ECS-603

**B.Tech.**

**(SEMESTER-VI) THEORY EXAMINATION, 2012-13**

**COMPILER DESIGN**

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

## Section – A

1.  Attempt **all** question parts :                                          $10 \times 2 = 20$

    (a)  Differentiate between dynamic loaders and linkers.

    (b)  Give the parse tree for the statement $a = b * c + 60$.

    (c)  What is bootstrapping a compiler ?

    (d)  What are rational preprocessors ?

    (e)  Explain proper prefix, proper suffix and proper substring with examples.

    (f)  Draw the transition diagram for identifiers.

    (g)  What is the need for separating the parser from scanner ?

    (h)  Describe language denoted by the following regular expression : $(1 + 0)^*$.

    (i)  What are the code optimization techniques ?

    (j)  What are Synthesized and Inherited Attributes ?

## Section – B

2.  Attempt any **three** question parts :                                          $10 \times 3 = 30$

    (a)  Write the algorithm for moving forward pointer in "input buffering" scheme.

    (b)  What are the lexical-error recovery actions ?

    (c)  What is the use of intermediate code during compilation ?

    (d)  Write role of flow of control statement.

    (e)  Explain the process of translating an assignment statement.

## Section – C

Attempt **all** question.            $10 \times 5 = 50$

3.    Attempt any **two** parts :         $5 \times 2 = 10$

     (a)    What is Left Recursion ? Write the rules to eliminate left recursion.

     (b)    How is scope information represented in symbol table ?

     (c)    Explain Machine–Independent Optimization.

4.    Attempt any **one** part :         $10 \times 1 = 10$

     (a)    Show that the following grammar is unambiguous :

$$S \rightarrow aSb \,|\, bSa \,|\, b$$

         For a string **abbbaabbbaaab** draw a parse tree.

     (b)    What is the role of lexical analyzer ? Enumerate the issues handled by a lexical analyzer.

5.    Attempt any **one** part :         $10 \times 1 = 10$

     (a)    Define a Quadruple. How it is different from triples ? Convert the following expression into three address code and quadruple.

$$S = (a + b)/(c - d)*(e + f)$$

     (b)    Write the prefix and postfix expression for $A = (20 + (-5) * 6 + 12)$. Also convert the expression "a or b and not c" into three address code.

6.    Attempt any **one** part :         $10 \times 1 = 10$

     (a)    What are the three storage allocation strategies ? Explain each in detail.

     (b)    Construct DAG for the following expression $(a + b) - (e - (c + d))$.

7.    Attempt any **two** parts :         $5 \times 2 = 10$

     (a)    Explain the phases of the compiler in detail. Write down the output of each phase for the expression $a = b * c + 50$. Standard precedence for operators may be used.

     (b)    Discuss the issues in a programming language design that affects the storage management.

     (c)    Explain the concept of Global data-flow analysis.

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