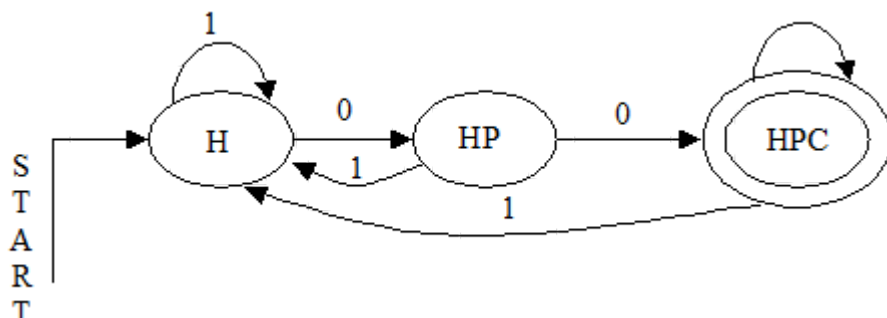
Type: MCQ

Marks: 1

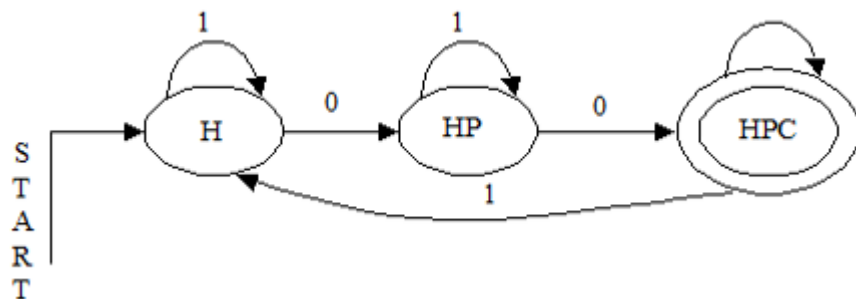
★★★★★

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

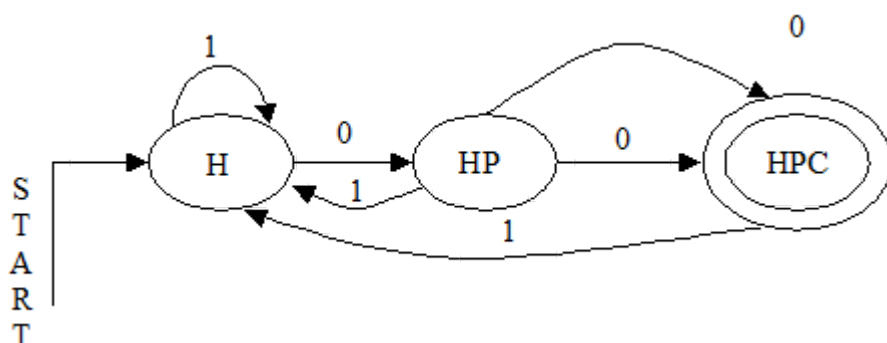
A)



B)



C)



D) None of the above

☒ A ☐ B ☐ C ☐ D ✓

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Explanation

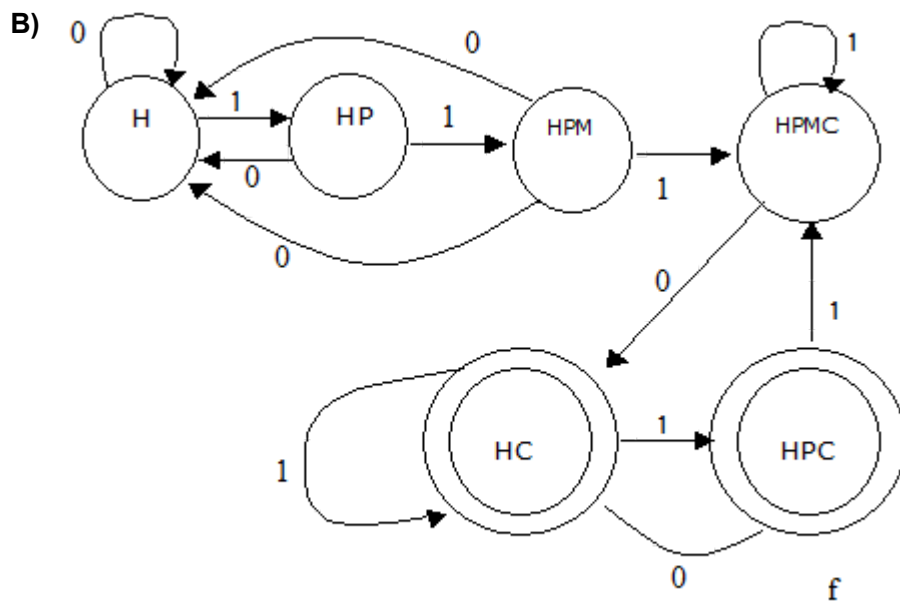
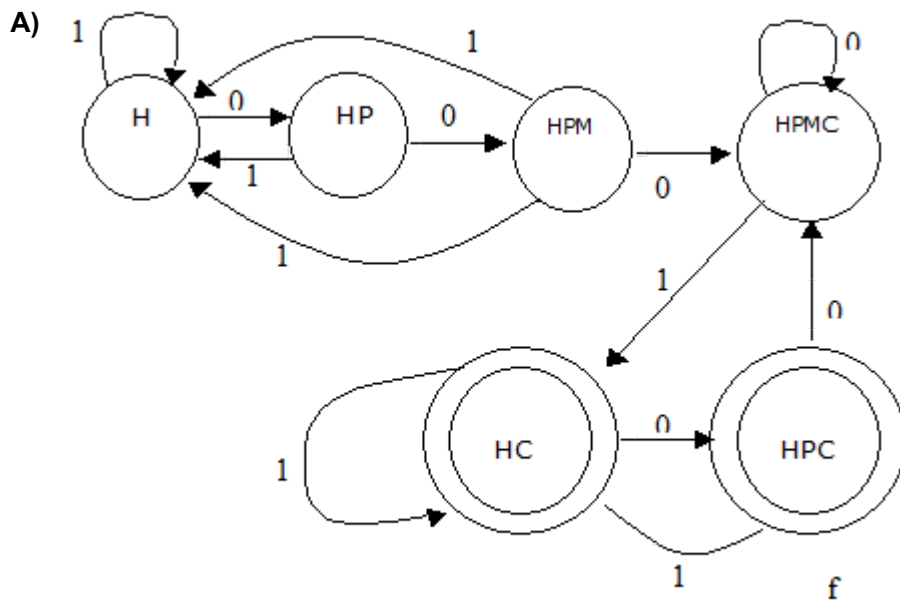
Type: MCQ

