Register number _____

SRM Institute of Science and Technology
College of Engineering and Technology
School of Computing
SRM Nagar, Kattankulathur – 603203, Chengalpattu District, Tamilnadu

Academic Year: 2022-23 (ODD)

B.Tech-Computer Science & Engineering

Test: CLA-T1 **Date: 14.09.2022**
Course Code & Title: 18CSC301T & Formal Languages and Automata Theory
Duration: 1 period
Year & Sem: III Year /V Sem **Max. Marks: 25**

SET-B

Course articulation matrix:

PLO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
CO 1	M	H	-	M	L	-	-	-	L	L	-	H	-	-	-
CO2	M	H	L	M	L	-	-	-	M	L	-	H	-	-	-
CO3	M	H	M	H	L	-	-	-	M	L	-	H	-	-	-
CO4	M	H	M	H	L	-	-	-	M	L	-	H	-	-	-
CO5	H	H	M	H	L	-	-	-	M	L	-	H	-	-	-
CO6	L	H	-	H	L	-	-	-	L	L	-	H	-	-	-

Part - A

Instructions: Answer all

Q. No	Question	Marks	BL	CO	PO	PI Code
1	All prime numbers are odd. But integer 2 is both prime and even. This can be proved by_____ a) Proof by counter example b) Proof by contradiction c) Proof by mathematical induction d) Proof by deduction	1	1	1	1	**1.6.1**
2	I: Σ={ *, ^, #, a, 0} II: w= {101, abccc, *yr7. Which of the following holds true? a) I denotes symbols while w denotes alphabets b) I denote alphabets and II denotes strings c) I denotes alphabets but II is not words d) I does not denote symbols but II denote words	1	2	1	**1.6.1**	
3	Let B={0,1}. What can be inferred about the operation that generated the following strings as output? Strings={ 0,1,00, 11, 01,10,111, 1010, 1010101, …} a) Negative closure b) Positive closure c) Closure d) Klenn's closure	1	3	2	2	**2.6.2**
4	What type of language does the RE, R=(a+b)* aaa (a+b)* represent? a) Language that accepts strings that contains ab as substring b) Language that accepts strings that starts with a c) Language that accepts strings that starts with b	1	2	2	2	**2.6.2**

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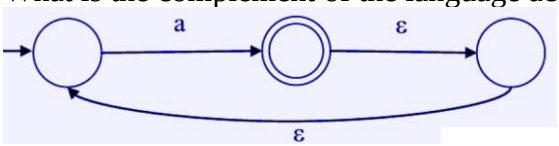
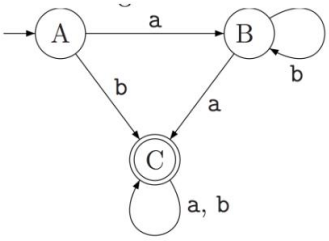
	d) Language that accepts strings has aaa as substring					
5	What can be told about the computing complexity of NFA, DFA and ε-NFA? a) DFA is more computationally expensive than NFA b) NFA is more expensive than DFA c) NFA is more expensive than ε-NFA d) The complexity is same for all	1	2	2	1	**1.6.1**
6	Which of the following is false? a) Both ε and φ indicates no transition between two states b) Only ε indicates no transition between two states c) Only φ indicates no transition between two states d) Both ε and φ indicates presence of transition between two states	1	2	2	1	**1.5.1**
7	Let S and T be language over ={a,b} represented by the regular expressions (a+b*)* and (a+b)*, respectively. Which of the following is true? a) S is a subset of T b) T is a subset of S c) S=T d) S and T don't have anything in common	1	3	2	2	**2.7.1**
8	What is the complement of the language accepted by the FSM?  a) φ b) a c) ε d) a and ε	1	4	2	2	**2.6.3**
9	Which of the following is the transition function of NFA? a) Q x (Σ U ε) → 2^Q b) Q x (Σ U ε) → Q c) Q x Σ → 2^Q d) Q x Σ → Q	1	2	2	2	**2.6.2**
10	I: For every ε-NFA we can construct an equivalent DFA II: A language recognized by a FSA may or may not be accepted by regular expression a) Only II is true b) Only I is true c)Both are false d) Both are true	1	2	2	2	**2.6.3**
	Part-B (1 x 5=5 marks)					
11	Mithra and Kanira are playing a game. They are asked to recite strings in such a way that the words start and end with same letter on the inputs {a, b, c}. Create a DFA for the same with a special mention to 5 tuple structure.	5	6	2	6	**6.3.1**
	Part-C (1 x 10=10 marks)					
12	Give the equivalent regular expression for the given DFA: 	10	5	2	4	**4.1.3**

