

Ref. No.

FCS/TIT-303

B. TECH. (CSE/IT)
(THIRD SEMESTER)

MID SEMESTER EXAMINATION, 2018

OOPs USING C++

Time : 1:30 Hours

Maximum Marks : 50

- Note : (i) This question paper contains two Sections.
(ii) Both Sections are compulsory.

Section—A

Find the output : (1×5=5 Marks)

(a) int a = 10 + 20/30% 4-5 && 7 ! 2; The value of a is

(b) # include <studio.h>
include <stdbool.h>
int main ()
{

 int a = 10, b = 4;
 bool res = ((a == b))&& cout
 <<“Hello”);

 cout <<res;
 return 0;

}

(c) #include<iostream>
 using namespace std;
 int main () // Hint : int is taking 4 byte
 {

 int a[] = {10, 15, 20, 25, 30};

 int *p1, *p2;

 p1 = a;

 p2 = &a[3];

 cout << p2 - p1;

 return 0;

}

(d) #include<iostream>

using namespace std;

void show(int a, int b = 10)

{

 cout << a + b;

}

int main ()

{

 show (20, 30);

 return 0;

}

(e) #include<iostream>

using namespace std;

int n = 20;

int main ()

```

{
    int n = 40;
    cout << n;
    cout << "\n" << ::n;

    {
        int n = 60;
        cout << n;
        cout << ::n;
    }

    return 0;
}

```

Attempt any five parts : (3×5=15 Marks)

- Difference between Class and Structure in C++.
- How do the following statement differ ?
 - `int const *ptr;`
 - `int *const ptr;`
- What is manipulator ? Give example of at least three manipulator.
- Explain insertion and extraction operator with diagram.
- Explain type casting (implicit and explicit) with example.
- What is the importance of destructor in the program ?

Section—B

3. Attempt any *two* parts of choice from (a) and (c). $(5 \times 2 = 10 \text{ Ma})$

- (a) Difference between Procedural Orie and Object Oriented Programme (D discuss principle of OOPs).
- (b) Define Inline Function. What is the of making a function inline with example
- (c) Define a class in C++ with the follow description :

Private Members

A data member Flight number of type integer

A data member Destination of type string

A data member Distance of type float

A data member Fuel of type float

A member function CALFUEL() calculate the value of Fuel as per following criteria :

Distance

≤ 1000

Fuel

500

more than 1000 and ≤ 2000 1100

more than 2000 2200

Public Members

A function FEEDINFO () to allow user enter values for Flight Number.

Destination, Distance and call function CALFUEL () to calculate the quantity to Fuel

A function SHOWINFO () to allow user to view that content of all the data members

Attempt any *two* parts of choice from (a), (b) and (c). $(5 \times 2 = 10 \text{ Marks})$

- Define a class Time that has three integer data members for hours, minutes and seconds, define a member function to read the values, member function to add two time objects, member function to display time in HH : MM : SS format. Write a main function to create two time objects, add them and display the results in HH : MM : SS format.
- Differentiate between Call by value, Call by address and Call by reference with the help of program.
- Define Constructor. Write the properties of a Constructor. Explain its types with example of each.

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5. Attempt any two parts of choice from
and (c). (5x2=10)

(a) Explain Static data member and
member function. Write a program
to count number of objects created in it.

(b) Write a function POWER () to
raise a number m to a power n. The function
accepts a double value for m and an integer
value for n and return the result correctly.
If the user gives a default value of 2 for n to make
the function to calculate square when
argument is omitted. Write a
function to read values for m and n
from the user.

(c) Can we use the same function name
as a member function of a class and an
ordinary function in the same program file ?
How are they distinguished ? If n
then give reasons.

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B. TECH. (THIRD SEMESTER) END SEMESTER EXAMINATION, 2018

OOPs USING C++

Time : Three Hours

Maximum Marks : 100

- Note : (i) This question paper contains five questions with alternative choice.
- (ii) All questions are compulsory.
- (iii) Each question has three Parts (a), (b) and (c). Attempt any *two* Parts of each question.
- (iv) Total marks assigned to each question are **twenty**.