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



C) Both are correct

D) None of above

☒ A ☐ B ☐ C ☐ D ✓

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Explanation

Type: MCQ

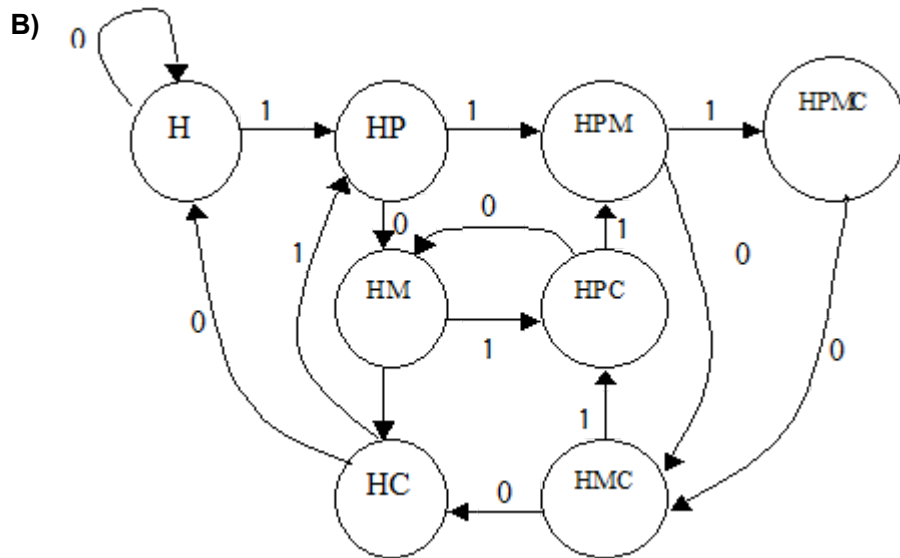
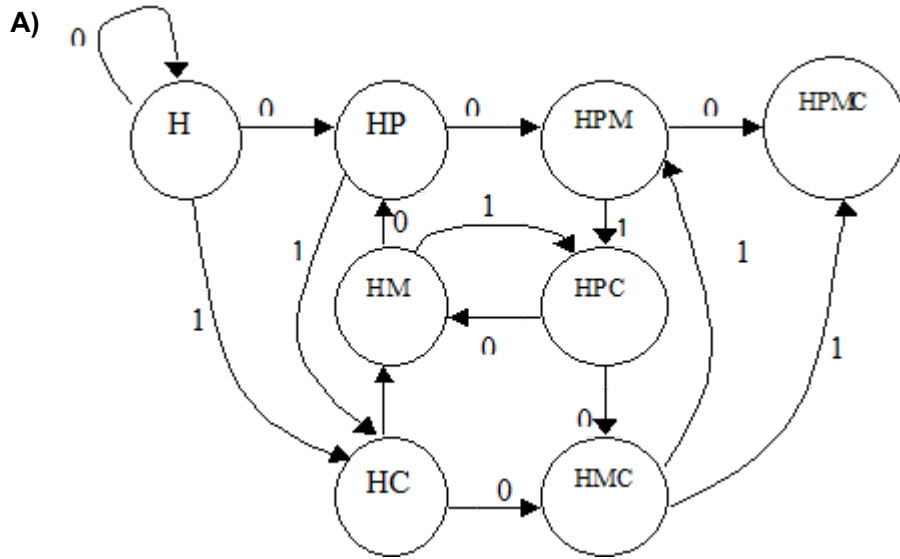
Marks: 1

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 ✓

Explanation

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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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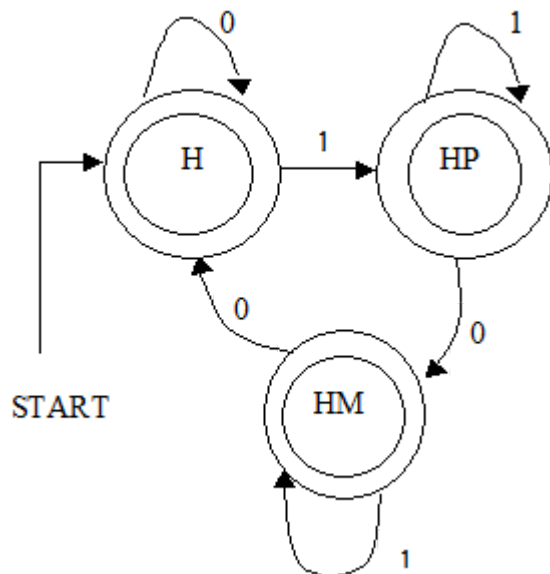
Type: MCQ

Marks: 1



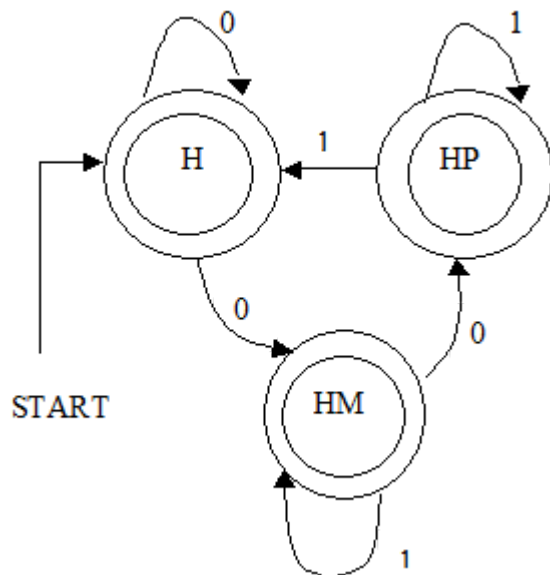
35) Give DFA accepting the following languages are (0, 1) The set of all strings not containing 101 as a substring

