Rajshahi University of Engineering & Technology

B.Sc. Engineering 1st Year 2nd Semester Examination, 2013

Department of Computer Science & Engineering

Course no: **CSE 207** Course Title: **Object Oriented Programming**

Full marks: 70 | Time: Three (03) hours

N.B. Answer six questions, taking three from each section.
The questions are of equal value.
Use separate answer script for each section.

SECTION-A

Q1. (a) Discuss briefly the following three types of concept used in programming: 04 2/3
i) Unstructured ii) Procedural and iii) Object-Oriented

(b) Find out the output of the following C++ program 04

```
class A{
    private:
        int w,l;
    public:
        void set(int wx, int lx){
            w=wx; l=lx;}
        int area(){
            return l*w;}};
void main(){
    A a;
    a.set(5,8);
    A*=b;
    b=&a;
    b->area();}
```

(c) What is the difference between run-time polymorphism and compile time polymorphism? 03

Q2. (a) What is data encapsulation and data hiding? Also, give a suitable C++ code to illustrate both. 03

(b) Answer the question (i) to (iv) based on the following 06

```
class student{
    int rno; char name[20]; float marks;
    protected: void result();
    public: student();
            void register();
            void display();
};
class faculty{
    long fcode; char name[20];
    protected: float pay;
    public: faculty();
            void enter();
            void show();
};
Class course: public student, private faculty{
    Long ccode[10]; char coursename[50];
    char startdate[8],enddate[8];
    public: course();
            void commence();
            void cdetail();
};
```

i) Which type of inheritance is illustrated in the above C++ code?
ii) Write the names of all the data members which is/are accessible from member function commence of class course.
iii) Write the names of the member functions which are accessible from object of class course.
iv) Write the names of the all members, which are accessible from object of class faculty.

(c) What are the unique features of "border layout"? 02 2/3

Q3 (a) What is pure virtual function? Why it is needed? 03

(b) How do the properties of following two derived classes differ? 04
i) class D1: private B{.....}
ii) class D2: public B {.....}

(a) Find the errors of the following C++ program:-

```
class mother{
        protected: int x,y;
        public:  void set(int a, int b){ x=a; y=b;}
        private: int z;
class daughter: public mother{
        private: int a;
        public: void show();}
void daughter::show(){
        x=20; set(10,20);z=100;}
```

Q4 (a) Explain the difference between method over-loading and method overriding. 02 2/3

(b) What are the similarities and differences between abstract classes and interface? 05

(c) Find the output of the following C++ program:- 04

```
class A{
        protected: int ax;
        public: void getA(int x){
                ax=x;} };
```

SECTION-B

Q5. (a) What does an explicit conversion from a double to an int do with the fractional part of the double value in Java? Does casting change the variable being cast? 04

(b) What is the purpose of declaring exception? How do you declare an exception and where? Can you declare multiple exceptions in a method declaration? 04

(c) Write a C++ program to the concept of unary operator '++' overloading. 02 2/3

Q6. (a) What is inline function? Find the output of the following C++ program:- 03

```
int x=0;
inline void f1(){x++;}
inline void f2(){x+=3; f1();}
void main(){
        f2(); cout<<x<<endl; }
```

(b) Write briefly about the following function related with C++ file 03
i) fail() ii) bad() iii) clear()

(c) Write a Java program to display a message "Welcome to RUET" in a frame of size 300X350 at location (200,250). 01 2/3

(d) What is immutable class in Java? 02

Q7. (a) What do you mean by synchronization? With an example state why do we need it? 04

(b) Write a Java program to create two threads, one thread will print odd numbers and second thread will print even numbers between 1 to 20. 05

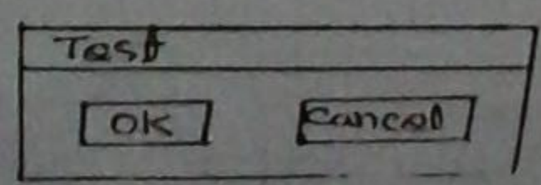
(c) Describe the use of final and super keywords with respect to inheritance. 02 2/3

Q8. (a) What is superclass in Java? Find output of following Java program:- 05

```
public static void main(String[] args){
        Sub s=new Sub();  S.print();}
class Sup{
    Sup(){System.out.println("Insied Super");}
        public void print(){System.out.println("Printed in Super");}}
class  Sub extends Sup{
    public Sub(){
        Super(20);  System.out.println("Inside Sub");}
public void print(){
        Super.print();
        System.out.println("Printed in Sub");}}
```

(b) Differentiate between abstract class and interface in Java. 02

(c) Write an Event-driven program in Java using the following diagram that displays "You clicked OK" and displays "You clicked Cancel" if "OK" and "Cancel" button are clicked respectively. 01 2/3



nal sheet for Q4(c)of course no. CSE 207

```
s B: virtual public A{
rotected:
        int bx;
public:
        void getB (int x) {
                bx=x;
}
};
class C: virtual public A {
        protected:
                int cx;
        public:
                void getC(int x) {
                cx=x; }
};
class P: public C, public B {
        public:
        int vol ( ) { return ax*bx*cx;}
};
void main ( ) {
P p;
p.getA(2); p.getB(3); p.getC (4);
cout <<"vol="<<p.vol( );
}
```

Rajshahi University of Engineering & Technology
B.Sc. Engineering 1st Year 2nd Semester Examination, 2012
Department of Computer Science and Engineering
Course no: CSE - 207 Course Title: Object Oriented Programming
Full marks: 70 Time: Three (03) hours

N.B. Answer six questions, taking three from each section.
The questions are of equal value.
Use separate answer script for each section.

SECTION-A

Q1. (a) What will be the output of the following program? Briefly explain the output. Marks $04\frac{2}{3}$

```
#include <iostream.h>
class A
{
public:
    void function(void) {cout<<"class A"<<endl;}
};
class B:public A
{
public:
    void function(void) {cout<<"class B"<<endl;}
};
class C:public B
{
public:
    void function(void) {cout<<"class C"<<endl;}
};
int main()
{
A *ptr;
B obj B;
ptr = &objB;
ptr = new C();
ptr ->function();
return 0;
}
```

(b) What are the advantages of inheritance? 03

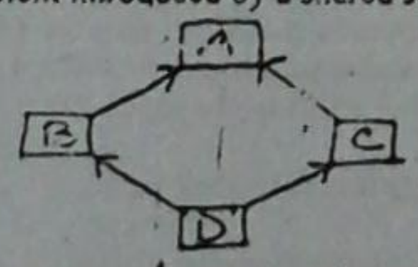
(c) What do you mean by inline function? [illegible] 04

Q2. (a) What will be the output of the following program? Briefly explain the output. 04

```
#include <iostream.h>
class constfunc
{
 int x,y;
  public:
   constfunc() {x = 0; y = 0;}
   constfunc(int xx, int yy) {x = xx; y = yy;}
   constfunc(constfunc *objB) {x = objB->x; y = objB->y;}
   void display() {cout<<x<<" "<<y;}
};
int main()
{
 constfunc obj(new constfunc(20, 40));
 obj.display();
 return 0;
}
```

(b) What are the main conceptual differences between object-oriented programming and other programming techniques? 04

(c) What type of problem introduced by a shared superclass of superclasses used with multiple inheritances? $03\frac{2}{3}$



Q3. (a) Describe in your own words the relationship between 05
(i) Instance and abstract data type.
(ii) Generic abstract data type and corresponding abstract data type
(iii) Instances of a generic abstract data type

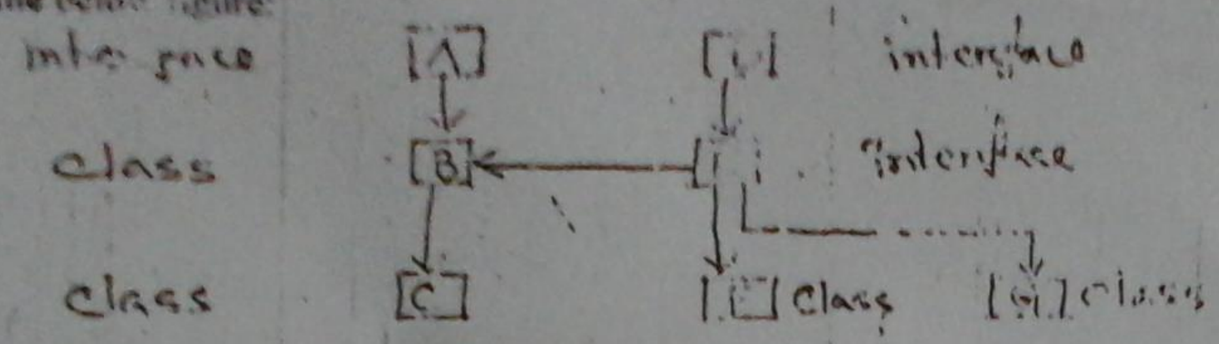
(b) Describe in your own words properties of abstract data types $05\frac{2}{3}$

Q4. (a) In C++, when we want to initialize the value of an object with the value of other object of same class type, how can we do it? Describe it [illegible] an example. 04

(b) Write a program to overload the binary + and – operator. $03\frac{2}{3}$

(c) Write a cpp program, where the fe[illegible] class test number are initialized when an object is created, find three best class test marks through best_mark()method, and find out the average of these marks through the best_avg() method. Methods are called by an object. 04

Q5. (a) How does Java support multiple inheritances? Define how a class or interface inherit a interface in the below figure: 04



