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Question Paper Code:46201

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2019

Sixth Semester

Computer Science and Engineering

14UCS601–PRINCIPLES OF COMPILER DESIGN

(Regulation 2014)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Which one is correct for language processing system?

   (a) pre-processor→compiler→Assembler→Loader & Linker

   (b) compiler→ pre-processor→Assembler→Loader & Linker

   (c) pre-processor→compiler→Loader & Linker→Assembler

   (d) pre-processor→ Assembler→ compiler→Loader & Linker

2. In a compiler the module that checks every character of the source text is called

   (a) The code generator (b) The code optimizer

   (c) The Lexical analyser (d) The syntax analyser

3. Which data structure in a compiler is used for managing information about variables and their attributes?

   (a) Abstract Syntax tree (b) Symbol Table

   (c) Semantic stack (d) Parse table

4. The process of assigning load addresses to the various parts of the program and reflect the assigned addresses is called

(a) Assembly (b) Parsing (c) Relocation (d) Symbol resolution

5. Which of the following strings is generated by the grammar?

(a) aaaabb (b) aabbbb (c) aabbab (d) abbbba

6. The grammar S→CC , C→cC | d is

(a) LL(1) (b) SLR(1) but not LL(1)
(c) LALR(1) but not SLR(1) (d) LR(1) but not LALR(1)

7. A linker is given object modules for a set of programs that were compiled separately. What information need to be included in an object module?

(a) Object mode
(b) Relocation bits
(c) Names and locations of all external symbols
(d) Absolute addresses of internal symbols defined in the object module

8. In a bottom-up evaluation of a syntax directed definitions, inherited attributes can

(a) Always be evaluated
(b) Be evaluated only if the definition
(c) be evaluated only if the definition has synthesized
(d) Never be evaluated

9. What is the minimum number of registers needed in the instruction set architecture of the processor to compile this code segment without any spill to memory?

(a) 3 (b) 4 (c) 5 (d) 6

10. Which languages necessarily need heap allocation in the runtime environment?

(a) those that support recursion
(b) those that use dynamic scoping
(c) those that allow dynamic data structure
(d) those that use global variables

PART - B (5 x 2 = 10 Marks)

11. Define tokens, Patterns and lexemes.

12. Eliminate left recursion from the grammar A→ Ac | Aad | bd | ε..

13. What is back patching?

14. Define basic blocks and flow graphs.

15. What are the properties of optimizing compilers?

PART - C (5 x 16 = 80 Marks)

16. (a) Explain the various phases of a compiler in detail. Also write down the output for the following expression after each phase a := b * c-d. (16)

Or

(b) (i) Mention any four compiler construction tools with their benefits and drawbacks. (10)

(ii) Describe the need for grouping of phases of compiler (6)

17. (a) Explain the process of constructing an NFA from regular expression. Find NFA for the expression $(a/b)^*$ abb. Also convert the obtained NFA into DFA. (16)

Or

(b) (i) Write in detail about the role of Lexical analyzer with the possible error recovery actions.and the tool for generating lexical analyzer (16)

18. (a) (i) Write down the translation scheme to generate code for assignment statement. Use the scheme for generating three address code for the assignment statement. g := a+b-c*d. (8)

(ii) Describe the various methods of implementing three-address statements. (8)

Or

(b) Construct the SLR parsing table for the following grammar (16)

S→CC

C→cC

C →d

19. (a) List out the various storage allocation strategies. (16)

Or

(b) Briefly explain about the type checking and its properties. (16)

20. (a) Explain peephole optimization and various code improving transformation (16)

Or

(b) (i) Explain the various issues in the design of code generation . (16)