Qn. Set Code-1

Semester: 3rd
Programme: B.Tech
Branch: CSE, IT, CSCE, CSSE

AUTUMN END SEMESTER EXAMINATION-2022

3rd Semester B.Tech

OBJECT ORIENTED PROGRAMMING

IT 2005

(For 2022 (L.E), 2021 & Previous Admitted Batches)

Time: 3 Hours Full Marks: 50

Answer any SIX questions.
Question paper consists of four SECTIONS i.e. A, B, C and D.
Section A is compulsory.
Attempt minimum one question each from Sections B, C, D.
The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable and all parts of a question should be answered at one place only.

SECTION-A

1. Answer the following questions. [1 × 10]

(a) How does a class enforce data-hiding, abstraction & encapsulation?

(b) Illustrate the concept of default arguments using appropriate example.

(c) Differentiate between function overloading and function overriding.

(d) What do you mean by virtual base class?

(e) In an overloaded binary operator function, why does friend function take two objects and whereas member function takes just one object?

(f) What is delegation?

(g) Find the output.

```
#include <iostream>
using namespace std;
class A
{
        int a;
        public:
                A(){}
```

```
        A(int d)
       {a=d;}
        ~A()
        {
        cout<<"Object of A being deleted"<<endl;
        }

       void show_A()
        {cout<<a<<endl;
        }
};
class B{
        int b;
        public:
                B(){}
                B(int d)
                {b=d;  }
                ~B()
                {
               cout<<"Object of B being deleted"<<endl;
                }
                void show_B()
                {cout<<b<<endl;}
};
class C: public A, public B
{
        int c;
        public:
                C():A(),B(){}
                C(int d1, int d2,int d3):A(d1),B(d2)
                {
                        c=d3;
                }
                ~C()
                {
                cout<<"Object of C being deleted"<<endl;
                }
                void show_C()
                {
                        show_A();
                        show_B();
                        cout<<c<<endl;
                }
};
```

```
int main()
{
        C *p;
        p=new C(10,20,30);
        p->show_C();
        delete p;
        return 0;
}
```

(h) Differentiate between the following statements:
throw;
throw 8;

(i) What do you mean by object slicing?

(j) Can we define a constructor as private member of a class? Justify your answer.

SECTION-B

2. (a) What is the difference between member function defined inside and outside the body of the class? How is inline member function defined outside the body of the class? Discuss the memory requirements for static and non-static data members. [4]

(b) Write a program in C++ to keep track of and display the number of objects created, the number of objects destroyed, and number of active objects for a class named counter. [4]

3. (a) Write a program to compare two data members belonging to two different classes. [4]

(b) What is abstract class? Write a program having student as an abstract class and create many derived classes such as engineering, science, medical & commerce from the student class. Create their objects and process them. [4]

SECTION-C

4. (a) Create a class student with data members: roll-no & name. Include two member functions to input and output the corresponding values of the above data members. Access members of student class using **Array of Pointers to Objects**. [4]

(b) WAP to create a class which stores name, id and salary of an employee. Allocate and de-allocate the memory dynamically for the employee name. Create objects using default, copy and parameterized constructor and display them. [4]

5. (a) Write a program to create class which stores and integer array. Overload the following operators given below:
-Unary minus to negate all the elements of the array.
-binary multiplication to multiply an integer number to all the elements of the array and store in another object. [OB2=OB1*5] [4]

(b) Write a program in C++ to throw the exception when user entered the amount to be withdrawn is less than zero(<0) and greater than 20000(>20000). [4]

6. (a) Write a program to copy the contents of one file in reverse order to another file. [4]

(b) Convert Centimeter to Meter using class type to basic type conversion.(1Meter=100 Centimeter) [4]

SECTION-D

7. (a) Write a program in C++ to enter a string into file and read the same file to display all the words in the file with starting letter 'R'. [4]

(b) Convert Degree to Radian using conversion routine in the destination class. (Radian=Degree* PI /180) [4]

8. (a) Write a C++ program to implement the following structure: [4]

Create a class Person with data members: name & age & member functions: void readdata() & void displaydata(). Derive a class Student from the class Person with data members: Roll No & Branch & member functions: void readdata() & void displaydata(). Derive a class Exam from the class Student with data members: mark1 & mark2 & member functions: void readdata() & void displaydata(). Derive a class Sports from the class Person with data members: game_name & score & member functions: void readdata() & void displaydata(). Derive a class Result from the class Exam & the class Sports with data member: total & member functions : void readdata() & void displaydata(). Result class will display the total marks scored by the student by adding the subject marks and score.

(b) Write a C++ program for overloaded template functions to calculate the perimeter of a circle, square and rectangle. [4]

*****