



Daffodil International University
Department of Software Engineering
Faculty of Science & Information Technology
Midterm Examination, Spring 2023

Course Code: **SE234** ; Course Title: **Theory of Computing**

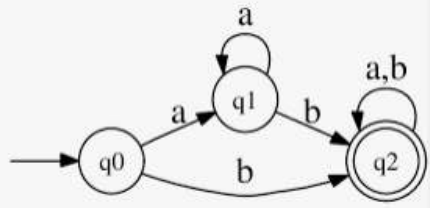
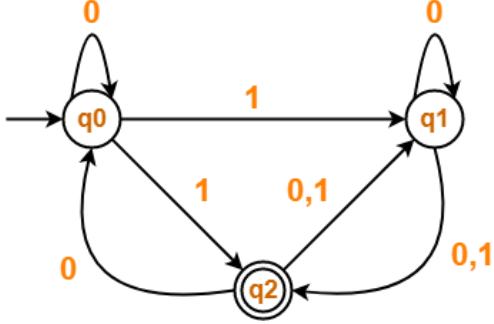
Sections & Teachers: A (35 Batch) , A (36 Batch) & FBR

Time: **1 Hour 30 Mins**

Marks: **25**

Answer ALL Questions

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1.	a)	Identify the difference between ϵ and ϕ with finite automata diagram.	[Marks-2]	CLO-1 Level-3
	b)	Construct Deterministic finite Automata for following language: . {w every odd position of w is a 1 for binary alphabet} Let $\Sigma = \{a, b\}$ and let $L = \{baa\}$. Design a DFA for L	[Marks-2.5+2.5]	
	c)	Demonstrate the following DFA and show epsilon acceptance. 	[Marks-3]	
2.	a)	Differentiate DFA and NFA by showing a proper example with diagram.	[Marks-3]	CLO-2 Level-5
	b)	Formulate subset construction method to convert the following Non-Deterministic Finite Automata (NFA) to Deterministic Finite Automata (DFA)- 	[Marks-4]	
	c)	Construct a Non deterministic finite automata for input {a,b} where	[Marks-3]	

		$L = \{w \mid w \text{ where any numbers of a's followed by any number of b's}\}$		
3.	a)	Explain Regular Expression and compare a^* and a^+	[Marks-3]	CLO-3 Level-3
	b)	Construct Regular Expression for the following Language: $L = \{w \mid w \text{ does contain 3 consecutive b's where alphabet in } \{b,c\}\}$	[Marks-2]	