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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 $L = \{0^n1^n / n \geq 1\}$ 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)



(8×2=16)

Unit - V

5. Write short notes on following

- a) Linear bounded automation
- b) Indexed Languages.

OR

5. Discuss chomsky hierarchy in detail. (16)

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

$baaBs \rightarrow$
 $bAAaSaA \parallel \rightarrow$
 $aBBbSbB \parallel \rightarrow$

For the string "baaababba" 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 $\{1^m0^n \mid m \geq n\}$ (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)