

## **Tutorial**

### **Programming For Problem Solving (3110003)**

#### **Assignment 1 – Theory**

1. Name the major components of computer system and give their function.
2. List out the operators used in C language and explain any three with example
3. Define algorithm and explain different symbols used in flowchart.\
4. Describe the four basic data types. How could we extend the range of values they represent?
5. Define variable and constant. Explain different types of constants.
6. What is array? Give example and advantages of array.
7. Explain: 1. Nesting if-else statement 2. Use of break statement.
8. Explain how string is defined in C. List the various inbuilt string functions.
9. What is pointer? Explain how pointers are declared and initialized. State its advantages.
10. What is structure? Explain with example how to declare a structure and how to initialize it.
11. What is dynamic memory allocation? Show the use of malloc() and calloc() function with their syntax.
12. Explain nested structure and array of structure with example.
13. Explain recursive function with proper syntax with small example.
14. Describe file management? List the various file handling operations in c
15. Explain call by value (pass by value) and call by reference (pass by reference) with examples in brief.
16. Explain various categories of functions with suitable example.
17. Distinguish between Structure and Union.
18. Describe file management? Recall various file modes.
19. Explain following string manipulation function. strcat( ), strcpy( ), strcmp( ) and strlen( )
20. What do you understand by looping? Explain different types of loops in C with example and compare them.
21. What is Software and Hardware? Explain different types of Software.
22. Explain Entry Controlled Loop and Exit Controlled Loop with flowchart.
23. What is bottom tested loop? Give example.

#### **Assignment 2 - Programme**

1. Write a program to that performs as calculator ( addition, multiplication, division, subtraction).
2. Write a program to find area of triangle( $a=h*b*.5$ ) Where a = area, h = height & b = base

3. Write a program to calculate simple interest ( $i = (p*r*n)/100$ ) Where  $i$  = Simple interest,  $p$  = Principal amount  $r$  = Rate of interest  $n$  = Number of years
4. Write a C program to interchange two numbers.
5. Write a C program to enter a distance in to kilometer and convert it in to meter, feet, inches and Centimeter
6. Write a program to compute Fahrenheit from centigrade ( $f=1.8*c +32$ )
7. Write a C program to find out distance travelled by the equation  $d = ut + at^2$
8. Write a C program to find that the accepted number is Negative, or Positive or Zero.
9. Write a program to read marks of a student from keyboard whether the student is pass or fail (using if else )
10. Write a program to read three numbers from keyboard and find out maximum out of these three. (nested if else)
11. Write a C program to check whether the entered character is capital, small letter, digit or any special character.
12. Write a program to read marks from keyboard and your program should display equivalent grade according to following table(if else ladder)

Marks	Grade
100 - 80	Distinction
79 – 60	First Class
59 - 40	Second Class
< 40	Fail

13. Write a c program to prepare pay slip using following data.  
 $Da = 10\%$  of basic,  $Hra = 7.50\%$  of basic,  $Ma = 300$ ,  
 $Pf = 12.50\%$  of basic,  $Gross = basic + Da + Hra + Ma$ ,  $Nt = Gross - Pf$ .
14. Write a C program to read no 1 to 7 and print relatively day Sunday to Saturday.
15. Write a C program to find out the Maximum and Minimum number from given 10 numbers
16. Write a C program to input an integer number and check the last digit of number is even or odd.
17. Write a C program to find factorial of a given number.
18. Write a program to reverse a number.
19. Write a program to generate first n number of Fibonacci series
20. Write a program to find out sum of first and last digit of a given number.
21. Write a C program to find the sum and average of different numbers which are accepted by user as many as user wants
22. Write a program to calculate average and total of 5 students for 3 subjects (use nested for loops)

23. Read five persons height and weight and count the number of person having height greater than 170 and weight less than 50.
24. Write a program to check whether the given number is prime or not.
25. Write a program to evaluate the series  $1^2+2^2+3^2+\dots+n^2$
26. Write a C program to find  $1+1/2+1/3+1/4+\dots+1/n$ .
27. Write a C program to find  $1+1/2!+1/3!+1/4!+\dots+1/n!$ .
28. Write a program to evaluate the series  $\text{sum}=1-x+x^2/2!-x^3/3!+x^4/4!\dots-x^9/9!$
29. Write a program to print following patterns :

i.    * * * * * * * * * * * * * * *	ii.    * * * * * * * * * * * * * * *	iii.   *
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30. Write a program to print following patterns:

i.    1 12 123 1234 12345	ii.   12345 1234 123 12 1	iii.   55555 4444 333 22 1	iv.    1 22 333 4444 55555
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31. Write a program to print following patterns:

i.    AAAAA BBBB CCC DD E	ii.   ABCDE ABCD ABC AB A
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32. Write a C program to read and store the roll no and marks of 20 students using array.
33. Write a program to find out which number is even or odd from list of 10 numbers using array.
34. Write a program to find maximum element from 1-Dimensional array.
35. Write a C program to calculate the average, geometric and harmonic mean of n elements in an array.
36. Write a program to sort given array in ascending order (Use Insertion sort, Bubble sort, Selection sort, Mergesort, Quicksort, Heapsort).
37. Write a program to find a character from given string.
38. Write a program to replace a character in given string.
39. Write a program to delete a character in given string.
40. Write a program to reverse string.
41. Write a program to convert string into upper case.
42. Write a program that defines a function to add first n numbers.

43. Write a function in the program to return 1 if number is prime otherwise return 0.
44. Write a function Exchange to interchange the values of two variables, say x and y. illustrate the use of this function in a calling function.
45. Write a C program to use recursive calls to evaluate  $F(x) = x - x^3 / 3! + x^5 / 5! - x^7 / 7! + \dots x^n / n!$ .
46. Write a program to find factorial of a number using recursion.
47. Write a C program using global variable, static variable.
48. Write a function that will scan a character string passed as an argument and convert all lowercase character into their uppercase equivalents
49. Write a program to read structure elements from keyboard.
50. Define a structure type struct personal that would contain person name, date of joining and salary using this structure to read this information of 5 people and print the same on screen.
51. Define structure data type called time\_struct containing three member's integer hour, integer minute and integer second. Develop a program that would assign values to the individual number and display the time in the following format: 16: 40:51
52. Define a structure called cricket that will describe the following information:
  - a. Player name
  - b. Team name
  - c. Batting Average

Using cricket, declare an array player with 50 elements and write a C program to read the information about all the 50 players and print team wise list containing names of players with their batting average.
53. Design a structure student\_record to contain name, branch and total marks obtained. Develop a program to read data for 10 students in a class and print them.
54. Write a program to print address of variable using pointer.
55. Write a C program to swap the two values using pointers.
56. Write a C program to print the address of character and the character of string using pointer.
57. Write a program to access elements using pointer.
58. Write a program for sorting using pointer.
59. Write a program to write a string in file.
60. A file named data contains series of integer numbers. Write a c program to read all numbers from file and then write all odd numbers into file named "odd" and write all even numbers into file named "even". Display all the contents of these file on screen