DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Supplementary Summer Examination – 2023

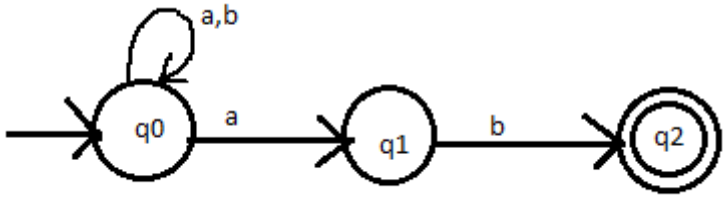
Course: B. Tech. **Branch :Computer Engineering** **Semester :V**

Subject Code & Name: Theory Of Computation (BTCOC502)

Max Marks: 60 **Date:09/08/2023** **Duration: 3 Hr.**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		**12**
A)	Construct a Deterministic Finite Automaton for the set of string over {a, b} such that length of the string |w|=2.	Design	**6**
B)	State and explain applications of Regular Expressions.	Understand	**6**
C)	Design an NFA with ∑ = {0, 1} accepts all string ending with 01.	Design	**6**
Q.2	**Solve Any Two of the following.**		**12**
A)	Distinguish between Moore machine and Mealy machine .	Analyze	**6**
B)	Write a regular expression over alphabet ∑ = {0, 1} for following . (i) begins with 1, ends with 1 (ii) ends with 00 (iii) contains at least three consecutive 1s	Create	**6**
C)	Convert the following Non Deterministic Automaton into Deterministic Finite Automaton . 	Apply	**6**
Q. 3	**Solve Any Two of the following.**		**12**
A)	Write the steps for grammar reduction. Eliminate Unit Productions from the following grammar. S -> Aa|B|c B -> A|bb A -> a|bc|B	Apply	**6**

B)	Explain Chomsky classification of grammar.	Remember	**6**
C)	When does context free grammar is said to be in Chomsky Normal Form(CNF)? Write steps to convert context free grammar into CNF.	Understand	**6**
Q.4	**Solve Any Two of the following.**		**12**
A)	Write the productions rule of Context free grammar for following regular expressions. (i) 0* (ii) (a+b)* (iii) (ab)*	Design	**6**
B)	What are the different components of Pushdown Automaton? Explain with neat diagram.	Remember	**6**
C)	Distinguish between Deterministic and Non Deterministic PDA.	Analyze	**6**
Q. 5	**Solve Any Two of the following.**		**12**
A)	Design Turing machine that accepts the language of all strings over alphabet $\sum = \{a, b\}$ whose second letter is b.	Design	**6**
B)	Explain the following (i)Multihead Turing machine (ii)Universal Turing machine (iii) Non Deterministic Turing machine	Understand	**6**
C)	What is Church Turing Thesis ? Explain.	Remember	**6**
	***** End *****		

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