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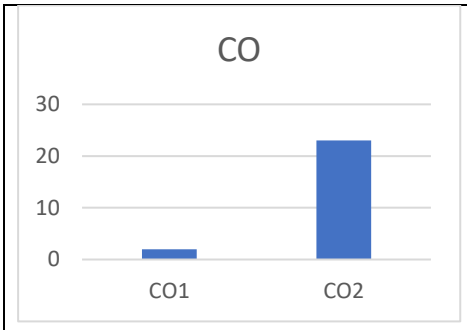

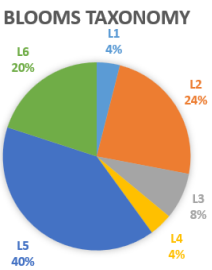

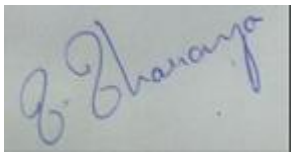

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Part - A

Instructions: Answer all

Q. No	Question	Marks	BL	CO	PO	PI Code
1	All prime numbers are odd. But integer 2 is both prime and even. This can be proved by_____ a) Proof by counter example b) Proof by contradiction c) Proof by mathematical induction d) Proof by deduction Ans: a)	1	1	1	1	**1.6.1**
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	Ans: b)					
4	What type of language does the RE, R=(a+b)* aaa (a+b)* represent? a) Language that accepts strings that contains ab as substring b) Language that accepts strings that starts with a c) Language that accepts strings that starts with b d) Language that accepts strings has aaa as substring Ans: d)	1	2	2	2	**2.6.2**
5	What can be told about the computing complexity of NFA, DFA and ε-NFA? a) DFA is more computationally expensive than NFA b) NFA is more expensive than DFA c) NFA is more expensive than ε-NFA d) The complexity is same for all Ans: b)	1	2	2	1	**1.6.1**
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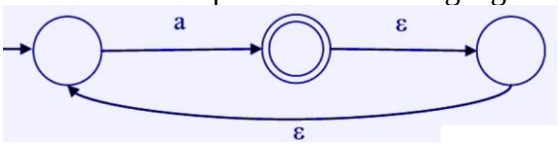
8	What is the complement of the language accepted by the FSM?  a) φ b) a c) ε d) a and ε Ans: d)	1	4	2	2	**2.6.3**
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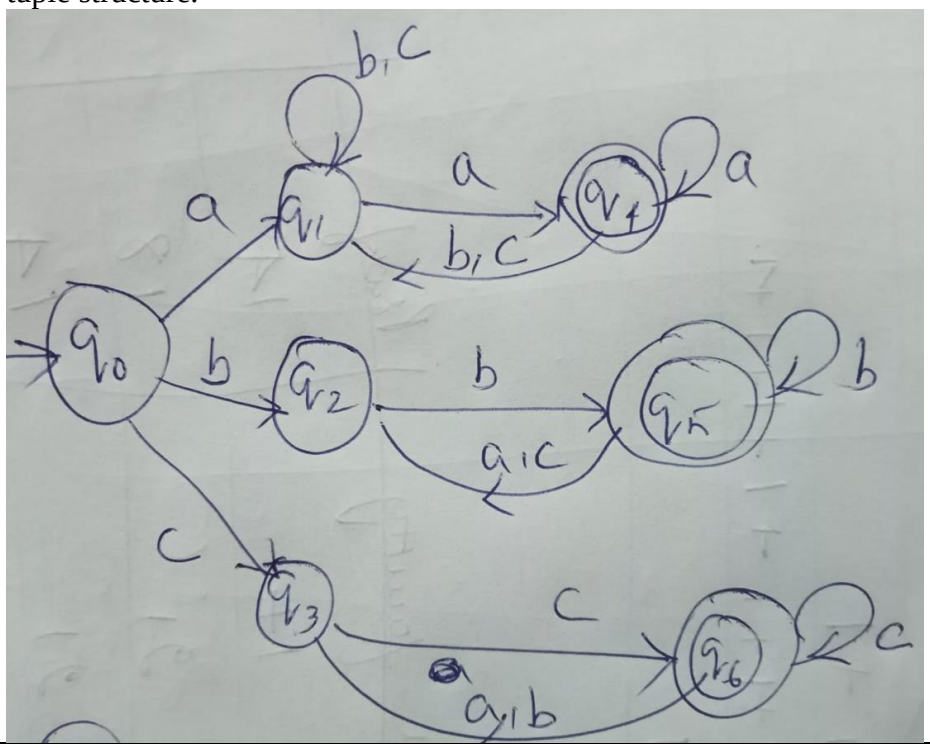
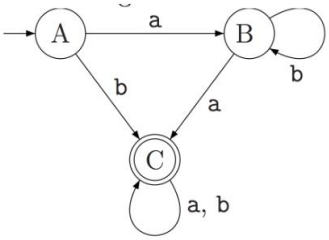
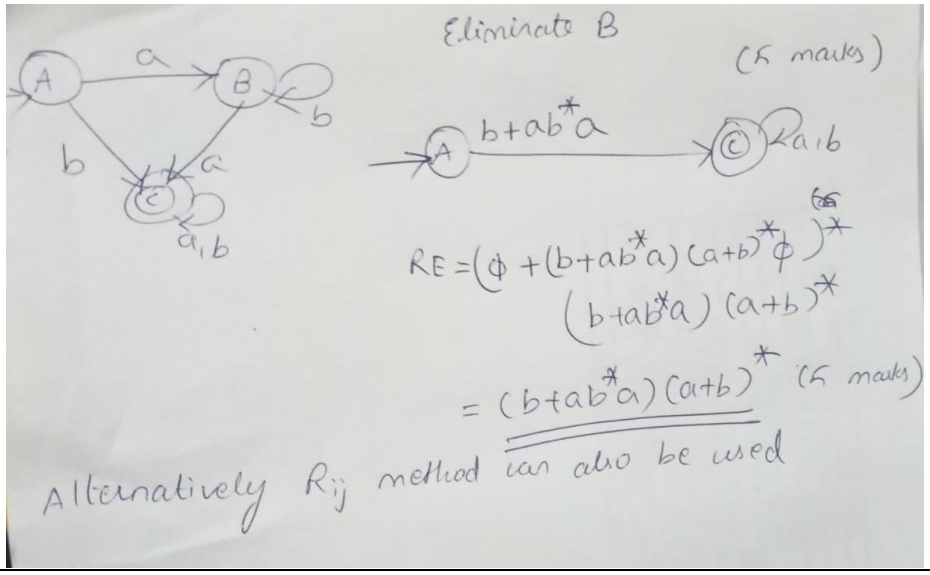
	inputs {a, b, c}. Create a DFA for the same with a special mention to 5 tuple structure. 					
	Part-C (1 x 10=10 marks)					
12	Give the equivalent regular expression for the given DFA:  	10	5	2	4	**4.1.3**

