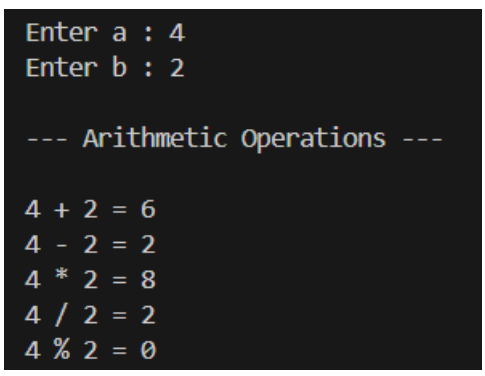
C++ Program Sheet

Topic: Operators & Conditional Statements
Total Questions: 15

Section A: Operators (Q1–Q7)

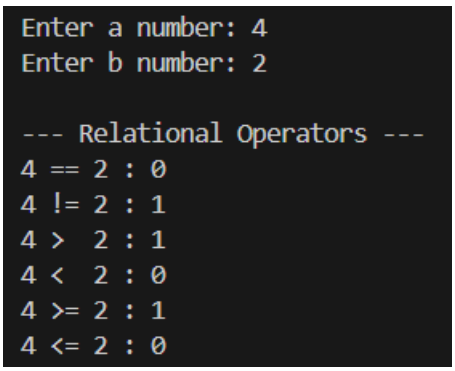
Q.1 Write a C++ program to input two integers and perform all arithmetic operations.

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

int main()
{
    int a, b;

    // Input
    cout << "\nEnter a : ";
    cin >> a;

    cout << "Enter b : ";
    cin >> b;

    cout << "\n--- Arithmetic Operations ---\n\n";

    // Addition
    cout << a << " + " << b << " = " << (a + b) << endl;

    // Subtraction
    cout << a << " - " << b << " = " << (a - b) << endl;

    // Multiplication
    cout << a << " * " << b << " = " << (a * b) << endl;

    // Division
    cout << a << " / " << b << " = " << (a / b) << endl;
    // Reminder
    cout << a << " % " << b << " = " << (a % b) << endl;

    return 0;
}
```



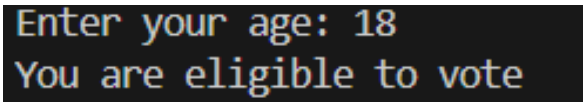
Q.2 Write a program to demonstrate relational operators between two numbers.

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

int main()
{
    int a, b;

    cout << "\nEnter a number: ";
    cin >> a;

    cout << "Enter b number: ";
    cin >> b;

    cout << "\n--- Relational Operators ---\n";

    cout << a << " == " << b << " : " << (a == b) << endl;
    cout << a << " != " << b << " : " << (a != b) << endl;
    cout << a << " >  " << b << " : " << (a > b) << endl;
    cout << a << " <  " << b << " : " << (a < b) << endl;
    cout << a << " >= " << b << " : " << (a >= b) << endl;
    cout << a << " <= " << b << " : " << (a <= b) << endl;

    return 0;
}
```



Q.3 Write a program to check voting eligibility using logical operators.

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

int main()
{
    int age;

    // Input
    cout << "Enter your age: ";
    cin >> age;

    // Condition using logical AND (&&)
    if (age >= 0 && age < 18)
    {
        cout << "You are NOT eligible to vote." << endl;
    }
    else if (age < 0)
    {
        cout << "You are NOT eligible to vote." << endl;
    }
    else
    {
        cout << "You are eligible to vote.";
    }
    return 0;
}
```



Q.4 Write a program demonstrating assignment operators (=, +=, -=, *=, /=).

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

int main()
{
    int a, b, temp;

    cout << "\nEnter value of a: ";
    cin >> a;

    cout << "Enter value of b: ";
    cin >> b;

    // = operator
    temp = a;
    temp = b;
    cout << "\nAfter a = b, a = " << temp << endl;

    // += operator
    temp = a;
    temp += b;
    cout << "After a += b, a = " << temp << endl;

    // -= operator
    temp = a;
    temp -= b;
    cout << "After a -= b, a = " << temp << endl;

    // *= operator
    temp = a;
    temp *= b;
    cout << "After a *= b, a = " << temp << endl;

    // /= operator
    temp = a;
    temp /= b;
    cout << "After a /= b, a = " << temp << endl;

    return 0;
}
```

```
Enter value of a: 4
Enter value of b: 3

After a = b, a = 3
After a += b, a = 7
After a -= b, a = 1
After a *= b, a = 12
After a /= b, a = 1
```

Q.5 Write a program to demonstrate pre and post increment/decrement operators.

