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-C

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	Which operation on languages allows us to extract all possible strings from the input Σ= {a, b, c}? a) Concatenation of symbols b) Union of symbols c) Closure d) Reflexive	1	2	1	1	**1.6.1**
2	Consider the word W1= {Formallanguages}and W2={Formal}. Which of the following is true? a) W2 is only a substring of W1 b) W2 is prefix of W1 c) W2 is prefix and substring of W1 d) W2 contains W1	1	1	1	**1**	**1.6.1**
3	Let u=a*(a+b)*, v=aa*b and w=a*b. Then which of the following holds true ? a) L(v) can generate all the strings generated by L(w) b) L(w) can generate all the strings generated by L(u) c) L(v) can generate all the strings generated by L(u) d) L(w) can generate all the strings generated by L(u)	1	3	2	2	**2.6.2**
4	A transition from a state to another state without reading any input is allowed in ___ a) DFA b) NFA c) epsilon-NFA d) RE	1	1	2	2	**2.6.2**
5	Which of the following is true? a) FSA cannot act as language acceptor b) FSA can act as language acceptor c) FSA can produce outputs d) FSA can count numbers	1	2	2	1	**1.6.1**

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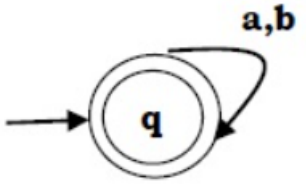
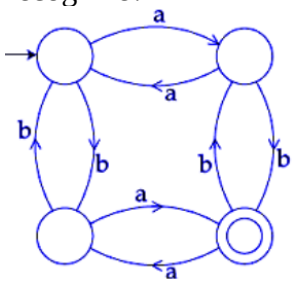
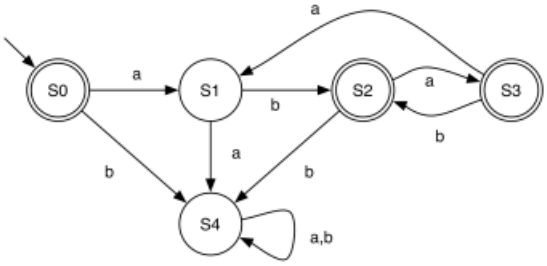
6	The string 1101 cannot be derived from__ a) 110* (0+1) b) 1(0+1)*101 c) (10)*(01)*(00+11)* d) (00+(11)*0)*	1	4	2	1	**1.5.1**
7	Which of the following is the limitation of FSM? a) It does not contain memory b) It cannot recognise a regular language c) It has infinite number of states d) It contains memory, which is expensive	1	2	2	2	**2.7.1**
8	What is the language recognized by the given FSA?  a) Any number of a's and b's where b follows a b) Any number of a's and b's c) Only one a and one b d) Either a or b	1	4	2	2	**2.6.3**
9	What does the given DFA recognize?  a) Odd number of a's b) Odd number of b's c) Even number of a's d) Odd number of a's and b's	1	4	2	2	**2.6.2**
10	Which of the following is true? a) (r + s) *=r* b) (r*s*)=(r+s)* c) (r+s)*=r*+s* d) r*s*=r* +s*	1	2	2	2	**2.6.3**
	Part-B (1 x 5=5 marks)					
11	Design a DFA that accepts strings in L such that the integer numbers , when expressed in its binary is divisible by 5. Give the 5 tuple structure.	5	5	1	6	**6.1.3**
	Part-C (1 x 10=10 marks)					
12	Give the DFA equivalent for the following 	10	6	1	4	**4.1.3**

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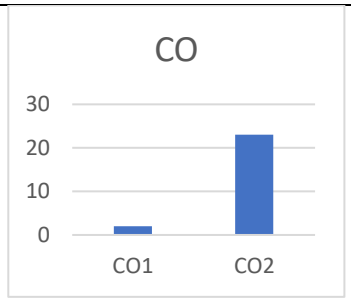

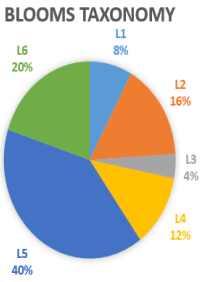

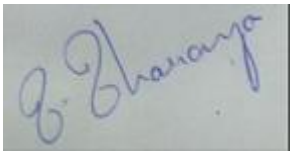

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CO4	M	H	M	H	L	-	-	-	M	L	-	H	-	-	-
CO5	H	H	M	H	L	-	-	-	M	L	-	H	-	-	-
CO6	L	H	-	H	L	-	-	-	L	L	-	H	-	-	-

