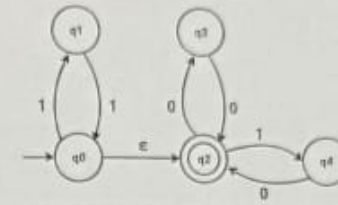


Name: _____ Printed Pages: 01
 Student University Roll No.: _____
 School of Engineering
 First Sessional Examination, Odd Semester (AS: 2023-24)
 B.Tech: CSE/AI/CCML Year: III Semester: V
 Course Title: Automata Theory M.M.: 30
 Course Code: BCS3504 Time: 1 hr

Instructions if any: Read the question Carefully.

SECTION 'A'		
Q.N.1. Attempt all parts of the following:	Course Objective	Marks
a) Define the terms alphabet, string, prefix, suffix, language and give examples to each.	CO4	1
b) Differentiate L^* and L^+ .	CO5	1
c) What are some real-world applications for finite state machines?	CO5	1
d) Obtain a regular expression to accept strings of a's and b's where number of a's and b's are odd.	CO1	1
e) Write Transition function of DFA & NFA.	CO2	1
SECTION 'B'		
Q.N.2. Attempt any two parts of the following:	Course Objective	Marks
a) Explain Myhill-Nerode Theorem using suitable example.	CO2	7.5
b) Consider the following regular expression and construct the finite automaton. 1) $a+b$ 2) $(a+b)^*$ 3) $a(a+b)^*$ 4) $a(a+b)^*b$	CO1	7.5
c) Give the resultant FA on Removal of ϵ -transition from the given FA.	CO1	7.5



d) State & Prove Arden's Theorem	CO3	7.5
SECTION 'C'		
Q.N.3. Attempt any one part of the following	Course Objective	Marks
a) Define Grammar? Explain Chomsky Hierarchy? Give an example	CO4	10
b) Construct a NFA for the Regular expression $10+(0+11)0^*1$.	CO1	10
c) Construct DFA accepting set of all strings containing even no. of a's and even no. of b's over input alphabet {a,b}.	CO1	10

Table 1: Mapping between COs and questions
(Number of COs may vary from course to course)

COs	Questions Numbers	Total Marks
CO1	1(d), 2(b), 2(c), 3(b), 3(c)	36
CO2	1(e), 2(a)	8.5
CO3	2(d)	7.5
CO4	1(a), 3(a)	11
CO5	1(b), 1(c)	2