Basics and Concepts

1. What is a program? Explain types of programming languages.
2. What is an algorithm? How does an algorithm and flowchart help in programming?
3. Discuss recent software trends and essential features of software.
4. List general rules for flowcharting and possible errors during debugging.
5. What are preprocessors and preprocessor directives?
6. What is compilation process? Explain with block diagram.
7. What is software? What are types of computer software?
8. Different generations of programming languages.
9. Define tokens, expressions, and identifiers.
10. Define structured programming and its importance.

C Programming: Basics

11. What is a ternary operator in C? Give example.
12. What are formatted and unformatted I/O functions? Write syntax of getch(), getchar(), scanf().
13. Write output of the given C programs (programs were provided in questions).
14. Explain keywords, constants, variables, and preprocessor directives.
15. Write differences between variable declaration and definition.
16. Explain macro expansion and file inclusion.
17. What is debugging and testing? Explain steps.

18. Define expression, precedence, and associativity of operators.

Control Structures and Looping

19. Differentiate between if-else-if ladder and switch-case.
20. Explain while, do-while, and for loops with differences.
21. Write a C program to find factorial / Fibonacci / Armstrong numbers.
22. Explain break, continue, and goto statements with examples.
23. Write a program to evaluate cos(x) or exponential series.
24. Write a program to sum series (e.g., 1+11+111+...).
25. Write program to check palindrome using loops.

Functions and Recursion

26. Explain function header, types of parameters (actual/formal), call by value and call by reference.
27. Write a recursive function for sum of digits or factorial.
28. Differentiate between iteration and recursion.
29. Write recursive function to reverse digits or calculate series.

Arrays and Strings

30. What is an array? Why use arrays? How to pass arrays to functions?
31. Write program to find largest/smallest element of an array.

32. Write C program to sort array elements.
33. Write C program to find 2D matrix addition, multiplication, transpose.
34. Differences between array and pointer.
35. Explain array of pointers with examples.
36. Write C program to find second largest element using pointers.
37. Write C program to reverse a string or check palindrome.

Structures and Unions

38. What is a structure? Explain nested structures with examples.
39. Write program using structure to store student/employee records.
40. Write program to sort records based on marks or salary.
41. Passing structures to functions.

File Handling

42. What is file handling? Different file opening modes.
43. Write C program to write and read data from files.
44. Write program to copy content from one file to another.
45. Write program to store and read employee/student data from a file.

Pointers

46. What is a pointer? Explain void pointer, NULL pointer, file pointer.

47. Explain relationship between array and pointer with example.

48. Write C program using pointers to swap values.

FORTRAN Programming (only where applicable)

49. Write differences between unconditional and computed GOTO in FORTRAN.

50. Explain DO loop and implied DO loop in FORTRAN.

51. Write FORTRAN program to sort numbers, calculate roots, or Fibonacci series.