H.T.No. | | | | | | | | | | |

Code No: CT1508 **GEC-R14**

II B. Tech I Semester Regular / Suppl. Examinations, November 2017

FORMAL LANGUAGES AND AUTOMATA THEORY

(Computer Science and Engineering)

Time: 3 Hours **Max. Marks: 60**

Note: All Questions from **PART-A** are to be answered at one place.
Answer any **FOUR** questions from **PART-B.** All Questions carry equal Marks.

PART-A

6 × 2 = 12M

1. a) Write the differences between NFA and DFA.
   b) What is the difference between empty language and null string?
2. Write formal definition of moore machine with an example.
3. Construct regular expression for set of all strings with at least one 0, one 1 and one 2 respectively.
4. Show the Venn diagram of Chomsky hierarchy language and their counterpart automata.
5. Prove that L={WW |w is bit string} is not Context Free Language.
6. Explain about Posts Correspondence problem.

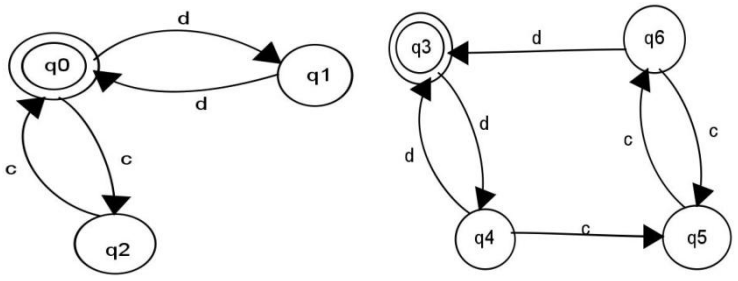
PART-B

4 × 12 = 48M

1. a) Design a DFA for a language which contains strings of a's & b's and each string ends with aab. (6M)
   b) Design a NFA to accept strings of 0's & 1's such that each string ends with 00. (6M)
2. a) Convert the following NFA to DFA. (6M)

δ	**o**	**1**
→p	{p,q}	p
q	r	r
r	s	-
***s**	s	s

   b) Find whether the following two FSM are equivalent or not. (6M)

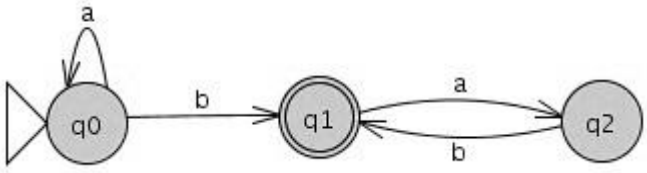


3. a) Show that L={a^P| P is a prime number} is not regular. (6M)

   b) Construct the regular expression for the following DFA. (6M)

	a	b
→q_0*	q1	q0
q_1	q0	q1

4. a) Convert the following DFA to Regular grammar. (6M)



   b) Suppose, L (G) = {$a^m b^n$ | m > 0 and n ≥ 0}. Find out the regular grammar G which produces L(G). (6M)

5. Show that L= {$a^n b^n c^n$ | n≥ 0} is not a context free language. (12M)

6. a) Construct a Turing machine M for ∑ = {a, b} which will convert lower case letters to upper case. (6M)

   b) Construct a Turing machine M, which recognizes the language L= {w c w | w ϵ $(a + b)^+$}. (6M)

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