

UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program: Third Semester – 2021

Roll No. _____

Subject: Object Oriented Programming
Course Code: IT-201/21400

Part – II

Time: 2 Hrs. 45 Min. Mar

ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

Q.2. Answer the following short questions: (10x2=20)

I. ✓ Write down the output of the following code

```
#include<iostream>
using namespace std;
class A{
public:
    int i_A; static
    static void f(){
        cout<<"Value of i_A: "<<i_A<<endl;
    }
}; and also initialize here to static data member
int main(){
    A a;
    a.i_A = 600;
    a.f();
    cout<<"Hello"<<endl;
    return 0;
}
```

II. ✓ Write down the short note on inheritance and Polymorphism?

III. ✓ What is difference between Function overloading and function overriding?

IV. ✓ Write down the difference between Copy Constructor and Assignment operator with the help of example.

Q.3. Answer the following questions. (2x15=30)

Given the following two classes.

```
class Item 2
{
    char name[100]; // Name of the Item
    double price; // Price of the Item
};
class Bill 3✓
{
    int id; // Unique Id for bill 1
    int itemCount; // No. of Items in the bill
    Item *list; // Array containing the Items which are part of the bill
    double billAmount; // Total amount of the bill (which is calculated as the sum of the
    // prices of all items present on that bill)
};
```

You are required to implement two functions as described below:

- 1) computeAllBills: it receives two parameters: an array (*allBills*) of type Bill and its size (*numBills*). The function computeAllBills calls another function computeOneBill for each element of Bill type, using a loop.
- 2) computeOneBill: it receives one parameter: a pointer to a Bill (*ptrBill*) and computes total amount of that Bill and stores it in its member variable *billAmount*.

Note: Indent your code properly. Use meaningful variable names. Write if, int, for, etc. all in lower case.

Q.1. Answer the following short questions: (6x5=30)

I. Write down the output of the following code.

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

int main(){
    A a;
    cout<<"Hello"<<endl;
    return 0;
}
```

- II. What is difference between a Class and Object?
- III. Why Operator overloading is used?

IV. Write the output of the following code

```
#include<iostream>
using namespace std;
class A{
public:
    A(){
        cout << "A" << endl;
    }
    ~A(){
        cout << "~A" << endl;
    }
};
class B : A{
public:
    B(){
        cout << "B" << endl;
    }
    ~B(){
        cout << "~B" << endl;
    }
};

int main(){
    B b;
    return 0;
}
```

- V. Write down the difference between Copy Constructor and Assignment operator with the help of example.
- vi. Write down the difference between private, protected and public access specifiers.

Q.2. Answer the following questions. (3x10=30)

Consider the following code:

<pre>class CString { private: int size; char * str; public: //All the function discussed in //latest lab/class implementation };</pre>	<pre>class Person { private: CString fname; CString lname; int age; public: Person(CString n="Muhammad", CString e="Abdullah",int a=24); Person(const Person & ref); };</pre>
--	---

Your task is to write/define the following:

- 1) Copy constructor in CString class.
- 2) Parameterized constructor in Person class as given in the above code:
 Person(CString n="Muhammad", CString e="Ali",int a=24)
- 3) Copy constructor in Person class.



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Examination: B.S. 4 Years Program

Roll No. in Fig.

Roll No. in Words.

PAPER: Object Oriented Programming

MAX. TIME: 15 Min.

Course Code: IT-201/21400 Part-I (Compulsory)

MAX. MARKS: 10

Signature of Supdt.:

Attempt this Paper on this Question Sheet only.

Please encircle the correct option. Division of marks is given in front of each question.

This Paper will be collected back after expiry of time limit mentioned above.

Q.1. Encircle the right answer, cutting and overwriting is not allowed. (1x10=10)

1. A class must have a constructor.
 - a) True
 - b) False
2. Class level variable can be accessed without class object.
 - a) True
 - b) False
3. If *ptr* is a pointer than `cout << ptr` will display the address of *ptr*.
 - a) True
 - b) False
4. We can store a double pointer address in a double pointer.
 - a) True
 - b) False
5. An entire structure may not be passed to a function as an argument.
 - a) True
 - b) False
6. A class object consist of
 - a) Private/public members
 - b) Attributes and functions
 - c) Either a or b
 - d) one of them
7. Encapsulation refers to the combining of data and code into a
 - a) Class
 - b) Program
 - c) Object
 - d) None of them
8. If class has only parametrize constructor. Then what will be its default constructor?
 - a) Same parametrize constructor
 - b) A constructor which takes no parameter
 - c) No default constructor.
 - d) None of them.
9. It is good to make getter function
 - a) Const
 - b) Public
 - c) public and const
 - d) None of these
10. We can have multiple
 - a) Default constructor
 - b) Parameterized constructor
 - c) Destructor
 - d) None of these



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Third Semester – 2019

Examination: B.S. 4 Years Program

Roll No.

PAPER: Object Oriented Programming

Course Code: IT-201/21400 Part – II

MAX. TIME: 2 Hrs. 45 Min.

MAX. MARKS: 50

ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

Q.2. Write short answers to the following questions.

(5x4=20)

I. Write down the output of the following code.

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

int main(){
    A a;
    cout<<"Hello"<<endl;
    return 0;
}
```

