Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV EXAMINATION – WINTER 2015

Subject Code: 140705 **Date:04/01/2016**

Subject Name: Object Oriented Programming with C++

Time: 02:30pm to 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)** (i) Explain any two characteristics of OOP. **07**
(ii) State merits & demerits of inline functions.

(b) Declare a class called bird having two private data members called name and weight. Define following functions : **07**

- default constructor for reading data members from key board
- overloaded constructor with two arguments to be used for initialization of data members.
- display function to display data members.
- overloaded member operator >= to compare weight of two bird objects, returning false if weight of first bird object is less than that of second & true otherwise.

Define function main to illustrate use of above functions.

Q.2 **(a)** (i) Explain default arguments by giving example(s). **07**
(ii) Explain by example(s), copy constructor.

(b) (i) Explain friend function & its use. **07**
(ii) Explain this pointer. Discuss effect of C++ statement *delete this* in the program.

OR

(b) Declare a class called my_string having char * str_ptr as a member, used to point to a string. Define a constructor for initializing member. Define an overloaded operator + to be applied on two operands of type class my_string for concatenating strings pointed by str_ptr of operands. The resultant string is placed in a new object of type class my_string which is returned. Define main to show the usage of these functions. **07**

Q.3 **(a)** (i) Explain in brief different types of inheritance. **07**
(ii) Destructor function cannot be overloaded. True or false? Justify your answer.

(b) Declare a class called logic_gate to represent logic gates. The class has two data members - input1 and input2 to represent two inputs of the gate and a virtual function member called get_gate_output. Derive two classes from the base class logic_gate, namely and_gate and or_gate to represent 'logical and gate' and 'logical or gate' respectively. Define function get_gate_output in both of these classes to get the output of the gate. Show use of above classes and functions to have dynamic polymorphism in function main. **07**

OR

Q.3 **(a)** (i) Explain virtual and pure virtual function. **07**
(ii) Explain dynamic binding with example.

(b) Declare a class called item having data members item_code, item_name, cost and discount. Derive two classes from class item, namely employee and customer. The class employee has data members like employee_id and amount. The class customer has data members like customer_name and amount. Define following functions **07**

- to initialize data members.
- to display the values of members.
- to compute amount to be paid for purchased item.
- main to create objects of both derived classes and to show usage of above functions.

Q.4 **(a)** (i) Explain manipulators by giving an example. **07**
(ii) Explain seekg & tellg functions.

(b) Declare a class called book having members like book_title, publisher and author_name. Overload operators << and >> for class book. Define function main. **07**

OR

Q.4 **(a)** (i) Explain ios::ate and ios::binary **07**
(ii) Explain characteristics of binary and random files.

(b) It is required to find roots of quadratic equation $ax^2 + bx + c = 0$. Write a program that reads values of a, b & c and finds roots if roots are real; otherwise raises and handles exception (if roots are complex). **07**

Q.5 **(a)** (i) Explain new & delete. **07**
(ii) Explain generic exception handler.

(b) Create a generic class (using template), called my_class having following data members : **07**

- an array to store numbers
- an array of flags to indicate whether the location is occupied or free

Define following member functions:

- to insert a number at specified location
- to remove a number from specified location, if the specified location is occupied
- to search a number in the array.

Define function main to crate two objects of type class my_class to store int & float numbers respectively. Also show usage of member functions in the main.

OR

Q.5 **(a)** (i) Explain reference variables and their usage by giving examples. **07**
(ii) Explain protected access specifier and its effects with different modes of inheritance.

(b) (i) Explain different constructors of ifstream. **07**
(ii) Explain by giving an example - use of class template and function template.

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