PVP 14

Code: CS3T4

II B.Tech - I Semester – Regular/Supplementary Examinations
November - 2018

FORMAL LANGUAGES AND AUTOMATA THEORY
(COMPUTER SCIENCE & ENGINEERING)

Duration: 3 hours Max. Marks: 70

PART – A

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

11x 2 = 22 M

1.

a) Define String and Language.
b) Distinguish between Moore and Mealy machine.
c) Construct Finite Automata for the regular expression (a+b)*.
d) What is the principle involved in pumping lemma for regular sets?
e) Differentiate left linear and right linear grammar.
f) Write the CFG for balanced parenthesis.
g) Define Chomsky Normal Form (CNF) grammar.
h) What are the different ways to accept strings with PDA?
i) What is an ID of a Turing machine?
j) Define Universal Turing machine.
k) What is decidability problem?

PART – B

Answer any ***THREE*** questions. All questions carry equal marks.
3 x 16 = 48 M

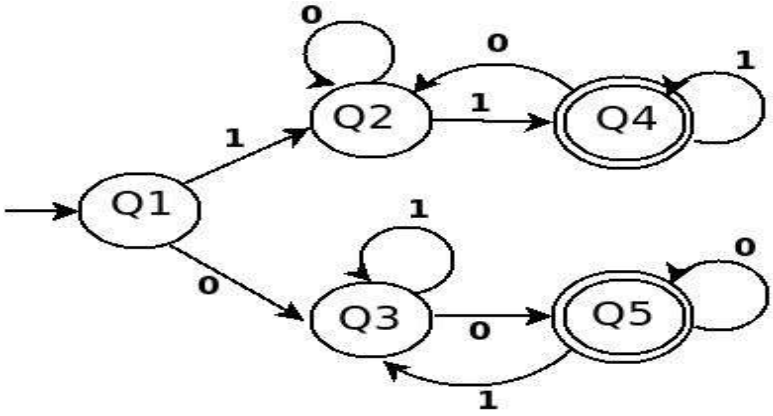
2. a) Construct DFA for L = {w / w is a binary string divisible by 5}. 8 M

b) Convert the following NFA into its equivalent DFA. 8 M

	0	**1**
→p	p, q	p
q	r, s	t
r	p, r	t
***s**	Φ	Φ
***t**	Φ	Φ

3. a) Construct finite automata for the regular expression (0/1)*(111)(0/1)*. 8 M

b) Find the regular expression generated by the following Finite Automata. 8 M



4. a) Define GNF grammar and convert the following CFG into its equivalent GNF

S → AB A → BS / b B → SA / a 8 M

b) Construct PDA for the grammar having productions and Check the string "010000" is accepted or not?

S → 0AA A → 0S / 1S / 0 8 M

5. a) Design a Turing machine for the language

$L = \{ a^n b^n c^n | n \geq 1 \}$ 8 M

b) Discuss in detail Church's hypothesis. 8 M

6. a) Define PCP and find whether the lists X = (01, 101, 11000) and Y = (0, 10, 101) have a Post Correspondence Solution?

8 M

b) Differentiate P and NP problems with suitable examples.

8 M