1. Attempt any *two* questions of choice from (a), (b) and (c). ($2 \times 10 = 20$ Marks)

(a) (i) What will be output of the following code ? Give reason to justify your answer.

```
#include<iostream>
using namespace std;
#define x 5+2
```

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```
int main ()  
{  
    int i;  
    i = x*x*x;  
    cout << i;  
    return 0;  
}
```

- (ii) What will be output of the following code ? Give reason to justify your answer.

```
int main ()  
{  
    int a = 8;  
    cout << (a>>3);  
    return 0;  
}
```

- (iii) What will be output of the following code ? Give reason to justify your answer.

```
int main ()  
{  
    char * p;  
    cout << size of (*p);  
    cout << size of (p);  
    return 0;  
}
```

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- (iv) What will be output of the following code ? Give reason to justify your answer.

```
class Test
```

```
{  
    static int a;
```

```
};
```

```
int main ()
```

```
{  
    Test t1;
```

```
    cout << sizeof (t1);  
}
```

- (v) What will be output of the following code ? Give reason to Justify your answer.

```
int main ()
```

```
{  
    int a [5] = {10, 20, 30, 40, 50};
```

```
    cout << a [3];
```

```
    cout << 3 [a];
```

```
    return 0;  
}
```

- (b) (i) Write any five new operators introduced in C++ with their meanings. 5

- (ii) Explain "using namespace std" with suitable example. 5

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- (c) (i) How does OOP overcome shortcomings of traditional programming approaches ?
(ii) Difference between Static memory allocation and Dynamic memory allocation with example.

2. Attempt any two questions of choice from (b) and (c). $(2 \times 10 = 20)$

(a) (i) What will be the order of the construction invocation of the following code :

class date

{
};

class time
{
};

class train
{

date ddate;
time dtime;

};

void main ()

{
data d1;
time t1;
train tr1;

}

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- (ii) How are the following two statements different ?
 $\text{Date D2} = \text{D1};$
 $\text{D2} = \text{D1};$
(iii) Reusability of classes is one of the major properties of OOPs. How is it implemented in C++ ?
(iv) What is the significance of access specifier in a class ?
(v) Why can't we pass an object by value to a copy constructor ?
(b) Imagine a tollbooth at a bridge. Cars passing by the booth are expected to pay a ₹ 50 toll. Mostly they do, but sometimes a car goes by without paying. The tollbooth keeps track of the number of cars that have gone by, and of the total amount of money collected.
Model this tollbooth with a class called TollBooth. The two data items are a type unsigned int to hold the total number of cars, and a type double to hold the total amount of money collected. A constructor initializes both of these to 0. A member function called payingCar () increments the car total and adds 50 to the cash total. Another function, called nopayCar (), increments the car total but adds nothing.

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to the cash total. Finally, a member function called display() which displays the total number of cars and total amount collected. Use static data members if required.

Create a menu drive program for the scenario.

- (i) Paying Car
- (ii) Non Paying Car
- (iii) Display
- (iv) Exit

(c) Differentiate between Constructor and Destructor. Also write a program to overload constructor.

3. Attempt any two questions of choice from (b) and (c). $(2 \times 10 = 20 \text{ Marks})$

(a) (i) Discuss all the three cases of friend function.

Case 1 : When friend function is a member of two classes.

Case 2 : When friend function is a member of one class and a friend of another class.

Case 3 : Friend class

(ii) Write a program to swap the data members of two different classes.

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(b) Create a class Location with data members Longitude and Latitude.

Write a C++ program to overload the following operators using member functions :

- (i) `>>` operator : to input the data members
- (ii) `<<` operator : to display the data members
