G 1309

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Reg. No....................................

Name.......................................

B.TECH. DEGREE EXAMINATION, MAY 2016

Seventh Semester

Branch : Computer Science and Engineering

CS 010 702—COMPILER CONSTRUCTION (CS)

(New Scheme—2010 Admission onwards)

[Improvement/Supplementary]

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all questions.
Each question carries 3 marks.

1. Write regular expression for identifiers in C programming language.

2. Explain the differences between LR and LL parsers.

3. Briefly explain the memory allocation strategies.

4. Explain the need for intermediate code generators.

5. Draw expression tree for the expression $a**2 + b - d/e + f + 2*f$.

(5 × 3 = 15 marks)

Part B

Answer all questions.
Each question carries 5 marks.

6. Construct one NFA from the regular expression abb+(a|bc)*.abb. Explain all the steps.

7. With an example, explain the concept of recursive descent parser.

8. Write a syntax directed translation scheme to evaluate a simple expression.

9. Convert the given infix expression into prefix from :

    (5*3)*5+45*(12-2)/23.

10. Draw a structure of symbol table and explain the need for a symbol table.

(5 × 5 = 25 marks)

Part C

Answer all questions.
Each full question carries 12 marks.

11. (a) Describe the languages denoted by the following regular expressions :—

    (i) a(a|b+)abb   (ii) a+ ba* ba* ba*   (4 marks)

    (b) Explain the process of implementing lexical analyzer using finite automation.   (8 marks)

Or

12. (a) With a block diagram, explain the phases of compiler.   (8 marks)

    (b) Write simple LEX spec for recognizing identifiers and if statement in C.   (4 marks)

Turn over

13. (a) Describe the relationship between a production and an item in an LR(0) grammar. How does this relate to the notion of the stack in an LR(0) grammar ? Give an algorithm for constructing the closure of a set of items LR(0) with respect to a particular grammar.

(9 marks)

(b) Write a brief note on YACC. (3 marks)

Or

14. (a) What is the difference between SLR and LR(1) parsing ? What changes are there when constructing an LR table compared to SLR table ? How does an LALR parser differ from SLR and LR(1) parsers ?

(7 marks)

(b) Construct LR(0) automation for the grammar S → e, e → e + v | v, v → x | y.   (5 marks)

15. (a) What is the difference between static and dynamic type checking ? What is the difference between name and structural equivalence ? What is a cyclic type ? Give examples to demonstrate your answers.

(8 marks)

(b) Define parameter passing and the parameter passing methods call by value and call by reference.

(7 marks)

Or

16. (a) With an example explain the concept of syntax directed translation.   (8 marks)

(b) Describe static and dynamic scoping and how they differ.   (4 marks)

17. (a) Draw a directed acyclic graph(DAG) for the expression (a − b) + c + d *e and write the corresponding 3-address code.

(6 marks)

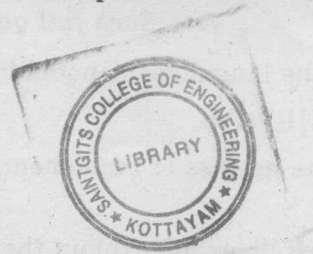(b) Explain the need for code optimizers in translation process.   (6 marks)

Or

18. (a) Explain in detail the machine independent and dependent optimizations with examples for each.

(10 marks)

(b) Define basic block with an example.   (2 marks)

19. (a) Discuss the method of generating target code from expression trees.   (6 marks)

(b) Explain the symbol table management in modern compilers.   (6 marks)

Or

20. Write note on the following :—

(a) Cross compilers ;

(b) Error handling ;

(c) Object code generation.

(12 marks)

[5 × 12 = 60 marks]