



VIT

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REG.NO.:

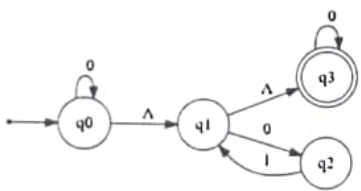
SCHOOL OF COMPUTER SCIENCE ENGINEERING AND INFORMATION SYSTEMS CONTINUOUS ASSESSMENT TEST - I WINTER SEMESTER 2025-2026

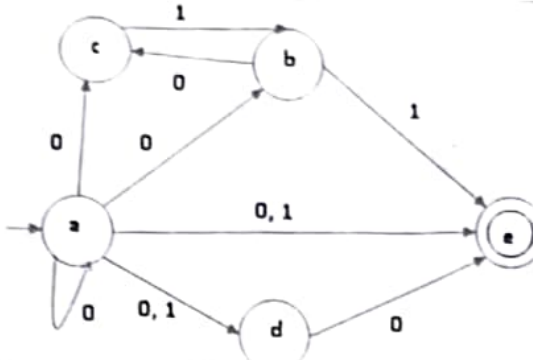
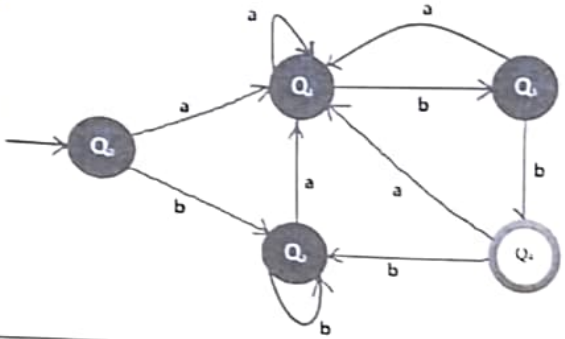
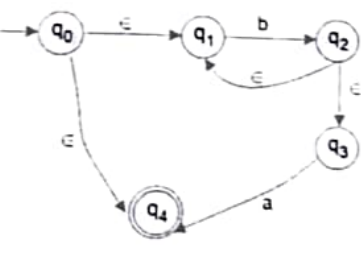
SLOT: B2+TB2

Programme Name & Branch : B.Tech & CSE (AIDE and CS)
Course Code and Course Name : BCSE304L and Theory of Computation
Faculty Name(s) : Dr. Raghavan R, Dr. Uma Maheswari G
Class Number(s) : VL2025260503591, VL2025260503589
Date of Examination : 28.01.2026
Exam Duration : 90 minutes **Maximum Marks: 50**

General instruction(s): Answer All Questions

- M - Max mark; CO – Course Outcome; BL – Blooms Taxonomy Level (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyse, 5 – Evaluate, 6 – Create)
- Course Outcomes
 CO1: Compare and analyse different computational models
 CO4: Represent the abstract concepts mathematically with notations.

Q. No	Question	M	CO	BL
1.	a) Define four Σ to cover the following strings (3 marks) abfzb , ab#bck , (())(()) , l@#\$\$%^&* b) Trace the output for the following (2 marks) $(abba)^2, (abba)^0, (abba)^1, (abba)^4$ c) Express the relationship between the delta tuple definition of NFA and DFA in the form of expression (2 marks) d) Match the following (3 marks) Kleene Star - Enforcing new restriction while generating output strings. Positive closure – Strings recognized by the machines like NFA, DFA Regular language – Only accepts strings without NULL string Formal language - Even accepts strings including NULL string.	10	CO4	3
2.	Convert the following NFA+Epsilon to NFA. Here \wedge is assumed as Epsilon. (5 marks) 	5	CO1	6
	b) Convert the following NFA to DFA (5 marks) (PTO)	5		

				
<p>3.</p>	<p>Design DFA from the following sources over $\Sigma = \{0,1\}$. Include necessary trap states.</p> <p>a) Regular sets $\{\wedge, 010, 1010, 01010, 1011010, 0101010, 1111010, 0000010, 1010010, \dots\}$</p> <p>b) Design a DFA that accepts all the string with at most three a's over $\Sigma = \{a,b\}$</p>	<p>5 5</p>	<p>CO1</p>	<p>6</p>
<p>4.</p>	<p>Minimize the following DFA</p> 	<p>10</p>	<p>CO1</p>	<p>5</p>
<p>5.</p>	 <p>For the given NFA+ Epsilon, $\delta(q_2, a) = \{\phi\}$, whereas Epsilon closure $(q_2, a) \neq \{\phi\}$. Justify the role of epsilon closure along with the definition and properties of epsilon closure. Also find Epsilon closure (q_1, b) and Epsilon closure (q_3, b).</p>	<p>10</p>	<p>CO1</p>	<p>5</p>