DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular/Supplementary Winter Examination – 2023

Course: B. Tech. **Branch : Computer and Allied**

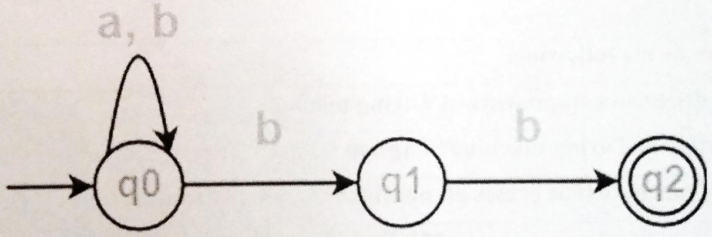
Semester :V

Subject Code & Name: Theory Of Computation (BTCOC502)

Max Marks: 60 **Date:03/01/2024** **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.**		**12**
A)	**Find the string set for following regular expressions.** (i)00* (ii)a*b* (iii) (0+1)*	**Create**	**6**
B)	**What are the elements of Deterministic Finite Automaton? How it is represented?**	**Remember**	**6**
C)	**Design Non Deterministic Finite Automaton that accepts set of all strings over {0,1} that start with 0 or 1 and end with 01 or 10.**	**Design**	**6**
Q.2	**Solve Any Two of the following.**		**12**
A)	**Distinguish between Mealy machine and Moore machine.**	**Remember**	**6**
B)	**Apply subset construction algorithm to convert following Non Deterministic Finite Automaton to Deterministic Finite Automaton** 	**Apply**	**6**
C)	**Consider the following production rules.** S→ aAB A→bBb B→ A|ϵ Obtain leftmost and rightmost derivation for string "abbbb"	**Apply**	**6**

Q. 3	Solve Any Two of the following.		12
A)	Show that the given grammar is ambiguous grammar. E→ E+E E→E*E E → a	Apply	6
B)	Explain Chomsky classification of grammar.	Remember	6
C)	Find Context Free Grammar without ϵ- productions equivalent to the following grammar . S→ABaC A→BC B→b | ϵ C→ D| ϵ D → d	Apply	6
Q.4	Solve Any Two of the following.		12
A)	Reduce the following grammar to Chomsky Normal Form(CNF). S→aAD A→aB | bAB B→b D→d	Apply	6
B)	Design Push down Automata (PDA) to accept language L=(a,b)* where $n_a = n_b$.	Design	6
C)	Distinguish between Deterministic and Non Deterministic PDA.	Remember	6
Q. 5	Solve Any Two of the following.		12
A)	What are the different components of Turing machine?	Remember	6
B)	What is halt state of Turing machine? Explain Church Turing thesis.	Understand	6
C)	Design Turing machine that erases all non-blank symbols from its tape .	Design	6
	*** End ***		