Started on	Monday, 17 February 2025, 10:22 AM
State	Finished
Completed on	Monday, 17 February 2025, 10:28 AM
Time taken	5 mins 51 secs
Grade	**7.00** out of 10.00 (**70**%)

Question 1

Correct

Mark 2.00 out of 2.00

Suppose the NFA, M=(Q, Σ, q_0 , A, δ) where Q={q_0 , q_1 , q_2 }, Σ={0,1}, A={q_2 } and δ specified as follows is given.

Current State q	**δ(q,0)**	**δ(q,1)**
q_0	{q_0}	{q_0, q_1}
q_1	{q_2}	{q_2}
q_2	Ø	∅

To find an equivalent DFA, M1=(Q_1, Σ, {q_0} , A_1, δ_1) , complete the following table with suitable values for each state.

Current State q	**δ_1(q,0)**	**δ1(q,1)**
{q_0}	{q_0}	{q0,q1}
{q0,q1}	{q_0, q_2}	{q0,q1,q2 }
{q_0,q_2}	{q_0}	{q0,q1}
{q0,q1,q2 }	{q0, q2}	{q0,q1,q2 }

Question 2

Incorrect

Mark 0.00 out of 3.00

Select the correct statement(s) about Finite Automata and Regular Languages.

Select one or more:

- a. If L_1 = {strings containing 1001} and L_2 = {strings not containing 1001}, then the minimum state DFAs for L_1 and L_2 have an equal number of states.
- b. An NFA accepts a string w only if every path that corresponds to w starts from the initial state and terminates in an accepting state. ✖
- c. A DFA that accepts the language L = $\{0^n1^n \mid n \geq 0\}$ has at least n states.
- d. The language L = $\{ww^R \mid w \in \Sigma^*$ with $\Sigma = \{0,1\}\}$ is regular. (Here w^R represents the reverse of string w)

Question 3

Correct

Mark 2.00 out of 2.00

Consider the language L given by expression **(a|b)*b(a|b)** over the alphabet **{a,b}**. What is the **minimum number of states** and the **number of accepting states**, respectively, in **DFA** that accepts the language L?

Select one:

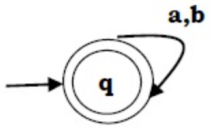
- a. Number of states = 5 and number of accepting states = 1
- b. Number of states = 4 and number of accepting states = 1
- c. Number of states = 4 and number of accepting states = 2 ✔
- d. Number of states = 5 and number of accepting states = 2

Question 4

Correct

Mark 1.00 out of 1.00

Consider the following FA.



What regular expression is represented by this FA?

Select one:

- A. (a|b)
- B. (ab|ba)*
- C. Λ
- D. (a|b)+
- E. (a|b)* ✔

Question 5

Correct

Mark 2.00 out of 2.00

Consider the following **Nondeterministic Finite Automaton (NFA):**

$M = (Q, \Sigma, q_0, A, \delta)$

- $Q = \{q_0, q_1, q_2\}$
- $\Sigma = \{0, 1\}$
- $A = \{q_2\}$
- The transition function is defined as follows:

State	$\delta(q, 0)$	$\delta(q, 1)$
q_0	$\{q_0, q_1\}$	$\{q_0\}$
q_1	ϕ	$\{q_2\}$
q_2	ϕ	ϕ

Using **subset construction**, which of the following sets represents the accepting states in the equivalent DFA?

Select one:

a. $\{\{q_0, q_1, q_2\}, \{q_2\}\}$

b. $\{\{q_0, q_1, q_2\}, \{q_0, q_2\}, \{q_2\}\}$

c. $\{\{q_0, q_1, q_2\}, \{q_0, q_2\}\}$

d. $\{\{q_0, q_2\}\}$ ✔