Part - A

Instructions: Answer all

Q. No	Question	Marks	BL	CO	PO	PI Code
1	Which operation on languages allows us to extract all possible strings from the input Σ= {a, b, c}? a) Concatenation of symbols b) Union of symbols c) Closure d) Reflexive Ans: c)	1	2	1	1	**1.6.1**
2	Consider the word W1= {Formallanguages}and W2={Formal}. Which of the following is true? a) W2 is only a substring of W1 b) W2 is prefix of W1 c) W2 is prefix and substring of W1 d) W2 contains W1 Ans: c)	1	1	1	**1**	**1.6.1**
3	Let u=a*(a+b)*, v=aa*b and w=a*b. Then which of the following holds true ? a) L(v) can generate all the strings generated by L(w) b) L(w) can generate all the strings generated by L(u) c) L(v) can generate all the strings generated by L(u) d) L(w) can generate all the strings generated by L(u) Ans: a or b or c or d	1	3	2	2	**2.6.2**
4	A transition from a state to another state without reading any input is allowed in ___ a) DFA b) NFA c) epsilon-NFA d) RE	1	1	2	2	**2.6.2**

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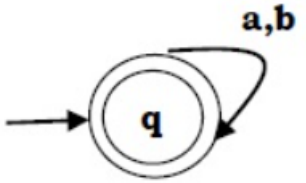
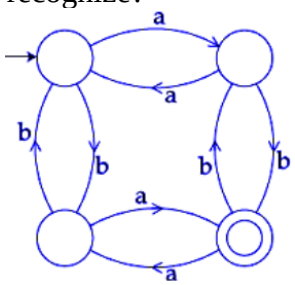
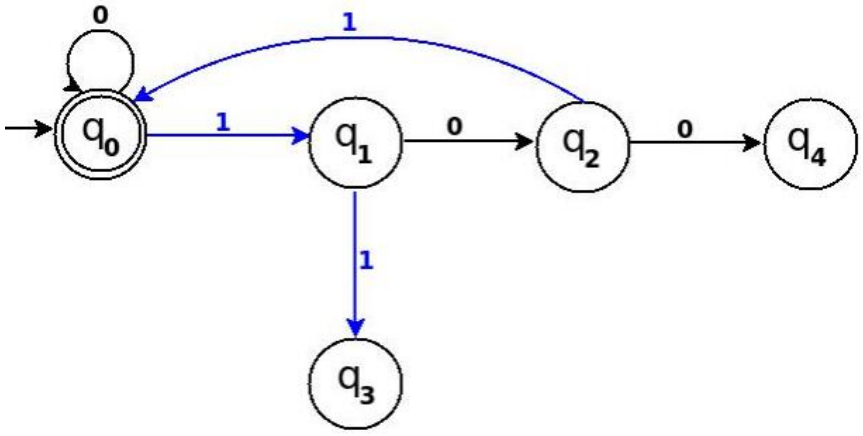
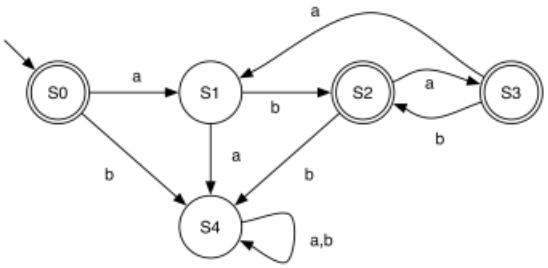
	Ans: c)					
5	Which of the following is true? a) FSA cannot act as language acceptor b) FSA can act as language acceptor c) FSA can produce outputs d) FSA can count numbers Ans: b	1	2	2	1	**1.6.1**
6	The string 1101 cannot be derived from__ a) 110* (0+1) b) 1(0+1)*101 c) (10)*(01)*(00+11)* d) (00+(11)*0)* Ans: c)	1	4	2	1	**1.5.1**
7	Which of the following is the limitation of FSM? a) It does not contain memory b) It cannot recognise a regular language c) It has infinite number of states d) It contains memory, which is expensive Ans: a)	1	2	2	2	**2.7.1**
8	What is the language recognized by the given FSA?  a) Any number of a's and b's where b follows a b) Any number of a's and b's c) Only one a and one b d) Either a or b Ans: b)	1	4	2	2	**2.6.3**
9	What does the given DFA recognize?  a) Odd number of a's b) Odd number of b's b) Even number of a's d) Odd number of a's and b's Ans: d)	1	4	2	2	**2.6.2**
10	Which of the following is true? a) (r + s) *=r* b) (r*s*)=(r+s)* c) (r+s)*=r*+s* d) r*s*=r* +s* Ans: b)	1	2	2	2	**2.6.3**
	Part-B (1 x 5=5 marks)					
11	Design a DFA that accepts strings in L such that the integer numbers , when expressed in its binary is divisible by 5. Give the 5 tuple structure. 3.5 marks	5	5	1	6	**6.1.3**

Register number _____

	 5 tuple structure: 1.5 marks					
	Part-C (1 x 10=10 marks)					
12	Minimize the DFA:  Iteration 1: 4 marks Iteration 2: 4 marks Conclusion: 2 marks	10	6	1	4	**4.1.3**

