FACULTY OF INFORMATICS
B.E. 3/4 (IT) II – Semester (Main) Examination, May 2014
Subject: Compiler Construction

Time: 3 hours
Max. Marks: 75

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.

PART – A (25 Marks)

1. What is a translator? List different types of translators.  
2. What is bootstrapping?  
3. Define the terms pattern and lexeme.  
4. What is the role of a parser in a compiler?  
5. Write the strategies used for error recovery.  
6. What is syntax directed definition?  
7. What is a dependency graph? Give one example.  
8. Write three-address code and quadruples for the statement a = b * - c + b * - c.  
9. Define temporal locality and spatial locality.  
10. What is a semilattice?

PART – B (50 Marks)

11. a) Write about various data structures used in a compiler.  
b) Draw a transition diagram for recognizing the lexemis matching the token relop.

12. Construct predictive parsing table for the following grammar.
   
   \[ S \rightarrow 0S1 | 01 \]
   \[ S \rightarrow +SS | \ast SS | a \]
   \[ S \rightarrow S(S)S \mid \epsilon \]
   \[ S \rightarrow S + S | SS | (S) | S \ast | a \]

13. Verify whether the following grammar is LALR(1) or not
   
   \[ S \rightarrow Aa | bAc | dc | bda \]
   \[ A \rightarrow d \]

14. Write the syntax directed definition for the following grammar and also draw the annotated parse tree for the input string 3 \ast 5 + 4n.
   
   \[ L \rightarrow En \]
   \[ E \rightarrow E + T | T \]
   \[ T \rightarrow T \ast F | F \]
   \[ F \rightarrow (E) | \text{digit} \]

15. a) Explain the strategies for dynamic storage allocation.  
b) Write about the performance metrics used in the design of a garbage collector.

16. a) Explain the techniques used for semantic preserving transformation.  
b) Explain the basic loader functions.

17. Write short notes on:
   a) Bootstrap loader  
   b) Input buffering in lexical analysis  
   c) Optimization of basic blocks

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