Total No. of Questions : 10] [Total No. of Printed Pages : 3

Roll No. .....

MCA–303

M. C. A. (Third Semester) EXAMINATION, June, 2008

OBJECT ORIENTED METHODOLOGY AND C++

(MCA–303)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

Note : Attempt *one* question from each Unit.

Unit–I

1. (a) What are object and classes ? How does class differ from structure ? 10

   (b) How many types of loops are available in C++ ? Explain each. 10

2. (a) What is a copy constructor ? What is its utility ? 10

   (b) Design classes to represent co-ordinates of a Point-Polar Class and Cartesian Class. Both the classes should have the following member functions : 10

   (i) Constructor, with default values

   (ii) Functions to set value

   (iii) Function to display value

P. T. O.

Make the polar class first; followed by the Cartesian class.

The Cartesian class should contain member functions to support conversion between Polar and Cartesian objects, i. e., conversion constructor and member conversion function. Design the main program also to demonstrate the conversion process.

Unit – II

3. (a) Overload Operator Binary "+ +". 10

   (b) What are Pointer to Class member ? How do they differ from normal pointer. 10

4. (a) What do you understand by diamond shape ambiguity ? How it can be removed ? 10

   (b) Overload function read which read the matrix of size $m \times n$ from the keyboard to read integer, float and character. 10

Unit – III

5. (a) "The virtual attribute is inherited and is hierarchical." Comment. 10

   (b) Illustrate the utility of friend function using an example. 10

6. (a) How run time polymorphism is achieved ? 10

   (b) Write short notes on the following : 10

   (i) Abstract class

   (ii) Early and late binding 10

Unit – IV

7. (a) Write a program to copy a file. 10

   (b) Discuss various stream classes in C+ +. 10

8. (a) Explain the various features that can be used to format the output. 10

(b) What is an Exception Specification ? Where it is used ? When do we use multiple catch handler ? 10

Unit – V

9. (a) Explain object oriented modeling. 10

(b) Design a use case diagram for Bank. 10

10. (a) What are UML specification ? How do they follow object oriented approach ? 10

(b) Find out the classes and object for your college and draw object diagram. 10

Total No. of Questions : 10] [Total No. of Printed Pages : 3

MCA-303

M. C. A. (Third Semester) EXAMINATION, June, 2007

OBJECT ORIENTED METHODOLOGY AND C++

(MCA – 303)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

Note : Attempt any *one* question from each Unit.

Unit – I

1. (a) Why C++ is object oriented ? 10

   (b) What is constructor and destructer function ? When the destructor is exactly called ? 10

Or

2. (a) How object and classes form an integrated parts of oops ? 10

   (b) What are object array ? Give their utility using an example. 10

Unit – II

3. (a) Overload uniary operator "–" using boh member and friend function. 10

   (b) Discuss Inheritance. What are various ambiguity in multiple inheritance ? 10

P. T. O.

Or

4. (a) What are the different access modifiers ? Illustrate each with example . 10

   (b) Differentiate between pointer to base and derived class. 10

Unit – III

5. (a) Discuss the utility and concept of virtual function. 10

   (b) How do you think early and late binding differ ? Support your view with proper example. 10

Or

6. (a) What are abstract classes ? Discuss their relevance for pure virtual function. 10

   (b) What are friend function ? Depict a situation where only friend function can help. 10

Unit – IV

7. Give the syntax and utility of the following : 20

   (i) seekg ( )

   (ii) tellg ( )

   (iii) tellp ( )

   (iv) seekp ( )

Or

8. (a) How file is opened ? Discuss various file mode parameter. 10

   (b) Define Exception. What is rethrowing exception ? 10

Unit – V

9. (a) Define three model used in object modelling technique. Draw an object diagram for card playing system. 10

(b) Specify various object oriented paradigm and visual modelling. 10

Or

10. (a) Compare and contrast various UML diagram. 10

(b) Discuss aggregation generalization and association. 10

Total No. of Questions : 8] [Total No. of Printed Pages : 3

MCA-303

M. C. A. (Third Semester)
EXAMINATION, May/June, 2006
OBJECT ORIENTED METHODOLOGY AND C++
(MCA—383)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

Note : Attempt any *five* questions. All questions carry equal marks.