(b) Why is a thread known as "lightweight process"? Give an example where a thread is created by creating a thread class. 04

(c) Let, we have four thread whose are nearly born. Now describe the running state and runnable state of those thread. $03\frac{2}{3}$

Q6. (a) Can a superclass variable reference a subclass object? Describe it with an example. 04

(b) What do you mean by dynamic method dispatch? Why we use it? $03\frac{2}{3}$

(c) Write a Java program where perform the below calculation: $b = \frac{c+d}{e}$. Here c,d and e are initialized when get_value() method is called c,d and e, may be integer or double i.e. get_value() method must be overloaded. If e = 0, then an error is catches in runtime. Otherwise, the value of b is displayed by display() method. 04 06

Q7. (a) Write the output of the following code 06

```
class A{public: int f(int x){cout<<x<<" ";}};
class B: public A {public: int f(int y){A:: f(y+1);}};
void g (A a, B b) {a.f(3); b.f(3);}
int main () {B p; B q; g(p,q);}
```

(b) Novice Java programmers often write code similar to $05\frac{2}{3}$

```
class C{public int x;. . . .}
. . . . . .
C[]a=new C[10];
for(int i=0;i<a.length; i++ )
a[i].x=i;
```

What is the problem with this code? Fix it. 06

Q8. (a) Define class rectangle by inheriting from class Point. The point should indicate the upper left corner of the rectangle. What is your class attributes? What additional methods do you introduce? $05\frac{2}{3}$

(b) Draw the inheritance graph including the following classes Drawable Object, Point, Circle, Rectangle, Polygon, Point and Sphere.

Khulna University of Engineering & Technology

B.Sc. Engineering 1st Year 2nd Semester Examination, 2011

Department of Computer Science and Engineering

Course No: CSE - 207 Course Title: Object Oriented Programming

Full marks: 70 Time: Three (03) hours

N.B. Answer six questions, taking three from each section.
The questions are of equal value.
Use separate answer script for each section.

SECTION-A

			Marks
Q1.	(a)	When is copy constructors called? What is the difference between malloc()/free() and new/delete?	$04\frac{2}{3}$
	(b)	Why do we need virtual functions?	03
	(c)	What is operator overloading? Illustrate operator overloading concept to concatenate strings.	04
Q2.	(a)	What do you understand by the term abstract data type?	03
	(b)	Write a program to show that the declaration of a class "Rectangle", which derives from the class "Square", which in turn derives from the class "Shape".	$04\frac{2}{3}$
	(c)	How is polymorphism achieved at runtime? Explain it with coding.	04
Q3.	(a)	What is the main advantage of passing arguments by reference? Explain this with an example.	03
	(b)	What is a dangling pointer? Name the operators that cannot be overloaded.	04
	(c)	What are the differences between a C++ struct and C++ class? What is multiple inheritance(virtual inheritance)? What are its advantages and disadvantages?	$04\frac{2}{3}$
Q4.	(a)	What will be the output of the following program segment and explain the output.	03

```
class A{
        A(int i) {
                cout<<i<<endl;
            }
    }a(2);
void main() { A b(1); }
```

	(b)	Explain multilevel and multiple inheritance with example.	$04\frac{2}{3}$
	(c)	What do you mean by early binding and late binding.	04

SECTION-B

			Marks
Q5.	(a)	What is a scope resolution operator? What do you mean by pure virtual functions?	$04\frac{2}{3}$
	(b)	What is the best way to declare and define global variables? What does "extern" mean in a function declaratio. ?	03
	(c)	What is the difference between char a[] = "string"; and char *p = "string"?	04
Q6.	(a)	Explain the IS-A and HAS-A class relationship. How would you implement each in a class design?	04
	(b)	Will the following program execute?	$04\frac{2}{3}$

```
void main()
{
  void *vptr = (void *)malloc (size of (void));
  vptr++;
}
```

If yes, then define the reason.

	(c)	What methods can be overriden in Java?	03
Q7.	(a)	"Java is platform independent"- Explain the statement.	03
	(b)	How does an array in JAVA is different than in C++. Briefly explain with example.	$02\frac{2}{3}$
	(c)	Why the main function is essential to declare both as static and public in JAVA? What type of argument is used in the main function of a JAVA program.	03
	(d)	What will be the output of the following program segment?	03

```
class A{
        public static void main() {
        int i = 290;
        byte b = (byte) i; system.out.println("b="+b);
        i = -20; b = (byte)i; system.out.println("b="+b);
    } };
```

Q8.	(a)	What is Applet? Write an applet that will display "Hello" at position (10, 15). What is wrapper class in Java?	$06\frac{2}{3}$
	(b)	What is the difference between interface and abstract class?	02
	(c)	What is the difference between multiprocessing and multithreading? What is to be done to implement these in a program?	03

Rajshahi University of Engineering & Technology
B.Sc. Engineering 1st Year 2nd Semester Examination, 2010
Department of Computer Science & Engineering
Course no: CSE 207 Course Title: Object Oriented Programming
Full marks: 70 Time: Three (03) hours

N.B. Answer six questions, taking three from each section.
The questions are of equal value.
Use separate answer script for each section.

SECTION-A

Q1. (a) How is object-oriented programming differing from the procedural-oriented programming? 3

(b) Distinguish the following terms $3\frac{2}{3}$
(i) Object and class
(ii) Inheritance and polymorphism
(iii) Data abstraction and data encapsulation

(c) Is the following fragment correct? If not, why? 3

```
class base{
        public: virtual int f(int a) = 0;
        //....
        };
class derived: public base{
        public: int f(int a, int b) { return a*b;}
        //....
        }
```

Q2. (a) What is the output of the following program: 4

```
#inlcude "stdafx.h"
#inlcude "siostream.h"

class A
{
public :
A() { cout<< "A"<<endl;}
};

class B{
public:
B() { cout<<"B"<<endl;}
};
A global A;
B global B;
int main (int argc, char *apgv[])
{ return 0;
}
```

(b) Have a look to your tasks of your day life. Chose one which does not improve too many steps (for example, watching TV, cooking a meal, etc). Describe this task in procedural and object-oriented form. Try to begin viewing the world to consist of objects. 4

(c) Name a few "message" rather than "procedure calls"? $3\frac{2}{3}$

Q3. (a) Differentiate between a template class and class template. What is an accessor? $3\frac{2}{3}$

(b) What do you mean by binding of data and function? 4

(c) Design an ADT function which describes properties of fractions. 4
(i) What data structures can be used? What are its elements?
(ii) What does the interface using on line?

Q4. (a) What is the basic nature of "cin" and "cout". What concept or principle we are ~~using~~ using on these two. 4

(b) Can constructor and destructor be virtual? Define reasons based on your answer. 4

(c) Can main() be overriden? What is function overloading and operator overloading? $3\frac{2}{3}$

SECTION-B

Q5. (a) What is the "this" pointer? 2

(b) Write down the advantages of using reference parameter. 3

(c) In what situations copy constructor is called? Why is it necessary? $3\frac{2}{3}$

(d) Explain why must be careful when passing object to function or returning objects from a function. 3

Q6. (a) Say we have a class overriden in three steps, form class A to B to C. If I do line this: 4

```
B*b=new C;
delete b;
```

Will this free the memory allocated by "new C"?

(b) How can a "::" operator be used as unary operator? What are the different types of polymorphism? 4

(c) What is the object oriented design, inheritance and dynamic polymorphism in C++? 3

Q7. (a) Why the main function is essential to declare both as static and public in java? What type of argument is used in the main function of a Java program? 3 $\frac{2}{3}$

(b) What is interface in Java program? Give an example where interface can be used to support multiple inheritances? Develop a standalone Java program as an example. 5

(c) Why synchronization is needed in multithreading? How this is achieved? 3

Q8. (a) Develop an applet to show a message " A simple Applet" at position (5,10) and then describe two different ways to run this applet. 6

(b) What is a package? What are the benefits of using package? 3

(c) What is bytecode? how bytecode is important an Java? 2 $\frac{2}{3}$

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Rajshahi University of Engineering & Technology
B.Sc. Engineering 1st Year 2nd Semester Examination, 2019
Department of Computer Science and Engineering
Course no. CSE 207 Course Title: Object Oriented Programming
Full marks: 70 Time: Three (03) hours

N.B. Answer six questions, taking three from each section.
The questions are of equal value.
Use separate answer script for each section.

SECTION-A

Q1. (a) Explain the following terms i) Data Encapsulation ii) Polymorphism and iii) Operator Overloading 03

(b) Imagine a tollbooth at a bridge. Car passing by the booth are expected to pay a 50 tk. toll. Mostly they do, but sometimes a car goes without paying. Now model this tollbooth with a class called "tollbooth" consisting two items one is int to hold the total number of cars and a double type to hold the total amount cash and a construction to initialize them to '0'. A member function payingcar( ) to increments the total car and BDT 50 to the cash total. Another function nopaycar( ) increments the car total but nothing to cash and finally a member function display( ) will display the two totals. Now write a C++ program to make an automatic tollbooth. 3 2/3

(c) How is object oriented programming differing from the procedural-oriented programming? 03

Q2. (a) What is constructor & destructor function? Write the properties of them. Can they both be overloaded? 04

(b) Write down a generic implementation of the stack class so that it can be used to store any type of object. — 383 3 2/3

(c) 04

```
class Base{
        public: void show( ){ cout<< "Base" << endl; }
        virtual void disp( ){ cout<< "Base" << endl; }
        };
class Der: public Base{
        public: void show( ){ cout<< "Derived" << endl; }
        void disp( ){ cout << "Derived" << endl; }
        };
void main( ){
        Der obj;
        Base bas, *ptr = &bas, *str = &obj;
        ptr→show( );
        ptr→disp( );
        str→show( );
        str→disp( );
}
```

yes, correct

Is the program correct? If so, then show the output. But if the answer is no, then explain the reason.

