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10IS662

**Sixth Semester B.E. Degree Examination, June/July 2018**  
**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. With the help of a neat diagram, explain the various phases of a compiler. (08 Marks)  
 b. What is input buffering? Explain the use of sentinels in recognizing the tokens in buffering. (08 Marks)  
 c. Write the regular definition for a decimal number. (04 Marks)
- 2 a. What is Predictive Parsing? Explain the predictive parsing algorithm. (08 Marks)  
 b. Explain ambiguous grammars with an example. (06 Marks)  
 c. Given the grammar :  $S \rightarrow iCt S \mid iC t Se S \mid a$   
 $C \rightarrow b$   
 i) Compute FIRST() of FOLLOW () sets  
 ii) Construct the predictive parsing table  
 iii) Check whether the given grammar is LL (1) (06 Marks)
- 3 a. Explain the working of a shift reduce parser with a neat diagram. (06 Marks)  
 b. What is handle pruning? Indicate handles by performing bottom-up parsing for the input string 00001111 for given grammar :  
 $S \rightarrow 0S1 \mid 01$ . (06 Marks)  
 c. Given the grammar :  
 $E \rightarrow 5 + T \mid 3 - T$   
 $T \rightarrow V \mid V * V \mid V + V$   
 $V \rightarrow a \mid b$   
 i) Perform LL (1) parsing  
 ii) Construct the predicative parsing table. (08 Marks)
- 4 a. What are the advantages of LR Parsers? Write the algorithm for LR – parsing. (08 Marks)  
 b. Given the grammar :  
 $A \rightarrow a$   
 $A \rightarrow (A)$   
 i) Draw the LR(0) automata  
 ii) Construct the SLR parsing table  
 iii) Show the sequence of moves made by the parse for the given input string : ((a)). (12 Marks)

**PART – B**

- 5 a. Explain the following  
 i) Synthesized attribute  
 ii) Inherited attribute  
 iii) Annotated parse tree. (06 Marks)
- b. What is syntax directed translation? What is the difference between syntax tree and parse tree? (06 Marks)
- c. What are three address codes? Explain the different ways of representing three address codes with example. (08 Marks)

- 6 a. Explain the following with an example: (08 Marks)  
i) Quadruples ii) Triples
- b. Write the SDTS (Syntax Directed Translation Scheme) for converting an infix to prefix expression. Show the actions for translating the expression,  $2 * 3 + 4$  into its equivalent prefix expression. (12 Marks)
- 7 a. Explain the typical subdivision of run time memory with a neat diagram. (06 Marks)  
b. Explain the strategy for reducing fragmentation in heap memory. (08 Marks)  
c. Explain the performance metrics to be considered while designing a garbage collector. (06 Marks)
- 8 a. Briefly explain various issues in the code generation phase. (10 Marks)  
b. Give the DAG representation for the following basic block :  
 $x = x * 3$   
 $y = y + x$  (04 Marks)  
c. Explain the various code optimization techniques. (06 Marks)

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