Q1. What are conditional statements? Explain conditional statements with syntax and examples.

Answer - Conditional statements in Programming, also known as decision-making statements, allow a program to perform different actions based on whether a certain condition is true or false. They form the backbone of most programming languages, enabling the creation of complex, dynamic programs.

Types of Conditional Statements in Programming

1. If Conditional Statement:

The if statement is the most basic form of conditional statement. It checks if a condition is true. If it is, the program executes a block of code.

Syntax of If Conditional Statement:

```
if (condition) {

        // code to execute if condition is true

}
```

2. If-Else Conditional Statement:

The if-else statement extends the if statement by adding an else clause. If the condition is false, the program executes the code in the else block.

Syntax of If-Else Conditional Statement:

```
if (condition) {

        // code to execute if condition is true

} else {

        // code to execute if condition is false

}
```

3. if-Else if Conditional Statement:

The if-else if statement allows for multiple conditions to be checked in sequence. If the if condition is false, the program checks the next else if condition, and so on.

Syntax of If-Else if Conditional Statement:

```
if (condition1) {
```

```
        // code to execute if condition1 is true

    } else if (condition2) {

        // code to execute if condition2 is true

    } else {

        // code to execute if all conditions are false

    }
```

4. Switch Conditional Statement:

The switch statement is used when you need to check a variable against a series of values. It's often used as a more readable alternative to a long if-else if chain.

In switch expressions, each block is terminated by a break keyword. The statements in switch are expressed with cases.

Switch Conditional Statement Syntax:

```
    switch (variable) {

        case value1:

            // code to execute if variable equals value1

                break;

        case value2:

            // code to execute if variable equals value2

                break;

        default:

            // code to execute if variable doesn't match any value

    }
```

5. Ternary Expression Conditional Statement:

The ternary operator is a shorthand way of writing an if-else statement. It takes three operands: a condition, a result for when the condition is true, and a result for when the condition is false.

Syntax of Ternary Expression:

condition ? result_if_true : result_if_false