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III/IV B.Tech (Regular / Supplementary) DEGREE EXAMINATION

January, 2022 — **Information Technology**

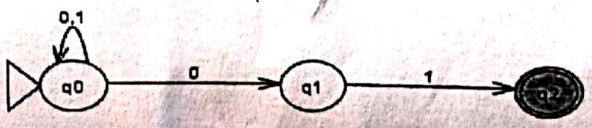
Fifth Semester — **Automata & Compiler Design**

Time: Three Hours — **Maximum:** 50 Marks

Answer Question No.1 compulsorily. (10X1 = 10 Marks)

Answer ONE question from each unit. (4X10=40 Marks)

1.	a)	Define Alphabet.		CO1	
	b)	Define DFA.		CO1	
	c)	$(R^*)^* =$		CO1	
	d)	What is ambiguous grammar?		CO2	
	e)	Define PDA.		CO2	
	f)	Define Compiler.		CO3	
	g)	What is handle.		CO3	
	h)	What is the role of the syntax analysis?		CO4	
	i)	What are the different types of intermediate representations?		CO4	
	j)	Define Basic Block.		CO4	
		Unit -I			
2.	a)	Design a DFA which accepts the strings with a substring as **aab.**		CO1	5M
	b)	State pumping lemma for Regular Languages. Explain with example.		CO1	5M
		(OR)			
3.	a)	Convert following NFA into DFA.		CO1	5M



	b)	Explain closure properties of Regular Languages.		CO1	5M
		Unit –II			
4.	a)	Consider the following grammar $S \rightarrow A1B$ $A \rightarrow 0A \mid \epsilon$ $B \rightarrow 0B \mid 1B \mid \epsilon$ Give leftmost and rightmost derivations of the following string **00101**	CO2	CO2	5M
	b)	Convert the following grammar in to Chomsky Normal Form (CNF). $S \rightarrow ABA \mid AB \mid BA \mid AA \mid B$ $A \rightarrow aA \mid a$ $\quad B \rightarrow bB \mid b$		CO2	5M
		(OR)			
5.	a)	Design Push Down Automata for the language $L=\{WCW^R \mid W \in (0+1)^*\}$.		CO2	5M
	b)	Explain pumping lemma for context free languages with an example.		CO2	5M
		Unit -III			
6.	a)	Describe the phases of a Compiler.		CO3	6M
	b)	Explain the Role of Lexical Analyzer.		CO3	4M
		(OR)			
7.	a)	Write short notes on input buffering in lexical analysis.		CO3	5M
	b)	Construct CLR parse table for the following grammar. $S \rightarrow CC$ $\quad C \rightarrow cC/d$		CO3	5M
		Unit -IV			
8.	a)	Explain about the design issues of the code generator.		CO4	5M
	b)	Write short notes on storage-allocation strategies.		CO4	5M
		(OR)			
9.	a)	How to generate intermediate code for the Boolean expression **a<b or c<d and e<f.**		CO4	5M
	b)	Explain about flow graphs.		CO4	5M