Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V • EXAMINATION – SUMMER • 2015

Subject Code: 152004 **Date: 07/05/2015**

Subject Name: Object Oriented Programming in C++

Time: 02.30pm-05.00pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** Explain fundamental concepts of Object Oriented Programming with suitable example. **07**

(b) List out types of inheritance and explain any three in detail. **07**

Q.2 **(a)** What is operator overloading? Write the steps for the process of overloading? Write a sample program to overload + operator. **07**

(b) Explain type conversion for the following cases. **07**

1. Basic to class type
2. Class type to basic type
3. Class type to class type

OR

(b) State whether the following statements are true or false **07**

1. Using the operator overloading concept, we can change the meaning of an operator.
2. Operator overloading works when applied to class objects only.
3. Friend functions cannot be used to overload operators.
4. The overloaded operator must have at least one operand that is user defined.
5. Operator functions never return a value.
6. Through operator overloading, a class type data can be converted to a basic type data.
7. A constructor can be used to convert a basic type to a class type data.

Q.3 **(a)** Explain copy constructor by giving the example of finding factorial. **07**

(b) Which kind of inheritance leads to ambiguity? Explain that ambiguity in detail with solution using proper example. **07**

OR

Q.3 **(a)** Explain 'this' pointer with example. **07**

(b) How can we achieve runtime polymorphism? Explain in detail with example. **07**

Q.4 **(a)** 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 the base class to a member function get_data() to initialize base class data members and another member function display_area() to compute and display the area of figures. Make display_area() as a virtual function and redefine this function in the derived classes to suit their requirements. **07**

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

The two values given as input will be treated as lengths of two sides in the case of rectangle and as a base and height in the case of triangle, and used as follows.
Area of rectangle = a*b;
Area of triangle = ½ * a*b;

(b) Extend the program given in Q.4 (a) to display area of circle. This requires addition of new derived class circle that computes area of circle. **07**

OR

Q.4 **(a)** Assume a bank maintains two kinds of accounts for customers, one called as saving account and another as current account. The savings account provides compound interest and withdrawal facilities but no cheque book facility. The current account holders should also maintain a minimum balance and if the balance falls below this level, a service charge is imposed. **07**

Create following class

1) Account
   - C_name
   - Acc_number
   - Type_of_acc
2) Cur_acct
3) Sav_acct

Include necessary member functions in order to achieve the following tasks.

A) Accept deposit from a customer and update the balance.
B) Display the balance
C) Compute the deposit interest.
D) Permit withdrawal and update the balance.
E) Check the minimum balance, impose penalty, and update the balance.

Use the constructor for all three classes.

(b) Write a program in C++ that display entered string into reverse order. **07**

Q.5 **(a)** Explain flags and bit fields for setf() function with example. **07**

(b) Discuss the syntax for creating user defined manipulators. Design a single manipulator to provide following output specification for printing float value. **07**

a) 10 column width
b) Right justified
c) Two digit precision
d) Filling of unused places with #
e) Trailing zeroes shown

OR

Q.5 **(a)** Explain following functions for manipulation of file pointers. **07**
seekg(), seekp(), tellg(), tellp()

(b) Explain class template with multiple parameter by giving appropriate example. **07**

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