Benha University
Faculty of Engineering
Electrical Engineering Department

Semester **0** (1ˢᵗ year)
Computer Programming (a) - E1123
Fall Semester 2022- 2023

Lab. (4)
Data Types and Variables

Answer the following questions

1) Write a program that produces the following output:

By initialize and constant variable a

```
| a | sqr | cube |
************
| 0 | 0 | 0 |
***********
| 1 | 1 | 1 |
***********
| 2 | 4 | 8 |
```

2) Consider the following C++ program in which the statements are in the incorrect order. Rearrange the statements so that it prompts the user to input the length and width of a rectangle and output the area and perimeter of the

rectangle.
```
#include <iostream>
{
int main ()
cout<< "Enter the length:";
cin>>length;
cout<< endl;
int length;
area=length*width;
int width;
cin>>width;
cout<< "Enter the width:"
cout<< endl;
```

```
cout<<"Area="<<area<< endl;
cout<<"Perimeter="<<perimeter<< endl;
int area;
int perimeter;
}
```

3) Write a C++ statement that outputs the values of name and study Hours with the appropriate text. For example, if the value of name is "Donald "and the value of study Hours is 4.5, the output is:

Hello, Donald! On Saturday, you need to study 4.5 hours for the exam.

4) Write a program that prompts the user to input a decimal number and outputs the number rounded to the nearest integer.

5) Write a C++ program to compute the perimeter and area of a circle with an input radius from user.

6) Write a C++ program to calculate the distance between the following two points: .
   $x_1 = 25$, $y_1 = 15$, $x_2 = 35$, $y_2 = 10$.

   Using $d=\sqrt[2]{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

7) Write a C++ program that accepts two integers from the user and print them in separate lines then perform the addition of these two numbers.

8) Trace and find the following programs output
```
#include <iostream.h>

int main()
{
int z;
bool x = true;
bool y = false;
z = x + !y;
cout << z<<endl;
```

```cpp
    return 0;
}
```

9) Trace and find the following programs output
```cpp
#include <iostream.h>
int main()

{
int x;
char y='2';
cout << "Size of char : " << sizeof(y) << endl;
cout << "Size of int : "  << sizeof(x) << endl;
cout << "x= " << x << endl;
cout << "y= " << y << endl;
return 0;
}
```

10)   Trace and find the following programs output
```cpp
#include <iostream.h>

int main()
{
int x=3,y=4,z=7,w=1;
cout << "1- x == y: " << (x == y) << endl;
cout << "2- x != z: " << (x != z) << endl;
cout << "3- y == z - 3: " << (y == z - 3) << endl;
cout << "4- !(z > w): " << !(z > w) << endl;
cout << "5- x + y < z: " << (x + y < z) << endl;
return 0;
}
```

11)   Trace and find the following programs output
```cpp
#include <iostream.h>

int main()
{
int x=10,y=15,z=20;
cout << "1- !(x > 10): " << !(x > 10) << endl;
cout << "2- x <= 5 || y < 15: " << ((x <= 5) || (y < 15)) << endl;
```

```cpp
cout << "3- (x != 5) && (y != z): " << ((x != 5) && (y != z)) <<
endl;
cout << "4- x >= z || (x + y >= z): " << ((x >= z) || (x + y >= z)) <<
endl;
cout << "5-(x <= y - 2) && (y >= z) || (z - 2 != 20): " << ((x <= y -
2) && (y >= z) || (z - 2 != 20)) << endl;
return 0;
}
```

12) Trace and find the following programs output
```cpp
#include <iostream.h>

int main()
{
int a;
a = 5 % 2 * 2 + 3 * 5 / 2;
cout << a<<endl;
return 0;
}
```

13) Trace and find the following programs output
```cpp
#include <iostream.h>

int main()
{
int x=5, y=4;
cout<< (x < y) <<endl;
y += ++x;
cout << x <<" "<< y<<endl;
return 0;
}
```

14) Write a program that inputs a four-digit integer at maximum, separates the integer into its digits and prints them separated by

three spaces each. For example, if the user types in 5386, the program should print: 5 3 8 6.

15) Write a C++ program that calculate the sum and average of numbers entered by user (three numbers at least).

16) Write a C++ program to accept marks in two objects (physics and chemistry) find the eligibility of admission for a professional course based on the following criteria: Total in all two subjects >=110

17) Which of the following is used for comments in C++?
a) /* comment */
b) // comment */
c) // comment
d) both // comment or /* comment */

18) Which of the following is a correct identifier in C++?
a) VAR_1234
b) $var_name
c) 7VARNAME
d) 7var_name

19) What will be the output of the following C++ code?

```cpp
1.    #include <iostream>
2.    using namespace std;
3.    int main()
4.    {
5.        char c = 74;
6.        cout << c;
7.        return 0;
8.    }
```

a) I
b) J
c) A
d) N