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Subject Code: ACSE 0404

Roll No: | | | | | | | | | | | |

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute)

Affiliated to Dr. A.P. J. Abdul Kalam Technical University, Uttar Pradesh, Lucknow

Course : B.Tech Branch: CSE

Semester- 4 Sessional Examination, I Year- (2021 - 2022)

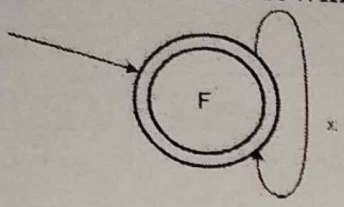
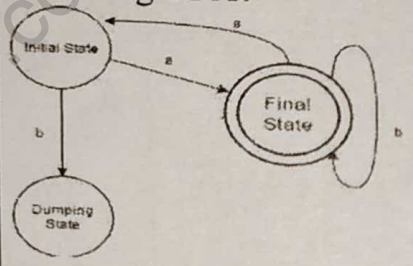
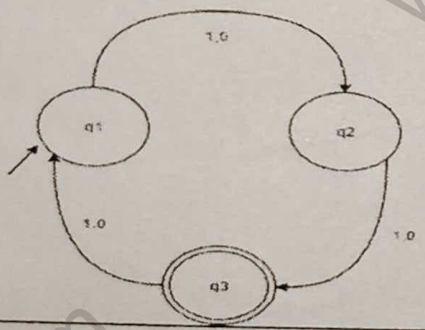
Subject Name: THEORY OF AUTOMATA & FORMAL LANGUAGES

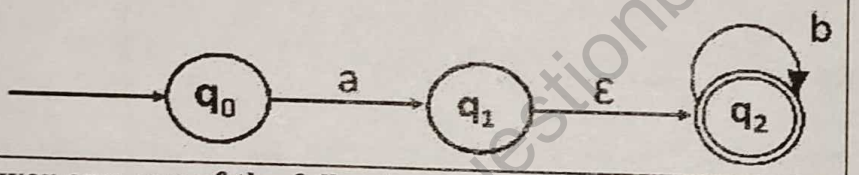
Time: 1.15 Hours **[SET- A]** **Max. Marks:30**

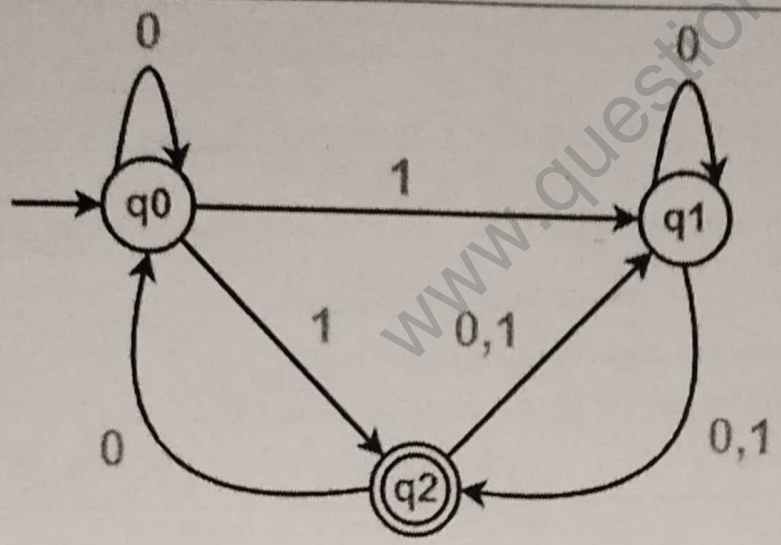
General Instructions:

- This Question paper consists of 4 pages & 5 questions. It comprises of three Sections, A, B, and C
- **Section A** -Question No- 1 is objective type questions carrying 1 mark each, Question No- 2 is very short answer type carrying 2 mark each. You are expected to answer them as directed.
- **Section B** - Question No-3 is Short answer type questions carrying 5 marks each. Attempt any two out of three questions given.
- **Section C** - Question No. 4 & 5are Long answer type (within unit choice) questions carrying 6 marks each. Attempt any one part *a* or *b*.

		SECTION – A	**[08Marks]**	
1.	**All questions are compulsory**		**(4×1=4)**	
	a.	The Number of states require to accept string ends with 10. a) 3 b) 2 c) 1 d) can't be represented	**(1)**	**CO1**
	b.	What is wrong in the given definition? Def: ({q0, q1, q2}, {0,1}, δ, q3, {q3}) a) The definition does not satisfy 5 Tuple definition of NFA b) There are no transition definition c) Initial and Final states do not belong to the Graph d) Initial and final states can't be same	**(1)**	**CO1**
	c.	A DFA cannot be represented in the following format a) Transition graph b) Transition Table	**(1)**	**CO1**

		c) C code d) None of the mentioned		
	d.	What does the following figure most correctly represents?  a) Final state with loop x b) Transitional state with loop x c) Initial state as well as final state with loop x d) Insufficient Data	**(1)**	**CO1**
2.	**All questions are compulsory**		**(2×2=4)**	
	a.	Which of the following will not be accepted by the following DFA?  a) ababaabaa b) abbbaa c) abbbaabb d) abbaabbaa	**(2)**	**CO1**
	b.	Which of the following will the given DFA won't accept?  	**(2)**	**CO1**

		a) ε b) 11010 c) 10001010 d) String of letter count 11		
		SECTION – B	**[10Marks]**	
3.		**Answer any <u>two</u> of the following-**	**(2×5=10)**	
	a.	Construct a DFA to accept string of 0's and 1's ending with the string 011.	**(5)**	**CO1**
	b.	Construct NFA with ∑ = {0, 1} and accept all string of length atleast 2.	**(5)**	**CO1**
	c.	Differentiate between DFA and NFA.	**(5)**	**CO1**
		SECTION – C	**[12Marks]**	
4		**Answer any <u>one</u> of the following-**	**(1×6=6)**	
	a.	Design FA with ∑ = {0, 1} accepts even number of 0's and even number of 1's.	**(6)**	**CO1**
	b.	Define Epsilon NFA. Convert the following NFA with ε to NFA without ε.  	**(6)**	**CO1**
5.		**Answer any <u>one</u> of the following-**	**(1×6=6)**	
	a.	Convert the following Non-Deterministic Finite Automata (NFA) to Deterministic Finite Automata (DFA)-	**(6)**	**CO1**

				
	b.	Construct DFA that accepts any strings over {0,1} that doesn't contain the string 0011 in it.	**(6)**	**CO1**