A)



Top

B)



C) Either A or B

D) None of the above

☒ A
 ☐ B
 ☐ C
 ☐ D
 ☒

Explanation

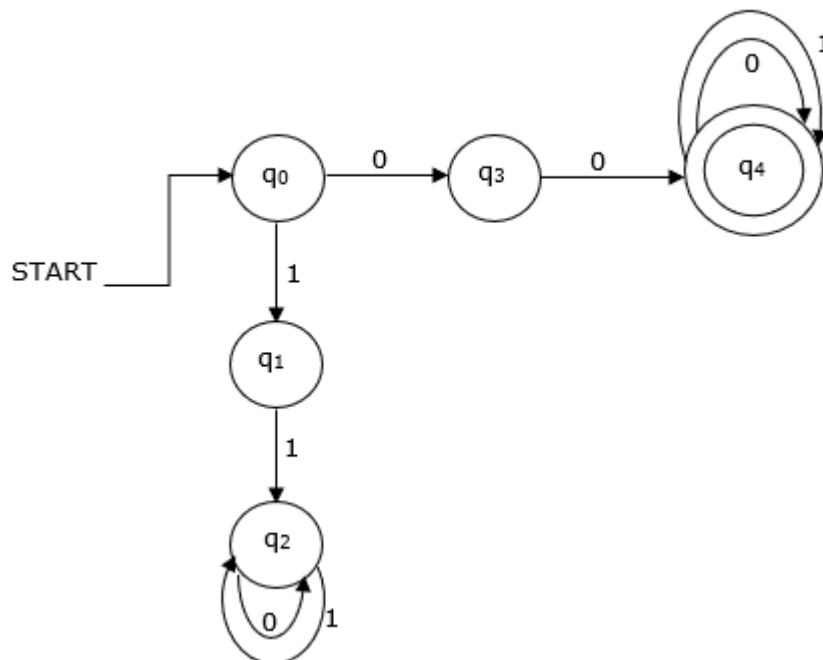
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Type: MCQ

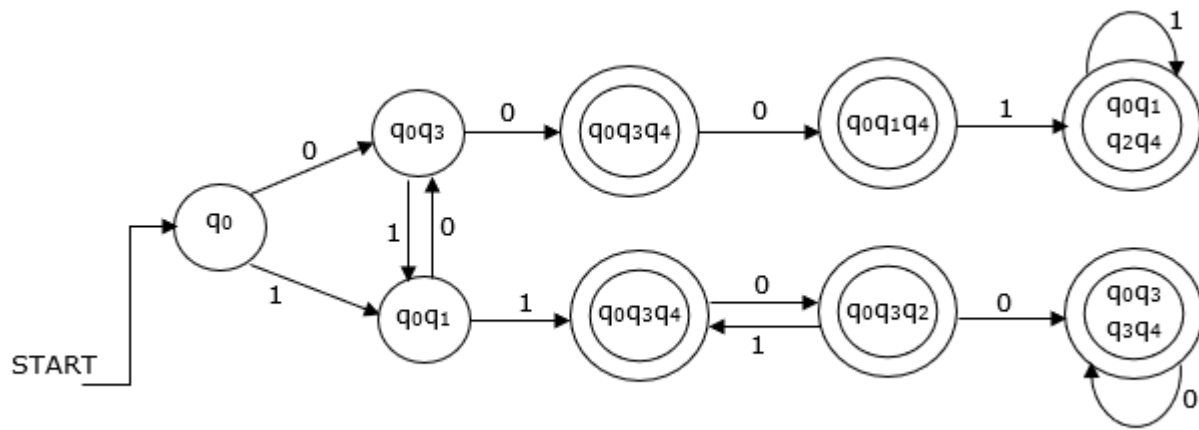
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Rating: 5/5 ★★★★★

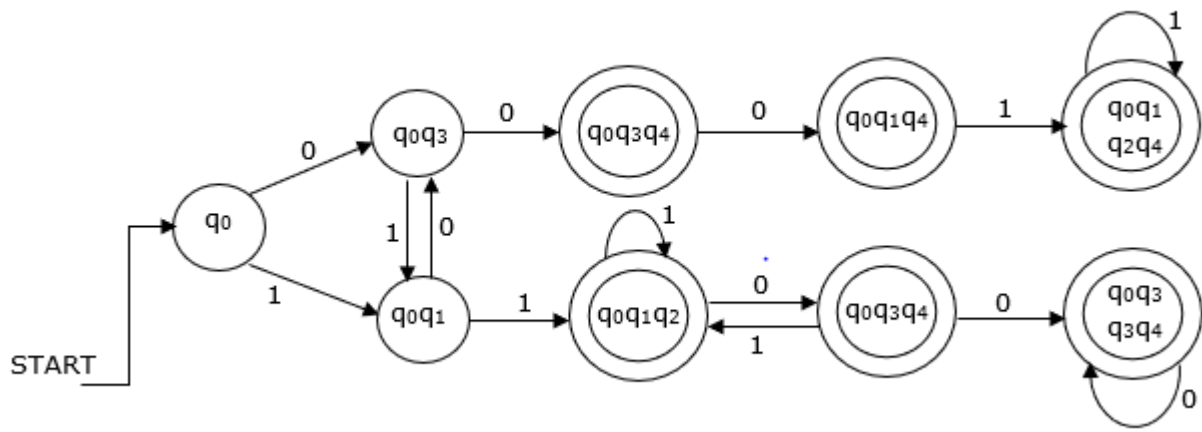
36) Convert following NFA to DFA:

[Top](#)

A)



B)