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

int main()
{
    int a = 10;

    cout << "Initial value = 10\n\n";

    // Pre Increment
    cout << "Pre-increment (++a): " << ++a << endl;
    cout << "Value of a after operation: " << a << endl
         << endl;

    // Post Increment
    cout << "Post-increment (a++): " << a++ << endl;
    cout << "Value of a after operation: " << a << endl
         << endl;

    // Pre Decrement
    cout << "Pre-decrement (--a): " << --a << endl;
    cout << "Value of a after operation: " << a << endl
         << endl;

    // Post Decrement
    cout << "Post-decrement (a--): " << a-- << endl;
    cout << "Value of a after operation: " << a << endl;

    return 0;
}
```

```
Initial value = 10

Pre-increment (++a): 11
Value of a after operation: 11

Post-increment (a++): 11
Value of a after operation: 12

Pre-decrement (--a): 11
Value of a after operation: 11

Post-decrement (a--): 11
Value of a after operation: 10
```

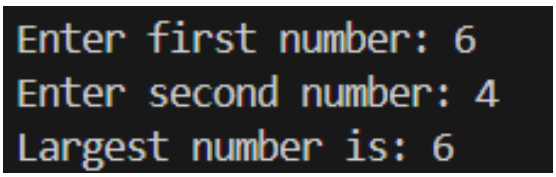
Q.6 Write a program to perform bitwise AND, OR, and XOR operations.

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

int main()
{
    int a, b;

    cout << "\nEnter first number: ";
    cin >> a;

    cout << "Enter second number: ";
    cin >> b;

    cout << "\n--- Bitwise Operations ---\n\n";

    // Bitwise AND
    cout << a << " & " << b << " = " << (a & b) << endl;

    // Bitwise OR
    cout << a << " | " << b << " = " << (a | b) << endl;

    // Bitwise XOR
    cout << a << " ^ " << b << " = " << (a ^ b) << endl;

    return 0;
}
```

```
Enter first number: 4
Enter second number: 2

--- Bitwise Operations ---

4 & 2 = 0
4 | 2 = 6
4 ^ 2 = 6
```

Q.7 Write a program to find the largest of two numbers using the ternary operator.

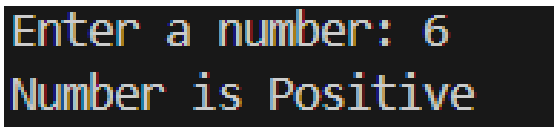
```
#include <iostream>
using namespace std;

int main()
{
    int a, b, largest;

    cout << "\nEnter first number: ";
    cin >> a;

    cout << "Enter second number: ";
    cin >> b;

    // Ternary operator
    largest = (a > b) ? a : b;

    cout << "Largest number is: " << largest << endl;

    return 0;
}
```



Section B: Conditional Statements (Q8–Q15)

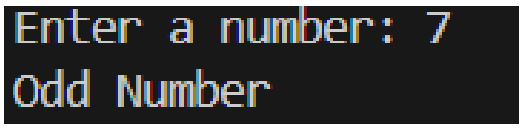
Q.8 Write a program to check whether a number is positive.

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

int main()
{
    int num;
    cout << "Enter a number: ";
    cin >> num;

    if (num > 0)
        cout << "Number is Positive";
    else
        cout << "Not Positive";

    return 0;
}
```



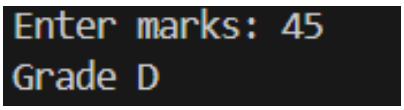
Q.9 Write a program to check whether a number is even or odd.

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

int main()
{
    int num;
    cout << "Enter a number: ";
    cin >> num;

    if (num % 2 == 0)
        cout << "Even Number";
    else
        cout << "Odd Number";

    return 0;
}
```



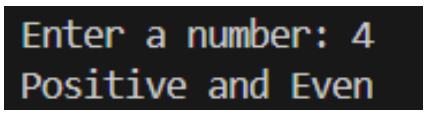
Q.10 Write a program to display grade based on marks using if-else ladder.

