B. Tech. Computer Science and Engineering

Sub: ESFP – II

Practical -12

AIM: **To learn about creation of function template and class template in C++.**

1. 1. Simran wants to implement a program in C++ to create a template which finds the largest among two integer, floating values & character values.

2. Create one class template and use it for to implement PUSH & POP operations of stack.

3. Demonstrate a C++ Program to show Example of Static member variable of template class.

Post Practical Task

1. Implement a program in C++ template class to multiply 3 by 3 matrix with different data types.

2. Predict the output?

```cpp
#include <iostream>
using namespace std;

template <typename T>
void fun(const T&x)
{
   static int count = 0;
   cout << "x = " << x << " count = " << count << endl;
   ++count;
   return;
}
int main()
{
   fun<int> (1);
   cout << endl;
   fun<int>(1);
   cout << endl;
   fun<double>(1.1);
   cout << endl;
   return 0;
}
A
```

x = 1 count = 0
x = 1 count = 1
x = 1.1 count = 0
B
x = 1 count = 0
x = 1 count = 0
x = 1.1 count = 0
C
x = 1 count = 0
x = 1 count = 1
x = 1.1 count = 2
D Compiler Error

3. Output of following program?
Assume that the size of int is 4 bytes and size of double is 8 bytes, and there is no alignment done by the compiler.

```
#include<iostream>
#include<stdlib.h>
using namespace std;

template<class T, class U, class V=double>
class A  {
    T x;
    U y;
    V z;
    static int count;
};
int main()
{
    A<int, int> a;
    A<double, double> b;
    cout << sizeof(a) << endl;
    cout << sizeof(b) << endl;
    return 0;
}
```

A
16
24

B
8
16

C
20
28

D Compiler Error: template parameters cannot have default values.