- (iii) `++` operator : to increment the location
- (iv) `--` operator : to decrement the location
- (v) `-` operator : to find the difference between two locations.

(c) What are the rules to overload operators through member function and through friend function ? Also list the operator which we cannot overload through member function and through friend function ?

Attempt any two questions of choice from (a), (b) and (c). $(2 \times 10 = 20 \text{ Marks})$

(a) Discuss the Diamond problem and give possible solution with program.

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- (b) Define pure virtual functions. Create a base class called Shape. Use this base class to store two double type values that can be used to compute the area of figure. Create two specific classes called Triangle and Rectangle from the base class Shape. In the base class, a member function get_data() to initialize base class members and another member function display_area() to compute and display the area of figures. Redefine display_area() as a virtual function and redefine this function in the derived classes to suit their requirements.

Using these three classes, design a program that will accept dimensions of triangle or a rectangle interactively and display the area.

Remember the two values given will be treated as lengths of two sides in the case of rectangles, and as base and height in the case of triangles, and so on follows :

$$\text{Area of rectangle} = x * y$$

$$\text{Area of triangle} = 1/2 * x * y$$

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- (c) (i) What is the importance of using inline function? Explain with example. 5
(ii) Explain the importance of this pointer with programming example. 5
5. Attempt any *two* questions of choice from (a), (b) and (c). (2×10=20 Marks)
- (a) Attempt any *five* questions :
State what will happen in the following situations :
(i) An exception is thrown outside of try block;
(ii) No catch handler matches the type of exception thrown.
(iii) Several handlers match the type of exception thrown.
(iv) A catch handler throws an exception.
(v) A function throws an exception of type not specified in the specification list.
(vi) catch (...) is the first cluster of catch handler.
(vii) Placing throw () in a function header line.
(viii) An exception rethrown within a catch block.

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- (b) Assuming that a text file named FIRST.TXT contains some text written into it, write a function named vowelwords(), that reads the file FIRST.TXT and creates a new file named SECOND.TXT, to contain only those words from the file FIRST.TXT which start with a lowercase vowel (i.e., with 'a', 'e', 'i', 'o', 'u').
For example, if the file FIRST.TXT contains
Carry umbrella and overcoat when it rains
Then the file SECOND.TXT shall contain
umbreall and overcoat it.
- (c) What is STL ? How is it different from the C++ standard library ? Why is it gaining importance among the programmers ?

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B. Tech. (CS/IT) (Third Semester) Mid Semester EXAMINATION, 2016

OOPS WITH C++

Time : Two Hours] [Maximum Marks : 60

- Note :** (i) This question paper contains *three* questions with alternative choice.
(ii) All questions are compulsory.
(iii) Each question carries four Parts (a), (b), (c) and (d). Attempt either Parts (a) and (b) or (c) and (d) of each question.
(iv) Each Part carries **ten** marks. Total marks assigned to each question are **twenty**.

1. (a) Explain the reasons why Object oriented programming approach is needed when we were having procedural programming approach already. List *five* applications of C++. **10**

(b) An electricity board charges the following rates to domestic users :

Public Members :

- (i) A function `GetFood()` to allow user to enter values for `FoodCode`, `Food`, `FType` and call function `GetSticker()` to assign Sticker.
- (ii) A function `ShowFood()` to allow user to view the content of all the data members.

Or

- (e) Answer the following questions :

- (i) How is dynamic initializations of objects achieved ? 2 each
- (ii) When is it better to make a function inline ?