Q3 (a) Distinguish between the following two statements: 4 2/3

time T_2(T_1);
time T_2 = T_1;

T_1 and T_2 are objects of "time" class;

(b) We have two classes X and Y. If 'a' is an object of X and 'b' is an object of Y and we want to say a=b; what type of conversion routine should be used and where? Explain briefly. → object assignment (89) 04

(c) When is a friend function compulsory? Give an example. — 03

Q4. (a) What happens when a protected member is inherited as i) public ii) private and iii) protected 3 2/3

slid

(b) Write a C++ program using binary operator overloading to add two times T_1 and T_2 are objects of "time" class. Where "time" class contain three members hours, minutes, seconds and two constructor to initialize them with supplied values. Another function overloading "+=" operator to add two times from T_1 and T_2. Finally a display( ) member function will display time in hours:minutes:seconds format (book) 05

(c) Explain why a virtual base class is need. — 649 03

SECTION B

Q5. (a) What is stream? Give the hierarchy of the stream classes for console I/O operation. 04

(b) Class D is derived from class B. The class D does not contain any data members of its own. Does the class D require constructor? If yes why? 03

(c) 4 2/3

```
Class B1{
public:
        void display( ) { }
};

class B2{
        int b;
        public :
        void display( ){ }
};

class C: public B1, Public B2{

};
void main( ){
    D d;
    d.display();
}
```

What will be happened when the program will run? How the problem can be resolved?

Q6. (a) What does *this refer to? Give an example of it. 3 $\frac{2}{3}$

(b) What are the differences between constructor, copy constructor, default copy constructor? Explain with example. 04

(c) When do we make a virtual function "pure"? What are the implications of making a function a pure virtual function? 04

Q7. (a) Why the main function is essential to declare both as static and public in Java? What type of argument is used in the main function of a Java program? 3 $\frac{2}{3}$

(b) What is interface in Java program? Give an example where interface can be used to support multiple inheritances? Develop a standalone Java program as an example. 05

(c) What is byte code in Java program? What are the importances of byte code in Java program? 03

Q8. (a) Write a Java program that will give the following output using for loop: 05

```
*
* *
* * *
* * * *
* * * * *
```

(b) Write a simple servlet program that will display the national flag of Bangladesh. Suppose the program resides on the remote machine 192.168.10.10. How will you execute the program? 05

(c) Draw the applet's state transition diagram. 1 $\frac{2}{3}$

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"Heaven's light is our guide"

Rajshahi University of Engineering & Technology

B.Sc. Engineering 1st Year 2nd Semester Examination, 2008

Department of Computer Science and Engineering

Course no: CSE 207 Course Title: Object Oriented Programming

Full marks: 70 Time: Three (03) hours

N.B. Answer six questions, taking three from each section.
The questions are of equal value.
Use separate answer script for each section

SECTION-A

Q1. (a) How is object-oriented programming differing from the procedural-oriented programming? 3

(b) Explain the following terms: (i) Encapsulation (ii) Polymorphism (iii) Inheritance 3

(c) Is the following fragment correct? If not, why? 3

```
class base{
        public: virtual int f( int n) = 0;
                // ........
};

class derived: public base{
        public: int f( int a, int b) { return a*b; }
                // ........
};
```

Q2. (a) What are constructor and destructor function? Can they both be overloaded? 3

(b) Explain multilevel and multiple inheritance with proper example. 4

(c) What happens when a protected member is inherited (i) public (ii) private and (iii) protected? 3

(d) What is pure-virtual function? 01

Q3. (a) What is an in-line function? Write the advantages and disadvantages of it? 3

(b) Why an operator is overloaded? Does it lose any of its original functionality? Can the precedence of an overloaded operator be changed? 3

(c) What is meant by late binding and early binding? 2

(d) Show the general forms for 'new' and 'delete'. Write are some advantages of using them instead of malloc() and free()? 3

Q4. (a) What is wrong with these two overloaded functions? 3

```
Void f(int a);
Void f(int &a);
```

(b) Explain why a virtual base class might be necessary? 2

(c) "Multithreading is a specialized form of multitasking" – explain. 4

(d) What is package? How does interface play an important role in multiple inheritance? 3

SECTION-B

Q5. (a) Define a class shape that includes two double type data members to compute the area of figures, member functions get_data() to initialize these data members and compute_area() to compute the area of figures. Derive two specific classes triangle and rectangle from the base class shape. Making compute_area() a virtual function, design a program that will accept of dimensions of a triangle or rectangle and compute its area. 5

(b) What is the visibility, lifetime and storage class of a variable? 3

(c) Write short notes on: (i) Super (ii) this (iii) Exception and (iv) Runnable. 3

Q6. (a) Describe briefly the following thread related terms: 4
(i) Synchronization (ii) Messaging (iii) Sleep() (iv) isAlive()

(b) Write a program in java that uses read() to input and display the contents of a text file, the name of which is specified as a command-line argument.

(c) What are the relations between JSP and Servlet? 2

Q7. (a) Develop an applet to show a message "A Simple Applet" at position (5,10) and then describe two different ways to run this applet.

(b) Why the main function is essential to declare both as static and public in Java? What types of argument is used in main function of Java programs?

(c) What is bytecode? How bytecode is important in Java?

Q8. (a) Can any trouble or side effects occur when one object is assigned to another? Give an example. 2

(b) What is class template? Develop a template class and mention the instantiating conditions to generate a template class object with different property type. 4

"Heaven's light is our guide"

Rajshahi University of Engineering & Technology

B.Sc. Engineering 1st Year 2nd Semester Examination 2007

Department of Computer Science & Engineering

Course no: CSE 207 Course Title: Object Oriented Programming

Full marks: 70 Time: Three (03) hours

N.B. Answer SIX questions, taking THREE from each section.
The questions are of equal value.
Use separate answer script for each section.

SECTION-A

Q1. (a) What is object oriented programming? How is it different from the procedure-oriented programming? 3

(b) Distinguish the following terms: 4½

(i) Objects and classes

(ii) Inheritance and polymorphism

(iii) Data abstraction and data encapsulation

(c) What kind of things can become objects in OOP? How data and methods organized in an object-oriented program? 4

Q2. (a) What is the "*this*" pointer? 2

(b) Write down the advantages of using reference parameter. 3

(c) In what situations copy constructor is called? Why is it necessary? 3½

(d) Write down the most common general form of a copy constructor. 3

Q3. (a) Explain why must be careful when passing object to function or returning objects from a function. 3

(b) Crate a function called *sroot()* that returns the square root of its argument. Overload *sroot()* three ways: have it return the square root of an integer, a long integer and a double. 4

(c) Why might the following function not be in-lined by your compiler? 2

```
void f(){
    int i;
    for (i=0;i<10;i++)
        cout<<i; }
```

(d) Explain some ways that ambiguity can be introduced when you are overloading functions. 2½

Q4. (a) What are the significance of the access specifiers in multiple inheritance? 2½

(b) Write down a generic implementation of the stack class so that it can be used to store any type of object. 5

(c) Describe virtual function with an example? What is pure virtual function? 4

SECTION-B

Q5. (a) Using polymorphism write a Java program that will reflect the multilevel hierarchy given below: 4½

area
↑
area-cr
↑
area-cl

where *area-cr* find out the area of a circle and *area-cl* find out the surface area of a cylinder.

(b) What are the difference between class and interface? 2

(c) Write a java program where there will be a function called *rev_str()* that reverses a string. Overload *rev_str()* so it can be called with either one character array or two. When it is called with one string, have that one string contain the reversal. When it is called with two strings, returns the reversed string in the second argument. 5

Q6. (a) What is interface? Give an example where interface can be used to support multiple inheritances. Develop a standalone java program for the example. 4½

(b) What is a package? What are the benefits of using package? 3

(c) Write the output of the following Java program: 4

```
class A{int i,j;
        A(int a, int b){i=a; j=b;}
        void show(){
            System.out.println("i and j:"+ i + " " +j);
        }}
class B extends A { int k;
                    B(int a, int b, int c){
                        super(a,b);
                        k=c;
                    }
                    void show(String msg){
                        System.out.println(msg+k);}}
```

Q7. (a) Draw the message "This is Java" one line on an applet at position (5,10). 3

(b) What are the relation between JSP and servlet? 2½

(c) Why synchronization is needed in multithreading? How this is achieved? 3

(d) What is the difference between multiprocessing and multithreading? What is to be done to implement these in a program? 3

Q8. (a) Write down the Java program that will draw the following output: 4

```
* * * *
*     *
*     *
*     *
* * * *
```

(b) Develop an applet that receives three numeric values as input from the user and then displays the largest of the three on the screen. Write a HTML page also. 6

Rajshahi University of Engineering & Technology
B.Sc. Engineering 1st Year 2nd Semester Examination, 2019
Department of Computer Science and Engineering
Course no. CSE 207 Course Title: Object Oriented Programming
Full marks: 70 Time: Three (03) hours

N.B. Answer six questions, taking three from each section.
The questions are of equal value.
Use separate answer script for each section.

