PRN: | Course Code : BCA208

Second Year **BCA** End Semester Examination Winter 2022

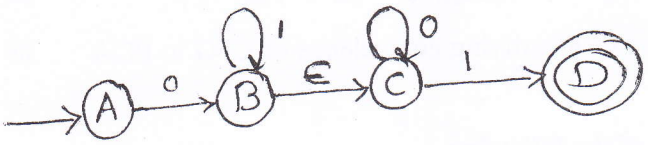
Theory of Computation

Day and Date: Tuesday , 20/06/2023 Max Marks: **100**

Time : 2:00 to 5:00 pm Duration: **03** hrs

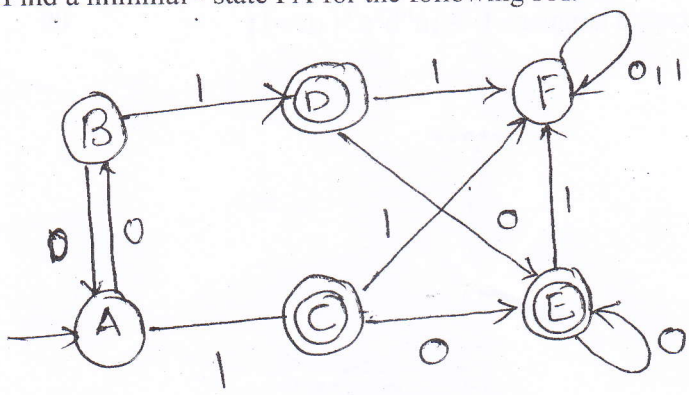
Instructions: 1) **Each question is compulsory.**
2)**Right figure indicates full marks.**

		Marks	Bloom's Level	CO
Q.1	**Attempt the following**			
a)	Describe types of Proof with an example.	08	L2	CO2
b)	Compare NFA and DFA . Design DFA over over{a,b} such that length of string 1.at least two. 2.at most two.	08	L2	CO2
	OR			
b)	Define Arden's Theorem with Proof.	08	L2	CO1
Q.2	**Attempt the following**			
a)	Find equivalence of NFA to DFA L={set of string over(0,1)that starts with 0}	08	L1	CO3
b)	Convert following Null NFA to NFA..	08	L3	CO2



OR

b) Find a minimal - state FA for the following FA. 08 L3 CO3



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Q.3	**Attempt any two from the following**				
	a)	Define a Context free grammar and explain Ambiguous grammar with an example.	08	L2	CO3
	b)	Explain Kleene's theorem part-II with an example.	08	L2	CO2
	c)	Explain with an example simplification of Context free grammar.	08	L2	CO3
Q.4	**Attempt any two from the following**				
	a)	Show that, if L_1 and L_2 are two context free languages, then L_1 U L_2, and L_1* are also context free languages.	08	L4	CO3
	b)	i. Draw BOTH type of derivation tree for the string "a*b+c" where production E=E+E E=E*E E=a/b/c ii. Draw BOTH type of derivation tree s-> aAS/aSS/ ^ a-> SbA/ba	08	L3	CO1
	c)	Define CNF form and convert the following CFG to Chomsky Normal Form. S → ASA| aB A → B| S | ^ B → b|^	08	L2	CO2
Q.5	**Attempt any Two of the following**				
	a)	Describe push down automata and its configuration with an example.	09	L2	CO3
	b)	Construct PDA from given language L = $\{a^n b^n \mid n>=1\}$	09	L3	CO3
	c)	Explain the theorem of identifying equivalence of CFG to PDA with example.	09	L2	CO3
Q.6	**Attempt any Two of the following**				
	a)	Explain the Turing machine as a language acceptor with an example	09	L2	CO3
	b)	Explain the Single-tape and Multi-tape Turing machines with their need.	09	L2	CO4
	c)	Design a TM to accept a language L = $\{a^n b^n c^n \mid n>=1\}$	09	L3	CO4

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