C) Either A or B

D) None of above

☐ A
 ☒ B
 ☐ C
 ☐ D
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Explanation

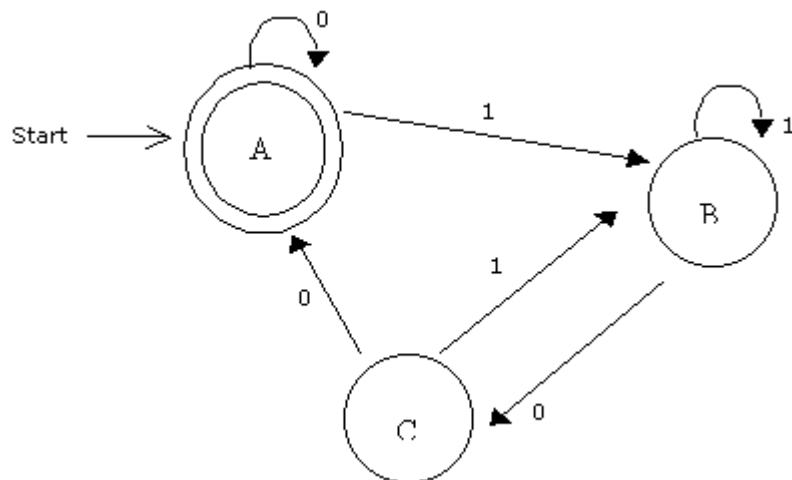
Type: MCQ

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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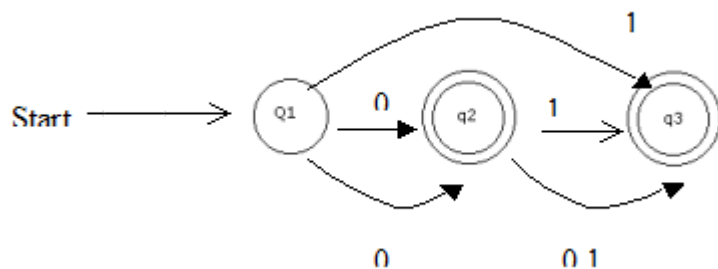
Explanation

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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Explanation

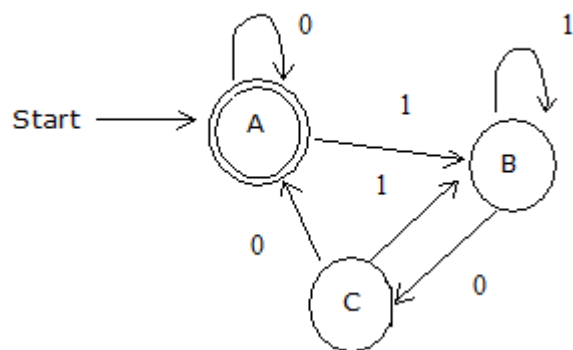
Type: MCQ

Marks: 1

Top

★★★★★

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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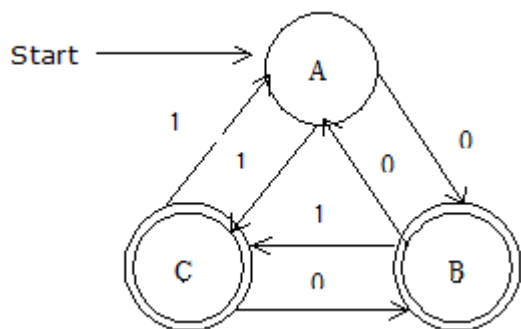
Explanation

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

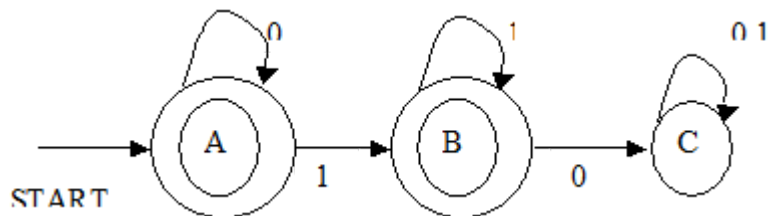
Type: MCQ

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

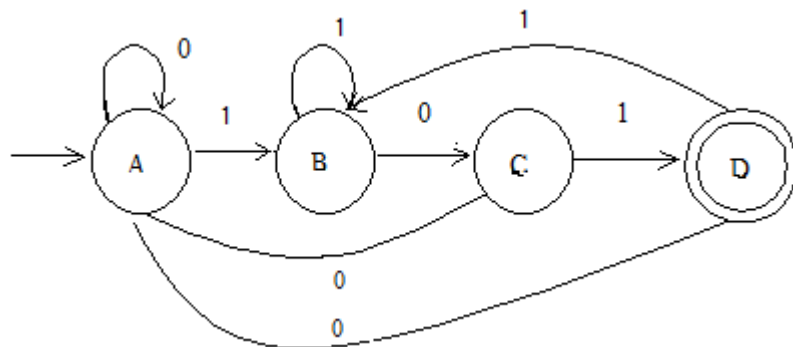
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Type: MCQ

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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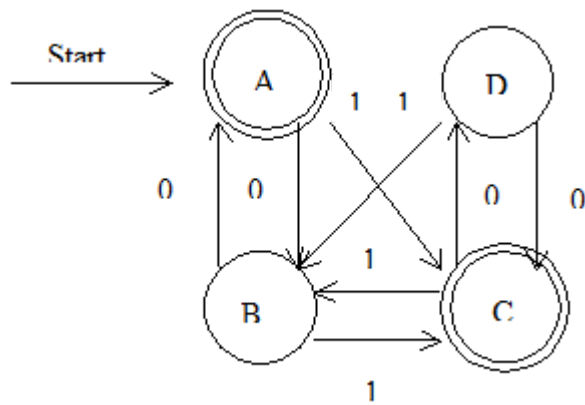
Type: MCQ

Marks: 1



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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 ✓

