

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE Supplementary Examination Summer 2024 Course: B. Tech. Semester :V Branch : Computer Engineering/ Computer Science And Engineering Subject Code & Name: Theory of Computation (BTCOC502) Max Marks: 60 Date: 03/07/2024 Duration: 3 Hrs.			
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.		
A)	Design Non deterministic Finite Automaton to accept all strings over alphabet {a, b} ending with abab.	Design	6
B)	Distinguish between Moore machine and Mealy machine.	Analyze	6
C)	Construct Deterministic Finite Automaton for regular expression (a+b)*aba	Design	6
Q.2	Solve Any Two of the following.		
A)	State some applications of regular expressions.	Remember	6
B)	Distinguish between regular language and context free language.	Understand	6
C)	Design context free grammar for following language $(ab)^n$ where $n \geq 1$ and $a^n b^n$ where $n \geq 0$.	Design	6
Q. 3	Solve Any Two of the following.		
A)	State some applications of Context Free Grammar.	Understand	6
B)	Explain the following. (i) Type 0 grammar (ii) Type 1 grammar (iii) Type 2 grammar (iv) Type 3 grammar	Remember	6
C)	Find the reduced grammar equivalent to the following grammar where productions are : $S \rightarrow AC \mid SB$	Apply	6

	$A \rightarrow bASC \mid a$ $B \rightarrow aSB \mid bbc$ $C \rightarrow BC \mid ad$		
Q.4	Solve Any Two of the following.		
A)	What is Push Down Automaton (PDA)? Explain different components of PDA.	Remember	6
B)	Design PDA to accept language $L = (ab)^*$ where $n_a = n_b$.	Design	6
C)	Construct PDA for following grammar. $S \rightarrow aAA$ $A \rightarrow aS \mid bS \mid a$	Apply	6
Q. 5	Solve Any Two of the following.		
A)	Explain how Turing machine is represented using transition diagram and transition table.	Understand	6
B)	Explain concept infinite loop in Turing machine with the help of an example.	Analyze	6
C)	Design Turing machine that recognizes the language L of all strings over $\{a, b\}$ with number of a's equal to number of b's.	Design	6
	*** End ***		