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FOR APPLIED SCIENCE AND TECHNOLOGY

Sheet 4

1. Draw a Flowchart for The Following Code

1.

```cpp
#include <iostream>  // Include the input-output library

using namespace std; // Use the standard namespace

int main() {
    int x; // Declare variable

    cout << "Enter a number: "; // Prompt user for input
    cin >> x; // Read user input

    if (x > 0)
        cout << "Positive number" << endl; // Print if x is positive
    else
        cout << "Negative number" << endl; // Print if x is negative or zero

    return 0; // Indicate successful execution
}
```

2.

```cpp
#include <iostream>
using namespace std;

int main() {
    int p = 7, z = 8, m = 9;

    if (p > 0)
        z += m++;  // Post-increment: z = 8 + 9 = 17, then m becomes 10

    if (z > 5)
        p += ++m;  // Pre-increment: m becomes 11, then p = 7 + 11 = 18

    cout << z << endl;  // Output: 17
    cout << p;          // Output: 18

    return 0;
}
```

3.

```cpp
#include <iostream>
using namespace std;

int main() {
    int p = 7, z = 8, m = 9;

    if (p > 0)
        z += m++;  // Post-increment: z = 8 + 9 = 17, then m becomes 10
    else if (z > 5)
        p += ++m;  // This will not execute since 'if (p > 0)' is true

    cout << z << endl;  // Output: 17
    cout << p;          // Output: 7

    return 0;
}
```

4.

```cpp
#include <iostream>
using namespace std;

int main() {
    int temp;
    cout << "Enter temperature: ";
    cin >> temp;

    if (temp <= 0)
        cout << "very cold";
    else if (temp <= 10)
        cout << "cold";
    else if (temp <= 20)
        cout << "warm";
    else if (temp <= 25)
        cout << "hot";
    else
        cout << "very hot";

    return 0;
}
```

5.

```cpp
#include <iostream>
using namespace std;

int main() {
    int a = 5, x = 10, y = 25, z = 30;

    if (x != y) { // 10 != 25 → true
        if (!(x < y) && (y < z)) { // !(10 < 25) && (25 < 30)
            // !(true) && true → false && true → false
            a += x++ + --y; // This block does not execute
        } else {
            a += ++x + y--; // a = 5 + (11) + (25)
        }
    }

    cout << x << endl; // 11
    cout << y << endl; // 24
    cout << a;         // 41

    return 0;
}
```

2. **Problem-Solving**

Draw Flowchart and Design an Algorithm for the following Problems :

1. Take a letter from the user and check whether it is constant or vowel.

2. Given two numbers *A* and *B*. Print "**Yes**" if *A* is **greater than or equal to** *B*. Otherwise print "**No**".

3. Given two numbers *A* and *B*. Print "Multiples" if *A* is **multiple** of *B* or **vice versa**. Otherwise print "No Multiples.

4. **Write** a C++ program that takes an integer input x representing a student's score. The program should:

   Check if the score is 50 or greater and print "Pass", otherwise print "Fail".

5. Take a letter from the user and check whether it is constant or vowel.

6. Find number of days in a month given by the user.

   Hint: Total days in each month are given by the following table.

Month	Total days
January, March, May, July, August, October, December	31 days
February	28/29 days
April, June, September, November	30 days