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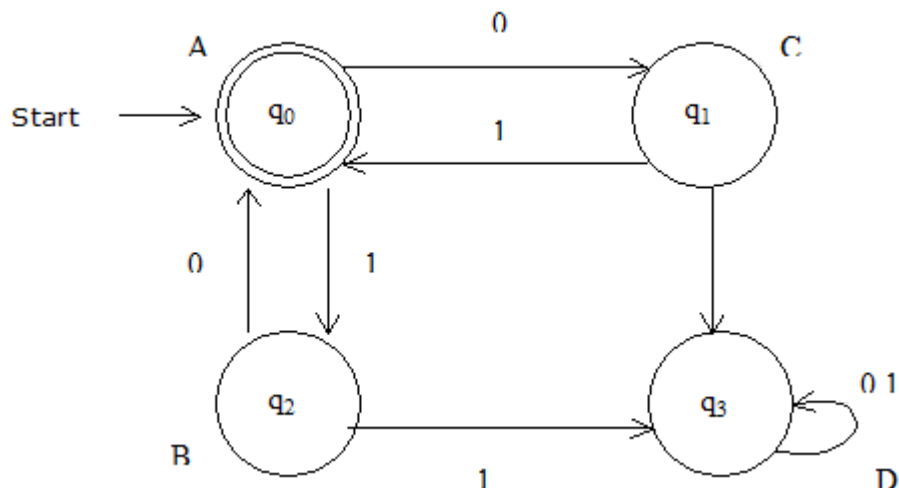
Explanation

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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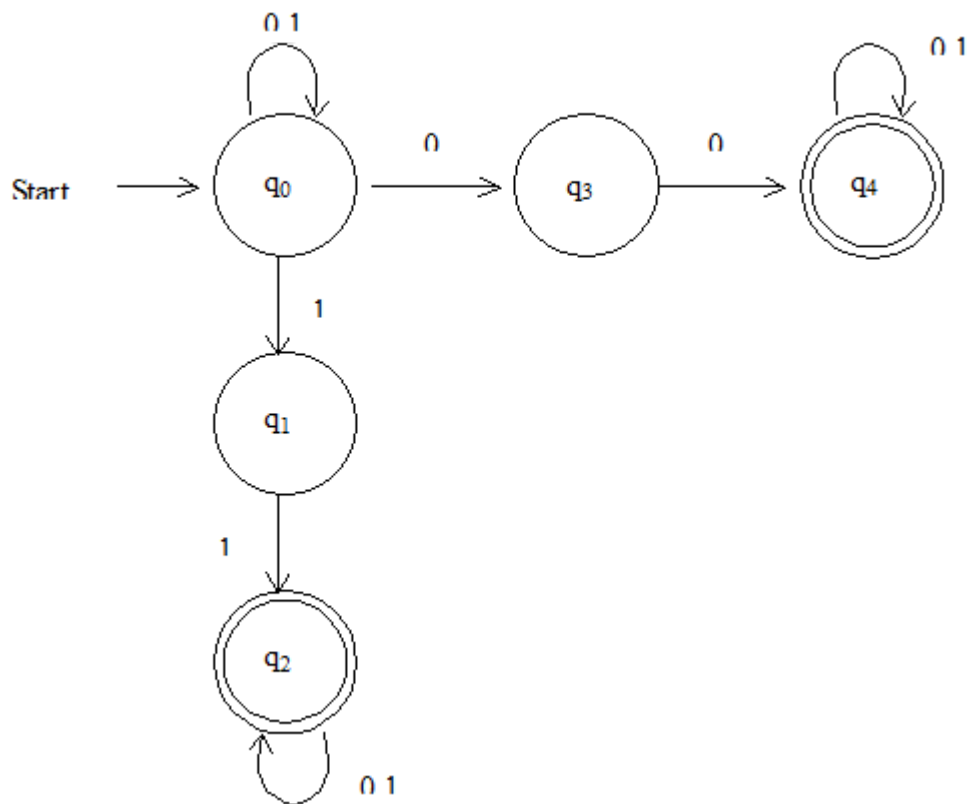
Explanation

