19CS101T / PROGRAMMING FOR PROBLEM SOLVING IN C

Part – C

UNIT-I   INTRODUCTION TO PROBLEM SOLVING AND C PROGRAMMING

1. **Explain the different types of Operators in C with an example.**
   - Define Operator with example
   - Types
     - Arithmetic operators with example
     - Relational operators with example
     - Logical operators with example
     - Increment and Decrement operators with example
     - Bitwise operators with example
     - Assignment operators with example
     - Miscellaneous operators with example
2. **Explain the formatted I/O statements in C with example.**
   - Formatted Input Statements:
     - scanf() function
   - Formatted Output Statements:
     - printf() function
3. **Explain the branching(selection or conditional) and looping (iteration) statements with example.**
   Branching statements are used to transfer program control from one point to another.
   - if statement – Syntax, Flow chart, Example program
   - if – else statement – Syntax, Flow chart, Example program
   - Nested if – else statement – Syntax, Flow chart, Example program
   - Switch statement – Syntax, Example program

   Iteration is the process of repeating same set of instructions again and again until the specified condition holds true.
   - for statement – Syntax, Flow chart, Example program
   - while statement – Syntax, Flow chart, Example program
   - do – while statement – Syntax, Flow chart, Example program.
4. **Explain the structure of C program with example.**
   - ➔ /* HEADER SECTION */
   - ➔ /* Contains name, author, revision number*/
   - ➔ /* INCLUDE SECTION */
   - ➔ /* contains #include statements */
   - ➔ /* CONSTANTS AND TYPES SECTION */
   - ➔ /* contains types and #defines */
   - ➔ /* GLOBAL VARIABLES SECTION */
   - ➔ /* any global variables declared here */
   - ➔ /* FUNCTIONS SECTION */
   - ➔ /* user defined functions */
   - ➔ /* main() SECTION */
5. **Discuss about the various data types in 'C'.**
   The four basic data types are
   a. INTEGER
   b. FLOATING POINT
   c. DOUBLE
   d. CHARACTER

UNIT-II   ARRAYS AND STRINGS

6. **Write a C program to perform matrix addition and matrix subtraction.**
   - Program for matrix addition and subtraction
   - Sample input and output
7. **Write a C program to perform matrix multiplication.**
   - Program for matrix multiplication
   - Sample input and output
8. **Explain linear and binary search with program.**
   - Definition of linear and binary search
   - Example of linear and binary search
   - Program of linear and binary search
9. **Explain the sorting concept with example program.**
   - Definition
   - Example
   - Program
10. **Explain the string Library Functions with example.**
   - Strlen() – Definition, Syntax and example.
   - Strcpy() – Definition, Syntax and example.
   - Strcat() – Definition, Syntax and example.
   - Strcmp() – Definition, Syntax and example.
   - Strrev() – Definition, Syntax and example.
   - Strlwr() – Definition, Syntax and example.
   - Strupr() – Definition, Syntax and example.

UNIT-III   FUNCTIONS AND STORAGE CLASSES

11. **Discuss about the elements of user defined functions and its use in C.**
    - Function Definition – Definition, Syntax, Example.
    - Function Declaration – Definition, Syntax, Example.
    - Function call – Definition, Syntax, Example.
12. **Discuss the function prototypes in C**
    - Function with no arguments and no return values – Definition, Syntax, Example program.
    - Function with arguments and no return values – Definition, Syntax, Example program.
    - Function with arguments and with return value - Definition, Syntax, Example program.
    - Function with no arguments and with return value - Definition, Syntax, Example program.
13. **Explain the parameter passing methods using functions.**
    - Call by value
    - Call by reference.
14. **Explain the Passing arrays to functions with example program.**
    - Definition
    - Example Program

15. Explain the storage classes with an example.
- auto – Definition,Syntax, example
- register – Definition,Syntax, example
- static – Definition,Syntax, example
- extern – Definition,Syntax, example

UNIT-IV   POINTERS

16. Explain the operation on pointers with example program.
- Addition
- Subtraction
- Comparison
- Increment
- Decrement

17. Discuss about pointers and its use in C
- Definition
- Pointer declaration
- Address operator
- Example Program

18. Define an integer pointer array of 10 integers. Initialize them to any integer values from the keyboard. Find the sum, average,minimum, and maximum of these 10 integers. Sort the 10 integers in descending order.

19. Write a C program to sort 'n' numbers using pointers.

20. Explain the dynamic memory allocation concept with example.
- malloc()
- calloc()
- realloc()
- free()
- example program

UNIT-V   STRUCTURES, UNIONS AND FILES

21. Explain about structure and Union declaration in C with suitable example.
- Definition
- Syntax
- Example program

22. Write a C program that gets *a*nd displays *t*he report o*f* n students with their personal an*d* academic details using structures.

23. Create a structure student with members i) roll no ii) name iii)structure dateOfBirth which will be declared inside the structure student iv)GPA Display the student details.

24. Write a C program to read integer data from the user and write it into a file. Read the same data from file and display it on the screen.

25. What is file? Explain the various file operations with example.
- open()
- close()
- read()
- write()
- fseek()
- ftell()

26. Write a program to perform random access in the File using fseek(),ftell(), rewind functions.

PROGRAMS:

1. Write a C program to check whether a given number is odd or even.
2. Write a C program to diplay Fibonacci series.
3. Write a C program to check whether a given number is palindrome or not?
4. Write a C program to check whether a given number is Armstrong or not?
5. Write a C program to check whether a given number is Prime or not?
6. Write a C program to sort the strings in alphabetical order.
7. Write a C program to search the string in the list of strings.
8. Write a C program for the following without stirng library functions
   String Length, String Copy, String Concatenation, String Reverse
9. Write a C program to find factorial of a number using recursion.
10. Write a C program for the following pointer operations
    i) Addition/ Subtraction of a constant number to a pointer
    ii) Subtraction of one pointer from another
    iii) Comparison of two pointers
11. Write and execute a C Program to implement payroll application with the given data by using structure. HRA=18% of basic Pay, DA=15% of Basic Pay, PF =10% of Basic Pay, LIC=7% of Basic Pay ,Deduction= PF + LIC, Gross Salary = Basic Pay + HRA + DA, Net Salary = Gross Salary – Deduction.
12. Write a C program to accept records of 5 cricket players using array of structures. The structure should contain name of the player, name of the country, and last 5 One Day International matches runs. Calculate the average runs of the each player and display all the details.