- (iii) What can be written in the blank out of static and const with the following function definition and what does that mean ?

`int sample(int a, float b, char c).....`

{

<function body>

}

- (iv) We create a class having name as `test`. Can a non-member function access the data member of this class. Justify your answer by an example.

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- (v) A function is called `fun(a, b)` where `fun()` is the function name and `a` and `b` are actual parameters. A student Shubham is saying to his friend Ramesh that this function is called using call by value method, whereas Ramesh is saying that this function is called using call by reference method. Who is correct ? Justify your answer.

- (d) Define a class `Candidate` in C++ with the following specification : 10

Private Members :

`Rno`(Registration Number) type long

`Cname` of type string

`Age_marks` (Aggregate Marks) of type float

`Grade` of type char

A member function `setGrade()` to find the grade as per the aggregate marks obtained by the student.

Equivalent aggregate marks range and the respective grade as shown below :

Aggregate Marks	Grade
<code>Marks >= 80</code>	<code>A</code>
Less than 80 and ≥ 65	<code>B</code>
Less than 65 and ≥ 50	<code>C</code>
Less than 50	<code>D</code>

For the first 100 units : 60 paisa per unit
 For next 200 units : 80 paisa per unit
 Beyond 300 units : 90 paisa per unit
 All users are charged a minimum of ₹ 50.
 If the total amount is more than ₹ 300, an additional surcharge of 15% is added.
 Write a C++ program to read the names, user and number of units consumed by the user and print out the charges with names. You can make the program with or without using class concept.

Or

Explain at least any five features of Object Oriented Programming style.

The voltage gain of an amplifier is given by the formula :

$$\text{Voltage-gain} = \left[\frac{275}{\sqrt{23^2 + (0.5f)^2}} \right]^n$$

where f is the frequency in Hertz and n is the number of stages in the amplifier. Write a complete C++ program that asks the user to input values for n and f , calculates the value of the voltage gain using the formula, and produces the following display on the terminal screen :

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At a frequency of X hertz, the voltage gain is Y where X is replaced by the frequency and Y is replaced by the voltage gain. 10

Note : Use float variables for the frequency and voltage gain.

- (a) Write short notes on the following : 2 each
- (i) Namespaces
 - (ii) Early Binding and Late Binding
 - (iii) Structure vs. Class
 - (iv) Manipulators
 - (v) Reference Variables
- (b) Define a class RESTRA in C++ with the following description : 10
- Private Members
- (i) FoodCode of type int
 - (ii) Food of type string
 - (iii) FType of type string
 - (iv) Sticker of type string
 - (v) A member function GetSticker() to assign the following value for Sticker as per the given FType :

FType	Sticker
Vegetation	GREEN
Contains Egg	YELLOW
Non-Vegetarian	RED

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(b) Write a program which asks to enter a integer number from user and prints the following table :

Sample output :

Enter any Integer Number : 10

NUM	SQR	SQRT.	LOG
1	1	1.000	0.0000e+0
2	4	1.414	6.9315e-0
3	9	1.732	1.0986e-0
4	16	2.000	1.3863e+0
5	25	2.236	1.6094e+0
6	36	2.449	1.7918e+0
7	49	2.646	1.9459e+0
8	64	2.828	2.0794e+0
9	81	3.000	2.1972e+0
10	100	3.162	2.3026e+0

You have to make this program using manipulators. Do not use tabs to print the spaces.

Description of each column is as follows :

SQR : It prints the square of the number (left justified)

SQRT : It prints the square root of each number (with precision of 3 decimal digits and the trailing zeros must be printed that

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is if answer is 3.000 it should not be printed as 3).

LOG : It prints the natural logarithm of number in scientific notation.

(c) (i) Explain briefly the following string class function : replace(), length() and capacity(), compare(). 5

(ii) Find the output/error in this code. Explain your answer also. (Otherwise no marks will be given)