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

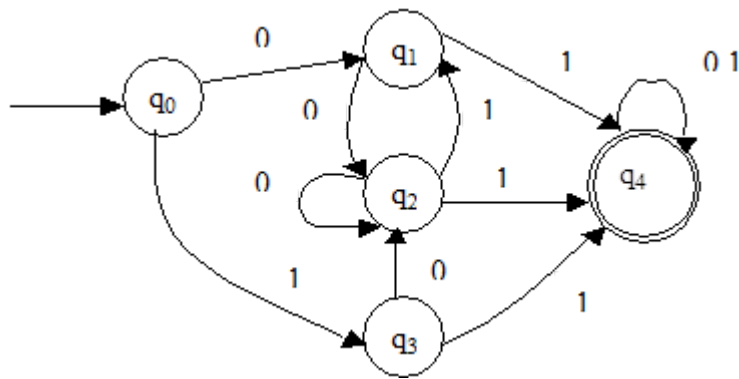
Type: NAT

Marks: 2

★★★★★

Top

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



3

Backspace

7

8

9

4

5

6

1

2

3

0

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-

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Clear All

Submit



Explanation

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Raise Query

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

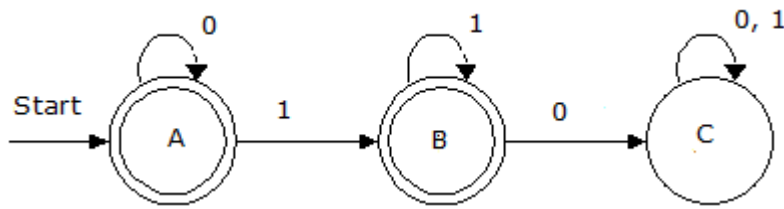
Marks: 1

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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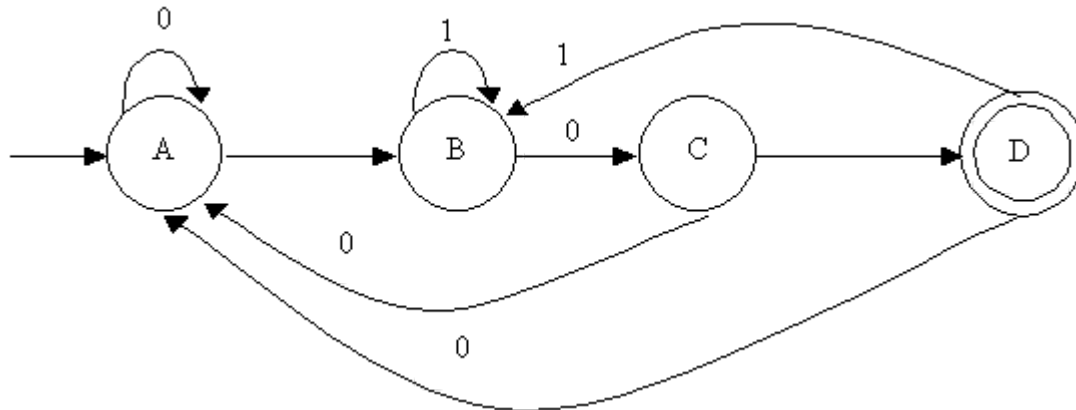
Explanation

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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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](#)

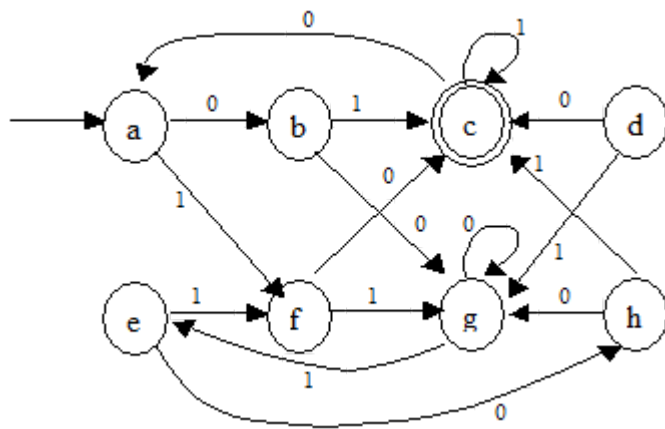
Type: NAT

Marks: 2



[Top](#)

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



5

Backspace

7

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4

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6

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3

0

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Clear All

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Explanation

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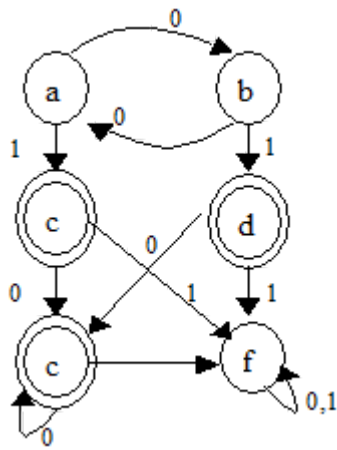
Raise Query

Type: NAT

Marks: 2



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



3

Backspace

7

8

9

4

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6

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Clear All

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Explanation

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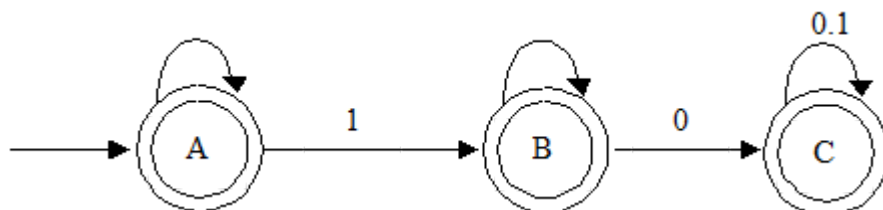
Type: NAT

Marks: 2

Rating: 3.5/5



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



3

Top

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

 ✓

Explanation

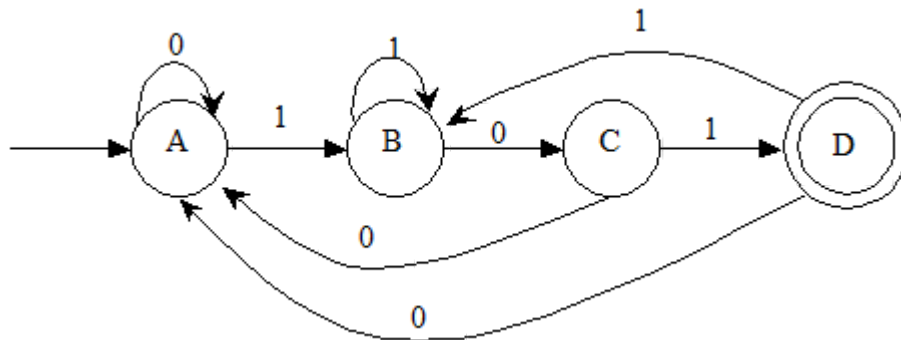
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Type: NAT

Marks: 2

Rating: 4/5 ★★★★★

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



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

Top

Clear All

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Explanation

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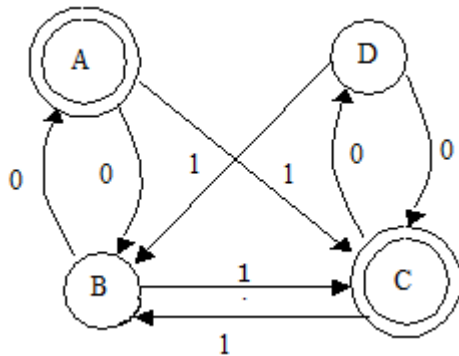
Raise Query

