



EASTERN UNIVERSITY, SRILANKA

DEPARTMENT OF MATHEMATICS

FIRST YEAR EXAMINATION IN SCIENCE –2007/2008

SECOND SEMESTER (Aug, /Sept, 2009).

CS 104 – OBJECT ORIENTED PROGRAMMING TECHNIQUES

(PROPER)

Answer all questions

Time allowed: 02 hours

Q1).

- a) Explain what is it meant by object oriented programming? Compare Object Oriented with Procedure Oriented Programming?
- b) List and explain the components of OOP. Also explain, any five characteristics of OOP.
- c) Explain different types of constructors with your own example? Clearly define what are constructors and destructors?
- d) Find any five errors and provide the corrections for the following code segment:

```
1. //Class Bluetooth that represent a simplified
2. //Bluetooth terminal
3.
4. #include<iostream>
5.
6.
7. class BlueTooth{
8. private:
9. char* DeviceName;
10. int status;
11.
12. public:
13. int BlueTooth(char* name, int stat){
14. int len=0;
15. char* temp;
16. temp = name;
17.
18. //counting the length of the word
```

```

19. while(*(temp++)!='\0')
20.     len++;
21.
22. DeviceName = char[len+1];
23.
24. //copy the char array
25. for(i=0;i<len;i++)
26.     DeviceName[i] = name[i];
27.
28. status = stat;
29. }
30.
31. Bluetooth::void display(){
32.     cout <<"Device Name: " << DeviceName << endl;
33.     if(status==0)
34.         cout <<"status : inactive\n";
35.     else
36.         cout <<"status : active\n";
37. }
38.
39. ~BlueTooth(int stat){
40.     delete DeviceName;
41. }
42. };

```

Q2).

- a) What is Inheritance? Explain, with examples, the various types of inheritance. Explain any four advantages of inheritance.
- b) Define a class in C++ with following 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() to calculate the value of Fuel as per the following criteria;

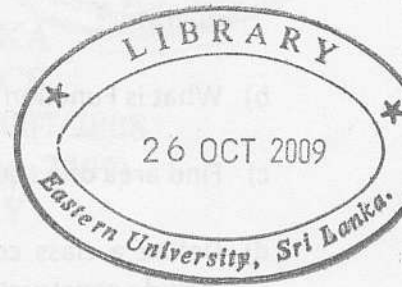
<i>Distance</i>	<i>Fuel</i>
<=1000	500
more than 1000 and <=2000	1100
more than 2000	2200

Public Members

- A function FEEDINFO() to allow user to enter values for Flight Number, Destination, Distance & call function CALFUEL() to calculate the quantity of Fuel;

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

c) Answer the questions (i) to (iii) based on the following:



```

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];
protected:
    float Salary;
public:
    SALESMAN();
    void Enter();
    void Show();
};
class SHOP : private CUSTOMER , public SALESMAN
{
    char Voucher_No[10];
    char Sales_Date[8];
public:
    SHOP();
    void Sales_Entry();
    void Sales_Detail();
};
  
```

- Write the names of data members which are accessible from objects belonging to class CUSTOMER.
- Write the names of all the member functions which are accessible from objects belonging to class SALESMAN.
- Write the names of all the members which are accessible from member functions of class SHOP.

Q3).

- a) Explain what is it meant by operator overloading? Why it is necessary to overload an operator?
- b) What is Function Overloading? Explain with suitable example.
- c) Find area of a square, a rectangle, a circle by using *Function Overloading*.
- d) Define a class complex that could work as a user defines complex number type. Include constructors
 - (i) to enable us to create an uninitialized complex number.

e.g: `complex z1; //z1=i`

(ii) to initialize an object with two values for real and imaginary part at the time of creation

e.g: `complex z2(a,b); // z2 =a+bi`

Write a complete C++ program to test your class for the following cases:

- i. Creates uninitialized complex objects.
- ii. Creates objects with two initial values for real and imaginary parts.
- iii. Input a complex number (hint: you have to overload the input operator `>>`).
- iv. Display a complex number (hint: you have to overload the output operator `<<`).
- v. Add two complex numbers (hint: you have to use overloading technique).

Q4).

- a) Explain what is it meant by Friend Function and Friend Class? Explain with example.
- b) Write a program to add 2 distances using *friend function* expressed in meters and cm and feet and inches.
- c) An electricity board charges the following rates for domestic user to discharge large concession of
 - For first 100 units 60 per unit,
 - For next 200 units 80 per unit,
 - Beyond 300 units 90 per unit,All users are charge minimum of rupees 50 all the total amount if more than rupees 300 than additional charge 15% it added write a program to read the name of users and number of unit consume and print out the charge with name.
- d) Write a program using polymorphism to calculate the square of any two numbers of type int, float, double and long.