1. Introduction to Programming & C Fundamentals

A. Overview of Programming Languages

- Machine language, Assembly language, High-level languages
- Compilers & Interpreters
- Problem solving with computers (Algorithms & Flowcharts)

B. Introduction to C

- History & Evolution of C
- Features & Modern relevance
- Structure of a C program
- C Program development life cycle (Edit → Compile → Link → Run)

2. Basic Building Blocks

C. Tokens & Language Elements

- Keywords, Identifiers
- Character set, Constants & Variables
- Data types (int, float, char, etc.)
- Operators & Expressions

D. Input & Output

- printf () and scanf () functions
- Format specifiers
- Basic I/O operations

3. Control Flow & Logic

E. Decision Making Structures

- if, if-else, switch
- Nested decision statements
- Conditional (ternary) operator

F. Looping Structures

- for loop
- while and do-while loops
- Use of break and continue

4. Functions & Modularity

H. Functions

- Definition, declaration, and call
- Function parameters & return values
- Scope of variables, storage classes
- Recursion basics

5. Arrays & Strings

I. Arrays

- One-dimensional arrays
- Two-dimensional arrays
- Array operations (initialize, access)

J. Strings

- Declaration, initialization
- Input & output of strings
- String handling basics

6. Pointers & Memory

K. Pointers

- Pointer basics & declaration
- Pointer arithmetic
- Pointers with functions
- Arrays & pointers relationship
- Relationship between arrays and pointers
- Pointer to pointer
- Null and void pointers

L. Dynamic Memory Allocation

- Dynamic Memory allocation concept
- malloc () function
- calloc () function
- free () function

7. User-Defined Data Types

M. Structures

- Defining & using structures
- Arrays of structures
- Nested structures

N. Unions & Enumerations

- Declaration & usage
- Differences between structures and unions

8. File Handling & Preprocessors

O. File Handling

- Opening, closing files
- Reading & writing text files
- Modes of file access

P. Preprocessors Directives

- #include, #define
- Conditional compilation
- Command-line arguments

8. Practical

Q. Hands-On Coding Practice

- Write programs for arithmetic logic
- Conditional problems & looping tables
- Functions, arrays, and pointers practice
- Mini projects using file I/O