PRN:		Course Code :	BCA208

000694

Second Year **BCA** End Semester Examination Winter 2024

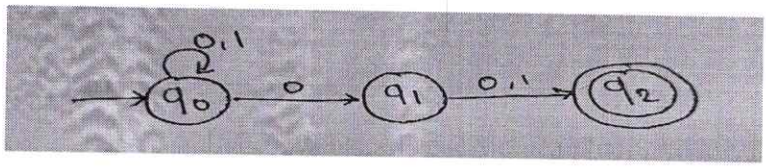
Theory Of Computation

Day and Date: Fri 22 NOV 2024 Max Marks: **100**

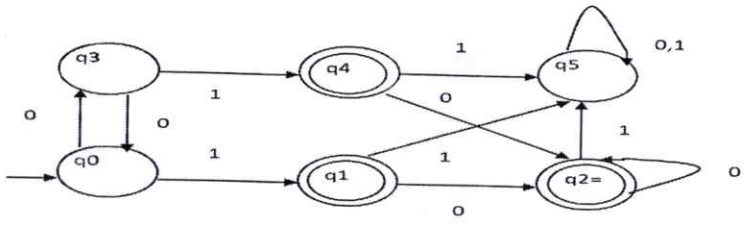
Time : 02:00PM To 05:00PM Duration: **03** hrs

Instructions: All questions are compulsory.

		Marks	Bloom's Level	CO
Q.1	**Attempt the following**			
a)	Explain types of proofs with example	08	L2	Co1
b)	Define Finite Automata. Design DFA for the following language 1) $L=\{ a^m b^n \mid m, n>0\}$ 2) All string in $\{0,1\}^*$ having even no of 0's	08	L1	Co1
	OR			
b)	Explain types of FA. Convert the following NFA to DFA NFA of all the binary string in which 2nd last bit is 1	08	L2	Co1



Q.2	**Attempt the following**			
a)	Construct FA by Minimizing No of states for following FA	08	L3	Co1



b)	Explain Kleene's Theorem part-I	08	L2	Co2
	OR			
b)	Explain Kleene's Theorem part-I	08	L2	Co2
Q.3	**Attempt any two from the following**			
a)	List & Explain types of Grammar in detail	08	L4	Co2
b)	Explain Derivation Tree. Build a Tree for the following S → Ab | b A A → a | As | b AA B→ b |Bs | a B B	08	L3	Co2
c)	Explain Simplification of context free Grammar with example	08	L2	Co2

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Q.4	**Attempt any two from the following**				
	a)	Convert CFG to CNF for the given example P: S→ ASA | a B A→B | S B→ b | ε	08	L3	Co3
	b)	Define CFL & Explain Closure Property in detail	08	L1	Co2
	c)	Construct CFG for the given language L= { WCW^R | Where w ∈ (a,b)* }	08	L3	Co3
Q.5	**Attempt any Two of the following**				
	a)	What is Push down Automata? Explain it with its types	09	L1	Co3
	b)	Construct PDA that accepts the following language 1) L= $\{a^n b^n \mid n>=1\}$ 2) L= $\{0^n 1^{2n} \mid n>0\}$	09	L3	Co3
	c)	What is Pumping Lemma? Show that L= $\{a^n b^n c^n \mid n>=0\}$ is not a context free language.	09	L2	Co3
Q.6	**Attempt any Two of the following**				
	a)	Define Turning Machine. Analyze TM for the language 1) L = $\{0^n 1^n \mid n>=1\}$ 2) L= $\{a^n b^n c^n \mid n>=1\}$	09	L4	Co4
	b)	Explain TM with its basic model	09	L2	Co4
	c)	Explain TM & Instantons description of TM	09	L2	Co4

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