**CB153**      **FUNDAMENTALS OF COMPUTER SCIENCE LAB**     **L  T  P  C  Int Ext**

**-  -  3 1.5 30 70**

### Semester I [First Year]

**COURSE OBJECTIVES:**

**The objectives of the course are, to make the student understand:**

1. Basic problem solving process using Flow Charts and algorithms.
2. Basic concepts of control structures in C.
3. Concepts of arrays, functions, pointers and Dynamic memory allocation in C.
4. Concepts of structures, unions, files and command line arguments in C.

**COURSE OUTCOMES:**

**After the successful completion of the course, students are able to**

1. Develop algorithms and flow charts for simple problems.
2. Use suitable control structures for developing code in C.
3. Design modular programs using the concepts of functions and recursion.
4. Develop code for complex applications using structures, pointers and file handling features.

**EXPERIMENTS:**

1. A program for electricity bill taking different categories of users, different slabs in each category. (Using nested if else statement or Switch statement).

| Domestic level Consumption as follows: | |
|---|---|
| **Consumption UNITs** | **Rate of Charges(Rs.)** |
| 0 - 200 | 0.50 per UNIT |
| 201 - 400 | 100 plus 0.65 per UNIT |
| 401 - 600 | 230 plus 0.80 per UNIT |
| 601 and above | 390 plus 1.00 per UNIT |
| **Street level Consumption as follows:** | |
| **Consumption UNITs** | **Rate of Charges(Rs.)** |
| 0 - 50 | 0.50 per UNIT |
| 100 - 200 | 50 plus 0.6 per UNIT |
| 201 - 300 | 100 plus 0.70 per UNIT |
| 301 and above | 200 plus 1.00 per UNIT |

2. Write a C program to evaluate the following **(using loops)**:

    a) $1 + x^2/ 2! + x^4 / 4! + $ .... upto ten terms

    b) $x + x^3 / 3! + x^5 / 5! + $ .....upto 7 digit accuracy

    c) $1 + x + x^2 / 2! + x^3 / 3! + $ .... upto n terms

    d) Sum of $1 + 2 + 3 + $ .... $+n$

3. A menu driven program to check the number is **(using Loops)** :

    i) Prime or not

    ii) Perfect or Abundant or deficient

    iii) Armstrong or not

    iv) Strong or not

4.  A menu driven program to display statistical parameters **(using one - dimensional array)**

    i) Mean  ii) Median  iii)  Variance  iv)  Standard  deviation

5.  A menu driven program with options **(using one - Dimensional array)**

    (i)  To insert  an  element  into  array

    (ii)  To delete an element

    (iii) To print elements

    (iv) To remove duplicates

6.  A menu driven program with options **(using two dimensional array)**

    (i)   To compute  A+B

    (ii)  To compute A x B

    (iii) To find transpose of matrix A

    Where A and  B are matrices. Conditions related to size to be tested

7.  A menu driven program with options **(using Two-dimensional Character arrays)**

    (i)  To  insert  a  student  name

    (ii) To delete a name

    (iii) To sort names in alphabetical order

    (iv) To print list of names

8.  A menu driven program **(using pointers)**

    a. Linear  search          b.  Binary  search

9.  A menu driven program with options **(using Dynamic memory allocation)**

    a. Bubble  sortb.  Insertion  sort

10. A menu driven program with options **(using Character array of pointers)**

    (i)  To  insert  a  student  name

    (ii) To delete a name

    (iii) To sort names in alphabetical order

    (iv) To print list of names

11. Write  a  program  to  perform  the  following  operations  on  Complex  numbers **(using Structures & pointers) :**

    i)   Read a Complex number

    ii)  Addition of two Complex numbers

    iii) Subtraction of two Complex numbers

    iv) Multiplication of two Complex numbers

    v)  Display a Complex number

12. a)  Write  a  C  program  to  copy  the  one  file  contents  to  the  another  file  (using  command  line

arguments).

b)  Write a C Program to count the frequencies of words in a given file.

## LEARNING RESOURCES:

### TEXT BOOK(s):

1.  The C Programming Language, (Second Edition) B.W.Kernighan and D.M.Ritchi, PHI.
2.  C:The Complete Reference, (Fourth Edition),Herbert Schildt,McGraw Hill

### REFERENCE BOOK(s):

1.  Programming in C,(Second Edition) B.Gottfried, Schaum Outline Series.
2.  Let Us C,Yashavant Kanetkar, B P B Publications