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Third Semester M.C.A Degree Examination, January/February 2005

Master of Computer Applications

Object Oriented Programming with C++

Time: 3 hrs.]

[Max.Marks : 100

- Note:** 1. Answer any FIVE full questions.
2. All questions carry equal marks.
3. Write neat diagrams wherever necessary.

- (a) Explain the concept of Object Oriented Programming. Bring out the salient features of structured programming and object oriented programming. (10 Marks)

(b) What is Volatile Qualifier? Give an example. (4 Marks)

(c) Explain how new and delete operators manage memory allocation dynamically. (6 Marks)
- (a) Discuss how call by reference methods of passing parameters can be achieved using reference variables. Illustrate this through a program to find the GCD of two positive integers. (8 Marks)

(b) What are default arguments? Explain with an illustration. State and explain the rules applying the default arguments. (6 Marks)

(c) What are friend functions? Why are they used? Explain with an example. (6 Marks)
- (a) Define class and object. With an example, explain the concept of data encapsulation and accessing of member functions. (10 Marks)

(b) Bring out the differences between C++ structure and C++ class. (4 Marks)

(c) Write a program to generate a series of Fibonacci numbers using copy constructor. (6 Marks)
- (a) What is polymorphism? What are their uses? (4 Marks)

(b) Write a program to perform multiplication of two complex numbers by overloading* operator. (10 Marks)

(c) What is virtual base class? Explain with an example the use of virtual base class. (6 Marks)
- (a) What is inheritance? Bring out the concept of various types of inheritances. (4 Marks)

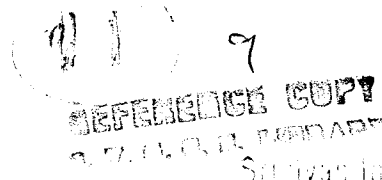
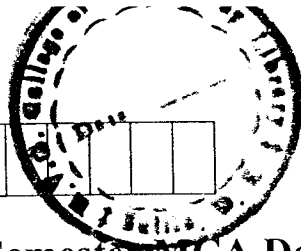
(b) Write C++ program to create a class called STUDENT with data members USN, name and age. Using inheritance, create the classes UGSTUDENT and PGSTUDENT having fields as semester, fees, and stipend. Enter the data for atleast 5 students. Find the semester wise average for all UG and PG students separately. (10 Marks)

(c) Write a note on the visibility of member function based on private, public and protected derivations. (6 Marks)

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6. (a) What is function template? Explain the purpose of function templates with suitable example. (8 Marks)
- (b) Write a program to implement a Bubble sort using function templates. (10 Marks)
- (c) What is template argument deduction? (2 Marks)
7. (a) What are virtual functions? With an example explain the need for virtual function. (8 Marks)
- (b) What are early and late binding? Explain with an example. (6 Marks)
- (c) What are manipulators? List the various predefined manipulators supported by C++ I/O streams. (6 Marks)
8. Write short notes on the following : (5×4=20 Marks)
- Inline function
 - Pure virtual function
 - Use of abstract classes in C++
 - This pointer with an example.

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Third Semester MCA Degree Examination, June-July 2009
Object Oriented Programming with C++

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions.

- 1 a. Explain the different characteristics of object-oriented programming. (10 Marks)
 b. Write short notes on the following:
 i) Size and sign qualifiers. (10 Marks)
 ii) Enumerated data types. (10 Marks)
- 2 a. Define a class and an object. Explain about accessing member functions with an example. (10 Marks)
 b. What are the various parameter-passing mechanisms for functions? Explain each with an example. (06 Marks)
 c. Explain Recursive functions with example. (04 Marks)
- 3 a. Write short notes on function overloading. (10 Marks)
 b. What is a copy constructor? Explain with an example. (05 Marks)
 c. Demonstrate the use of static member function with an example. (05 Marks)
- 4 a. What do you mean by operator overloading? Explain the 2 ways of overloading operators with example. (10 Marks)
 b. Explain dynamic memory allocation and deallocation of arrays using example. (10 Marks)
- 5 a. What are friend functions? Why they are used? Explain with an example. (10 Marks)
 b. Discuss implicit this pointer. (05 Marks)
 c. Explain about pointers to class members. (05 Marks)
- 6 a. What is nested class? Give an example. (05 Marks)
 b. Write short notes on inline functions. (05 Marks)
 c. What is inheritance? What are the different types of inheritance? Explain how multiple inheritance is implemented in C++ with example. (10 Marks)
- 7 a. Discuss the concept of virtual functions, with an example. (10 Marks)
 b. Explain the visibility of members based on private, public and protected derivations. (06 Marks)
 c. What are abstract classes? Explain their use in C++. (04 Marks)
- 8 a. What are I/O-streams in C++? Give stream class hierarchy. (10 Marks)
 b. What is a generic function? Explain with example. (05 Marks)
 c. List out the various modes of opening a file in C++. (05 Marks)

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Third Semester MCA Degree Examination, Dec.09/Jan.10
Object Oriented Programming with C++

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions.

- 1
 - a. What is the object oriented programming? Discuss the characteristics of an object oriented system. (10 Marks)
 - b. What are default arguments? Explain with an example. (06 Marks)
 - c. What are inline functions? Discuss the advantages of inline functions. (04 Marks)
- 2
 - a. What is a generic function? Write a C++ program to create a template for finding maximum element of an array and demonstrate it for integer and character array. (10 Marks)
 - b. What is function overloading? Explain the three steps on the resolution of function overloading, with an example. (10 Marks)
- 3
 - a. Specify different uses of scope resolution operator in C++. (04 Marks)
 - b. Explain static data members and static member functions of a class. (08 Marks)
 - c. What are friend functions? Explain with suitable example. (08 Marks)
- 4
 - a. Write a program to perform multiplication of two complex numbers by overloading '*' operator. (10 Marks)
 - b. Write a note for 'this' pointer. (04 Marks)
 - c. Explain default constructor and copy constructor. (06 Marks)
- 5
 - a. What is virtual base class? Explain its use, with an example. (06 Marks)
 - b. What do you mean by inheritance? Explain the use of 'protected' access specifier. (04 Marks)
 - c. Define a base class STACK1 which performs only push, pop and display operations. Override the above operations through a derived class STACK2, which takes care of STACK FULL and STACK EMPTY situations. Show how the objects of these classes use the above functions in the main function. (10 Marks)
- 6
 - a. What are the I/O streams? Give the stream class hierarchy. (10 Marks)
 - b. Differentiate between early and late binding. (05 Marks)
 - c. Explain how constructors are called in multilevel inheritance, with an example. (05 Marks)
- 7
 - a. Discuss dynamic allocation and de-allocation in C++, with suitable program segments. List common program errors associated with dynamic allocation of objects. (10 Marks)
 - b. What is a virtual function? Illustrate with an example the usage of virtual functions. (10 Marks)
- 8

Write short notes on :

 - a. Scope and lifetime
 - b. Reference variables
 - c. Local classes
 - d. Constant and volatile classifier. (20 Marks)

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