

Adarsh Kumar Prasad , 12019428

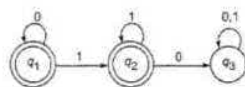
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Q: 30 of 30

Recognize the regular expression corresponding to the following Finite Automata using Arden's Method:



- a. 0^*1^*
- b. $(0 + 1)^*$
- c. $(1101)^*$
- d. $(0 + 11 + 010)^*$

Options :

- ☒ A
- ☐ B
- ☐ C
- ☐ D

[Clear Response](#)

6 of them are incorrect and remaining 24 are correct

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Q: 27 of 30

Consider the following languages

$$L1 = \{ww \mid w \in \{a, b\}^*\}$$

$$L2 = \{ww^R \mid w \in \{a, b\}^*, w^R \text{ is the reverse of } w\}$$

$$L3 = \{0^{2i} \mid i \text{ is an integer}\}$$

$$L4 = \{0^{i^2} \mid i \text{ is an integer}\}$$

Which of the languages are regular?

- a) Only L1 and L2
- b) Only L2, L3 and L4
- c) Only L3 and L4
- d) Only L3

Options :

- ☐ A
- ☒ B
- ☐ C
- ☐ D

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Given the language $L = \{ab, aa, baa\}$, which of the following strings are in L^* ?1) abaaabaaabaa2) aaaabaaaa3) baaaaabaaaab4) baaaaabaa

a) 1, 2 and 3

b) 2, 3 and 4

c) 1, 2 and 4

d) 1, 3 and 4

Feedback Regular Score

Options :

- ☐ A
- ☐ B
- ☒ C
- ☐ D

[Clear Response](#)

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- A. A and B are Equivalent
- B. A and B are not Equivalent
- C. Cannot be defined
- D. None of these

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7. Which one of the following languages over the alphabet $\{0,1\}$ is described by the regular expression?

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

- a. The set of all strings containing the substring 00.
- b. The set of all strings containing at most two 0's.

- c. The set of all strings containing at least two 0's.
- d. The set of all strings that begin and end with either 0 or 1.

Options :

- ☐ A
- ☐ B
- ☒ C
- ☐ D

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4. Consider the languages $L1 = \phi$ and $L2 = \{a\}$. Which one of the following represents $L1 L2^* \cup L1^*$ (A) $\{\epsilon\}$ (B) ϕ (C) a^* (D) $\{\epsilon, a\}$

a) A

b) B

c) C

d) D

Options :

☒ A☐ B☐ C☐ D[Clear Response](#)

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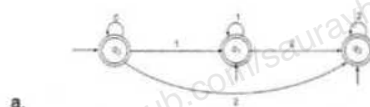
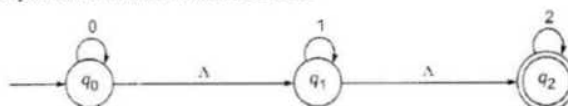
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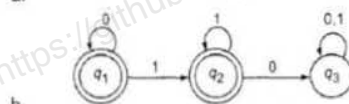
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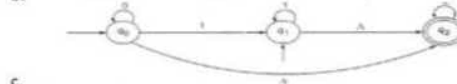
Consider a finite automaton, with A-moves, given in Fig. which among the following is the Equivalent automaton without A-moves.



a.



b.



c.

d. None of above

Options :

- ☒ A
☐ B
☐ C

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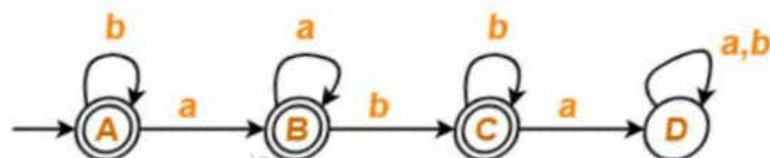
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Q5) Find the regular expression for the given

a) $b^*(aa^*(bb^*+\epsilon)+\epsilon)$ b) $b^*(aa^*(aa^*+\epsilon)+\epsilon)$

c) both a and b

d) none of the above

Options :

☐ A☐ B☒ C☐ D[Clear Response](#)

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Which of the following CFG's can't be simulated by an FSM ?

+

A. $S \rightarrow Sa \mid b$ B. $S \rightarrow aSb \mid ab$ C. $S \rightarrow abX, X \rightarrow cY, Y \rightarrow d \mid aX$

D. None of these

Options :

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If $L1 = \{a^n \mid n \geq 0\}$ and $L2 = \{b^n \mid n \geq 0\}$ is regular then $L3 = L1.L2 = \{a^m.b^n \mid m \geq 0 \text{ and } n \geq 0\}$ is also regular?

a. False

b True

c. None of the above

d.Regular

Options :

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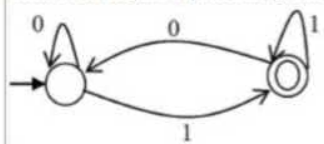
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Q5

Which of the regular expressions given below represent the following DFA?

