

K-973

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[Roll No.]

MCA-15/MSCIT-15

**MCA/MSCIT IVth Semester
Examination Dec., 2023**

SYSTEM SOFTWARE

Time : 2 Hours]

[Max. Marks : 70

Note :- This paper is of Seventy (70) marks divided into two (02) Sections 'A' and 'B'. Attempt the questions contained in these Sections according to the detailed instructions given there in. Candidates should limit their answers to the questions on the given answer sheet. No additional (B) answer sheet will be issued.

Section-A

(Long Answer Type Questions) 2×19=38

Note :- Section 'A' contains Five (05) Long-answer type questions of Nineteen (19) marks each. Learners are required to answer any two (02) questions only.

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(1)

P.T.O.

1. How does system software contribute to the overall functionality and efficiency of a computer system, and what key components fall under the umbrella of system software ?
2. What is lexical analysis, and what role does it play in the process of compiling programming code ? Discuss in detail about the lexical errors.
3. What is syntax-directed translation ? How does it integrate syntax analysis and semantic actions to generate target code during compilation ?
4. Can you provide a detailed overview of the code generation phase in the compilation process, and how it transforms an intermediate representation of code into machine or assembly language ?
5. Compare and contrast top-down and bottom-up parsing techniques, highlighting their strengths, weaknesses, and applications in different parsing scenarios.

Section–B

(Short Answer Type Questions) 4×8=32

Note :– Section ‘B’ contains Eight (08) Short-answer type questions of Eight (08) marks each. Learners are required to answer any *four* (04) questions only.

1. Can you provide a comprehensive overview of the roles of linkers and loaders in the process of converting source code into executable programs ?
2. What is the primary function of an assembler in the context of computer programming, and how does it contribute to the translation of assembly language code into machine code ?
3. Provide an overview of Chomsky’s hierarchy of formal languages, outlining the different classes and their characteristics.
4. What are the phases of compiler ? Discuss in detail.
5. Define LL(1) parsing and discuss its importance in predictive parsing, specifying the conditions that an LL(1) grammar must satisfy.

6. Introduce the fundamental concepts of code optimization.
Discuss about the basic techniques of code optimization.
7. What are overlays, and how do they address memory constraints by loading portions of a program into memory as needed? Discuss the concept of overlay structures in the context of memory management.
8. How to compute the FIRST() and FOLLOW() function ?
Compute the FIRST() and FOLLOW() of the following grammar :

$S \rightarrow AaAb \mid BbBa$

$A \rightarrow \epsilon$

$B \rightarrow \epsilon$