SECTION-A

Q1. (a) Explain the following terms i) Data Encapsulation ii) Polymorphism and iii) Operator Overloading 03

(b) Imagine a tollbooth at a bridge. Car passing by the booth are expected to pay a 50 tk. toll. Mostly they do, but sometimes a car goes without paying. Now model this tollbooth with a class called "tollbooth" consisting two items one is int to hold the total number of cars and a double type to hold the total amount cash and a construction to initialize them to '0'. A member function payingcar( ) to increments the total car and BDT 50 to the cash total. Another function nopaycar( ) increments the car total but nothing to cash and finally a member function display( ) will display the two totals. Now write a C++ program to make an automatic tollbooth. 3 2/3

(c) How is object oriented programming differing from the procedural-oriented programming? 03

Q2. (a) What is constructor & destructor function? Write the properties of them. Can they both be overloaded? 04

(b) Write down a generic implementation of the stack class so that it can be used to store any type of object. — 383 3 2/3

(c) 04

```
class Base{
        public: void show( ){ cout<< "Base" << endl; }
        virtual void disp( ){ cout<< "Base" << endl; }
        };
class Der: public Base{
        public: void show( ){ cout<< "Derived" << endl; }
        void disp( ){ cout << "Derived" << endl; }
        };
void main( ){
        Der obj;
        Base bas, *ptr = &bas, *str = &obj;
        ptr→show( );
        ptr→disp( );
        str→show( );
        str→disp( );
}
```

yes, correct

Is the program correct? If so, then show the output. But if the answer is no, then explain the reason.

Q3 (a) Distinguish between the following two statements: 4 2/3

time T_2(T_1);
time T_2 = T_1;

T_1 and T_2 are objects of "time" class;

(b) We have two classes X and Y. If 'a' is an object of X and 'b' is an object of Y and we want to say a=b; what type of conversion routine should be used and where? Explain briefly. → object assignment (89) 04

(c) When is a friend function compulsory? Give an example. — 03

Q4. (a) What happens when a protected member is inherited as i) public ii) private and iii) protected 3 2/3

slid

(b) Write a C++ program using binary operator overloading to add two times T_1 and T_2 are objects of "time" class. Where "time" class contain three members hours, minutes, seconds and two constructor to initialize them with supplied values. Another function overloading "+=" operator to add two times from T_1 and T_2. Finally a display( ) member function will display time in hours:minutes:seconds format (book) 05

(c) Explain why a virtual base class is need. — 649 03

SECTION B

Q5. (a) What is stream? Give the hierarchy of the stream classes for console I/O operation. 04

(b) Class D is derived from class B. The class D does not contain any data members of its own. Does the class D require constructor? If yes why? 03

(c) 4 2/3

```
Class B1{
public:
        void display( ) { }
};

class B2{
        int b;
        public :
        void display( ){ }
};

class C: public B1, Public B2{

};
void main( ){
    D d;
    d.display();
}
```

What will be happened when the program will run? How the problem can be resolved?

B.Sc. Engineering 1st Year 2nd Semester Examination, 2006
Department of Computer Science and Engineering
Course no: CSE 207 Course Title: Object Oriented Programming
Full marks: 70 Time: Three (03) hours

N.B. Answer six questions, taking three from each section.
The questions are of equal value.
Use separate answer script for each section.

SECTION-A

Q1. (a) What is an object and a class? What are the differences between a class and a structure? 3

(b) What is meant by instance variable and class variable? 2

(c) Design a manipulator in C++ that will give the following output. 3½

HELLOW *****

(d) What is meant by inline function? Explain with necessary example. 3

Q2. (a) What is constructor & destructor function? Write the properties of them. Can they both be overloaded? 4

(b) 3½

```
class samp ( int a,
        public : samp (int n) ( cout<< n ;)};
```

Create a samp 2D array & initialize them. Write your opinion if you have alternate process to create them.

(c) Write a polymorphic function that performs the following things 4

|± 5.5| = 5, |± 5.5| = 5.5, 'C' = 86

Q3. (a) Write down the utility of following file mode parameters 4

ios :: ate, ios:: out, ios:: trunc, ios::binary, ios :: app, ios:: in

(b) Create a class that can overload <<&>> operator. 4½

(c) Using new keyword how you can allocate a double having initial value of -123.09877 How can you deallocate it? 3

Q4. (a) Explain multilevel & multiple inheritance with proper example. 4

(b) What is virtual base class? 1½

(c) Define a class called shape that includes two double type data members to compute the area of figures, member functions get_data() to initialize these data members and compute_area() to compute the area of figures. Derive two specific classes triangle and rectangle from the base class shape. Making compute_area() a virtual function design a program that will accept dimensions of a triangle or rectangle and compute its area. 4½

(d) What happens when a protected member is inherited i) public ii) private and iii) protected? 1½

SECTION-B

Q5. (a) Describe the main features of object oriented programming. 4

(b) Discuss about the basics of a typical Java development environment. 4

(c) Write short notes on: 4

i) Super ii) This iii) Throwable and iv) Runable.

Q6. (a) What is meant by polymorphism? Write down the conditions that must be satisfied for using polymorphism. 3

(b) Using polymorphism write a Java program that calculates the overtime salary of employees. Use a base class Employee and two derived classes X and Y. The method over time salary (double hours) should be used to calculate the overtime salary of Mr X and Mr. Y. 3

(c) What are differences between class and interface? 2

(d) Generate the same output as the following program you have to use interface. 3½

```
public abstract class student {
private string stdName;
public student (string name) { stdName = name}
public abstract double obtainedMArks();
}
public class Opp extends student {
```

(e) Draw the applet's state transition diagram.

..... The End .....

```
private double incentiveMarks, acquiredMarks;
public Oop (string name, double marks){
super (name); setIntercentiveMarks (marks);}
incentiveMarks = marks*0.25; acquiredMarks = marks;
}
public double obtainedMarks(){
return(incentiveMarks + acquiredMarks);}
public class Test {
public static void main (string [ ] args) {
student,std; Oop oop = new Oop ("John", 12.0); std = oop;
system.out.println (std.getName() + "got" + std.obtainedMarks()
+ "marks");
}
}
```

Q7. (a) How does Java Applet provide security? (Java security) 2

(b) Draw the message "This is a Java program" on one line on an applet at position (10,10). (in applet section) $2\frac{2}{3}$

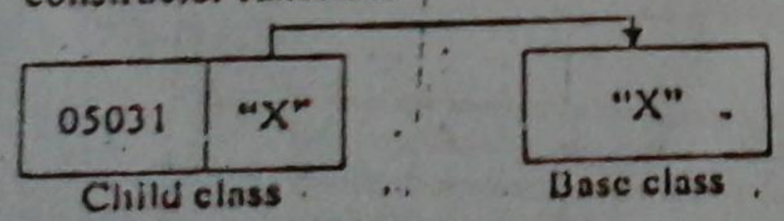
(c) Where JSP is used? What is the relation between JSP and servlet? (2412: rmg) 3

(d) Write a simple servlet program that will display the national flag of Bangladesh. Suppose the program resides on the remote machine 182.0.0.1. How will you execute the program? 4

Q8. (a) What is thread, demon thread & user thread. Explain with examples. (2201) $4\frac{2}{3}$

(b) How synchronization is achieved in multithreading? (2/7) 3

(c) Write a program in Java that performs the following operation. You must have to use the constructor function. 4



1. Base class object prints "Mr. X"
2. Child class object prints " Roll NO: 05031"

*** The End ***

"Heaven's light is our guide"

Rajshahi University of Engineering & Technology

B.Sc. Engineering: 1st Year 2nd Semester Examination, 2005

Department of Computer Science and Engineering

Course no: CSE 2078 ; Course Title: Object Oriented Programming

Full marks: 70 Time: Three (03) hours

N.B. Answer six questions, taking three from each section.
The questions are of equal value.
Use separate answer script for each section.

SECTION – A

1. (a) What do you mean by object and class? 4 2 2005

(b) Discuss about the exceptional features of Object Oriented Programming. P-541 (7)

(c) By default, objects are passed to functions by value, which means that what occurs to the copy inside the function is not supposed to affect the argument used in the call. Can there be a violation of this principle? If so, give an example. P- 576 /97

(d) What are the purposes of scope-resolution Operator? Discuss about the result of the following program – to define a member function

```
class Test{
public: int data;
Test (int d) { data=d; }
void print() { cout<<d; }
};
void main() {
Test t;
t.print();
cout<<Test::data;
}
```

2. (a) Explain with an example that how a normal function can be a friend of multiple classes. P- 575 /09

(b) How can you pass an object by reference? Give an example. P-604

(c) Give two reasons why you might want (or need) to overload a class's constructor. P-609

(d) Briefly explain why copy constructors are needed? P - 607 (16/21)

3. (a) What are the advantages of Friend Function and Friend Class? 5/03

(b) What will be the output of the following program –

```
int data=10;
class Test{
public: int data;
Test(){ data=16; cout<<data<<endl;}
void show1(){ cout<<data<<endl;}
void show2(){ int data=25; cout<<data<<endl;}
};

void main(){
Test t;
t.show1();
t.show2();
cout<<data<<endl;
```

data: 16
show1(): data 16
show2(): data 25
data: 10.

```
cout<<endl;
}
```

(c) What is the main purpose of operator overloading? Overload the -- operator for the following "Coord" class. Create both its prefix and postfix forms. The "Coord" class is used to maintain X, Y coordinates. C10 177 211

```
class Coord {
int x,y; // coordinate values
public:
Coord() { x = 0;y = 0;}
Coord(int i, int j) { x = i;y = j;}
void get_xy(int &i, int &j) { i = x; j = y;}
};
```

4. (a) Explain why the protected category is needed in inheritance? P- 238

(b) Verify the following program whether it is correct or wrong. If your answer is 'wrong', then explain sufficient reasons. Otherwise show the output.

```
class Test{
int dummy() = = 0;
};
class Test1:public Test{
void dummy(){ cout<<"Test1"<<endl;}
};
class Test2 public Test{
int dummy(){ cout<<"Test2"<<endl;}
};

Void main(){
Test2 t;
int p = t.dummy();
}
```

(c) How can a virtual base class prevent two copies of base? Explain with suitable example. P- 200

(d) Write a program to display the following output using C++ manipulating function –

```
BANGLADESH!
    1
   10
  100
 1000
```

SECTION – B

5. (a) What will be the status of private, public and protected members of a base class in one of its derived class if the class is inherited :-

i. Privately
ii. Protectedly
iii. Publicly

(b) Why can't an object be created by using an abstract class? Explain with example. P - 268

method যদি definition এবং না declare থাকে

(c) Write down a program using template where there is a class and it has three objects. One of those operates with integer type data, another with float and the other with double.

