PVP 14

Code: CS3T4

II B.Tech - I Semester–Regular/Supplementary Examinations
November 2016

FORMAL LANGUAGES AND AUTOMATA THEORY
(COMPUTER SCIENCE AND ENGINEERING)

Duration: 3 hours Max. Marks: 70

PART – A

Answer ***all*** the questions. All questions carry equal marks

11x 2 = 22 M

1.
a) List any two applications of finite automata.
b) Define a string. Identify the set of strings generated by the language L = {w/w is a binary integer that is prime}.
c) Design automata for a switch.
d) Identify the language generated by the regular expression (10)*1+1*01.
e) Define Regular Grammar. Write an example for Right Linear Grammar.
f) Write any two differences between Context-Free Grammar and Regular Grammar.
g) Define Instantaneous description of Push down Automata.
h) Design a Turing machine which finds the one's complement of a given binary integer?
i) Write short notes on Church's hypothesis.
j) What is PCP?

k) List any two examples for the languages that are not recursively enumerable.

PART – B

Answer any ***THREE*** questions. All questions carry equal marks.

3 x 16 = 48 M

2.

a) Design a DFA accepting the language L = { w ε {a,b,c}* / w starts and ends with the same symbol } 8 M

b) Design a Moore Machine to determine the residue mod 4 for each binary string treated as integer. 8 M

3.

a) State and Prove Pumping lemma for regular sets. 8 M

b) Find NFA-ε for the left linear grammar **S→S10/0.** 8 M

4.

a) Eliminate the useless, unit and null productions from the grammar. 8 M

S→aA/aBB

A→aaA/ε

B→bB/bbC

C→B

b) Construct a PDA for the language with set of all strings over alphabet {a,b} with exactly twice as many a's as b's. 8 M

5.

a) List and explain the types of Turing machines. 8 M

b) Design a Turing machine accepting the language $L = \{ a^n b^n c^n / n \geq 1 \}$ 8 M

6.

a) Show that the following PCP has a solution and give the solution. 8 M

	List A	List B
i	w_i	x_i
1	11	111
2	100	001
3	111	11

b) Write short notes on undecidability of complement of a language. 8 M