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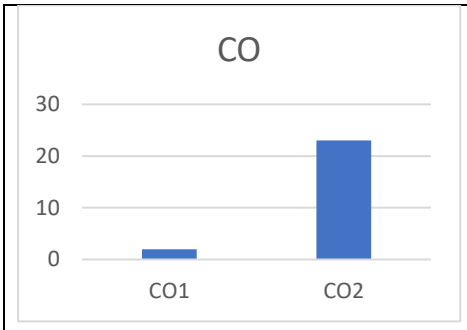
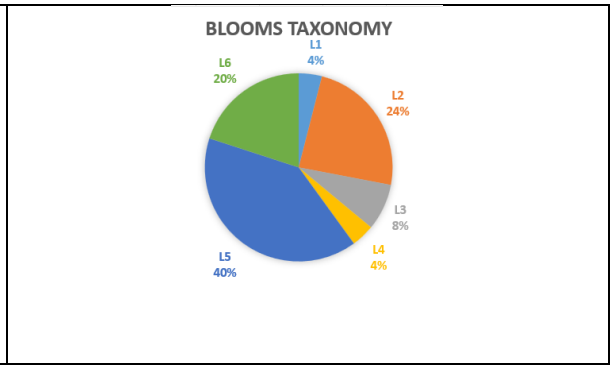
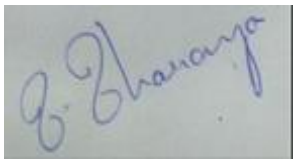
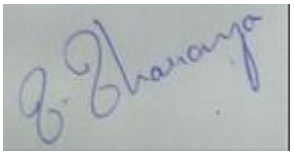






Question Paper Setter



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