```
#include<iostream>
using namespace std;
int main()
{
    try {
        throw 'a';
    }
    catch (int x)
    {
        cout << "You are Caught\n";
    }
    try
    {
        throw 6;
    }
    catch (...)
    {
        cout << "What is this ?";
    }
}
```

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```

{
cout<<endl<<endl<<endl<<endl<<endl
    "Destroyed"
}
}

main()
{
Point Point1(2,5);
cout<<"Good Question"<<endl;
Point Point2(4, 5);
cout<<sizeof(Point1)<<
    " " << sizeof(Point0);
}

```

```

(ii) #include <iostream>
using namespace std;
int a = 5;
int main()
{
    int a = -9;
    cout<< "a = " <<a << endl;
    {
        int a = 7, b = 6;
        int c = 4 + 13 & 2 - 1 &&c;
        cout<< "a = " <<a << " "
            <<c <<c;
    }
    cout<< "a = " <<a << " " <<b << endl;
    return 0;
}

```

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B. Tech. (CS/IT) (Third Semester) End Semester EXAMINATION, 2016 OOPS USING C++

[Time : Three Hours] [Maximum Marks : 100]

- Note :** (i) This question paper contains five questions.
- (ii) All questions are compulsory.
 - (iii) Attempt any two questions of your choice from a, b and c in each from Q. No. 1 to Q. 5.
 - (iv) Total marks assigned to each question are twenty.
 - (v) Write to the point answers. Do not beat about the bush.
1. Attempt any two questions of choice from (a), (b) and (c). $(2 \times 10 = 20 \text{ Marks})$
- (a) Write short notes on the following :
- (i) Features of object oriented language.
 - (ii) User defined type conversions.

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A constructor to assign default values to data members as follows :

Rno = 0, Cname = "N.A", Agg_marks = 0.0

A function Getdata() to allow users to enter values for Rno, Cname, Agg_marks and call function setGrade() to find the grade.

A function dispResult() to allow user to view the content of all the data members.

Write the C++ program to perform the above task.

3. (a) Define Constructor and its types. Explain copy constructor with the help of example. Can a constructor be made as private member function in a class ? 10
- (b) Create a class employee, having the following : 10

Data members :

Employee name, employee id, salary.

The member functions are :

enterdetails() :	to enter the details of employee
displaydetails() :	to display the details of employee
searchid() :	to search a particular employee id asked by user from the records of employees

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Write a C++ program to enter the details of employees. The program should ask for an employee id to be searched from records of employees and if employee id is found then print the message "ID found" with all the details corresponding to that employee id. If employee id is not found then print the message "ID NOT FOUND".

Or

- (c) Define overloading and function overloading. Explain function overloading with the help of suitable example. 10

- (d) Find the output or error (if any) present in the following codes : 5 each

(i)

```
#include <iostream>
using namespace std;
class Point
{
private;
float x, y;
public:
Point(float TempX = 0, float Temp
Y = 0)
{
x = Temp X;
y = Temp Y;
}
~Point()
```

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- (ii) List two kinds of exceptions, each with example.

- (iii) What is this pointer ?

- (iv) Find the output/error in this code. (assume size of int as 4 bytes and double as 8 bytes).

```
#include<iostream>
using namespace std;
class Test
{
    static int i;
    int j;
    double
};

int Test::i;
int main()
{
    cout << sizeof(Test) + sizeof(double);
    return 0;
}
```

- (v) Consider the following statements :

```
string s1("C ++ Question"); //line 1
string s2("Average Exam");//line 2
cout <<..... //line 3
```

friend function of Distance class.

main () should have the statement $d3 = d1 + d2$. These are objects of Distance class ($d3$ stores final answer, $d1$, $d2$ stores the first and second distance respectively). Example : first distance : 6 centimetre

Second distance : 10 meter 70 centimetre
Answer : 17 metre 30 centimetre

Write the program to implement the functionality.

(c) Why do we use template in C++ ? Write syntax of class template and function template.

Write a program having function template which find the maximum value in an array.

5. Attempt any two questions of choice from (a) and (c). $(2 \times 10 = 20)$

(a) Answer the following questions briefly.

(i) When we can make member function to initialize the data members of a class then why do we need the constructor actually ?

```
~Test( ) {cout << "Des  
executed/n";}  
};  
  
int main()  
{  
    Test();  
    Test t;  
    t.~Test();  
    return 0;  
}
```

- (ii) Write a C++ program to enter a number and print its binary equivalent.
- (c) State the errors (if any) in each following statements and correct them.
- (i) int p = new int(10);
 - (ii) float a = 10, c;
 c = a% 3;
 - (iii) Consider bp as a class. show function in class bp.
 Following lines are written in main
 bp *t;
 *t. show();
 - (iv) int a1 [10], a2 [15];
 a1 = a2;
 - (v) ifstream.in file ("consonant");

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4. Attempt any *two* questions of choice from (a), (b) and (c). $(2 \times 10 = 20 \text{ Marks})$

(a) What do you mean by operator overloading ? Write the syntax to overload the unary and binary operator when operator function is a :

- (i) member function of class
 - (ii) friend function of class
- for each case.

