Institute of Information Technology

Jahangirnagar University

B.Sc. in ICT

1st year 2nd Semester Final Examination, 2021

Duration: 3 hrs.

Full Marks: 60

Course Code: ICT-1203

Course Title: Object Oriented Programming

Do not write anything on the question paper.

There are 7 (Seven) questions.

Figures in the right margin indicate marks.

Part – A (Mandatory to answer)

CLO1	1.	a)	Describe all the features of OOP.	4
CLO2, CLO3		b)	Consider the following class named Circle:	2

Circle
radius: Float
area() : Float

How would you compare the Circle class's constructor and destructor concept in C++ and Java?

CLO2, CLO3		c)	Apply the problem of 1(b) by writing codes in both C++ and Java.	3
CLO4		d)	Suppose, you want to develop a software to collect some customer information (like-customer name, customer national id and customer back account number) using Java GUI. Analyze the scenario and write down the names of required Java swing components to develop it.	2
CLO5		e)	Recall the name of java library used for testing any java application.	1

Part – B

Answer any 4 (Four) questions

2. a) Is it possible to grant a nonmember function access to the private members of a class? Explain showing your logic.   3

   b) Define a class to represent a Player. Include the following members: 3
   Data Members
      i) id
      ii) name
      iii) score
   Member functions
      i) insertRecord()-To input id, name, score
      iii) display()- To print id, name, score
   Now write the necessary code in C++ to view id, name, score.

c) Why do we need an inline function in C++? 4

d) Explain Objects as Function arguments. 6

3. a) class Addition {
      int x, y;

```
            public:
                int ADD(int p, int q)
                {
                    x=p;
                    y=q;
                int sum=x+y;
                return sum;
                }
                int ADD() {
                    string a= "HELLO ";
                    string b="SAMIEN";
                    string c= a+b;
                    cout<<c<<endl;
                }
};
```

   i. Encapsulation is the mechanism that binds together code and the data it manipulates.

   ii. It keeps both safe from outside interference and misuse.
   Now explain the implementation of Encapsulation for i. and ii. from the above example code

   iii. Explain the property of polymorphism from the same example. 3

b) What is early and late Binding? Explain with Example. 3

c) What is 'this' pointer? Write the program to print employee information and show the 3
   older employee from the information using this pointer.

```
            Class: employee
             data member: char name[20], float age;
            Use constructor employee (char *s, float a)
            and member function :
            employee Greater(employee &x, employee &y)
            Sample output:
                    name : REEMA
                    age: 30
                    name : KRISHNA
                    age: 35
                    name : PERVAGE
                    age : 50
                    Elder Employee is:
                    name : PERVAGE
                    age : 50
```

New Delete operators 3

age : 50

4 a) Explain Dynamic Memory Allocation and Deallocation using New, Delete operators.　3
   b) Show the Key Difference between Call by Value and Call by Reference.　3
   c) Write a C++ program to perform operations on complex numbers using operator　3
      overloading.
      1. Addition 2. Substraction 3. Multiplication 4. Exit
      Enter the choice: 1
      Enter the First Complex Number:
      Enter the Real Part : 3

      Enter Imginary Part: 2
      = 3+2i
      Enter the Second Complex Number:
      Enter the Real Part : 4
      Enter Imginary Part: 3
         = 4+3i
         =7+5i
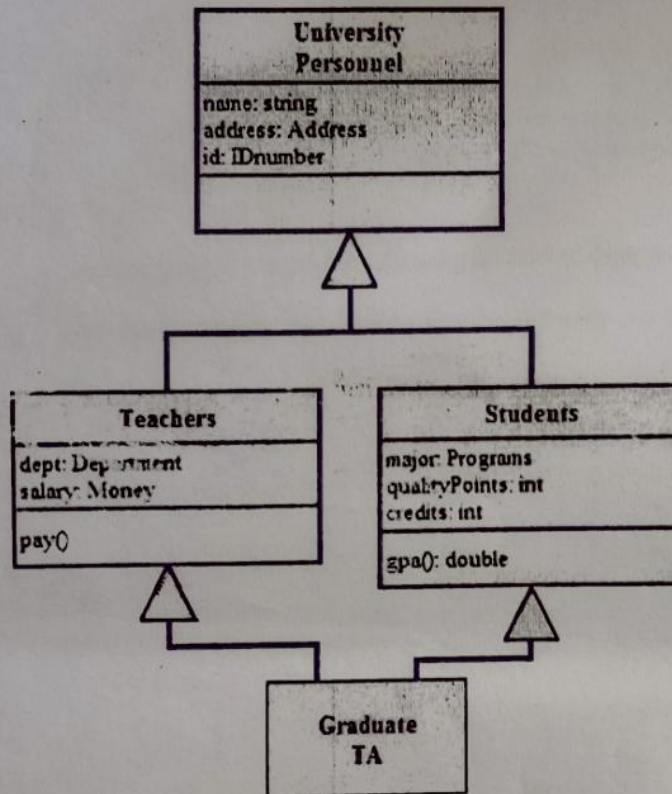   1. Addition 2. Substraction 3. Multiplication 4. Exit

   d) Is it possible to call the base class method without creating an instance?　3

5. a) "The duplication of the inherited members can be avoided by making common base class　3
      as the virtual base class." Explain with example code.　7
   b) Analyze the given diagram and write the code to show inheritance relationship in Java or
      C++.

C++.


```
        ┌─────────────────────┐
        │     University      │
        │     Personnel       │
        ├─────────────────────┤
        │ name: string        │
        │ address: Address    │
        │ id: IDnumber        │
        ├─────────────────────┤
        │                     │
        └─────────────────────┘
                  △
```

Teachers	Students
dept: Department	major: Programs
salary: Money	qualityPoints: int
	credits: int
pay()	gpa(): double

```
        ┌─────────────┐
        │  Graduate   │
        │     TA      │
        └─────────────┘
```

c) Does Java support multiple inheritance? Explain.   2

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6. a) Java Programs are platform independent. Why?   3
    b) Distinguish between method overloading and method overriding in java. 3
    c) Can you create an instance of an abstract class? Explain with example. 3
    d) What do you mean by Creation of multiple objects by one type only?   3

7   a) Show the difference between class and object with an example.   3
    b) What is Packages? Show the Java's access control mechanism for same class, same
        package subclass, same package non-subclass, different package subclass, different   3
        package non-subclass.
    c) Mention the problem without exception handling and write the solution. Show the   3
        Internal working of java try-catch block.
    d) Can we start a thread twice? What if we call run() method directly instead start()   3
        method?