(in generic class) (378 P)

11 chapter

(c) Why pure virtual function is needed?

6. (a)

```
class Alpha{
int pubData;
protected: int data1;
public: int data2;
};
class Beta: protected Alpha{
int pData;
public: int data3;
protected: int fstData;
}objB;
class Gamma:public Beta{
int dataC;
protected: int pcData;
public: int pbData;
} objC;

void main(){
objB.data1 = 20;          //statement 1
objB.pData = 9;           //statement 2
objB.pubData = 100;       //statement 3
objC.dataC = 25;          //statement 4
objC.pubData = 95;        //statement 5
objC.fstData = 76;        //statement 6
objC.pbData = 14;         //statement 7
}
```

Explain which statements are correct. If any of them is wrong, then explain sufficient reason.

(b) Suppose a file "in.dat" contains some unsorted integers. Write a complete program using C++ file handling mechanism that will read this file, sort the data in ascending order and then write those sorted integers to a separate file "out.dat". What is the utility of Two-Phase-Cleaning?

(c) How can you create your own inserters and extractors? Give with example.

7. (a) What is Bytecode? How Bytecode is important in Java?

(b) When an operator is overloaded, does it lose any of its original functionality?

(c) Write a program that swaps each character pair in a text file. For example, if the file contains "1234", then after the program is run, the file will contain "2143". (For simplicity, you may assume that the file contains an even number of characters.)

8. (a) Why the main function is essential to declare both as static and public as well? What type of argument is used in the main function of JAVA programs?

(b) What are the differences between Applet and Application?

(c) What are the purposes of the keywords

i) super
ii) extends
iii) implements
iv) try/catch
v) import

Rajshahi University of Engineering & Technology

B.Sc Engineering 1st Year 2nd Semester Examination, 2024

Department of Computer Science & Engineering

Course No: CSE 2026 Course Title: Object Oriented Programming

Full Marks: 70 Time: Three (03) hours

N.B. *Answer any six questions, taking three from each section. All questions are of equal value. Use separate answer scripts for each section. Assume necessary missing data, if any, and indicate them on the top of each programs.*

SECTION – A

1. (a) What do you mean by object oriented programming? What are the main features of OOP? Explain briefly.

(b) What is *Enumerated Data*? Where enumerated data differs from a single dimensional array? Let for this enumerated data

```
enum data{d1, d2=-1, d3, d4, d5, d6, d7=6, d8};
```

What are the values of d1, d3, d6 and d8?

(c) Write down a program, which will add two private integer values of two objects by using overloaded unary plus operator.

2. (a) What is constructor? Can a constructor be defined with a return type? Justify your answer?

(b) What is the main thing needs to consider before overloading a function? If the following program is correct, then write down the output. Otherwise, specify errors.

```
class foverload{
    int data;
    public:foverload(){}
    int funct () {return 5;}
    int funct (int d1) { return (d1+2);}
    int funct (int d1, int d2){return (d1*2+d2);}
};
void main(){
    foverload obj;
    cout << funct (funct (funct()),5);
}
```

(c) Write a program by overloading -= and += operators, so that we can add and subtract two *times* by simple writing the following statements,

```
T1+=T2;
T2-=T3;
```

where T1, T2 and T3 are the object of *time* class which contains three values hours, minutes and seconds.

(d) Explain *Default Argument* with an example. Define *External Variable*.

3. (a) What do you mean by *data conversion*? What are it's advantages?

3. (b) What do you mean by *Data Ambiguity*? How it can be removed in OOPS? Explain following program –

```
class Abstract{
        virtual void display() =0;
};
class Derived:private Abstract{
        public:void display(){
                cout<<5;
        }
};
void main(){
        Derived obj;
        obj.display();
}
```

Output: 5

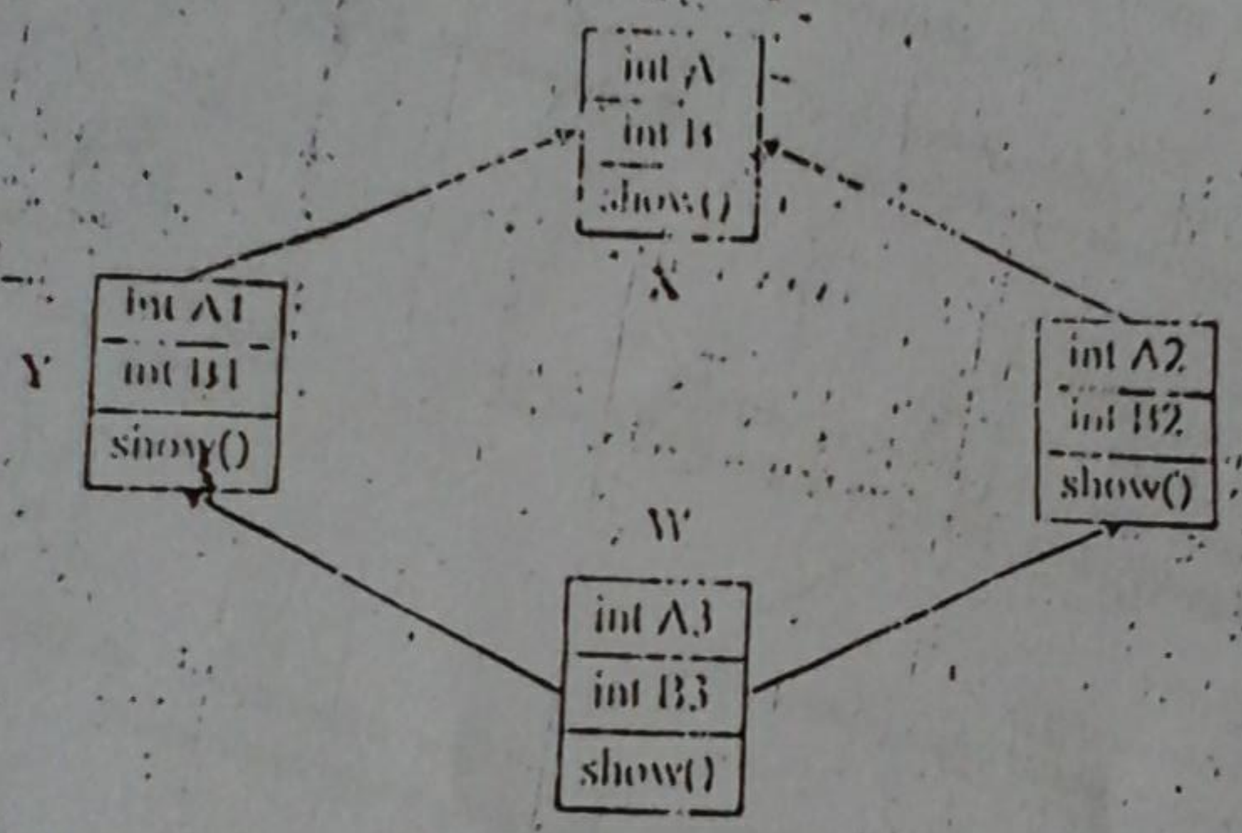
If the program is right then show the output. Otherwise, indicate the error and explain.

(c) What is *Destructor*? What is the purpose of defining it? How it can be called so? P-44 error

(d) Define the term "*visibility*" of a variable.

public protected

4. (a)



Convert the visual structure into C++ code, where show function displays the values of *A* and *B*. Assume all classes are derived publicly.

