

(6 pages)

Reg. No. :

Code No.: 7888

Sub. Code: WAIE 13

M.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2023

First Semester

Computer Science with Artificial Intelligence

COMPILER DESIGN

(For those who joined in July 2023 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (15 × 1 = 15 marks)

Answer ALL questions.

Choose the correct answer :

1. The table management also called
 - (a) Symbol table
 - (b) Bookkeeping
 - (c) Pass
 - (d) Expression
2. The output of the syntax analyser is representation of a _____
 - (a) Syntax tree
 - (b) Binary tree
 - (c) Binary operator
 - (d) Parse tree
8. Which of the following error can a compiler check?
 - (a) Syntax Error
 - (b) Logical Error
 - (c) Both Logical and Syntax Error
 - (d) Compiler cannot check errors
9. Identify the data structure which has minimum access time in case of symbol table implementation?
 - (a) Self-organizing list
 - (b) Hash Table
 - (c) Search tree
 - (d) Linear
10. DAG representation of a basic block allows
 - (a) Automatic detection of local common sub expressions
 - (b) Automatic detection of induction variables
 - (c) Automatic detection of loop invariant
 - (d) Automatic detection of inner loop
11. "09-10 rule" states that
 - (a) 90% of the time is spent in 10% of the code.
 - (b) 90% of the inner loop is spent in 10% of the time.
 - (c) 90% of the code is spent in 10% of the time.
 - (d) 90% of the job is spent in 10% of the code.

3. Compiler can check _____ error.
 - (a) Syntax
 - (b) Content
 - (c) Logical
 - (d) Spelling
4. A specialized kind of flowchart for lexical analysers, called a _____
 - (a) Chart
 - (b) Diagram
 - (c) Code
 - (d) Transition diagram
5. The empty string is of length _____
 - (a) Zero
 - (b) One
 - (c) Null
 - (d) Infinity
6. The transitions of an NFA can be represented in tabular form by means of a _____
 - (a) Transition Table
 - (b) Transition Diagram
 - (c) Transition Data
 - (d) Transition form
7. What is the use of a symbol table in compiler design?
 - (a) Finding name's scope
 - (b) Type checking
 - (c) Keeping all of the names of all entities in one place
 - (d) All of the mentioned

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12. The basic blocks and their successor relationship by a directed graph called a
 - (a) flow graph
 - (b) loops
 - (c) code motion
 - (d) induction variables
13. To perform register allocation _____ keeps track of what is currently in each register.
 - (a) Address Descriptor
 - (b) Register Descriptor
 - (c) Register Buffer
 - (d) Register Stack
14. Peephole optimization
 - (a) Loop Optimization
 - (b) Local Optimization
 - (c) Constant folding
 - (d) Data Flow analysis
15. Which one to the following false?
 - (a) The code contains loop-in variant computation
 - (b) There is scope of common sub-expression elimination in this code
 - (c) There is scope strength reduction in this code
 - (d) There is scope of dead code elimination in this code

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PART B — (5 × 4 = 20 marks)

Answer ALL questions, choosing either (a) or (b).

16. (a) What is the need of translators?
Or
(b) Write a note on lexical analysis.
17. (a) Give an overview about a simple approach to the design of lexical analyzers.
Or
(b) Explain about context-free grammars.
18. (a) Discuss about hash tables.
Or
(b) Describe about syntactic errors.
19. (a) Write down the directed acyclic graph.
Or
(b) Explain about global data-flow analysis.
20. (a) Write the code-generation algorithm.
Or
(b) List down the problems in code generation.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b)
Each answer should not exceed 600 words.

21. (a) Describe about the phases of a compiler.
Or
(b) Discuss about code optimization.
22. (a) Analyze deterministic automata.
Or
(b) Enumerate shift reduce parsing.
23. (a) Illustrate the contents of a symbol table.
Or
(b) Explain about lexical-phase errors.
24. (a) Enumerate the principle sources of optimization.
Or
(b) Classify loop optimization.
25. (a) Discuss about code generation from DAG's.
Or
(b) Analyze peephole optimization.