(PROGRAMMING FUNDAMENTALS)

MID EXAM SOLUTION

SUBMITTED TO: MAM SADIA

SUMITTED BY: MAHNOOR SAQIB

QUESTION NO. 1:

Match the C++ Statements with the Type of Error:

Column A (CODE)		Column B (ERROR TYPE)
1.cout “hello”;	**a**	**a.**Missing operator(<<)
2.cin<<a;	**b**	**b.**Wrong direction of extraction
3.int 2num=5;	**c**	**c.**Invalid identifier name
4.cout<<”Hello\nWorld;	**d**	**d.**Missing quotation mark
5.if(x>0);cout<<”Yes”;	**e**	**e.**Logical error
6.cout<<a+b>>c;	**f**	**f.**Invalid operator usage

QUESTION NO. 2:

Write the output of Conditional Statements in the Output Column:

Code	**Output (true/false)**
1. !(4>6)	**True**
2.(12>=11)	**True**
3.!(a!=b)	**False**
4.(12%3==0||12%5==0)	**False**
5.a=10,b=20,c=15; (a>b&&a>c)	**False**
6.(10!=5*2)	**False**

QUESTION NO.3:

. Which data type will you select for the following values:

VALUE	**DATA TYPE**
"25.75"	string
23	int
'A'	char
"Ali"	string

QUESTION NO. 5:

Write answers of following questions:

1. **Difference between cin and cout in C++:**
   cin is for input, cout is for output. cin reads from standard input, cout writes to standard output**.**
2. **User inputs wrong data type using cin:**
   If a user inputs a value of the wrong data type using cin, , input is not extracted, and the variable's value isn't changed. You might need to clear the error and ignore remaining input.
3. **Differentiate between float and double:**
   float is single-precision (usually 32 bits), double is double-precision (usually 64 bits). double has more precision and range.
4. **Using an uninitialized variable:**
   Using an uninitialized variable in an expression leads to undefined behavior. The variable may has a garbage value or may cause error.
5. **Escape sequence in C++:**
   An escape sequence is a sequence of characters starting with a backslash (\) used to represent special characters (like \n for newline). Needed for characters that are hard to type or have special meanings.
6. **Can't press Enter for newline in a string:**
   Pressing Enter inside a string literal isn't allowed; use \n for a newline.
7. **Purpose of modulus (%) operator:**
   The modulus operator gives the remainder of integer division.
8. **Using else without preceding if:**
   No else cannot be used without preceding if. Because if can be executed without else but else cannot be executed without preceding if.
9. **End condition if with semicolon:**
   Ending an if condition with a semicolon (if (condition);) makes the if body empty; code after it executes regardless of the condition.
10. **Difference between == and =:**
    == checks equality, = assigns a value.
11. **Combine multiple relational conditions:**
    Yes, using logical operators like && (AND), || (OR). Example: if (a > 0 && b > 0).
12. **Operators with same precedence:**
    When operators have the same precedence, associativity decides evaluation order (left-to-right or right-to-left).
13. **Ternary operator syntax:**

condition ? expr_if_true : expr_if_false. Evaluates condition, then returns one of the expressions.

14. **Naming rules for identifiers in C++:**
    Identifiers must start with a letter or underscore, followed by letters, digits, or underscores. Can't use keywords.Spaces are not allowed.These are case sensitive.

QUESTION NO. 6:

write a C++ program that checks whether a given year lies between 2000 and 2025.If the year is between 2000 and 2025(inclusive),calculate and display sum of 2000 and 2025. If the year is between 2016 and 2025(inclusive),calculate and display the sum of 2016 and 2025.If the year is outside this range ,display the message"Year is not in the range".

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

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

   if (year >= 2016 && year <= 2025) {
      int sum = 2016 + 2025;
      cout << "Sum of 2016 and 2025 is: " << sum << endl;
   }
   else if (year >= 2000 && year <= 2025) {
      int sum = 2000 + 2025;
      cout << "Sum of 2000 and 2025 is: " << sum << endl;
   }
   else {
      cout << "Year is not in the range" << endl;
   }
return 0;
}
```

QUESTION NO. 4:
TRACE OUTPUT OF THE FOLLOWING:

PROGRAM 1:

int main(){
cout<<”Hello\tWorld\n”;
cout<<”C++\\Program\nming”;
cout<<”C++\bProgramm\bing”;
	OUTPUT:
	
	Hello World
		int main() {
		
		int a = 10, b = 4;
			OUTPUT:
			
			2

}	**C++\Program**
	mimgC++⍰Programm⍰ing
	OUTPUT:
	9
		cout << a % b;
		}	

int main() {int x = 3;
x = x + 4;
cout << x + 2;}
		int main() {
		int a= 2.3;
		cout<<a;
		}
			OUTPUT:
			2

int main(){ int x = 3, y = 4, z = 5;
if (x > y)
z += x;
else if (y > z)
z = z - y;
else z = z * 2;
cout << z;}
	OUTPUT:
	10
		int main(){
		int age;
		cout << "Enter age: ";
		cin >> age;
		cout << "Your age is " << age;
		return 0
		}
			OUTPUT:
			Enter age: 25
			Your age is 25

Int main(){ if(a > 5)
cout << "A";
cout << "B";}
	OUTPUT:
	Error:
	wrong keyword and a is not declared.
		Int main(){ int x = 2, y = 3, z = 4;
		cout << x + y * z / x;}
			OUTPUT:
			Error: wrong datatype keyword used.

int main()
{ int a = 5, b = 10;
cout << (a > b ? a : b);}
	OUTPUT:
	10
		int main(){ int x = 2, y = 3;
		cout << (x+1 * y+1) + (y-1);}
			OUTPUT:
			8

int main(){
float lrate = 10.5;
cout<<lrate;}
	:**OUTPUT:**
	10.5
		int main(){ if (a=5) {cout<<"Five";}}	**OUTPUT:**
			Error: a is not delared

int main(){ int a;
cout << a;}
	OUTPUT:
	0
		int main(){ cout << "She said "Hello"";}	**OUTPUT:**
			Error in syntax

int main(){ int = 5;}	**OUTPUT:** **Error: variable name is missing.**	int main(){ int num = "5";}	**OUTPUT:** **Error: wrong datatype**

int main(){ cout << "Area = ";
cout<<"3.14*r*r";}
	OUTPUT:
	Area = 3.14*r*r
		int main(){
		if x>0
		{cout<<"Positive";}
			OUTPUT:
			Error: brackets after if.

int main(){
cin << number;
if(number =10)
cout << "Equal";}
	OUTPUT:
	Wrong syntax of cin function.
		int main(){
		if(x<5 && >2)
		cout<<”Range”;}
			OUTPUT:
			Error: x' was not declared

int main(){
if(x>y)
cout<<"Greater";
else(x<y)
cout<<"Smaller";}
	OUTPUT:
	Error: variables are not declared
		int main(){
		int result = 10 / 2 * ;}
			OUTPUT:
			Error

int main(){
cout << 1 + 4 >> 7;}
	OUTPUT:
	Error: wrong syntax
		int main(){
		cout << "Path: C:\newfolder";}
			OUTPUT
			Path: C:
			ewfolder