National University of Computer and Emerging Sciences

Lab Manual

for

Programming Fundamentals

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Objectives:

In this lab we will learn

- User Defined Functions
- Use of Library functions

Sample Codes:

Sample Code 1:

```cpp
#include<iostream>

using namespace std;

void myfirstfunction(){

    cout<<"This is my first function"<<endl;

}

int main(){

//function calling

    myfirstfunction();

return 0;

  }
```

Sample Code 2:

//Code for calculation power with positive value of power

```cpp
#include<iostream>

using namespace std;

int Power(int base, int power){

int pow=base;

if(power==0&&base>0){

    return 1;

}
```

```cpp
else{

    for(int i=1;i<power;i++)

        pow=base*pow;

    return pow;

}

}

int main(){

//function calling

    cout<<Power(4,0);

return 0;

    }
```

//Equivalent code with using a library function of cmath

```cpp
#include<iostream>

#include<cmath>

using namespace std;

int main(){

    cout<<pow(3,4);

    return 0;

}
```

Problems:

Problem 1: (Marks 10)

Write a function printDiagonal for printing number in diagonal as shown excluding multiple of 3, as shown in sample output. Make a main for testing it.

Example:

Input: **5**   Output: 1

                                                  2 4

                                                  5 7   8

                                                  10 11 13   14

                                                  16 17 19 20 22

Problem 2: (Marks 10)

Write a program which makes function with following prototype:

bool isArmStrong(int number);

That function takes n digit number as input and tells the number is Armstrong or not. Note: A number is an Armstrong number if the sum of its own digits raised to the power number of digits gives the number itself. i.e.

153 is an Armstrong number because $(1^3) + (5^3) + (3^3) = 153$

1634 is an Armstrong number because $(1^4) + (6^4) + (3^4) + (4^4) = 1634$