USN ☐☐☐☐☐☐☐☐☐☐ 　.　 **06CS63**

Sixth Semester B.E. Degree Examination, December 2012
Compiler Design

Time: 3 hrs. 　　　　　　　　　　　　　　　　　　　　　　　　　　　　Max. Marks:100

Note: *Answer FIVE full questions choosing*
atleast TWO questions from each part.

PART – A

1 a. How to handle reserved words and identifiers during recognition of tokens? Explain.
　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　(07 Marks)
　 b. Discuss three types of software productivity tools. 　　　　　　　　　**(06 Marks)**
　 c. Enlist algebraic laws for regular expression. 　　　　　　　　　　　　**(07 Marks)**

2 a. Consider the production given below :
　　　 S → CC | CSC
　　 Prof. James wanted to parse input string CCCCCC, using recursive descent parsing. Is it possible to do that? Justify your answer. 　　　　　　　　　　　　　**(04 Marks)**
　 b. Remove left recursion from the grammar given below :
　　　 S → (M) | a
　　　 M → M ; S | S. 　　　　　　　　　　　　　　　　　　　　　　　**(04 Marks)**
　 c. Enlist the conditions to test whether a given grammar is LL(1). 　　　　**(03 Marks)**
　 d. Construct predictive parsing table for the following grammar
　　　 S → a AB b
　　　 A → A c | ∈
　　　 B → d | ∈. 　　　　　　　　　　　　　　　　　　　　　　　　　**(09 Marks)**

3 a. Write an algorithm for computation of CLOSURE of LR(0). 　　　　　　**(02 Marks)**
　 b. Construct LR(0) parsing table for the following grammar
　　　 S → Ac
　　　 A → AB | ∈
　　　 B → a B 1 b. 　　　　　　　　　　　　　　　　　　　　　　　　**(10 Marks)**
　 c. Consider the grammar A → (A) | a. Construct the DFA of sets of LR(0) items. Show the parsing actions for the input string ((a)). Clearly show states and symbols on the stack.
　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　(08 Marks)

4 a. Consider
　　　 S → id | V : = E
　　　 V → id
　　　 E → V | n
　　 Construct canonical LR(1) parsing table. 　　　　　　　　　　　　　**(14 Marks)**
　 b. Write a YACC specification for desk calculator with error recovery. 　　**(06 Marks)**

PART – B

5 a. Write semantic rules to compute 5 * 6, using a grammar suitable for top down parsing.
　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　(07 Marks)
　 b. Give syntax directed definition for simple type declaration. Construct dependency graph for the declaration, int id_1, id_2. 　　　　　　　　　　　　　　　　　　**(08 Marks)**
　 c. Write SDD for while statement. 　　　　　　　　　　　　　　　　　　**(05 Marks)**

6 a. Describe syntax directed definition for flow of control statements. **(10 Marks)**

   b. Generate three address code for Boolean operations. **(10 Marks)**

7 a. Write intermediate code for the following :

        a = f(b [i]). **(04 Marks)**

   b. Explain the procedures to maintain display, with an example. **(08 Marks)**

   c. Discuss the performance metrics to be considered while designing a garbage collector.

      (08 Marks)

8 a. Write machine code equivalent for the following :

        'if x < y goto L' **(04 Marks)**

   b. Write an algorithm for partitioning three address instructions into basic blocks. Consider intermediate code to set a 10×10 matrix to an identify matrix. Apply an algorithm to convert this code into basic blocks. **(08 Marks)**

   c. Discuss the different issues in the design of the function getReg(I). **(08 Marks)**

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