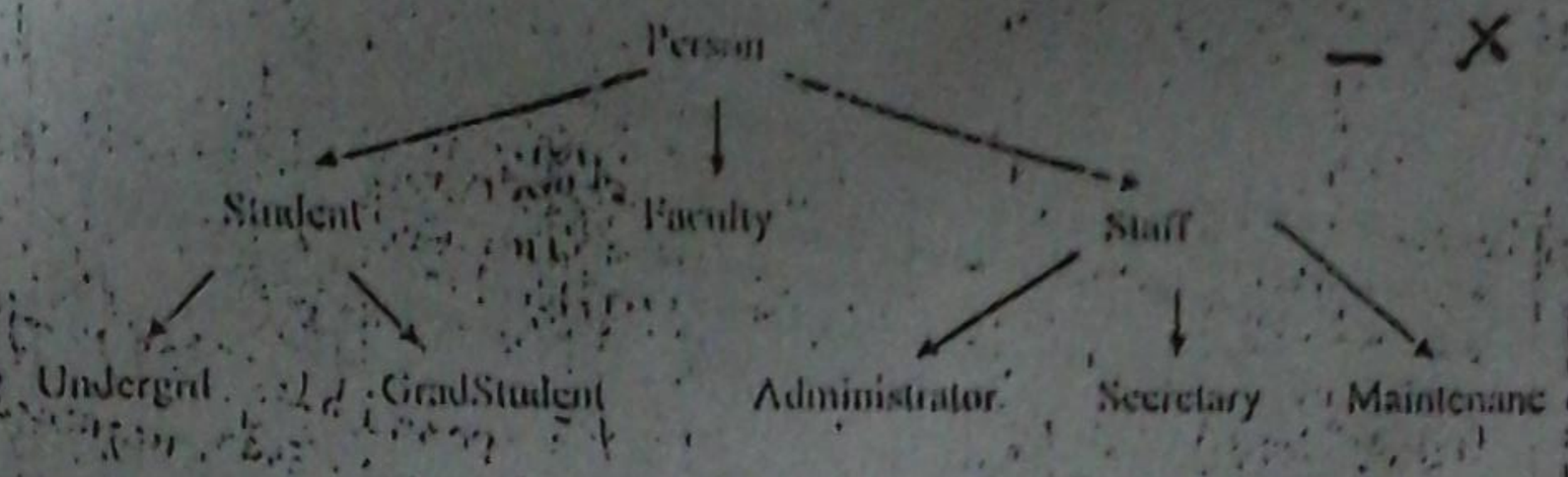
(b)

```
class Base{
        public:void show(){cout<<"Base"<<endl;}
        virtual void disp(){cout<<"Base"<<endl;}
};
class Der:public Base{
        public:void show(){cout<<"Derived"<<endl;}
        void disp(){cout<<"Derived"<<endl;}
};
void main(){
        Der* obj;
        Base bas,*ptr=&bas,*str=&obj;
        ptr->show();
        ptr->disp();
        str->show();
        str->disp();
}
```

Output:
base
base
base
derived

What will be the output of the program?

(c) Implement the following class hierarchy:



The Person, Student and Staff classes should be abstract base classes and other six classes should be concrete derived classes.

SECTION – B

5. (a) What do you mean by Accessibility? Define Platform Independence? Is C++ platform independent?

(b) Differentiate between normal and static function? What do you mean by *Late Binding*? SOP

changable – no change

(c) What will be the output of this program:

```
#include<iostream.h>
class base{
public:
 void show(){cout<<"\n I am Base";}
 };
class dery1:public base{
public:
 void show(){cout<<"\n I am dery1";}
 };
class dery2:public base{
public:
 void show(){cout<<"\n I am dery2";}
 };

void main()
{
 dery1 d1;
 dery2 d2;
 base *ptr;
 ptr=&d1;
 ptr->show();
 ptr=&d2;
 ptr->show();
}
```

Output:
I am base
I am base

(d) Can a class be a friend of another class? What will be the benefit of declaring this? Explain in a brief with an example. SOP

6. (a) What is the level of ifstream, ofstream and fstream classes in the stream class hierearcy? Write a program which will declare a binary file. Write a structure into the file, again read and display on the screen. Use only C++ file operations. (313)

(b) List the buzzwords that are used for java.

(c) Write down the importance of JAVA over internet. Define Bytecode and explain the operation and importance of JVM.

7. (a) Which function acts as the main function of an Applet program? Write a Applet program that will draw a string at (25, 25) position and necessary HTML code to load.

7. (b) Either the following Java program is correct or not? Justify your answer.

```
class conversion {
public static void main(String arg[]) {
 byte a=50;
 byte b=3,c;
 c=a*b;
System.out.println ( c );
}
}
```

Error: possible loss of precision found: int, required: byte

(c) Write a short note on Java's *transient* and *volatile* modifier. (29) Ri → Hariant

(d) What are the benefits of Applet program over application program? (Applet - 3)

8 (a) Define the following terms:
1) Late binding 2) Virtual function

P- 302

(b) Write a program so that it can write objects into and read any objects from a file named "TEST.TXT" specified by the user such as 3rd and 5th objects.

(c)

```
interface baseClass{
        void baseClass(int param);
}
class derivClass : extends implements{
        public static void main(String args[]){
                System.out.println("This is Test program");
        }
}
```

derivC public, static, void, main

Is the program correct? If so, then show the output. But if your answer is no, then explain the reason with sufficient logic.

*The end***

2nd

"Heaven's Light is Our Guide"

Rajshahi University of Engineering and Technology

B.Sc. Engineering 1st Year 2nd Semester Examination, 2003

Department of Computer Science and Engineering

Course no: CSE 207C Course Title: Object Oriented Programming

Full marks: 70 Time: Three (03) hours

N.B. Answer six questions, taking three from each section.
The questions are of equal value.
Use separate answer script for each section.

SECTION-A

Q1. (a) Describe the main features of object oriented programming. Is it possible to build object oriented programs using structural programming technique like C? Give reasons in support of your answer. (4½)

(b) Why might the following function not be in-lined by your compiler?

```
Void f1 () {int i;
        for (i=0, i<10;i++)
        cout<<i;}
```

(c) What is wrong with the following fragment?

```
#include<iostream>
using namespace std;
class c11 {int i,j; public: c11 (int a, int b) {i=a; j=b;} };
class c12 {int i,j; public: c12 (int a, int b) {i=a; j=b;} };
int main( ){ c11 a(10,20); c12 b(0,0);
        a=b; int d=15; cout<<d ;}
```

Error: Could not find a match for 'c11 :: c11 (c12)'

(d) Write the output of the following program. 125

```
#include<iostream.h>
class samp{ int a; public: samp (int n){a=n;}
        int get_a( ){return a;}
        };
int main( ){ samp ob[4][2]={
        1, 2,
        3, 4,
        5, 6,
        7, 8
        };
int i; for (i=0;i<4;i++){cout <<ob[i][0].get_a( )<<" "
cout<< ob[i][1].get_a( ) << "\n";}
cout<< "\n";
return0;}
```

FABER CASTELL

output

1	2
3	4
5	6
7	8

Q2. (a) What are classes and objects? What are the main differences between classes and structures?

(b) Create a class that contains a person's name and telephone number. Using new, dynamically allocate an object of this class and put your name and phone number into these fields within this object. P 583

3 (a) What are the two ways that new might indicate an allocation failure? P - 584

(d) Write a new version of the following program to implement reference variable.

```
#include<iostream>
using namespace std;
void f(int *n);
int main ( ) {int i=0; f(&i);
cout << "here is i/s new value : "<< i << '\n';
return 0;}
void f(int *n){*n=100;}
```

void f (int &n);

main (int &i);

Q3. (a) Write the output of the following program.

```
#include<iostream.h>
class myclass { int who;
public : myclass (int n){ who=n;
cout <<"Constructing" << who << "\n";}
~myclass ( ) { cout <<" Destructing" << who << "\n";}
int id ( ) {return who;}
};
void f (myclass 0){cout << " Received" << 0.id ( ) << "\n";}
int main ( ) {myclass X(1); f(X); return 0;}
```

Output;

constructing 1
received 1
destructing 1
destructing 1

(b) What is the output of the code segment below?

```
#include<iostream.h>
void f (int a=0,int b)
{cout<<"a: "<<a <<", b: "<< b;
cout <<"\n";}
int main ( ) {f ( ); f(10); f(10,99);
return 0;}
```

Error: Default value missing following parameter a

two
→ Infer parameters to call f-(int, int)

(c) What is copy constructor? P - 207

(d) Examine whether the following program will create ambiguous situation or not.

```
#include<iostream.h>
void f (unsigned char c)
{cout<< c;}
void f(char c) {cout <<c;}
int main ( ) {f('c'); f(89); return 0;}
```

Yes, ambiguity.
But Why?

Q4. (a) Write a program to overload the binary +, - and = operator. P - 202

(b) What happens when a protected member is inherited as public? What happens when it is inherited as private? What happens when it is inherited as protected? 173

(c) Explain the utility of virtual base class. 241

(d) Write the output of the following code segment.

```
#include<iostream.h>
class B1 { public: B1 ( ) {cout << "Constructing B1" << endl;}
~ B1 ( ) {cout << "Destructing B1" << endl;}
};
class B2 { int b; public: B2 ( ) {cout << "Constructing B2\n";}
~ B2 ( ) {cout << "Destructing B2\n";}
};
class D: public B1, public B2 {
public: D ( ){ cout << "Constructing D\n";}
~ D ( ){ cout << "Destructing D\n";}
};
int main ( ) { D ob; return 0;}
```

Output:

Constructing b1
constructing b2
constructing d
Destructing d
Destructing b2
Destructing b1

SECTION-B

Q5. (a) What will be displayed by the following program?

```
#include <iostream.h>
int main ( ){cout << 123.23 << "hello" << 100 << endl;
cout << 10 << " " << -10 << endl;
cout << 100.0 << "\n \n";
cout. unsetf (ios::dec);
cout. setf (ios::hex | ios::scientific);
cout << 123.23 << "hello" << 100 <<endl;
cout.setf (ios::showpos);
cout << 10 << " " << -10 << endl;
cout.setf (ios::showpoint | ios::fixed);
cout << 100.0;
return 0;
```

Output:

123.23 hello 100
10 -10
100
1.2323e+02 hel
ffffffff6
+100.000000

(b) Write the utility of the following function.
i) precision ( ), ii) fill ( ), iii) width ( ), iv) setw ( ).

(c) How will you create your own inserter and extractor? Explain.

