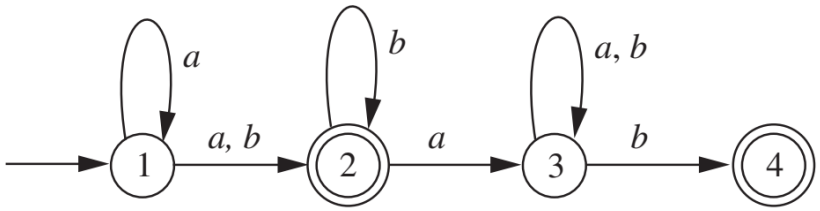
Started on	Thursday, 15 February 2024, 8:16 AM
State	Finished
Completed on	Thursday, 15 February 2024, 8:22 AM
Time taken	5 mins 59 secs
Grade	**5.67** out of 10.00 (**56.67**%)

Question 1

Partially correct

Mark 1.00 out of 2.00



Consider the above NFA.

Select the states which are included in the set $\delta^*(1, abab)$?

Select one or more:

- a. 4 ✔
- b. 3
- c. 1
- d. 2

Question 2

Partially correct

Mark 0.50 out of 1.00

Let L be a regular language on Σ*, and let n be a positive integer. If there are n strings in Σ* such that any two of them are distinguishable w.r.t. L, then which of the following statements is/are true?

Select one or more:

- a. There exists a finite automaton that recognizes L with fewer than n states.
- b. Every finite automaton that recognizes L has at least n states. ✔
- c. There exists a finite automaton that recognizes L with exactly n states.
- d. Every finite automaton that recognizes L should have more than n states.

Question 3

Partially correct

Mark 1.50 out of 3.00

Suppose $M_1=(Q_1 , \Sigma, q_1, A_1 , \delta_1)$ and $M_2=(Q_2 , \Sigma, q_2 , A_2 , \delta_2)$ are Finite Automata(FA)s that accept languages L_1 and L_2 where $L_i \subseteq \Sigma^*$, Then which of the following is/are true?

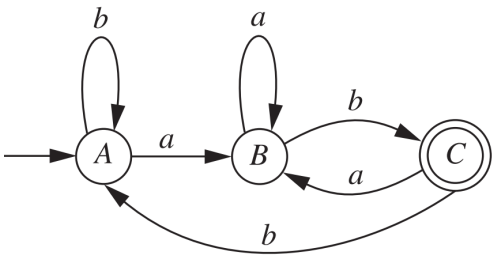
Select one or more:

- a. There is no such a FA, M that accepts the language $L_1 \cap L_2$
- b. There is an FA, M that accepts the language L_1^* ✔
- c. There is no such an FA, M that accepts the language $\Sigma^* - L_1$
- d. If $x \in \Sigma$ then there is an FA recognizing {x}

Question 4

Correct

Mark 2.00 out of 2.00



Select one or more correct statements about this FA

Select one or more:

- [x] a. The language accepted by this FA has infinite number of strings. ✔
- [ ] b. If a given string X halts in state B (after all the transitions), Then all strings generated through the regular expression Xb*a are accepted by this FA.
- [x] c. All strings generated through regular expression b^*a^+b are accepted by the above FA. ✔
- [ ] d. Assume that a string X is accepted by this FA. (X consists of 'a' s and/or 'b' s). Then Xaba is also accepted by this FA.

Question 5

Partially correct

Mark 0.67 out of 2.00

Consider the NFA M=(Q, Σ, q0, A, δ) with A={q2, q7, q9}.

Which subset of states in the NFA is a possible accepting state in the equivalent DFA?

Select one or more:

- [ ] a. {q4}
- [x] b. {q2,q7,q9} ✔
- [ ] c. {q5,q8}
- [ ] d. {q6,q7}
- [ ] e. {q1,q2,q3}