6E 6023

Roll No. _____ [Total No. of Pages : 3]

6E6023

B.Tech. VI Semester (Main&Back) Examination, May-June 2015

Computer Science

6CS3A Theory Of Computation

Common for IT

Time : 3 Hours **Maximum Marks : 80**

Min. Passing Marks : 24

Instructions to Candidates:

*Attempt any **five** questions, selecting **one** question from **each unit**. All questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

Unit - I

1. a) What do you understand by finite automata and regular expression **(8)**

b) State the difference between deterministic and non deterministic finite automata **(8)**

OR

1. a) Discuss mealy & moore machines **(8)**

b) State pumping lemma for regular languages **(4)**

c) Draw the transition diagram(automata) for an identifier **(4)**

Unit - II

2. a) Check whether the language $L = (0^n1^n / n >= 1)$ is regular or not **(8)**

b) Construct a DFA that will accept string on {a,b} where the number of b's divisible by 3 **(8)**

OR

2. a) Prove that a language L is accepted by some DFA if L is accepted by some NFA **(8)**

   b) Construct a NFA for regular expression (a/b)*abb and draw its equivalent DFA **(8)**

Unit - III

3. Let G be the grammar

$bAaBs \mid\rightarrow$
$bAAaSaA \mid\mid\rightarrow$
$aBBbSbB \mid\mid\rightarrow$

For the string "baaabbabba" find left most derivation, rightmost derivation and parse tree **(16)**

OR

3. a) Give detailed description of ambiguity in context free grammar **(8)**

   b) If L is context free language then prove that there exists PDA M such that L=N(M) **(8)**

Unit - IV

4. Construct a Turing machine for the language $\{\}1\mid01\geq=nLnn$ **(16)**

OR

4. Explain how a Turing machine with multiple tracks of the tape can be used to determine the given number is prime or not **(16)**

Unit - V

5. Write short notes on following **(8×2=16)**

   a) Linear bounded automation

   b) Indexed Languages.

OR

5. Discuss chomsky hierarchy in detail. **(16)**