

**LAB EXERCISE 3**  
**TOPIC: FUNCTIONS**

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**SECTION: 05**

**QUESTION 1**

Describe the difference between predefined function and programmer-defined function?

Predefined function is C++ promotes code reuse with predefined classes and functions in the standard library and programmer-defined function are created by the programmer.

**QUESTION 2**

Write a statement to calculate the equation or to convert the statement below using function from library.

- a) Square root of y.  
`sqrt(y); <cmath>`
- b) x to the power of y.  
`pow(x,y); <cmath>`
- c) cos x.  
`cos(x); <cmath>`
- d) Change character to uppercase.  
`toupper('x'); <cctype>`
- e) Copy the string of x into string y.  
`strcpy(y,x); <cstring>`

### **QUESTION 3**

What is the difference between local variable, global variable, global constant and static local variable?

Local variables are not automatically initialized. They must be initialized by programmer.

Global variables (not constants) are automatically initialized to 0(numeric) or NULL (character) when the variable is defined.

Global constants defined for values that do not change throughout the program's execution.

Static local variables are defined and initialized only the first time the function is executed. 0 is the default initialization value.

#### **QUESTION 4**

Given the following coding, fill in the blank with the “terms” of function as a comment.

```
#include <iostream>
using namespace std;
int average(int, int, int); //function prototype
int main()
{
    int x, y, z, avrg;
    cout << "Please enter three numbers:" << endl;
    cin >> x >> y >> z;
    avrg = average (x, y, z); //function call
    cout << "The average of the given three numbers is: " <<
    avrg << endl;
    return 0;
}
int average(int a, int b, int c) //function definition
{
    int sum, avrg2;
    sum = a + b + c;
    avrg2 = sum / 3;
    return avrg2; //statement return value avrg2
}
```

## **QUESTION 5**

Find the errors in the following given code.

```
#include <iostream>
#include <cmath> //Error 1
using namespace std;
int average(int, int, int); //Error 2
int power (int); //Error 3
int main()
{
    int x, y, z, avrg, powerOf;
    cout << "Please enter three numbers:" << endl;
    cin >> x >> y >> z;
    avrg = average (x, y, z); //Error
    cout << "The average of the given three numbers is: " << avrg <<
endl;
    power (avrg); //Error 4
    cout << "The average number to the power of two is: " << power
(avrg) << endl; //Error 5
    return 0;
}
int average(int a, int b, int c)
{
    int sum, avrg2;
    sum = a + b + c;
    avrg2 = sum / 3;
    return avrg2; //Error 6
}
int power (int p)
{
    int pOf;
    pOf = pow(p, 2);
```

```
    return pOf; //Error 7  
}
```

### **QUESTION 6**

Write a C++ program to calculate a rectangle's area. The program consists of the following function:

- `getLength` – This function should ask the user to enter the rectangle's length, and then returns that value as a double
- `getWidth` – This function should ask the user to enter the rectangle's width, and then returns that value as a double.
- `getArea` – This function should accept the rectangle's length and width as arguments and return the rectangle's area.
- `displayData` – This function should accept the rectangle's length, width and area as arguments, and display them in an appropriate message on the screen.
- `main` – This function consists of calls to the above functions.

For Question 6, provide the answer in .cpp file.