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## Sixth Semester B.E. Degree Examination, June 2012

### Compiler Design

Time: 3 hrs.

Max. Marks:100

**Note: Answer FIVE full questions, selecting  
at least TWO questions from each part.**

#### PART – A

- 1 a. Give the general structure of a compiler. Show the working of different phases of a compiler taking an example. (10 Marks)
- b. List the and explain reasons for separating analysis portion of a compiler into lexical analysis and syntax analysis phases. (06 Marks)
- c. Why two-buffer scheme is used in lexical analysis? Write an algorithm for “look ahead code with sentinels”. (04 Marks)
- 2 a. Show how left recursion and left factoring help top down parsing? (06 Marks)
- b. Give algorithm for FIRST and FOLLOW sets construction. Give the same for the grammar.  
 $E \rightarrow TE'$ ,  $E' \rightarrow TE'/\epsilon$ ,  $T \rightarrow FT'$ ,  $T' \rightarrow * FT'/\epsilon$ ,  $F \rightarrow (E)/id$ . (08 Marks)
- c. Explain the “panic-mode recovery” and “global correction” error recovery strategies. (06 Marks)
- 3 a. What is meant by handle pruning? How it helps in shift reduce parsing? List the actions of a shift reduce parser. (10 Marks)
- b. Show that the following grammar.  
 $S \rightarrow Aa Ab/ Bb Ba$   $A \rightarrow \epsilon$   $B \rightarrow \epsilon$  is not SLR (1) clearly mention the reasons. (10 Marks)
- 4 a. Construct LR (1) items for  $S \rightarrow Cc$   $C \rightarrow cC/d$ , also construct GOTO graph for the same grammar. (10 Marks)
- b. How ambiguous grammar are handled by YACC? Develop unambiguous YACC specification for a desktop calculator. (10 Marks)

#### PART – B

- 5 a. Define inherited and synthesized attributes. Give examples. (05 Marks)
- b. Define syntax directed definition for a simple type declaration. (05 Marks)
- c. Give a SDD for desktop calculator and show its stack implementation. (10 Marks)
- 6 a. List various three address instruction forms. Give one example for each. (10 Marks)
- b. Write a note on quadruple and triples. (05 Marks)
- c. Give a semantic action for  $S \rightarrow \text{while } (B) S$ . (05 Marks)
- 7 a. With a diagram explain the typical subdivision of run time memory. (08 Marks)
- b. Discuss about the various components and their use in an activation record. (08 Marks)
- c. How access to non local data in the stack is done? (04 Marks)
- 8 a. What is a basic block? How optimization is done in basic blocks? (10 Marks)
- b. Give the code generation process for an arithmetic operation. Generate instructions for the statement,  
 $t = a - b$ ,  $u = a - c$ ,  $v = t + u$ . (10 Marks)