1/4 B.Tech FIRST SEMESTER

IT1L2   **C PROGRAMMING LAB**   **Credits: 4**

Lecture: --   **Internal assessment: 25 marks**
Lab   : 6 periods/week   **Semester end examination: 50 marks**

Objectives:
- To make the student learn a programming language.
- To learn problem solving techniques.
- To teach the students to write programs in C and to solve the problems.

Outcomes:
The student will be able to
- Read, understand and trace the execution of programs written in C language.
- Write the C code for a given algorithm.
- Implement Programs with pointers and arrays, perform pointer arithmetic, and use the pre-processor.
- Write programs that perform operations using derived data types.

Exercise 1

1. Write a program to read a character and print its ASCII value.
2. Write a Program to Perform Arithmetic operations (+,-,*,/,%).
3. Write a Program to check equivalence of two numbers using conditional operator(?)
4. Write a Program to demonstrate pre increment and post increment.(++a,a++)where a is a value to be initialized.
5. Write a Program to demonstrate pre decrement and post decrement. .(--a,a--)where a is a value to be initialized.

Exercise 2
1. Write a Program to demonstrate relational operators.(<,>,<=,>=,==,!=)

2. Write a Program to determine size of int, float, double and long double, character using **sizeof()** operator.
3. Write a Program to display 1 if the input number is in between 100 and 1000. Otherwise print 0 (use LOGICAL AND, LOGICAL OR).
4. Write a Program to read radius value from the keyboard and calculate the area of circle and print the result in exponential notation also.
5. Write a Program to convert temperature conversion (Fahrenheit –Centigrade and vice-versa)

Exercise 3

1. Write a Program to read two numbers and swap their values with out using third variable.
2. Write a Program to read two numbers and swap their values with using third variable.
3. Write a program to read values from keyboard and find the values using abs(), sqrt(), floor(), ceil() and pow() functions.
4. Write a Program to check whether the entered number is even or odd.
5. Write a Program to check whether the entered year is leap year or not
6. Write a Program to check the equivalence of two numbers.
7. Write a Program to check whether the given number is positive or not.

Exercise 4

1. Write a Program to read marks of a student in six subjects and print whether pass or fail(using if-else).

2. Write a Program to calculate roots of quadratic equation (using if-else).

3. Write a Program to calculate student grade by accepting marks in six subjects.

   a) >80   A++

   b) 70 – 80   A

   c) 60 – 70   B

   d) 35 – 60   C

   e) <35   fail

4. Write a Program to calculate electricity bill. Read starting and ending meter reading. The charges are as follows.
   No. of Units Consumed   Rate in(Rs)
   1-100   1.50 per unit
   101-300   2.00 per unit for excess of 100 units
   301-500   2.50 per unit for excess of 300 units
   501-above   3.25 per unit for excess of 500 units
5. Write a Program to find smallest of given 3 numbers.

Exercise 5

1. Write a Program to perform arithmetic operations using switch case.
2. Write a Program to display colors using switch case (VIBGYOR).
3. Write a Program to display vowels and consonants using switch case.
4. Write a Program to display names of days in a week using switch case.
5. Write a Program to check whether the given number is even or odd using switch.

Exercise 6

Do the Following Programs Using for,while,do-while loops.
1. Write a program to calculate sum of individual digits of a given number.
2. Write a program to print given number in reverse order.
3. Write a program to check whether given number is palindrome or not.
4. Write a program to check whether given number is Armstrong or not.
5. Write a program to print prime numbers in the given range.
6. Write a program to print even or odd numbers in the given range.

Exercise 7

1. Write a program to print the Fibonacci series for given 'N' value.
2. Write a program to check whether a given number is a Fibonacci number or not.
3. Write a program to convert decimal to binary and binary to decimal.
4. Write a program to read a number and display the number in word format.
5. Write a program to read 2 numbers x and n then compute the sum of the Geometric Progression. $1+x+ x^2+x^3+   - - - - - - - +x^n$

Exercise 8

1. Write a program to print the following formats.

```
1              1            *           1 1 1 1              *
1 2            2 2          * *          1 1 1          *      *
1 2 3          3 3 3        * * *          1 1        *     *      *
1 2  3 4        4 4 4 4   * * * *             1    *     *     *      *
```

2. Write a program to read natural numbers up to 100 and print them in reverse order.
3. Write a program to print perfect number in a given range.
4. Write a program to find the positive factors of a given number.
5. Write a program to display multiplications tables from 1 to 10 except 3 and 5.

Exercise 9

1. Write a program to read and print the row sum, col sum of 2-D array.
2. Write a program to perform matrix addition and matrix subtraction.
3. Write a program to perform matrix multiplication by checking the compatibility.
4. Write a program to print the transpose of a matrix

Exercise 10

1. Write a program to print minimum and maximum elements in the 1-D array.
2. Write a program to sort the given elements by using bubble sort.
3. Write a program to sort the given elements by using insertion sort.
4. Write a program to sort the given elements by using selection sort.
5. Write a program to search the given element by using linear search.

6. Write a program to search the given element by using binary search.

Exercise 11
1. Write a program to perform various string manipulations using built-in functions.
2. Write a program to print the given strings in ascending order.
3. Write a program to verify the given string is palindrome or not (without built-in functions, with using built-in functions).
4. Write a program that read large string and display the count of vowels, consonants, digits and symbols.
5. Write a program to convert lower case string to upper case string without using library functions.

Exercise 12
1. Write a program to swap 2 numbers using call by value
2. Write a program to find product of 2 numbers using functions without arguments, without return type.
3. Write a program to find difference of 2 numbers using functions without arguments, with return type.
4. Write a program to find sum of 2 numbers using functions with arguments &without return type.
5. Write a program to find product of 2 numbers using functions with arguments, with return type.

Exercise 13
1. Write a program to swap two numbers using Call By Reference.
2. Write a program to print the given numbers in words using recursion.
3. Write a program to print 1-100 numbers without using loops.
4. Write program to perform arithmetic operations using pointer.
5. Write a program to display an array element with their addresses using array name as a pointer.
6. Write a program matrix addition using pointers.

Exercise 14

1. Write a program to display the size of structure and union using **size of()**.
2. Write a program to create structure for an account holder in a bank with following Fields name, account number, address, balance and display the details of five account holders.
3. Write a program to find total marks of individual student and average marks for 10 students using structures.
4. Write a program using pointer to structure illustrating the initialization of the members in the structures
5. Write a program to perform arthiimetic operations(+,-,*) on complex numbers using structures.

Exercise 15

1. Write a program which copies the contents of one file to another file using command line arguments.
2. Write a program to count the number of lines, words and characters in a given file
3. Write a program to perform bitwise AND, bitwise OR on any two numbers.

Reference Books :

1. Programming in C by Pradip Dey, Manas Ghosh 2nd edition Oxford University Press.
2. Problem Solving and Program Design in C, 4th edition, by jeri R. Hanly and Elliot B.Koffman.
3. E.Balaguruswamy, Programming in ANSI C 5th Edition McGraw-Hill
4. Gray J.Brosin, A first book of ANSI C, 3rd edition Cengagedelmer Learning India P.Ltd
5. AL Kelly, Iraphol, Programming in C,4th edition Addison-Wesley -professional
6. Brain W.Kernighan & Dennis Ritchie, C Programming Language, 2nd edition, PHI