Total No. of Questions : 8] *[Total No. of Printed Pages : 2*

Roll No .....

CS-4005 (CBGS)

B.E. IV Semester

Examination, May 2018

Choice Based Grading System (CBGS)

Theory of Computation

Time : Three Hours

 Maximum Marks : 70

Note: i) Attempt any five questions.

ii) All questions carry equal marks.

1. a) Explain Deterministic and nondeterministic finite automata with example. 7

   b) Explain applications of pumping lemma. 7

2. a) Construct a NDFA accepting all string in {a, b} with either two consecutive a "s or two consecutive b "s. 7

   b) Find a grammar in Chomsky Normal form equivalent to S->aAD; A->aB/bAB; B->b, D->d. 7

3. Explain the following: 14

   a) Regular Grammars

   b) Context free grammars

   c) Derivation trees

4. a) Construct a grammar in GNF which is equivalent to the grammar S->AA/a, A->SS/b. 7

   b) Define deterministic Push Down Automata DPDA. It is true that DPDA and PDA are equivalent in the sense of language acceptance is concern? Justify your answer. 7

5. a) Demonstrate the working of your TM with an example. 7

   b) Explain in detail notes on universal Turing machines with example. 7

6. a) Describe the recursively Enumerable Language with example. 7

   b) Construct a PDA for set of palindrome over the alphabet {a, b} $L(M) = \{WcW^R\}$. 7

7. a) Give a detailed description of ambiguity in Context free grammar. 7

   b) Explain Vertex cover problem and Hamiltonian path problem. 7

8. Explain the following: 14

   a) NP complete and NP hard

   b) Traveling salesman problem

   c) Partition problem

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