Sl. No.

B5.2-R4 : AUTOMATA THORY AND COMPILER DESIGN

NOTE :
1. **Answer question 1 and any FOUR from questions 2 to 7.**
2. **Parts of the same question should be answered together and in the same sequence.**

Time : 3 Hours   **Total Marks : 100**

1.   Explain the following with example :
  (a) Mathematical induction
  (b) Non - Deterministic Finite Automata
  (c) Equivalence of CFG and PDA
  (d) Optimization of DFA-Based Pattern Matchers   **(7+7+7+7)**

2.   (a) Define Ambiguous grammar. Show that the following grammar is ambiguous
       and write the unambiguous grammar for the same.
         $S \rightarrow A/B$, $A \rightarrow aAb/ab$, $B \rightarrow abB/^{\wedge}$
  (b) Explain with a suitable example, the Top-Down Parsing, Bottom-Up Parsing. **(10+8)**

3.   (a) Discuss the issues in the design of a code generator.
  (b) Construct the basic blocks for the following three address statement,   **(9+9)**
         Sum = 0;
         for (i = 0; i < = 10; i + +)
             Sum = sum + a [i];

4.   (a) Define Turing Machine and explain how Turing machine can be used to compute
       integer functions ?
  (b) Design Turing Machine to recognize the following :   **(9+9)**
         L ={W C W ^{R}/ W ϵ (a +b)*& c is a or b}
           R : Reverse

5.   (a) Discuss the benefits of dynamic storage allocation. Explain various dynamic
       storage allocation techniques in detail.
  (b) Discuss the issues of source language, and how can it be overcome ? Explain in **(9+9)**
       detail.

6.   (a) Obtain the DAG for the expression a+a*(b-c)+(b-c)*d. Explain the steps to construct
       the same.
  (b) Translate the arithmetic expression a+ - (b+c) into quadruples, triples and indirect
       triples.
  (c) Explain the syntax directed translation of switch statements.   **(6+6+6)**

7.   Write short notes on **any three**.
  (a) Pumping lemma for CFL with example
  (b) CNF
  (c) Universal TM
  (d) Parsing   **(6+6+6)**

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