Roll No. | | | | | | | | | | | | |

Total No. of Pages : 02

Total No. of Questions : 18

B.Tech.(CSE) (2011 Onwards) (Sem.–7,8)

THEORY OF COMPUTATION

Subject Code : BTCS-702

Paper ID : [A2986]

Time : 3 Hrs. Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt ANY FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt ANY TWO questions.**

SECTION-A

Answer briefly :

1. Differentiate between NFA and DFA.
2. State Pumping Lemma for Context Free Languages.
3. What is Chomsky Classification of formal languages?
4. Differentiate between Moore and Mealy Machine.
5. What is the difference between acceptance of string in PDA with null stack or with final state?
6. Explain briefly Lex and Yacc.
7. Explain the concept of Unit Production.
8. Explain the acceptance of the string over NFA and DFA over the same alphabet.
9. Define terminal and non-terminal symbol.
10. Define leftmost and rightmost derivation.

SECTION-B

11. Explain in brief the properties of LL (k) grammars.

12. Explain in brief various types of languages. Also name the automata accepting those languages.

13. Find the grammar generating $L = \{a^n|b^n c^i\ |n \geq l,\ i \geq 0\}$.

14. Design a Turing Machine which recognizes the set of all even length palindromes over {0,1}.

15. Consider the following productions.

    $S \rightarrow aB|bA \quad A \rightarrow aS|bAA|a \quad B \rightarrow bS|aBB|b$

    For the string aaabbabbba, find the

    a) Leftmost derivation

    b) Rightmost derivation

    c) Parse Tree

SECTION-C

16. Write short notes on :

    (a) Griebach Normal Form.

    (b) Push Down Automata.

    (c) Cellular Automata

17. Describe *"equivalent states"* in finite state automaton and prove that the relation *"equivalent"* among states is an 'equivalence' relation. How this equivalence relation can be used to minimize the number of states in FA?

18. Design a PDA which recognizes the set of all even length palindromes over {a,b}.