**LAB EXERCISE 3**

**TOPIC: FUNCTIONS**

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## QUESTION 1

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

## QUESTION 2

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

a) Square root of y.
b) x to the power of y.
c) cos x.
d) Change character to uppercase.
e) Copy the string of x into string y.

## QUESTION 3

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

1. Predefined function is functions that are already provided by the programming language. For example; sqrt().
Programmer-defined function is functions that are defined by the programmer to perform a specific task. For example; int sum(int a, int b)

2. a) sqrt(y);
b) pow(x,y);
c) cos(x);
d) toupper(character);
e) strcpy(x,y),

3. • Local variable: declared inside a function. Can only be used in the function.
• Global variable: declared outside all functions. Can be used throughout the program.
• Global constant: global variable with const qualifier. The value cannot be changed.
• Static local variable: local variable with static keyword. Retains its 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 header
{
      int sum, avrg2;
      sum = a + b + c;
      avrg2 = sum / 3;
      return avrg2; // return statement
}
```

**QUESTION 5**

Find the errors in the following given code.

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

int average (int,int,int);

int power(int p)

avrg = average(x,y,z);

power(p)

power(p)

return pOf;

**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.