II. What is difference between a Class and Object?

III. Why Operator overloading is used?

IV. Write the output of the following code

```
#include<iostream>
using namespace std;
class A{
public:
    A(){
        cout << "A" << endl;
    }
    ~A(){
        cout << "~A" << endl;
    }
};
class B : A{
public:
    B(){
        cout << "B" << endl;
    }
    ~B(){
        cout << "~B" << endl;
    }
};
int main(){
    B b;
    return 0;
}
```

P.T.O.

Q.3. Long questions.

(7+7+7+9=30)

We are going to create class of Matrix. You have to write the definition of the following function given below in the Matrix class.

```
class Matrix{
private:
    int noOfRows; //Total number of rows
    int noOfColumns //Total number of columns
    int ** data; //Matrix data
public:
    Matrix(int noOfRows, int noOfColumns); // If noOfRows > 0 and noOfColumns
    then assign it and allocate the rows in the heap. Otherwise assign 0 to all.

    void displayData(); // Display all records present in data.

    ~Matrix(); // Deallocate the memory allocated by Matrix.

    Matrix(const Matrix & ref) // copy construtor
};
```

You have to write down the definition of following functions.

1. **Matrix(int noOfRows, int noOfColumns)**
2. **void displayData();** // Display all records present in data.
3. **~Matrix();** // Deallocate the memory allocated by Matrix.
4. **Matrix(const Matrix & ref)** // copy construtor



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TIME ALLOWED: 30 mins.
MAX. MARKS: 10

Attempt this Paper on this Question Sheet only.

OBJECTIVE

Question # 01:- Write the selected option (A or B) on your answer sheet against each of the following [1 x 10 = 10]

1. The analysis, design and implementation of information systems using object oriented programming languages, technologies and techniques is called object-oriented development? **A. True B. False**
2. The pointer, automatically supplied when you call a non-static class member function is this? **A. True B. False**
3. When you call a public static function from outside its class, you can use an object? **A. True B. False**
4. A member function can always access the data in the private part of its class? **A. True B. False**
5. Game(); is a legal constructor for the Game class? **A. True B. False**
6. The primary advantage to overloading functions is use one function name for many types of items? **A. True B. False**
7. If you do not overload an = operator for a class the compiler will not give an error? **A. True B. False**
8. The number of associations possible between classes of objects is called multiplicity? **A. True B. False**
9. An advantage of inheritance includes facilitating abstract classes? **A. True B. False**
10. A virtual function is a function that causes its class to be abstract? **A. True B. False**



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TIME ALLOWED: 2 hrs. & 30 mins.
MAX. MARKS: 50

Attempt this Paper on Separate Answer Sheet provided.

SUBJECTIVE

Question # 02:-

[4 x 5 = 20]

Give precise and short answers of the following:

1. Private and Protected access identifiers.
2. Inheritance and Aggregation.
3. Shallow and Deep copy constructor.
4. Virtual table.

Question # 03:-

[30]

Provide the implementation of a class named **Rational** having **two data** members (a and b) of type float with **private** access.