Type: NAT

Marks: 2

★★★★★

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



4

Backspace

7

8

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4

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6

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2

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Clear All

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Explanation

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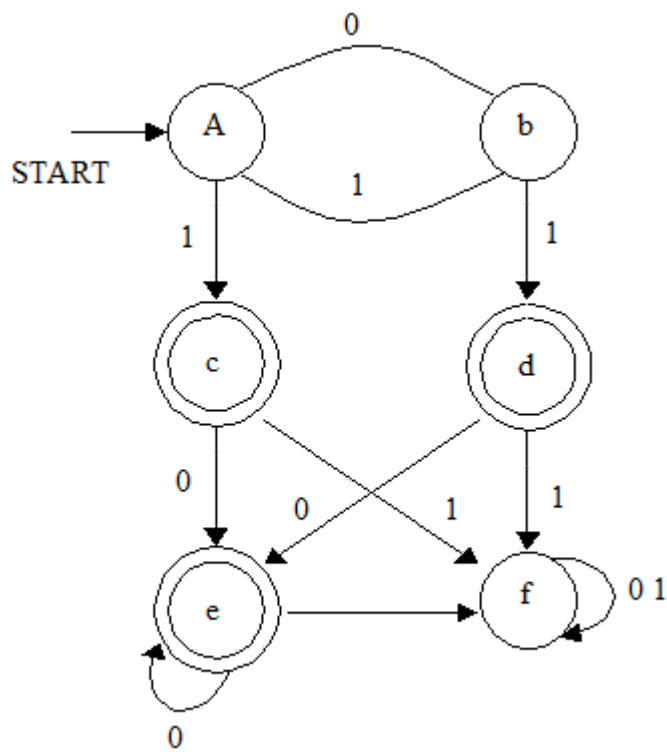
Type: NAT

Marks: 2

★★★★★

Top

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



3

Backspace

7

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Clear All

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Explanation

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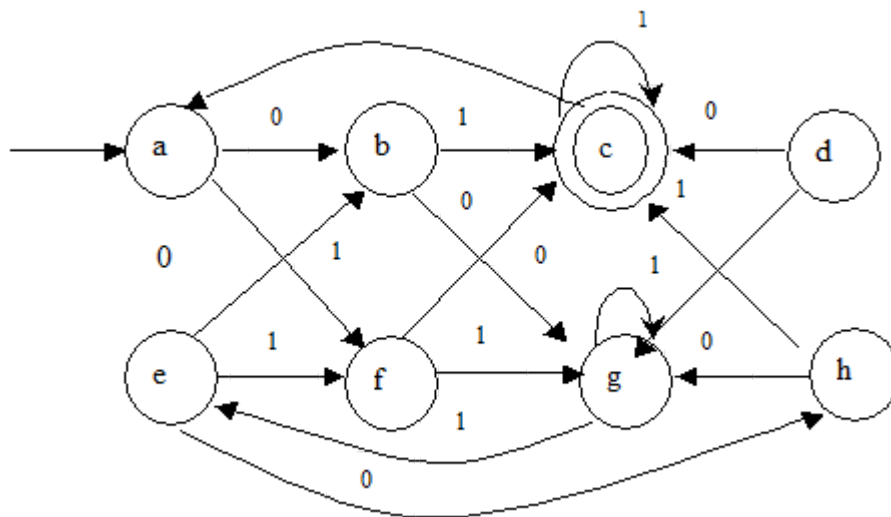
Type: NAT

Marks: 2



Top

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



5

Backspace

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4

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6

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Clear All

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Explanation

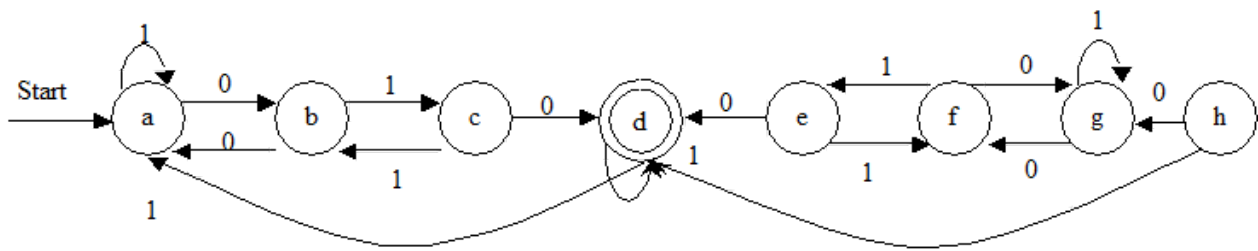
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Type: NAT

Marks: 2


[Top](#)

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



5

Backspace

7

8

9

4

5

6

1

2

3

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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

3

Backspace

7

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1

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3

Top

0	.	-
<<	>>	
Clear All		



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

Explanation

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Type: MCQ

Marks: 1



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

A) 2 states

B) 4 states

C) 3 states

D) 5 states

☐ A ☐ B ☒ C ☐ D

Explanation

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Type: MCQ

Marks: 1

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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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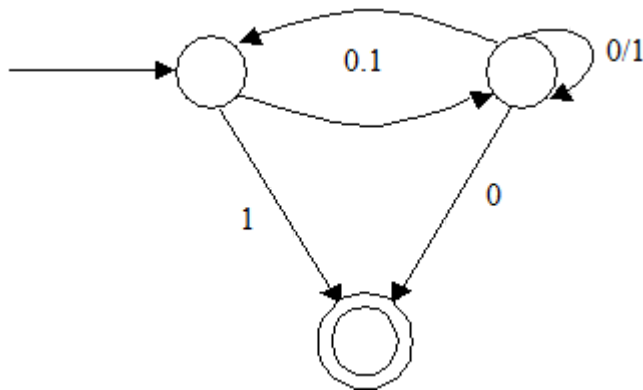
Explanation

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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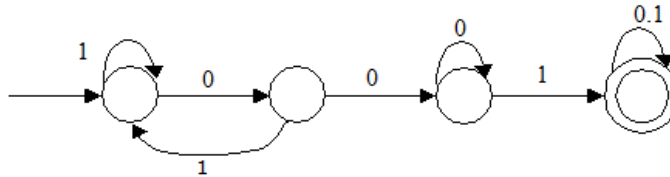
Explanation

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

7

8

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4

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6

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2

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0

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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
0	.	-
<<		>>
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	.	-
<<		>>
Clear All		