Also list 5 operators in C++ which cannot be overloaded.

- (b) Create a class Distance having the following specifications :

Data members :

- (i) to hold the meter part of a distance.
(float)
- (ii) to hold the centimeter part of distance.
(float)

Member function :

- (i) a parameterized constructor()-it asks the user to input the distance (distance consists of meter and centimeter part).
- (ii) display()-display the distance

Example : first distance : 6 metre 60 centimetre

Second distance : 10 metre 70 centimetre

Answer : 17 metre 30 centimetre

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2. Attempt any two questions of choice from (a), (b) and (c). (2×10=20 Marks)
- Answer the following questions briefly.
 - List two differences between reference and pointer.
 - When a class B is derived from class A (having some private, protected members), using *protected derivation*, then which members of class A are derived in class B and how class B treats those members of derived class A.
 - Is it allowed in C++ to make a function in a class as private ? If yes, then show how it is done ?
 - What is destructor ? Can we define a destructor outside the class ?
 - Write two uses of scope resolution operator.
- (b) Write a program which opens 2 already existing files file 1, file 2. file 1 has some name of students and file 2 has their section name (There are four sections CSA, CSE, CSC, IT).

Program should open both files and should print the name of student 1 and his section then print name of student 2 and his section and so on.

- Member functions are :
- Setvalue()-to set the values to 2 data members.
 - A friend function mean() which find the mean of data members.
 - Display()-prints the computed mean
- Write the program for the above.
3. Attempt any two questions of choice from (a), (b) and (c). (2×10=20 Marks)
- Why do we need virtual function ? Show with suitable example. What is pure virtual function ? How can you define it ?
 - (i) Find the output/error in the following code with explanation :
- ```
#include<iostream>
using namespace std;
class Test
{
public :
Test() {cout << "Constructor is
executed/n";}
```

using string class function/s. Fill the space  
provided against cout in line 3.

Note : Writing "C++ Average Exam" in line  
3 will be marked as incorrect.

- (b) Answer the question (i) to (v) based on the  
following code snippet:

(consider the following sizes in bytes: int = 4,  
float = 4, char = 1)

class CUSTOMER

{

int Cust\_no;

char Cust\_Name [20];

protected:

void Register();

public:

CUSTOMER();

void Status();

};

class SALESMAN

{

int Salesman\_no;

char Salesman\_Name [20];

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protected :

float Salary;

public:

Salesman();

void Enter();

void Show();

};

class SHOP : private CUSTOMER, public  
SALESMAN

{

char Voucher\_No[10];

char Sales\_Data[8];

public :

SHOP();

void Sales\_Entry();

void Sales\_Detail();

}

(i) Write the names of data members which  
are accessible from objects belonging to  
class CUSTOMER.

(ii) Write the names of all the member  
functions which are accessible from  
objects belonging to class SALESMAN.

We want the line 3 to print C++ Average Exam by doing some operation on s1 and q using string class function/s. Fill the space provided against cout in line 3.

Note : Writing "C++ Average Exam" in line 3 will be marked as incorrect.

- (b) Answer the question (i) to (v) based on the following code snippet:

(consider the following sizes in bytes: int = 4, float = 4, char = 1)

class CUSTOMER

{

int Cust\_no;  
char Cust\_Name [20];

protected:

void Register();

public:

CUSTOMER();

void Status();

};

class SALESMAN

{

int Salesman\_no;  
char Salesman\_Name [20];

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protected :

float Salary;

public:

SALESMAN();

void Enter();

void Show();

};

class SHOP : private CUSTOMER, public  
SALESMAN

{

char Voucher\_No[10];

char Sales\_Data[8];

public :

SHOP();

voidSales\_Entry();

voidSales\_Detail();

}

(i) Write the names of data members which are accessible from objects belonging to class CUSTOMER.

(ii) Write the names of all the member functions which are accessible from objects belonging to class SALESMAN.