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Third Semester B.E. Degree Examination, December 2011
Object Oriented Programming with C++

Max. Marks:100

Time: 3 hrs.

**Note: Answer FIVE full questions, selecting
atleast TWO questions from each part.**

PART - A

- 1 a. Explain the terms encapsulation, polymorphism and inheritance in object oriented programming. (06 Marks)
- b. What is function overloading? Write a C++ program to define three overloaded functions area (), to find area of rectangle area of rectangular box and area of circle. (08 Marks)
- c. With an example explain the concept of inline functions. (06 Marks)

- 2 a. Differentiate between class and object. Write a C++ program to define a class called TIME with hour, minute and second as data members and read(), display() and add() as member functions. (10 Marks)
- b. What is a constructor? What are its characteristics? Define a suitable parameterized constructor with default values for the class box with data members length, breadth and height as data members. (10 Marks)

- 3 a. What is a friend function? Explain the need of friend functions in C++. (05 Marks)
- b. Write a C++ program to swap two integer and floating-point numbers, using a function template. (05 Marks)
- c. What is operator overloading? Write a C++ program to add two complex numbers by overloading the + operator. Also overload >> and << operators for reading and displaying the complex numbers. (10 Marks)

- 4 a. Explain the visibility of the base class members, for the access specifiers : private, protected and public while creating the derived classes. (06 Marks)
- b. Differentiate between private members and protected members. Write a C++ program to illustrate protected members in the base class. (07 Marks)
- c. With an example explain multiple inheritance. (07 Marks)

PART - B

- 5 a. With an example explain the order of invocation of constructors and destructors and passing arguments to base class contractors in multilevel inheritance. (10 Marks)
- b. What are the ambiguities that arise in multiple inheritance? How to overcome this? Explain with examples. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg, 42+8 = 50, will be treated as malpractice.

- 6 a. What is a virtual function? Explain with a suitable example. (06 Marks)
- b. Write a C++ program to 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 `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 derived classes to suit their requirements. (08 Marks)
- c. Write a C++ program to create base class called number with an integer data member and a member function to set the value for this data member. Derive three classes from this base class called hexadecimal, decimal and octal. Include a member function `show()` in all these three derived classes to display the value of the base class data member in hexadecimal, decimal and octal respectively. Use the concept of pure virtual functions. (06 Marks)
- 7 a. With an example and general syntax explain the member functions :
i) `width()`
ii) `precision`
iii) `fill()`. (06 Marks)
- b. Write a C++ program to define a class called phonebook with data members name, area code, prefix and number and the member functions `readdata()` which reads the values of the data members from the keyboard and `writedata()` which displays the values of the data members. Enter the data for at least 5 phone numbers and store details in a binary file phone and read the stored details and display on the screen. (09 Marks)
- c. Briefly explain the member functions :
`setf()` and `unsetf()`. (05 Marks)
- 8 a. What is exception handling? Briefly explain the facilities in C++ for exception handling. (10 Marks)
- b. Briefly explain the use of containers, vectors, lists and maps in STL. (10 Marks)
