CS3201: OBJECT ORIENTED PROGRAMMING LABORATORY

Topic: Programs using Data Types, Operators and Control Structures

Lab: 01   **Date: 01/03/2024**

OBSERVATION (PREPARATORY TOPICS)

1. What is the significance of data types in memory allocation?
2. What will the following program print?

```cpp
#include<iostream>
using namespace std;
int main(){
int a = 17, b=22, c=2, x,y,z;
x = a == b != c;
y = a == ( b != c );
z= 3*(5-2*y+11*x/2%3-1 + a++);
cout<<z<<endl;
return 0;
}
```

3. Will the given program print anything? Explain.

```cpp
#include<iostream>
using namespace std;
int main(){
int num = 5;
cout << "Original value of num: " << num << endl;
cout << "Value after ++num: " << ++num << endl;
cout << "Value after operation: " << num << endl;
return 0;
}
```

4. What differentiates do-while loops and while loops? Give one instance of when do-while loops are used over while loops.
5. What is the following program trying to calculate? Predict the output when the user enters: **2** and **4.5** as input.

```cpp
#include<iostream>
using namespace std;
int main() {
int length, breadth;
cout << "Enter length of rectangle: ";
cin >> length;
cout << "Enter breadth of rectangle: ";
cin >> breadth;
float ans = length * breadth; //program calculation
cout << "Answer is: " << ans << endl;
return 0;
}
```

EXECUTION QUESTIONS

LEVEL 1

1. Check whether a given year is a leap year using-
(a) if-else control structure
(b) ternary operators
2. Write a program to calculate volume of a sphere. The program should be menu driven, where the user is asked to either input the radius, diameter or the circumference of the circle.

LEVEL 2

1. Write a program that takes an integer input from the user and multiplies it by a power of 2 using bitwise operators. Display the result.

Constraint: -
   .   The number inputted by the user should be greater than 0. If they enter a number less than 0, they should not be allowed to progress in the program. Implement using ***do-while loop***.
   .   The power entered should be a non-negative integer. If the user does not follow this, display an error message and terminate the program.