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

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

    if (marks >= 90)
        cout << "Grade A";
    else if (marks >= 75)
        cout << "Grade B";
    else if (marks >= 60)
        cout << "Grade C";
    else if (marks >= 40)
        cout << "Grade D";
    else
        cout << "Fail";

    return 0;
}
```



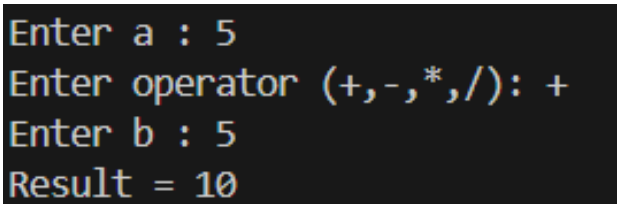
Q.11 Write a program using nested if to check positive/negative and even/odd.

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

int main()
{
    int num;
    cout << "Enter a number: ";
    cin >> num;

    if (num >= 0)
    {
        cout << "Positive ";
        if (num % 2 == 0)
            cout << "and Even";
        else
            cout << "and Odd";
    }
    else
    {
        cout << "Negative ";
        if (num % 2 == 0)
            cout << "and Even";
        else
            cout << "and Odd";
    }

    return 0;
}
```



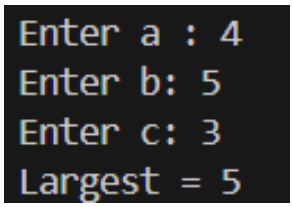
Q.12 Write a program to create a simple calculator using switch case.

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

int main()
{
    int a, b;
    char op;

    cout << "\nEnter a : ";
    cin >> a;
    cout << "Enter operator (+,-,*,/): ";
    cin >> op;
    cout << "Enter b : ";
    cin >> b;

    switch (op)
    {
    case '+':
        cout << "Result = " << a + b;
        break;
    case '-':
        cout << "Result = " << a - b;
        break;
    case '*':
        cout << "Result = " << a * b;
        break;
    case '/':
        if (b != 0)
            cout << "Result = " << a / b;
        else
            cout << "Division by zero not allowed";
        break;
    default:
        cout << "Invalid Operator";
    }

    return 0;
}
```



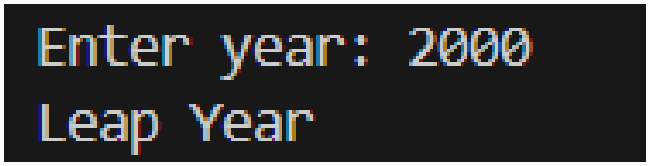
Q.13 Write a program to find the largest of three numbers.

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

int main()
{
   int a, b, c;
   cout << "\nEnter a : ";
   cin >> a;
   cout << "Enter b: ";
   cin >> b;
   cout << "Enter c: ";
   cin >> c;

   if (a >= b && a >= c)
      cout << "Largest = " << a;
   else if (b >= a && b >= c)
      cout << "Largest = " << b;
   else
      cout << "Largest = " << c;

   return 0;
}
```



Q.14 Write a program to check whether a given year is a leap year.

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

int main()
{
    int year;
    cout << "\nEnter year: ";
    cin >> year;

    if ((year % 4 == 0 && year % 100 != 0) || (year % 400 == 0))
        cout << "Leap Year";
    else
        cout << "Not a Leap Year";

    return 0;
}
```



Q.15 Write a program to calculate electricity bill based on unit slabs.

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

int main()
{
    int units;
    float bill;

    cout << "\nEnter electricity units: ";
    cin >> units;

    if (units <= 100)
        bill = units * 5;
    else if (units <= 200)
        bill = (100 * 5) + (units - 100) * 7;
    else
        bill = (100 * 5) + (100 * 7) + (units - 200) * 10;

    cout << "Total Bill = Rs. " << bill;

    return 0;
}
```