LAB

Basic C++ - Part II

2

WEEK

KEYWORDS:

++ -- <><= >= != == && || ! setw

LAB EXERCISE:

Program 1:

Type the following program in the editor of the C++ environment. Compile the program and run it.

```
#include<iostream>

using namespace std;

int main()
{
	int a=2;

	cout << ++a;			// increment first then display.
	cout << endl;

	cout << a++;			// first display then increment.
	cout << endl;

	cout << a;
	cout << endl;

	cout << --a;			// decrement first then display.
	cout << endl;

	cout << a--;			// first display then decrement.
	cout << endl;

	cout << a;
	cout << endl;

	system("PAUSE");
	return 0;
}
```

Output:

```
3
3
4
3
3
2
```

Program 2:

Type the following program in the editor of the C++ environment. Compile the program and run it.

```
#include<iostream>

using namespace std;

int main()
{
	int a=1,  b=2;

	cout << (a<b);
	cout << endl;

	cout << (a>b);
	cout << endl;

	cout << (++a == b);
	cout << endl;

	cout << (a<=b);
	cout << endl;

	cout << (a>=b);
	cout << endl;

	system("PAUSE");
	return 0;
}
```

Output:

```
1
0
1
1
1
```

Program 3:
Type the following program in the editor of the C++ environment. Compile the program and run it.

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

int main()
{
	int a=1,b=2;
	cout << ( (a<b) && (a<=b));
	cout << endl;

	cout << ( (a==b) || (a<b));
	cout << endl;

	cout << ( !(a==b));
	cout << endl;

	system("PAUSE");
	return 0;
}
```

Output:

```
1
1
1
```

Program 4:
Type the following program in the editor of the C++ environment. Compile the program and run it.

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

int main()
{
	cout <<"11111";
	cout << endl;

	cout << setw(10);
	cout <<"22222";
	cout << endl;

	//cout << setw(10);
	cout <<"33333";
	cout << endl;

	cout << setw(2);
	cout <<"44444";
	cout << endl;

	system("PAUSE");
	return 0;
}
```

Output:

```
11111
      22222
33333
44444
```

ASSIGNMENT:

Question 1: Evaluate the following expressions.

a. 25 / 3

8

b. 20 - 12 / 4 * 2

20 - 3 * 2 -----> 20 - 6 = 14

c. 32 % 7

4

d. 3 - 5 % 7

3 - 5 = -2

e. 18.0 / 4

4.5

f. 28 - 5 / 2.0

28 - 2.5 = 25.5

g. 17 + 5 % 2 –3

17 + 1 - 3 = 15

h. 15.0 + 3.0 * 2.0 / 5.0

15.0 + 6.0 / 5.0 ---------> 15.0 + 1.2 =16.2

Question 2: If x = 5, y = 6, z = 4 and w = 3.5, evaluate each of the following statements, if possible. If it is not possible, state the reason.

a. (x + z) % y

(5 + 4)%6 -----> 9 % 6 = 3

b. (x + y) % w

(5 + 6)%3.5 -----> 11 % 3.5 = 0.5

c. (y + w) % x

(6 + 3.5)%5 -----> 9.5 % 5 = 4.5

d. (x + y) *w

(5 + 6)%6 -----> 11 * 3.5 = 38.5

e. (x % y) % z

(5 % 6)%4 -----> 5 % 4 = 1

f. (x *z) % y

(5 * 4)%6 -----> 20 % 6 = 2

g. ((x *y) *w) *z

((5 * 6) * 3.5)*4 -----> (30 * 3.5) * 4 -----> 105.0 * 4 = 420.0

Question 3: Given:

```
int num1, num2, newNum;
double x, y;
```

Which of the following assignments are valid? If an assignment is not valid, state the reason. When not given, assume that each variable is declared.

a. num1 = 35;

assignments is valid

b. newNum = num1 – num2;

assignments are valid

c. num1 = 5; num2 = 2 + num1; num1 = num2 / 3;

assignments are valid

d. num1 * num2 = newNum;

assignments is not valid , reason -->(num1 * num2) error

e. x = 12 * num1 - 15.3;

assignments is valid

f. num1 * 2 = newNum + num2;

assignments is not valid , reason -->(num1 * 2) error

g. x / y = x * y

assignments is not valid , reason -->(x / y) error

Question 4: Suppose x, y, and z are int variables and w and t are double variables. What value is assigned to each of these variables after the last statement executes?

```
x = 17;
y = 15;
x = x + y / 4;
z = x % 3 + 4;
w = 17 / 3 + 6.5;
t = x / 4.0 + 15 % 4 - 3.5;
```

17 + 15 / 4 ----> 17 + 3 = 20

20 % 3 + 4 -----> 2 + 4 = 6

17 / 3 + 6.5 -----> 5 + 6.5 = 11.5

20 / 4.0 + 15 % 4 - 3.5 -----> 5.0 + 15 % 4 - 3.5 ---> 5.0 + 3 - 3.5 = 4.5

x = 20 **y** = 15 **z** = 6 **w** = 11.5 t = 4.5

Question 5: Suppose x, y, and z are int variables and x = 2, y = 5, and z = 6. What is the output of each of the following statements?

a. cout << "x = " << x << ", y = " << y << ", z = " << z << endl;
b. cout << "x + y = " << x + y << endl;
c. cout << "z / x = " << z / x << endl;
d. cout << "2 times " << x << " = " << 2 *x << endl;

Output:

x = 2, y = 5, z = 6
x + y = 7
z / x = 3
2 times 2 = 4

Question 6: What is the output of the following statements? Suppose a and b are int variables, c is a double variable, and a = 13, b = 5, and c = 17.5. في هذا السؤال استخدم الآلة الحاسبة

a. cout << a + b – c << endl; 13 + 5 - 17.5 = 0.5
b. cout << 15 / 2 + c << endl; 15 / 2 + 17.5 ----> 7 + 17.5 =24.5
c. cout << a / static_cast<double>(b) + 2 * c << endl; 13 / 5.0 + 2 * 17.5 ---> 2.6 + 2 * 17.5 --> 2.6 + 35 = 37.6
d. cout << static_cast<int>(c) % 5 + a – b << endl; 17 % 5 + 13 - 5 ---> 2 + 13 - 5 = 10
e. cout << 13.5 / 2 + 4.0 * 3.5 + 18 << endl;
13.5 / 2 + 4.0 * 3.5 + 18 ---> 6.75 + 4.0 * 3.5 + 18 ---> 6.75 + 14 + 18 = 38.75

Output:

0.5
24.5
37.6
10
38.75

Question 7: Copy the following program in the editor of the C++ environment. Compile the program and run it.

```
#include<iostream>

using namespace std;

int main()
{
	cout  <<"3 / 2 + 5.5 = "<<  3 / 2 + 5.5  <<  endl;
	cout  <<"15.6 / 2 + 5 = "<<  15.6 / 2 + 5  <<  endl;
	cout  <<"4 + 5 / 2.0 = "<<  4 + 5 / 2.0  <<  endl;
	cout  <<"4 * 3 + 7 / 5 - 25.5 = "<<  4 * 3 + 7 / 5 - 25.5 <<  endl;

	system("PAUSE");
	return 0;
}
```

Output:

```
3 / 2 + 5.5 = 6.5
15.6 / 2 + 5 = 12.8
4 + 5 / 2.0 = 6.5
4 * 3 + 7 / 5 - 25.5 = -12.5
```