Paper Code: **HCSGE1012T**	**Paper Name: Computer Fundamentals and Programming in C (THEORY)**	**Marks: 60**
Sl. No.	**Topic**	**No. of Periods**
GROUP-A		**26**
1	**Introduction to Computer:** Different Generations, Functional Units, Basic I/O devices, Storage devices, Bus Structure	2
2	**Number Systems and Codes:** Weighted and Non-Weighted Codes, Positional Number Systems like Binary, Octal, Decimal and Hexadecimal, Conversion of one number system to another, BCD, Concept of r's and (r-1)'s Complement.	5
3	**Binary Arithmetic:** Addition and Subtraction using Complement Operation. **Representation of Characters:** ASCII and Unicode	2
4	**Introduction to Problem Solving:** Concept of Data and Information, Basic problem solving using Flow Chart and Algorithm	3
5	**Software:** Types and Brief Ideas about Each of the Types	4
6	**Introduction to C -** History of C, Overview of Procedural Programming, Using main() function, Compiling and Executing Simple Programs in C.	2
7	**Types, Variables, Constants, Operators and Basic I/O -** Declaring, Defining and Initializing Variables, Scope of Variables, Keywords, Data Types, Casting of Data Types, Operators (Arithmetic, Logical and Bitwise), Using Comments in programs, Character I/O (getc, getchar, putc, putchar, etc), Formatted and Console I/O (printf(), scanf()), Using Basic Header Files (stdio.h, conio.h, etc.).	4
8	**Expressions, Conditional Statements and Iterative Statements -** Simple Expressions in C (including Unary Operator Expressions, Binary Operator Expressions), Understanding Operators Precedence in Expressions, Conditional Statements (if construct, switch-case construct), Understanding syntax and utility of Iterative Statements (while, do-while, and for loops), Use of break and continue in Loops, Using Nested Statements (Conditional as well as Iterative).	4

GROUP-B		26
9	**Functions and Arrays -** Utility of functions, Call by Value, Call by Address, Functions returning value, Void functions, Inline Functions, Return data type of functions, Functions parameters, Differentiating between Declaration and Definition of Functions, Command Line Arguments/Parameters in Functions, Functions with variable number of Arguments. Creating and Using One Dimensional Arrays (Declaring and Defining an Array, Initializing an Array, Accessing individual elements in an Array, Manipulating array elements using loops), Use Various types of arrays (integer, float and character arrays / Strings) Two-dimensional Arrays (Declaring, Defining and Initializing Two Dimensional Array, Working with Rows and Columns), Introduction to Multi-dimensional arrays	10
10	**Derived Data Types (Structures and Unions) -** Understanding utility of structures and unions, Declaring, initializing and using simple structures and unions, Manipulating individual members of structures and unions, Array of Structures, Individual data members as structures, Passing and returning structures from functions, Structure with union as members, Union with structures as members.	4
11	**Pointers in C -** Understanding a Pointer Variable, Simple use of Pointers (Declaring and Dereferencing Pointers to simple variables), Pointers to Pointers, Pointers to structures, Problems with Pointers, Passing pointers as function arguments, Returning a pointer from a function, using arrays as pointers, Passing arrays to functions.	4
12	**Memory Allocation in C -** Differentiating between static and dynamic memory allocation, use of malloc, calloc and free functions in C, storage class specifiers in C and storage of variables in static and dynamic memory allocation.	4
13	**File I/O, Preprocessor Directives -** Opening and closing a file (use of fstream header file, ifstream, ofstream and fstream classes), Reading and writing Text Files, Using put(), get(), read() and write() functions, Random access in files, Understanding the Preprocessor Directives (#include, #define, #error, #if, #else, #elif, #endif, #ifdef, #ifndef and #undef), Macros.	4
	Total	**52**

Books and References:

1. “Let Us C" by Yashavant Kanetkar
2. “Programming in Ansi C" by E. Balagurusamy.
3. "Programming in C" by Reema Thareja.

Paper Code: **HCSGE1012P**	**Problem solving using C** **(PRACTICAL)**	**Marks: 40**