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B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2009.

Sixth Semester

Computer Science and Engineering

CS 337 — PRINCIPLES OF COMPILER DESIGN

(Regulation 2001)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Distinguish between pass and phases of a compiler.
2. List the compiler construction tools.
3. Define auxiliary definitions in Lex.
4. How will you eliminate left recursion?
5. Define handle.
6. Define canonical LR(1) items.
7. Draw DAG for $(a+b)*(a+b)+(a+c)$.
8. Write down quadruple, triple for the expression - $(a+b)*(c+d)-(a+b+c)$.
9. Define flow graphs.
10. What is the purpose of next-use information in the code generation phases.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain in detail the front end of the compiler. (10)

(ii) Draw and explain how the expression $a = b + c * d$ will be converted into a object code. (6)

Or

(b) (i) Discuss the purpose of error handler in compilation. (8)

(ii) Describe compiler-generators. (8)

12. (a) (i) Draw the NFA for recognizing the keywords IF, WHILE, FOR, ELSE, SWITCH. (8)

(ii) Write short notes on Lex. (8)

Or

(b) (i) How will you eliminate left recursion from a grammar G? Explain. (8)

(ii) Consider the following grammar $S \rightarrow A\,a|bA \rightarrow Ac|\,Sd\,|\,e$ Eliminate left recursion. (8)

13. (a) Draw the predictive parser table for the following grammar G, $S \rightarrow iC\ t\ S|iCtSeS|a\ \ C \rightarrow b$. (16)

Or

(b) Construct the SLR parser table for the grammar $S \rightarrow L = R\,|\,R\ \ R \rightarrow L$ $L \rightarrow *R\,|id$. (16)

14. (a) Derive the syntax directed translation schema for flow control statements. (16)

Or

(b) Discuss in detail how you design a symbol table. (16)

15. (a) Discuss in detail the principal source of optimization. (16)

Or

(b) (i) Describe the issues in the design of code generator. (8)

(ii) Describe Peephole Optimization. (8)
