

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc (SS) DEGREE EXAMINATION MAY 2023
(Ninth Semester)

Branch- SOFTWARE SYSTEMS
(Five year integrated)

DISCIPLINE SPECIFIC ELECTIVE IV:
PRINCIPLES OF COMPILER DESIGN

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer ALL questions

ALL questions carry EQUAL marks (10 x 1 = 10)

- 1 Which of the following file is an output of the assembler?
(i) Program file (ii) Data File
(iii) Object File (iv) Task File
- 2 Macro expansion is performed by
(i) Macro processor (ii) Macro pre-processor
(iii) Assembler (iv) Micro pre-processor
- 3 Number of tokens in the statement: `printf("k= %d, &k = %x", k, &k);`
(i) 11 (ii) 31 (iii) 10 (iv) 4
- 4 Symbol table is generated by
(i) Assembler (ii) Compiler
(iii) Loader (iv) Interpreter
- 5 In _____ phase of compiler design, characters are grouped in to tokens.
(i) Code generator (ii) Lexical analyzer
(iii) Parser (iv) Code optimization
- 6 The Tuples for NDFA is _____
(i) $\Sigma, Q, q_0, F, \delta$ (ii) Q, q_0, F, δ
(iii) $\Theta, Q, q_0, F, \delta$ (iv) $F, Q, \Delta, q_0, \delta$
- 7 Top down parser generates
(i) Right-most derivation in reverse
(ii) Left-most derivation in reverse
(iii) Right-most derivation
(iv) Left-most derivation
- 8 Which of the following parser is most powerful?
(i) Operator precedence (ii) SLR
(iii) Canonical LR (iv) LALR
- 9 A tool to depict the structure of basic blocks, flow of values among them and offers optimization is
(i) DAG (ii) CAG (iii) SAG (iv) PAG
- 10 Which optimization technique is used to reduce the multiple jumps?
(i) Latter optimization (ii) Peephole optimization
(iii) Local optimization (iv) Code optimization

Cont...

SECTION - B (25 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks (5 x 5 = 25)

- 11 a. Describe in detail. Statement of the problem in designing assembler.
OR
b. Outline the tasks of Macro instructions.
- 12 a. Specify the data structure in the design of direct linking loader.
OR
b. State some compiler construction tools.
- 13 a. Write a short note on Lexical errors with example.
OR
b. Distinguish NFA and DFA.
- 14 a. How will you define a context free grammar?
OR
b. Explain about Recursive Descent parsing.
- 15 a. Write the three address code sequence for the following assignment statement: $d := (a-b) + (a-c) + (a-c)$.
OR
b. Summarize the facts related to back patching of Boolean expressions.

SECTION - C (40 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks

Question No.16 is Compulsory

(5 x 8 = 40)

16. Write about the use of databases in assembler passes with neat diagram.
- 17 a. Discuss the need for various loader schemes.
OR
b. Describe in detail about general Phases of compilers.
- 18 a. Write an algorithm to convert NFA to DFA and minimize to DFA.
OR
b. Prioritize the importance of expressing tokens in regular expression.
- 19 a. Why SLR and LALR are more economical to construct than canonical LR?
OR
b. Differentiate top down parsing from bottom up parsing.
- 20 a. Enumerate and explain various issues in the design of code generators.
OR
b. Explain the principle sources of code optimization in detail.

Z-Z-Z

END