Basic Questions

1. History and Features of C

1. Who is the father of C language?
2. In which year was C language developed?
3. C was developed at which research center?
4. C is a successor of which programming language?
5. Name two main features of C language.
6. Why is C called a middle-level language?
7. What are the applications of C language?
8. Why is C called a portable language?

2. Structure of a C Program

1. What are the main sections of a C program?
2. What is the use of the `#include` directive?
3. Why is `main()` function important in C?
4. Write the general structure of a C program.
5. What is the difference between header files and source code files?
6. What is the role of the `return 0;` statement in `main()`?

3. Constants and Variables

1. What is a variable in C?
2. Define constants in C.
3. What is the difference between a variable and a constant?
4. Which keyword is used to define constants in C?
5. Give an example of an integer constant.
6. What is the difference between symbolic constant and literal constant?
7. Can we change the value of a constant during execution?

4. Data Types and Type Conversion

1. What are the basic data types in C?
2. What is the difference between `int` and `float`?
3. What is the size of `char` in C?
4. What is the range of `int` in C (16-bit compiler)?
5. Define type conversion in C.
6. What is the difference between implicit and explicit type conversion?
7. What is type casting? Give an example.
8. What is the difference between signed and unsigned integers?

5. Operators and Expressions

1. What is an operator in C?
2. List the types of operators in C.
3. What is the difference between `=` and `==`?
4. Explain the difference between pre-increment (`++i`) and post-increment (`i++`).
5. What is the use of the modulus (`%`) operator?
6. What is operator precedence in C?
7. What is the difference between logical AND (`&&`) and bitwise AND (`&`)?
8. What is an expression in C? Give an example.

6. Input and Output Functions

1. What is the difference between `printf()` and `scanf()`?
2. Why do we use format specifiers in C?
3. What is the format specifier for `float`?
4. Which header file is required for `printf()` and `scanf()`?
5. Write the syntax of `scanf()` function.
6. How can we take a single character as input in C?
7. How can we print multiple values using `printf()`?
8. What happens if you don't use `&` in `scanf()`?

7. Programs

1. Write a program to print your name, course, and university.
2. Write a program that prints "C is a powerful language" five times.
3. Write a program to demonstrate portability (compile and run the same code on two different compilers).
4. Write a program to display "Welcome to C Programming" using a separate user-defined function.
5. Write a program with two functions: one to calculate the square of a number and another to calculate the cube.
6. Write a program that uses a function to print your roll number and name.
7. Write a program to declare and print an integer, a float, and a character variable.
8. Write a program to demonstrate the use of `const` keyword.
9. Write a program to define a symbolic constant for the value of Pi and calculate the area of a circle.
10. Write a program to input an integer and a float and print their sum.
11. Write a program to demonstrate implicit type conversion in an expression.
12. Write a program to demonstrate explicit type casting by converting `float` to `int`.
13. Write a program to find the ASCII value of a given character.
14. Write a program to perform all arithmetic operations on two numbers.

15. Write a program to check whether a number is even or odd using modulus operator.
16. Write a program to demonstrate the difference between pre-increment and post-increment.
17. Write a program to calculate the simple interest (SI = P × R × T / 100).
18. Write a program to evaluate the expression: `(a + b) * (c - d)`.
19. Write a program to input two integers and print their sum, difference, product, and quotient.
20. Write a program to input name, age, and percentage of a student, and print them in a formatted way.
21. Write a program to input radius of a circle and print area and circumference.
22. Write a program to input temperature in Celsius and convert it into Fahrenheit.
23. Write a program to input marks of 3 subjects and print the average.