I) $0^*1(1+00^*1)^*$ II) $0^*1^*1+11^*0^*1$ III) $(0+1)^*1$

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

Options :

- ☐ A
☐ B
☐ C
☒ D

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By using Arden's Theorem, the equation $q_1 = q_1(\underline{ab} + \underline{ba}) + \wedge$ can be written as,

- a. $q_1 = (a + b)^*$
- b. $q_1 = (\underline{abba})^*$
- c. $q_1 = (\underline{ab} + \underline{ba})^*$
- d. $q_1 = (ab)^*$

Options :

- ☐ A
- ☐ B
- ☒ C
- ☐ D

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Let P and Q be two regular expressions over Σ . If P does not contain \wedge , then according to Arden's theorem, $R = Q + RP$ has a unique solution given by _____

- a. $R = QP^*$
- b. $R = Q + P^*$
- c. $R = Q^*P$
- d. $R = Q + P$

Options :

☒ A☐ B☐ C☐ D[Clear Response](#)

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9. Which of the following pairs of regular expressions are equivalent?

a. $1(01)^*$ and $(10)^*1$ b. $x(xx)^*$ and $(xx)^*x$ c. x^++ and $x^+x^+(*+)$

d. All of the above mentioned

Options :

☐ A☐ B☐ C☒ D[Clear Response](#)

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Q. If $\Sigma = \{a, b\}$ and given productions are $S \rightarrow XaaX$ $X \rightarrow aX \mid bX \mid \Lambda$

Then the above grammar defines the language expressed by _____ regular expression

- a. $(a+b)^*aa(a+b)^*$
- b. $(a+b)^*a(a+b)^*a$
- c. $(a+b)^*aa(a+b)^*aa$
- d. $(a+b)^*aba+b)^*$

Options :

- ☒ A
- ☐ B
- ☐ C
- ☐ D

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A context sensitive language is accepted by

- a) Finite automata
- b) Linear bounded automata
- c) Both (a) and (b)
- d) None of these

Options :

- ☐ A
- ☒ B
- ☐ C
- ☐ D

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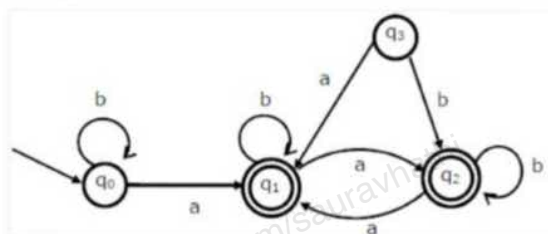
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Q: 14 of 30

Consider the following Finite State Automaton. The language accepted by this automaton is given by the regular expression



Options :

(A) $b^*ab^*ab^*ab^*$ (B) $(a+b)^*$ (C) $b^*a(a+b)^*$ (D) $b^*ab^*ab^*$

- ☐ A
☐ B
☒ C
☐ D

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Q: 11 of 30

1. Regular expression Φ^* is equivalent to

- a) ϵ
- b) Φ
- c) 0
- d) 1

Options :

- ☒ A
- ☐ B
- ☐ C
- ☐ D

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Q: 06 of 30

Which of the following is more powerful?

- a) PDA
- b) Turing machine
- c) Finite automata
- d) Context sensitive language

Options :

- ☐ A
- ☒ B
- ☐ C
- ☐ D

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Q: 01 of 30

Regular languages are closed under (closure properties)

- a. Concatenation
- b. Union
- c. Complement
- d. All of the above

Options :

- ☐ A
- ☐ B
- ☐ C
- ☒ D

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1. Regular expression Φ^* is equivalent to

- a) ϵ
- b) Φ
- c) 0
- d) 1

Options :

- ☒ A
- ☐ B
- ☐ C
- ☐ D

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A regular language over an alphabet a is one that can be obtained from

- a) union
- b) concatenation
- c) kleene
- d) All of the mentioned

Options :

- ☐ A
- ☐ B
- ☐ C
- ☒ D

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The entity which generate Language is termed as:

- a) Automata
- b) Tokens
- c) Grammar
- d) Data

Options :

- ☐ A
- ☐ B
- ☒ C
- ☐ D

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(a + b*c) most correctly represents:

- a. (a + b) * c
- b. (a) + ((b) * .c)
- c. (a + (b *)).c
- d. a + ((b *).c)

Options :

- ☐ A
- ☒ B
- ☐ C
- ☐ D

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A grammar $G = (V, T, P, S)$ in which V is

- a) Set of variables
- b) Set of terminals
- c) Set of variables and terminals
- d) None of these

Options :

- ☒ A
- ☐ B
- ☐ C
- ☐ D

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Q: 09 of 30

Arden's theorem is true for:

- a. More than one initial states
- b. Non-null transitions
- c. Null transitions
- d. None of the above

Options :

- ☐ A
- ☒ B
- ☐ C
- ☐ D

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Q: 08 of 30 1. A Finite Automata with null **moves** is considered to be _____

- a. DFA
- b. NDFA
- C. BOTH
- D. None of the above

Options :

- ☐ A
- ☒ B
- ☐ C
- ☐ D

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Which of the following relates to Chomsky hierarchy?

- a) Regular<CFL<CSL<Unrestricted
- b) CFL<CSL<Unrestricted<Regular
- c) CSL<Unrestricted<CF<Regular
- d) None of the mentioned

Options :

- ☒ A
- ☐ B
- ☐ C
- ☐ D

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Q10 Find the pair of regular expressions that are equivalent

a. $(0+1)^*$ and $(0^*+1^*)^*$ b. $(0+1)^*$ and $(0+1^*)^*$ c. $(0+10)^*$ and $(0^*+10)^*$

d. All of the mentioned

Options :

☐ A☐ B☐ C☒ D[Clear Response](#)

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Which of the following is useful for converting a finite automaton into a regular expression?

- a. Null Moves
- b. Kleen's Closure
- c. Transition Function
- d. Arden's Theorem

Options :

- ☐ A
- ☐ B
- ☐ C
- ☒ D

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