1. **Data member** of this class should contain **negative data** or **-1 (default value)** for a particular object. Write all the **set functions** for each data member to **set** their values. [02 + 02 + 02]
2. Implement **default** (sets all data members to -1), **parameterized** and **copy constructor**. [02 + 02 + 02]
3. Implement **getData** member function for taking the inputs for a particular object's data. [02]
4. Overload **arithmetic assignment operator (/=)** to divide and assign the data of one object to another. [03]
5. Overload **stream insertion operator** to display the data of object on the console. [03]
6. Overload **arithmetic product (*) operator** to return the result of **two** objects after multiplication. [03]
7. Overload **unary minus (-) operator**, returns true if an object contains data less than zero, false otherwise. [02]
8. Implement **getEqualObjects** member function which accepts an array of **Rational** objects and return the **index** of an object which is equal to the left hand side object. [05]



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TIME ALLOWED: 30 mins.
MAX. MARKS: 10

Attempt this Paper on this Question Sheet only.

OBJECTIVE

Question # 01:- Write the selected option (A or B) on your answer sheet against each of the following [1 x 10 = 10]

1. A technique that programmers use to provide object encapsulation is to usually make objects' data private?
A. True B. False
2. To create just one memory location for a field no matter how many objects you instantiate, you should declare it static?
A. True B. False
3. Constructor is called automatically each time an object is created?
A. True B. False
4. A function that has been declared to be a friend of a class has access to the private data in the class?
A. True B. False
5. For the object for which it was called, a const member function can modify non-const member data?
A. True B. False
6. :: (scope resolution) operators can be overloaded?
A. True B. False
7. Distance operator++(int); is the correct syntax for overloading post increment unary operator as friend function?
A. True B. False
8. The kind of relationship in which an object contains reference to other object and having independent life cycle is Aggregation?
A. True B. False
9. A derived class inherits data members and member functions from base class?
A. True B. False
10. We can output text to an object of class ofstream using the insertion operator << because the ofstream is a stream?
A. True B. False



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MAX. MARKS: 50

Attempt this Paper on Separate Answer Sheet provided.

SUBJECTIVE

Question # 02:-

[4 x 5 = 20]

Give precise and short answers of the following:

1. Arguments passed by value and by reference.
2. Aggregation and Composition.
3. Over-loaded and Over-ridden functions.
4. Virtual and Pure Virtual functions.

Question # 03:-

[30]

Provide the implementation of a class named **Algebra** having **two data** members (a and b) of type integer with **private** access.

1. **Data member** of this class should contain **positive data** or **0 (default value)** for a particular object. Write all the **set functions** for each data member to **set** their values. [02 + 02 + 02]
2. Implement **default** (sets all data members to 0), **parameterized** and **copy constructor**. [02 + 02 + 02]
3. Implement **putData** member function to display the data of an object on the console. [02]
4. Overload **arithmetic assignment operator (+=)** to add and assign the data of one object to another. [03]
5. Overload **stream extraction operator** for taking the inputs for a particular object's data. [03]
6. Overload **arithmetic minus (-) operator** to return the result of two objects after subtraction. [03]
7. Overload **unary plus (+) operator**, returns true if an object contains data greater than zero, false otherwise. [03]
8. Implement **countEqualObjects** member function which accepts an array of **Algebra** objects and return the **total count** of all the objects which is equal to the left hand side object. [05]



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Roll No.

Third Semester 2015
Examination: B.S. 4 Years Programme

PAPER: Object Oriented Programming
Course Code: IT-201/

TIME ALLOWED: 30 mins.
MAX. MARKS: 10

Attempt this Paper on this Question Sheet only.

OBJECTIVE

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[1 x 10 = 10]

1. The analysis, design and implementation of information systems using object oriented programming languages, technologies and techniques is called object-oriented development? A. True B. False
2. The pointer, automatically supplied when you call a non-static class member function is this? A. True B. False
3. When you call a public static function from outside its class, you can use an object? A. True B. False
4. A member function can always access the data in the private part of its class? A. True B. False
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SUBJECTIVE

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Give precise and short answers of the following:

(4 x 5 = 20)

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4. Virtual and Pure Virtual functions.

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[30]

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