

# Indian Institute of Information Technology Ranchi

Department of CSE

B. Tech Mid Semester Examination – Spring Semester 2022-23

Semester: 6<sup>th</sup>

Branch: CSE

Course Code: OE-3020

Course Name: Object Oriented System Design

## QUESTION PAPER

Duration: 2 Hrs.

Max Marks: 60

### Instructions:

- (1) Answer all the questions. Number in [ ] indicates marks.
- (2) Any missing data can be assumed suitably.

- 1 (a) Distinguish between the Procedural and OOP languages by explaining their advantages and disadvantages. Write five benefits of OOP approach in programming. [5]
- (b) What is a friend function? Explain it with an example. [5]
- (c) Define and discuss the rules of virtual function. [5]
- (d) Briefly explain the use of inheritance. Discuss multiple and multilevel inheritance with the real-world example. [5]
- 2 (a) How do the properties of the following two derived classes differ in following example? [5]
  - i. Class D1: private B {.....}
  - ii. Class D2: public B {.....}
- (b) State whether the following statements are TRUE or FALSE? Justify the answer. [5]
  - I. Defining a derived class requires some changes on the base class.
  - II. A base class is never used to create objects.
  - III. An entire class can be made a friend of another class.
  - IV. A function can return a value by reference.
  - V. A member function defined inside a class specifier need to define as inline function.
- (c) A private member of a base class is not inheritable. Is there any way to access the private member of the base class? State the answer with proper justification? [5]
- (d) Differentiate between compile time polymorphism and run time polymorphism. [5]
- 3 (a) Explain the declaration, accessing and storage of static data member and static member function with the help of a suitable example. [10]
- (b) What will be the output of the following program? [4+]  
[3+3]  
[1]
  - i) class B
  - {



```

class B {
    int x;
public:
    B() { cout << "1\t"; }
};
class D : public B
{
    int y;
public:
    D() { cout << "2\t"; }
    D(int i) { cout << "3\t"; }
};
int main ()
{
    B b;
    D d1;
    D d2(1);
}

```

ii)

```

sum = 0;
ocount = 1;
while(ocount <= 3)
{
    icount = 1;
    while(icount <= ocount)
    {
        sum = sum + icount;
        icount++;
    }
    ocount++;
}
cout << sum << endl;

```

iii) Fix the compilation errors and find the output of following program

```

#include<iostream>
class Test
{
private: int x;
public: Test(int x = 0) { this->x = x; }
    void change(Test *t) { this = t; }
    void print() { cout << "x = " << x << endl; }
};
void main()
{
    Test obj(5);
    Test *ptr = new Test (10);
    obj.change(ptr);
    obj.print();
}

```