(d) What is virtual function? What is pure virtual function? If a class declaration contains a pure virtual function, what is that class called, and what restrictions apply to its usage?

Q6. (a) "Generic functions are valuable and may help to simplify the source code of a program"- Explain how.

(b) Define multithreading and multitasking. Why shall we use multithreading? (201 → Book)

(c) Write the differences between class and interface.

(d) Write the output of the following Java program.

```
Class A { int i, j;
        A (int a, int b) {i=a; j=b;}
        void show ( ){
System.out.println (" i and j: " + i +"  " + j);}
        }
class B extends A { int k;
                B (int a, int b, int c) { super (a,b); k=c;}
        void show( String msg){ System.out.println (msg+k);
                                }
                }
class Override { public static void main (String args[ ])
        { B ob = new B (1, 2, 3);
          ob.show (" This is k: ");
          ob.show ( );
        }
}
```

Output: This is K 3
i and j: 1 2

Q7. (a) Write necessary code to create a class named myclass in a package test.mypack.

(b) What are the various methods in an applet skeleton? When are they called?

(c) How does Java Applet provide security?

(d) Write an applet program that will draw a rectangle, a circle and an ellipse. Fill those objects with various colors.

Q8. (a) What are the basic differences between an applet and a servlet?

(b) Write a simple servlet program that will display the name of your institution. How will you execute the program? Suppose the program resides on the remote machine 192.160.10.200.

(c) Write a simple Java program that will create three buttons labeled "Yes", "No", and "Undecided". Each time one is pressed, a message is displayed that reports which button has been pressed.

(d) Where JSP is used? What is the relation between JSP and Servlet?

********** THE END **********

Heaven's Light is Our Guide

Bangladesh Institute of Technology, Rajshahi

Computer Science and Engineering Department

B.Sc. Engineering First Year Second Semester Examination, 2002

Course no :CSE 207C, Course Title: Object Oriented Programming

Full Marks: 70 — Time: 3 hours

N.B. Answer six questions , taking three from each section.
The questions are of equal value.
Use separate answer script for each section.

Section A

Q.1(a) How is object oriented programming different from the procedure-oriented programming ?

(b) Create a function called min() that returns the smaller of the two numeric arguments used to call the function. Overload min() so it accepts characters, integers, and double as arguments.

(c) What is wrong with the following fragments ?

```
//include<iostream>
using namespace std;
class C11 {int i,j;
        public:C11(int a, int b) {i=a;j=b;}
        };
class C12 {int i; int j;
        public: C12(int a, int b){i=a; j=b}
        };
int main(){ C11  x(10,20); C12  x(60,0);
        int x=30;
}
```

(d) Write a program to exchange the private values of two classes by a common friend function. The friend function will be called by reference.

(e) How does a class accomplish data hiding ?

Q.2(a) Create a class FLOAT that contains one float data member. Overload all the four arithmetic operators so that they operate on the objects of FLOAT.

(b) Debug the following program

```
//include <iostream.h>
class B1 { int b1;
        public:
        void display();
        { cout<<b1<< "\n";}
        };
class B2 { int b2;
        public:
        void display();
        { cout<<b2<<endl;}
        };
class D: public B1, public B2
        { ;
main()
        { D d;d.display(10)
                d.B1::display();
                d.B2::display();
        }
```

(c) What will happen during the compilation of the following program ?

```
//include<iostream>
using namespace std;
float f(float i)
```

```
double f(double i){return i/3.0;}
int main(){float x=10.09;
        double y=10.09;
        cout<<f(x);
        cout<<f(y);
        cout<<f(10);
        return 0;
        }
```

(d) When is it appropriate to use default arguments ? When is it probably a bad idea ?

Q.3(a) When do we make class virtual ?

(b) What is containership ? How does it differ from inheritance ?

(c) When a base class is inherited as public by the derived class, what happens to its public members ? What happens to its private members ? If the base is inherited as private by the derived class, what happens to its public and private members ?

(d) Write the output of the following program.

```
//include<iostream>
using namespace std;
class base { public:
                    virtual void func()
{ cout << "using base version of func()\n";}
};
class derived1: public base {
        public: void func(){cout<< "using derived version of func()\n";}
};
class derived2: public derived1 {
        public: void func(){ cout<< "using derived 2's version of func()\n";}
};
int main(){ base *p; base ob; derived1 d_ob1;
        derived2 d_ob2; p=&ob; p->func();
        p=&d_ob1; p->func();
        p=&d_ob2; p->func();
        return 0;
        }
```

Output:

Using base version of func()
" base " "
" derived2's " " "

(e) What is pure virtual function ?

Q.4(a) Create an inserter and extractor for this class:

```
class pwr{ int base; int exponent;
double result;
  public: pwr( int b, int e);};
pwr:: pwr( int b, int e)
{ base=b; exponent=e;
        result=1;
for(; e; e--) result=result*base;
}
```

(b) What does the following program display ?

```
//include<iostream.h>
class A{ public: A() { cout<< "Constructing A\n";}
        ~A(){ cout<< "Destructing A\n";}
        };
class B{ public: B(){ cout<< "Constructing B\n";}
        ~B(){ cout<< "Destructing B\n";}
        };
class C: public A, public B{ public:
 C(){ cout<< "Constructing C\n";}
 ~C(){ cout<< "Destructing C\n";}
};
int main()
        { C ob;
        return 0;
}
```

Constructing a
" b
" c
Destructing c
" b
" a

Fill in the missing Constructor functions in this program:

```
//include<iostream.h>
class base { int i, j;
        public:
        // write Constructor
void showij(){ cout<< i <<j;}
};
class derived: public base{ int k;
public:
        // write Constructor
void show(){ cout <<k <<"  "<<showij();}
};
int main()
{ derived ob(1,2,3);
ob.show();
return 0;
}
```

(iii) Define late binding and early binding.

Section B

Q.5(a) What is stream ? Give the hierarchy of the stream classes for console I/O operations.

(b) Discuss the syntex for creating user defined manipulators. Design a single manipulator to provide the following output specification for printing float values: (i)10 column width (ii)Right justified (iii) Two digits precision (iv) Filling unused spaces with '*' and (v) Trailing zeros shown.

(c) What are manipulators ? Give the structure of user defined manipulator.

Q.6(a) How constructor can be used to open a file ? What will be the action of the following functions:
(i) seekg(0, ios:: beg) (ii) seekg(0, ios:: cur) (iii) seekg(-10,ios:: end) (iv) seekg(m, ios:: cur).

(b) Mention some situation that causes bad file operations. How these situations can be handled using function ?

(c) Suppose you are given a class definition as:

```
class BOOK {
char title[30];
char author[30];
int ISBN;
float cost;
public:
void readdata(void);
void showdata(void);};
```

Write a complete C++ program that will take input about book's information from user and store them in a file named "books.txt".

Q.7(a) Why Java is important for internet ?

(b) What is the difference between Java application and Java applet ? What is Java Virtual Machine(JVM) ?

(c) Write a Java program that will consume lowest amount of memory for storing the following numeric triangle in a 2-D array.

```
0
1   2
3   4   5
6   7   8   9
```

Q.8(a) Explain the methods that perform initialization and termination of a java applet.

(b) How applet provides security to your computer resources ? Write a java applet code that will display the following message in the status window of the browser: " you can see status here....."

(c) Write a java applet program that will take five integers as parameters through applet tag, compute their sum and display the result.

*****The End*****

Heaven's Light is Our Guide

Bangladesh Institute of Technology, Rajshahi

Computer Science and Engineering Department

B.Sc. Engineering First Year Second Semester Examination, 2001.

Course no :CSE 207. Course Title: Object Oriented Programming

Full Marks: 70 Time: 3 hours

N.B. Answer six questions , taking three from each section.
The questions are of equal value.
Use separate answer script for each section.

