Daffodil International University

Faculty of Science & Information Technology

Department of Computer Science & Engineering

Mid Semester Examination, Fall 2024

Course Code: CSE228, Course Title: Theory of Computation

Level: L2 Term: T2 Batch: 64

Time: 01.5 Hrs **Marks:25**

Answer ALL Questions

[All portions of each question must be answered sequentially.]

Q1	a)	**Summarize** the difference between ø and ϵ. Given the Alphabet $\sum=\{y, z, 0\}$, so compute $\sum^2$	[2]	CO1
	b)	**Evaluate** the string 00110 using extended transition function for the following transition table.	[2]	
	c)	**Summarize** the meaning of "a*b+b*a".	[1]	
Q2	a)	**Apply** the knowledge of NFA to Design NFA's accepting the following languages over the alphabet {a,b} i) The set of all Strings containing **aba** anywhere in the string ii) The set of all Strings ending with **bba** iii) ending with **bbb**	[3]	CO2
	b)	**Apply** the knowledge of DFA to Design DFA's accepting the following languages over the alphabet {0,1} i) The set of strings containing 010 at the end in the string ii) Design DFA to accept the following language, L={W/ W has odd number of 1's and even number of 0's}	[3]	
	c)	Considering the transition table from the Q1 b. If the mentioned Automata is NFA, then **convert** to DFA.	[4]	
Q3	a)	**Construct** the Regular Expression for the language consisting of all the strings of 0' and 1's that have the following condition: i) Containing 110 anywhere in the string ii) Containing 1 either two or three possible position from the beginning. iii) Containing 101 at the end of the string	[3]	CO2
	b)	**Convert** the following Regular expression (RE) into NFA with ϵ transition. i) 1(1+0)*0 ii) (a|b)*(abb|a*b)	[3]	
	c)	**Convert** the following NFA into equivalent RE	[4]	

	0	1
→ q0	{q0}	{q0,q1}
q1	{q2}	Ø
*q2	Ø	Ø