Explanation

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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
0	.	-
<<	>>	
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
0	.	-
<<	>>	
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

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Explanation

Type: NAT

Marks: 1

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

3

Backspace

7

8

9

4

5

6

1

2

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Clear All

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Explanation

Top

Type: NAT

Marks: 2



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

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

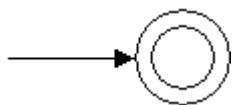
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Type: MCQ

Marks: 1

[Top](#)

85) The FSM pictured below recognizes



- 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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Explanation

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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Explanation

Top

Type: MCQ

Marks: 1



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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[Explanation](#)

Type: MCQ

Marks: 1



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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[Explanation](#)

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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[Explanation](#)

[Top](#)

Type: MCQ

Marks: 1



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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[Explanation](#)

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Type: MCQ

Marks: 1



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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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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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

Explanation

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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

Explanation

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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

Top

D) None of the above

☐ 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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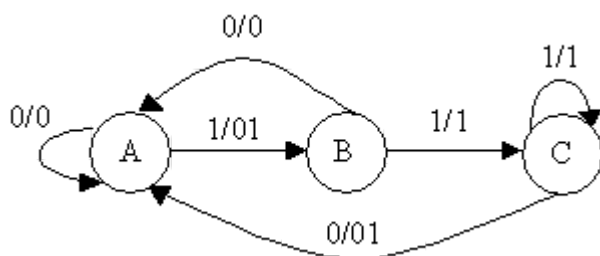
Explanation

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

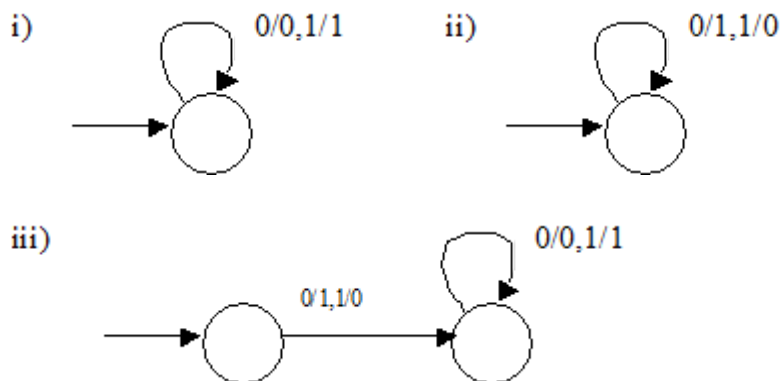
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Type: MCQ

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 ☒

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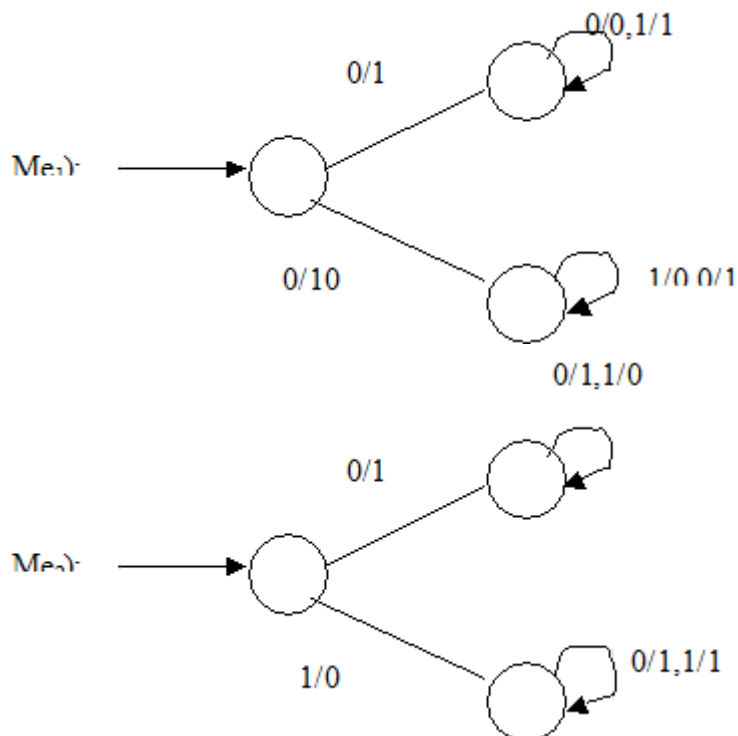
[Explanation](#)

Type: MCQ

Marks: 1



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 ✓[Share](#) [Mark IMP](#) [Raise Query](#)

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 ✓[Share](#) [Mark IMP](#) [Raise Query](#)

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 ✓[Share](#) [Mark IMP](#) [Raise Query](#)

Explanation

Type: MCQ

Marks: 1

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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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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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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?

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- 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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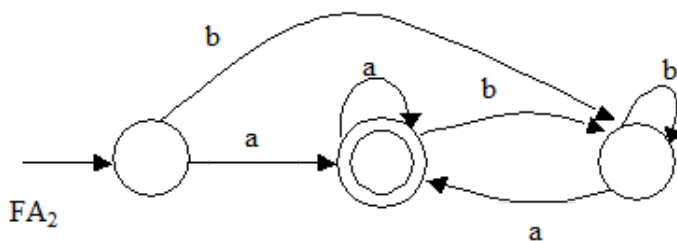
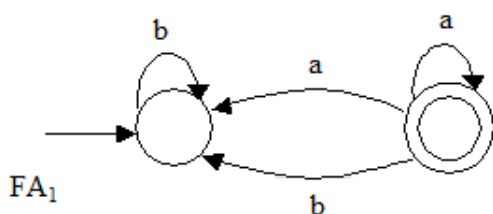
Explanation

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) $L = \{x/x \text{ has an equal number of a's and b's}\}$ is regular
- B) $L = \{a^n b^n / n \geq 1\}$ is regular
- C) $L = \{x/x \text{ has more a's than b's}\}$ 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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[Explanation](#)

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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[Explanation](#)

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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Explanation

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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?

256

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Explanation

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Type: MCQ

Marks: 1



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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