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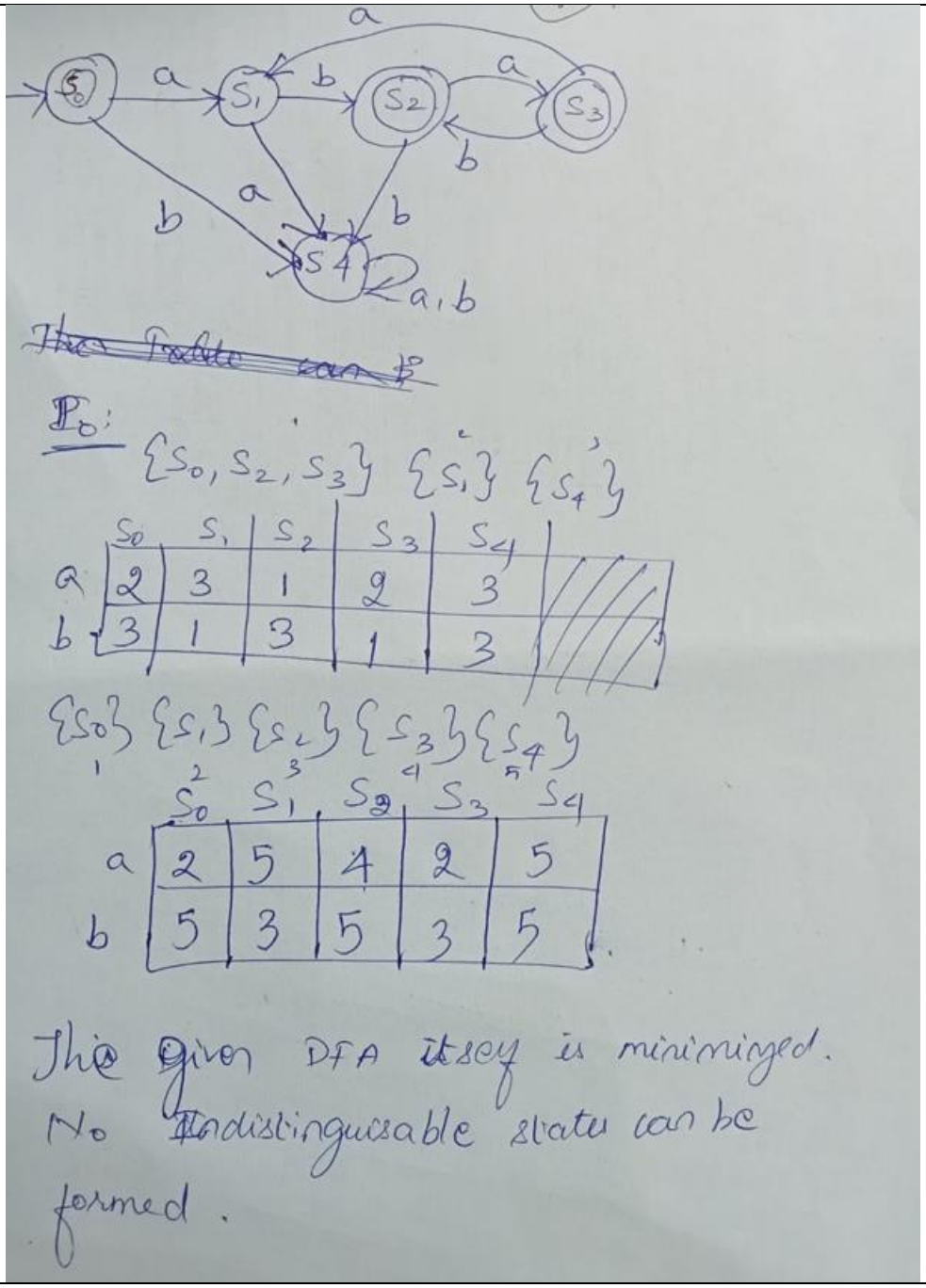

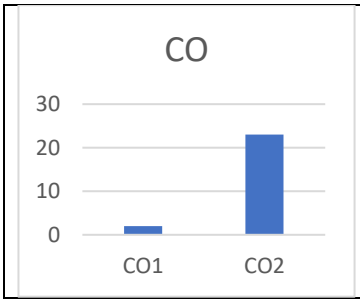

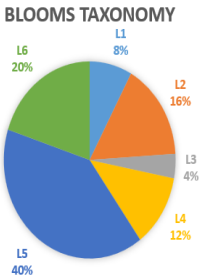

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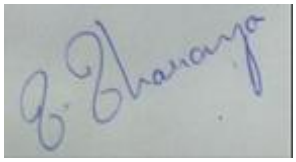
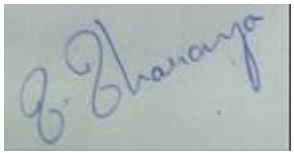


Question Paper Setter



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