Everest Engineering College
Sanepa-2, Lalitpur

Date of distribution:……….
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Subject: Object Oriented Programming in C++

Lab-11
Title: Template and Exception handling

Objective:
- To be familiar with class template and function template
- To be familiar with exception handling mechanism and implement them whenever necessary

Theory:
- Introduction to generic programming
- Function template with their syntax
- Class template with their syntax
- Exception handling mechanism in C++

Lab exercises (please code yourself and show the output to instructor)

1) Create a function template to find the sum of two integers and float using function template.
2) Write a program to find the sum and product of two integer and float using function template.
3) Write a C++ program to find the largest among two integers, two characters and float using function template.
4) Create a function template to swap two integers, two float and two characters.
5) Write a program to find the roots of the quadratic equation using function template.
6) Create a class template to find the sum and average of two integers and two float using class template.
7) Write a program to illustrate exception handling mechanism in C++.
8) Write a program that catches multiple exceptions. (Handling Multiple exceptions)

Practice Questions:

1. **Write a program to overload multiplication operator (*) showing the multiplication of float and integer.**

```cpp
#include <iostream>
using namespace std;
template <class T>
class Multiply
{
private:
    T num;
public:
    Multiply(T x)
    {
        num = x;
    }

    T operator*(Multiply obj)
    {
        return (num * obj.num);
    }
};
int main()
{
    Multiply<int> m1(5), m2(6);
    Multiply<float> f1(3.5), f2(2.2);
    cout<<"Multiplication of two integer="<<m1*m2<<endl;
    cout<<"Multiplication of two float="<<f1*f2<<endl;
    return 0;
}
```

2. **Create a class template to find the scalar product of vectors of integers and vectors of floating point number.**