M.Sc. (Computer Science)
Semester-1
MSCS-1-01T: Computer Programming

Total Marks: 100
External Marks: 70
Internal Marks: 30
Credits: 4
Pass Percentage: 40%

INSTRUCTIONS FOR THE PAPER SETTER/EXAMINER
1. The syllabus prescribed should be strictly adhered to.
2. The question paper will consist of three sections: A, B, and C. Sections A and B will have four questions from the respective sections of the syllabus and will carry 10 marks each. The candidates will attempt two questions from each section.
3. Section C will have fifteen short answer questions covering the entire syllabus. Each question will carry 3 marks. Candidates will attempt any ten questions from this section.
4. The examiner shall give a clear instruction to the candidates to attempt questions only at one place and only once. Second or subsequent attempts, unless the earlier ones have been crossed out, shall not be evaluated.
5. The duration of each paper will be three hours.

INSTRUCTIONS FOR THE CANDIDATES
Candidates are required to attempt any two questions each from the sections A and B of the question paper and any ten short questions from Section C. They have to attempt questions only at one place and only once. Second or subsequent attempts, unless the earlier ones have been crossed out, shall not be evaluated.

Course: Computer Programming	
Course Code: MSCS-1-01T	
Course Outcomes (COs)	
After the completion of this course, the students will be able to:	
CO1	Understand the basic language implementation techniques.
CO2	Develop C programs to demonstrate the applications of derived data types such as arrays, pointers, strings and functions.
CO3	Understand the concept of object oriented programming language.
CO4	Develop ability to learn and write small programs in C and C++.
CO5	Understand the concepts of OOPs including inheritance.

SECTION-A

Unit I: **Problem Solving with Computers**: Evolution of C Language, Character Set in C, Tokens, Keywords, Identifier, Constants, Variables, Rules for defining Variables, Data Types in C Language: Basic data type, Derived data type and Enum data type.

Unit II: **Operators in C**: Types of Operator: Arithmetic, Relational, Logical, Comma, Conditional, Assignment, Operator Precedence and Associativity in C, Input and Output Statements, Assignment statements.

Unit III: **Control Structure:** Sequential Flow Statement, Conditional Flow Statement, Decision Control statements: if, if-else, nested-if, else-if ladder. Loop control statements: While, do-while, for loop, Nested of Loops. Case Control Statements: Switch Statement, goto Statement, Break Statement, Continue Statement.

Unit IV: **Arrays and Pointers in C:** Arrays, Characteristic of Arrays, Representation, Declaration and Initialization of an Array, Types of Arrays: one dimensional, multi-dimensional arrays. Pointer, Pointers Declaration and Initialization, Types of Pointers, Pointer Expressions and Pointer Arithmetic.

SECTION-B

Unit V: **Functions:** Function in C, Function Declaration and Definition, Types of Functions, Library Vs. User-defined Functions, Function Calling Methods, Function Parameters: Actual Parameter, Formal Parameter, Parameter Passing Techniques: Call by Value and Call by Reference, Recursive Function, Pointers and Functions. Strings: C Strings, Difference between char array and string literal, Traversing String, Accepting string as the input, Pointers with strings, String Functions.

Unit VI: **User Defined Data types:** Structure, Structure Variables Declaration, Accessing Structure Data Members, Array of Structures, Nested of Structure, Passing structure to function, Structures Limitations, Union, Difference between Structure and Union in C.

Unit VII: **Object Oriented Programming:** Need of an Object-Oriented Programming, C++ and its Applications, OOPs Concepts in C++: Class, Objects, Encapsulation, Abstraction, Polymorphism, Inheritance, Dynamic Binding and Message Passing. Access Specifiers in C++: Private, Protected and Public.

Unit VIII: **Constructor in C++:** Characteristics of Constructors, Difference between constructor and member function, Types of Constructors: Default Constructor, Parameterized Constructors, Copy Constructors, Dynamic Constructors, Destructor in C++, Difference between Constructor and Destructor. Inheritance in C++, Modes of Inheritance, Type of Inheritance: Single inheritance, Multiple inheritance, Hierarchical inheritance, Multilevel inheritance, Hybrid inheritance.

Reference Books:

- E. Balagurusamy, "Programming in C", Tata McGraw Hill.
- Kamthane, "Programming with ANSI and Turbo C", Pearson Education
- Rajaraman,V, "Fundamentals of Computers", PHI
- Kanetkar, "Let Us C", BPB Publications.

- Herbert Schildt, "The Complete Reference C++", Tata McGraw-Hill.
- Deiteland Deitel, "C++ How to Program", Pearson Education.
- Robert Lafore, "Object Oriented Programming in C++", Galgotia Publications.
- Bjarne Strautrup, "The C++ Programming Language", Addition-Wesley Publication Co.
- Stanley B. Lippman, Josee Lajoie, "C++ Primer", Pearson Education.
- E. Balagurusamy, "Object Oriented Programming with C++", Tata McGraw-Hill