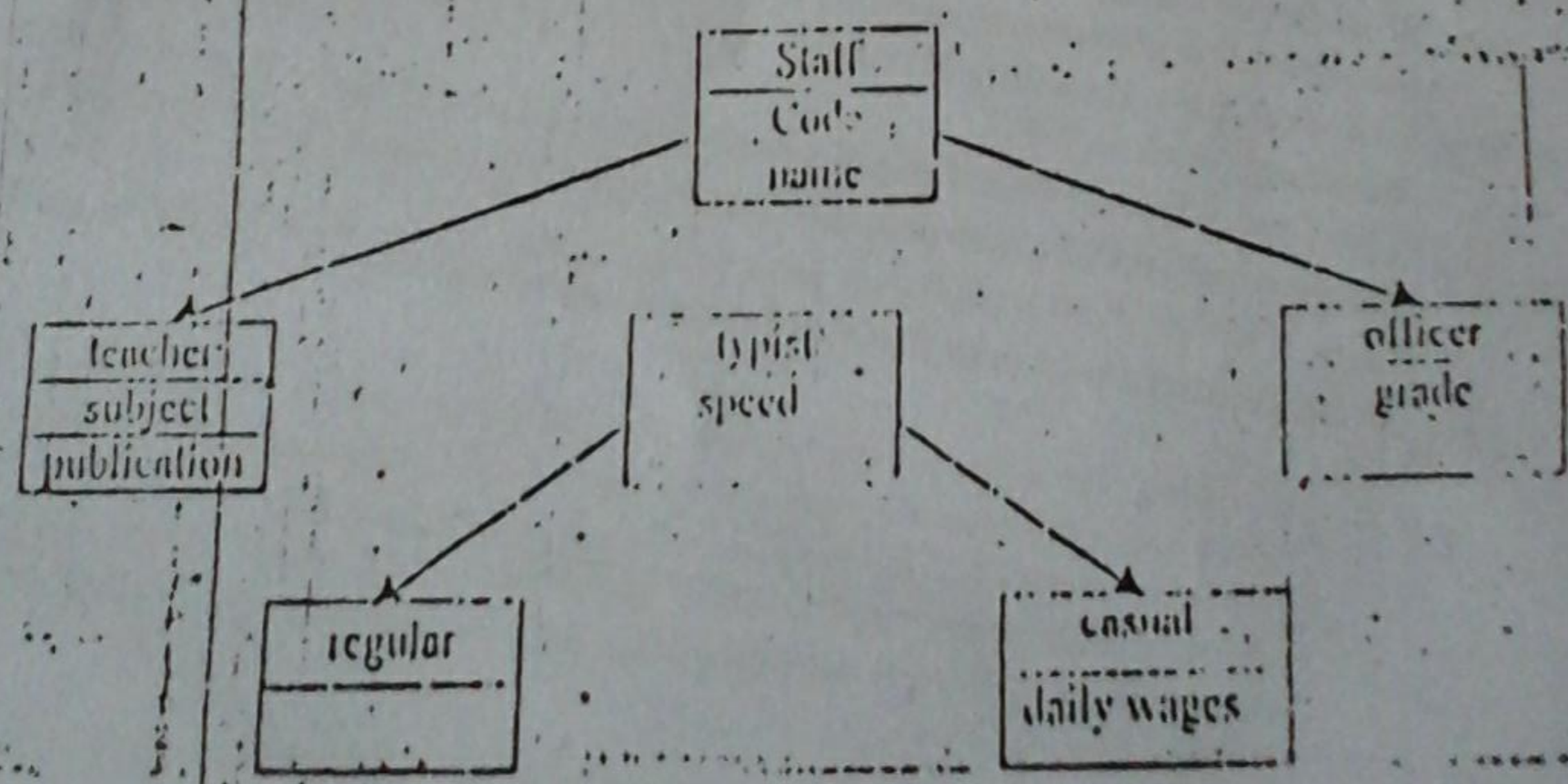
Section A

Q.1(a) Explain function overloading and function overriding.

(b) Write the output of the following program.

```
#include<iostream>
using namespace std;
class B1 {public:B1(){cout<< "constructing B1\n";}
    ~B1() {cout<< "Destructing B1\n";}
    };
class B2{int n;
    public: B2(){cout<< "constructing B2\n";}
    ~B2(){cout<< "Destructing B2\n";}
    };
class D: public B1, public B2 {
    public: D() {cout<< "constructing D\n";}
        ~D() {cout<< "Destructing D\n";}
        };
int main()
{ D obj;
return 0;
}
```

(c) An educational institution wishes to maintain a database of its employees. The database is divided into a number of classes whose hierarchical relationships are shown in figure below. The figure also shows the minimum information required for each class. Specify all the classes and define function to create database and retrieve information as and when required.



Q.2(a) Draw the hierarchy of C++ stream classes for console I/O operation.

(b) Write a program that will save the contents of a screen in another portion of RAM. Suppose the beginning address is 0X1B800 and the mode is text.

(c) Design your own manipulator to provide the following output specifications for printing float values

i) 12 columns width ii) Right justified iii) two digits precisions iv) filling the unused places with *.

Q.3(a) Explain the utility of VROOM.

(b) Describe the error handling functions for file operations. How error can occur during file operation ?

(c) Write statements using seekg() to achieve the following:

i) To move the pointer 15 positions backward from current position.

ii) To go to the beginning after an operation is over.

iii) To go backward by twenty bytes from current.

iv) To go to byte no 50 in the file.

Q.4(a) What are the advantages of saving data in binary form ?

(b) Define STL. Write a program that will implement the find() algorithm.

(c) What are the basic differences between vector and array ?

(d) Write a simple applet program with minimum HTML tags.

Section B

Q.5(a) In OOP " Data and code are encapsulated". Discuss the fact with proper example.

(b) Why is this pointer for ? What is the advantage of using *this pointer ?

(c) What is friend function ? Describe with suitable example.

Q.6(a) Let we have a class "student". A number of objects is instantiated during program execution. Write code that is able to keep track the number of objects generated at any point of program execution.

Also discuss how your code makes it possible

(b) How any method of base class is overridden from a derived class in java ? Explain it with an example.

(c) Which operators cannot be overloaded in C++ ?

Q.7(a) Create a function template to display a value that is both preceded and followed by 10 asterisks on a line. Write a main program that tests the function with character, integer and double data.

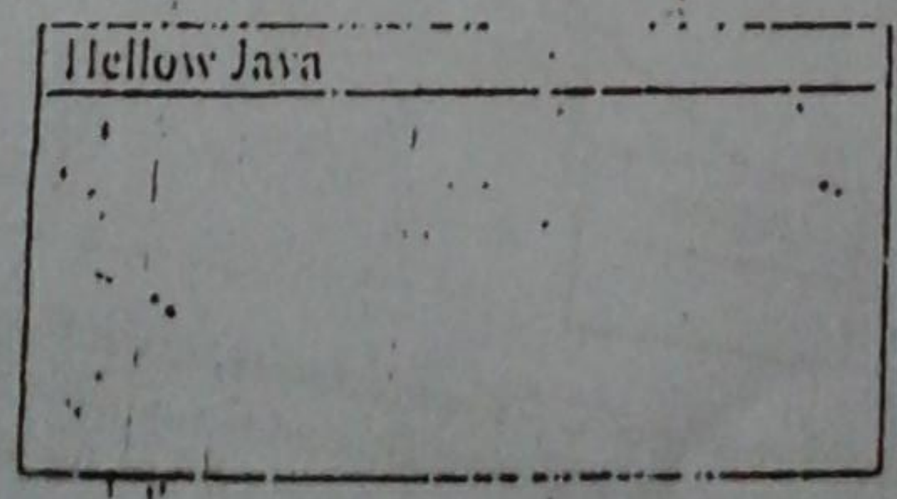
(b) What are the arguments in the main() function in case of java. Explain by example.

(c) What is class template ? Developed a template class and mentioned the instantiating conditions to generate a template class object with different property type.

Q.8(a) Why exception Handling Needed ? Write the general structure of a exception handling block in OPP.

(b) Can you assign an object of a derived class to an object of the base class ? Can you assign an object of a base class to an object of the derived class ? If possible, show how.

(c) Write a program in java that displays a window and shows " Hellow Java" in the title bar.



Haven't Eat is our guide

Bangladesh Institute of Technology (BIT), Rajshahi.

Computer Science and Engineering Department

B.Sc Engineering 1st year 2nd Semester Examination, 2000

Course No CSE-207 Course Title: Object Oriented Programming

Full marks: 70 Time: 3 hours

*N.B: Answer 6 (six) questions Taking 3 (three) from each section.

The question are of equal value.

Use separate answer script for each section.

Section-A

Q1(a) Briefly describe the various features of an object oriented programming language.

b) Create a function called min( ) that returns the smaller value of two numeric arguments used to call the function. Overload min( ) so it accepts characters or integer or double as an argument.

c) What is wrong with the constructor shown in the following fragment?

```
class sample {
double a,b,c;
double sample();
};
```

Q2(a) Explain the visibility, lifetime and storage class of a variable.

b) How inline function works? Which function is by default inline? What is the difference between inline function and the macro 'define'?

c) Explain the term data hiding in view of object oriented programming.

d) What do you mean by dynamic initialization of objects? Why do we need to do this?

Q3(a) What does inheritance mean in c++? What are the different forms of inheritance? Give an example for each.

b) Suppose each class1, and class2 keeps a data item. Write a program so that a friend function adds the two data items and returns the value.

c) Why shall we overload operator? Write a program that overloads binary operator '+' to add two objects ob1 and ob2; Assign the value to another object ob3, i.e, ob3= ob1+ ob2 . What happens when the compiler sees the following statement?
ob3=100+ob1

Q4(a) Create a generic base class called building that stores the number of floors a building has, the number of rooms and its total square footage. Create a derived class called house that inherits building and also stores the number of bedrooms and the number of dressing rooms. Next create a derived class called office that inherits building and also stores the number of fire extinguishers and the number of telephones.

b) Why do we need virtual functions? When do we make virtual function "pure"?

c) While one class inherits another when are the classes' constructors called? When are their destructors called?

Section-II

Q5 a) Explain early bounded and late bounded polymorphism.

b) Create a base class called shape. Use this class to store two double type values that could be used to compute the area of figures. Derive two specific classes called triangle and rectangle from the base shape. Add to the base class a member function getdata( ) to initialize base class data members and another member function display( ) to compute and display the area of figures. Make display as a virtual function and redefine this function in the derived classes to suit their requirements.

c) When do we make virtual function pure?

Q6 a) What is abstract class?

b) Show the hierarchy of stream classes and briefly write their contents. Why should we use dot operator to call the member function of stream classes? Such as cin.get(c).

c) Design a single manipulator to provide the following output specifications for printing the float values: i) 12 columns width ii) Right justified iii) 7 digits precision iv) Filling of unused places with *.

Q7 a) Write necessary syntax for creating your own inserter and extractors.

b) Explain with an example, how would you create space for an array of objects using pointer

c) Write a C++ program that reads a text file and prints the file. Error handling during file operation is mandatory.

Q8 Write short notes on i) Templates ii) Abstract data Types.

Q9 a) Distinguish between objects and classes.

b) What is containership? How does it differ from inheritance?

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