Programming in C (Theory)

UNIT 1

1. What do you mean by programming language? Explain machine language, assembly language and high-level language.
2. Why high-level programming is preferred over low-level programming language? Explain advantages and disadvantages of high-level programming language and low-level programming language.
3. What do you mean by language translation? Differentiate compiler and interpreter.
4. Explain different types of software with suitable examples.
5. Explain different generation of programming language.
6. Explain the concept of structured programming.
7. Discuss the Significance of Algorithm and Flowchart in Programming.
8. What are the different steps in problem solving using computer? Briefly explain each step.
9. Write an Algorithm and flowchart to find the number given by user is divisible by 2,3, and 6 or not.
10. Write an algorithm and flowchart to input a number and check whether it is even and divisible by 3.
    (Perform similar operation to check the number is exactly divisible by 5 but not 7)
    (perform similar operation for whether it is even and divisible by 3)
11. Draw a flowchart for finding greatest digit for the supplied number by user**.**
12. Write an algorithm a draw a flowchart to find middle number in between 3 integers**.**
13. Draw a flowchart to find sum of numbers from 20 to 200 that are exactly divisible by 5 but not 7**.**
14. Write short notes on:
    - Debugging and testing
    - Errors in programming

(Practice algorithm and flowchart for Lab 2 and Lab 3 and for more details refer solution of algorithm and flowchart)

UNIT 2

1. Explain the following terms:
    i. C as a middle level language
    ii. C as a system programing language
2. Which programming language do you prefer to develop system software and application software.
3. Define the following terms with suitable examples.
    - Character set
    - Token
4. Why it is necessary to have knowledge of data type in C programming. Explain all types of data types of data type available in C.

    OR

    (What are different data types available in C? Explain their type's qualifier, conversion character, range of value and storage size in memory occupied by each type)
5. How can you declare following variables using suitable data types? Mobile phone numbers, address, body, temperature, salary. Also explain each memory occupancy size and range
    (Perform similar operations for Registration number, Account number, age, weight, distance jumped by frog, Examination symbol number of student, Prime number between 5 and 555)
6. Define operator and operand. List the types of operators and explain any five of them.

7. Describe about the unary operator, binary operator and ternary operator with example.

   OR

   Describe different types of operators with suitable examples.

8. Describe different types of operators on the basis of number of operands.
9. Differentiate between keywords and identifier. Write the rules of naming identifiers in C?
10. What are the rules of naming variables? How is a variable is declared and initialized in a compile time and run time? Explain with example.
11. Differentiate between variables and constants. Which of the following are invalid variable name and why?

Minimum	First.name	Row Total	&name
Doubles	3rd_row	Column-total	integer

12. What do you mean by formatted and unformatted i/o functions in C programming. Explain different formatted i/o functions with suitable examples.
13. Write short notes on:

- History of C language
- Features of C
- ASCII
- Format specifier

UNIT 3

1. Describe the different types of decision control statements used in C programming with their syntax.
2. What are control statements? Explain all looping statements in C with examples.
   (Explain the different types of looping constructs available in C with suitable examples).
3. What do you mean by selective and repetitive statement?
4. Differentiate between while and do while loops with suitable examples.
   (Explain entry controlled and exit controlled loops with examples)
5. Differentiate pre-test and post-test loop.
   [Hint for solution: while and for loop are pre-test loop and do while is post-test loop]
6. Why do you use "continue" and "break" statement in your program? Explain with suitable example program
7. What is (menu driven structure/switch case statement) explain with suitable examples.
8. Write a program to convert decimal number into binary bits.

UNIT 4

- What is array?
- Why do we use array in programming language?
- Limitation of Array
- Why array is called static data type?
- Why array is important in programming? How can you initialize different types of arrays? Explain 2-dimensional array in C.

String

1. Define string. Explain string handling functions with suitable example.
2. Practice tracing the program:
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UNIT 5

1. Write the basic structure of C program.
2. Without using functions also, we can write a program. But we need functions in our program. What are the benefits of using them.
3. Function supports code reusability. Do you agree with this statement. Support your answer with suitable examples.
4. Explain actual and formal arguments with examples.
5. Define function, function definition, function calling, function declaration with code example.
6. Why header files in C are included in program? Give reasons. Also list out different header files you know. Illustrate the program showing the use of header file.
7. Distinguish between call by value and call by reference with examples.
8. What do you mean by storage class? Explain different types of storage classes in C? Use examples to illustrate.
9. What do you mean by preprocessor directives explain with suitable examples?
10. Practice tracing the program:
    Unit-5 Page number 28/29

UNIT 6

- What is a pointer in c?
- What are the advantages of using pointer?
- What are the advantages of using pointer in a function?
- Explain pointer arithmetic in brief.
- What do you mean by pointer operator? Explain.
- Explain chain of pointers/double indirection with examples.
- Does function return single or multiple value? When and how a function will return single or multiple value? Illustrate with examples.
- What do you mean by dynamic memory allocation? Explain with suitable examples.
- How dynamic memory allocation is better than static memory allocation?
- Why Dynamic Memory allocation is necessary? Differentiate Static memory allocation and Dynamic Memory allocation.
- Practice tracing the program:
  Unit-6 Page number 39-43

UNIT 7

- Define structure. Explain why structure is needed?
- How members of the structure are accessed? Show it with example.
- What is nested structure? How the members of the nested structure are accessed? Show it with example.
- How to declare and initialize array of structure variables?
- Differentiate between structure with union with example codes.

UNIT 8

- What is file? Why file handling is needed in C program?
- What is the significance of file pointer in file handling?
- Discuss the role of file handling technique in C programing.
- Describe the different file opening modes in C.
- Discuss the role of file pointer, fopen() and fclose() functions with a simple program.

Write a short notes on:

• Debugging and Testing • SDLC • Compilation Process • Documentation • Binary and unary operators • Basic data type in C • External vs global variable • Escape Sequence • The switch statement • Nested loop • Go to statement • Multidimensional Array	• String handling function • Macros • Local vs Global variable • Preprocessor directives • Header files • Recursive function • Library function vs User defined function • Macro vs Function • Storage class in C • Malloc() vs Calloc() • Memory Leak	• Self -Referential Structure • Differences between structure and union • Union in C • File opening in C • Getc() and Putc() • Void pointer • Pointer Arithmetic. • Array of pointer • Difference between array and pointer • Pointer to Array • Array vs Pointer • Array of pointer vs Pointer to array