

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 :
 $S \rightarrow CC \mid CSC$
 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 :
 $S \rightarrow (M) \mid a$
 $M \rightarrow M ; S \mid S.$ (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
 $S \rightarrow a AB b$
 $A \rightarrow A c \mid \epsilon$
 $B \rightarrow d \mid \epsilon.$ (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
 $S \rightarrow Ac$
 $A \rightarrow AB \mid \epsilon$
 $B \rightarrow a B 1 b.$ (10 Marks)
- c. Consider the grammar $A \rightarrow (A) \mid a$. 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
 $S \rightarrow id \mid V : = E$
 $V \rightarrow id$
 $E \rightarrow V \mid n$
 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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