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Printed Pages : 3

35003

BT–5 / D-19

AUTOMATA THEORY

Paper–CSE-305

Time allowed : 3 hours] *[Maximum marks : 100*

Note:- *Attempt any five questions. Selecting at least one question from each unit. All questions carry equal marks.*

Unit- I

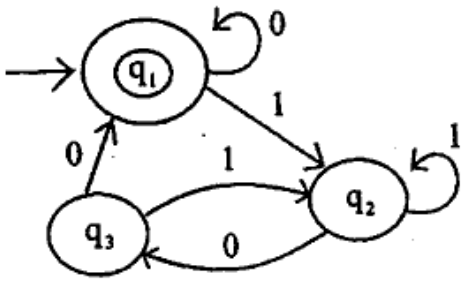
1. (a) What do you mean by regular expression and also describe the following set by regular expression. 10

(i) L1-- the set of all strings of 1's and 0's ending in 00

(ii) L2-- the set of all strings of 1's and 0's beginning with 0 and ending with 1

(iii) L3-- { ∧11, 1111, 11111.....}

(b) Construct a regular expression from the state diagram.



10

2. Construct the DFA equivalent to the given regular expression is (0+1)*.(00+11) (0+1)*(step by step) 20

Unit-II

3. Construct the Moore machine which is equivalent to Mealy machine as shown in given table: 20

Present state	Next state			
	Input a = 0		Input a = 1	
	State	output	State	output
$\rightarrow q_1$	q_3	0	q_2	0
q_2	q_1	1	q_4	0
q_3	q_2	1	q_1	1
q_4	q_4	1	q_3	0

4. Draw a minimum state automation diagram from the given table: 20

State /Σ	0	1
$\rightarrow q_0$	q_1	q_5
q_1	q_6	q_2
(q_2)	q_0	q_2
q_3	q_2	q_6
q_4	q_7	q_5
q_5	q_2	q_6
q_6	q_6	q_4
q_7	q_6	q_2

Unit- III

5. Find a grammar in Chomsky Normal Form equivalent to

   (a) S→aAbB, A→aA|a, B→bB|b 10

   (b) S→aAD,A→aB|bAB, B→b, D→d 10

6. (a) What do you mean by Push Down Automata (PDA) and construct a PDA A accepting L={wcwTw ∈(a,b)*} by final state. 10

   (b) Construct a PDA A equivalent to the following context free grammar: 10

   S→0BB,B→0S|1S|0. Test whether 010^4 is in N (A)

Unit-IV

7. What are different 7-tuple in Turing machine and explain their purposes and also describe which string is accepted by this Turing Machine strings are (a) 011 (b) 0011 (c) 001. the transition table of TM is given : 20

q_6 is final state

Present state	Tape symbol				
	0	1	X	Y	B
$\rightarrow q_1$	xRq_2				bRq_5
q_2	$0Rq_2$	yLq_3		yRq_2	
q_3	$0Lq_4$		xRq_5	yLq_3	
q_4	$0Lq_4$		xRq_1		
q_5				$yxRq_5$	bRq_6
(q_6)					

8. Design a Turing machine which can multiply two positive integers. 20