1. (a) What are the benefits of object oriented programming ? Discuss the problems associated with object orientation. 10

   (b) Write a program in C++ that creates a class called time containing hours, minutes and seconds. Write functions to accept and display data in a proper format. Also write a function update ( ) that updates the time entered by one second. 10

2. (a) Explain the purpose of using constructors and destructors in a program. Write a program using a class stack to demonstrate the working of stack data structure. Use constructor and destructor functions. 10

P. T. O.

(b) How and why objects are passed by reference to a function ? Write a short program to illustrate the aspect of passing object by reference. 10

3. (a) What is the default mechanism of arguments ? How it permits you to achieve function overloading ? 10

(b) What do you understand by operator overloading ? Write a program to overload the operator [ ] ( ) function in such away that [ ] can be used in both sides of an assignment statement. 10

4. (a) Define various data type conversions available in C++ and the method of accomplishing each conversion. 10

(b) Using friend function overload unary operator ..... relative to class distance with data members meter, centimeter and millimeter. 10

5. (a) What are the different forms of inheritance ? Give examples of each. 10

(b) Why do we need virtual functions ? When do we make a virtual function pure ? 10

6. (a) Write a program using inserter and extractor functions to print the following triangle. Create a triangle class with one parameter n-of-line. Write inserter function to read the triangle and through extractor function print the triangle. If n-of-line = 5

```
    *
   * *
  * * *
 * * * *
* * * * *
```

10

(b) List IOS class format flags and explain their usage by giving example of each. 10

7. (a) Write a program that creates a disk file of objects of class inventory with members partno, partname, cost, quantity. Also read the file and display its contents. 10

(b) Can you restrict the types of exceptions thrown by a function ? Give the syntax when a function xyz (int n, int m, float a) is restricted to throw only integer and character exceptions. 10

8. (a) Discuss about various components of object oriented design method. 10

(b) What are the different steps involved in object oriented analysis ? Explain. 10

Total No. of Questions : 8] [Total No. of Printed Pages : 4

MCA-303

M. C. A. (Third Semester) EXAMINATION, June, 2005

OBJECT ORIENTED METHODOLOGY AND C++

(MCA—303)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

Note : Attempt any *five* questions. All questions carry equal marks.

1. (a) Compare object oriented, object based and class based languages. 6

   (b) What are the benefits of Object Oriented Programming ? Also discuss the problems associated with Object Orientation. 6

   (c) Write a program in C++ using structures to add two distances entered in feet and inches and store the result in third distance. Pass two distances as arguments to function add-dist ( ) and this should return the added distance. 8

2. (a) What are constructors and destructors ? Why and how do we overload constructors ? 6

   (b) What is meant by nesting of member functions ? Explain by giving an example. 6

P. T. O.

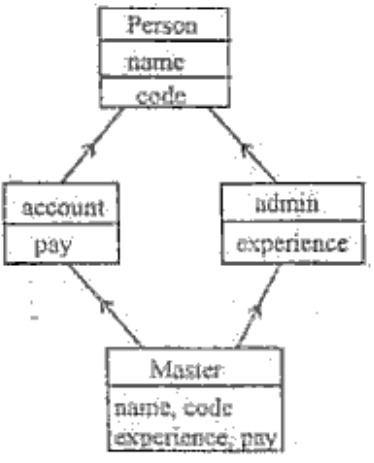
(c) Create a class called time that has separate int member data for hours, minutes and seconds. One constructor should initialize this to 0 and another should initialize it to fixed values. A member function should display it in HH : MM :: SS format. The final member function should add two objects of time passed as arguments.

Implement this class in a working program. 8

3. (a) What are the role of access specifiers in class declaration ? Discuss this role in inheritance. 6

(b) When do we make a virtual function "Pure" ? What are the implementations of making a function pure virtual function ? 6

(c) Consider the following diagram : 8



class master is derived from account and admin class which derives information from class person. Define all four classes and write a program to create, update and display the information contained in master object.

4. (a) What are the special characteristics of a static member variable ? 4

(b) Distinguish between the following two statements : 8

time T2 (T1);

time T2 = T1; T1 and T2 are objects of class time.

(c) Write a program in C++ to accept two strings and concatenate them. Use dynamic memory allocation facility and a class called string. Also use appropriate constructors and destructor functions. 8

5. (a) What is a friend function ? When is it compulsory ? Give proper example. 6

(b) What is containership ? How does it differ from inheritance ? 6

(c) Using friend function write a program to over load == operator to compare two strings of class string. 8

6. (a) What is an abstract class ? Can we create an object of an abstract class ? Explain. 6

(b) Compare Early binding and Late binding. When virtual functions are created for implementing late binding. What basic rules should be observed ? 8

(c) Discuss the following : 6

(i) Class scope

(ii) Abstraction and encapsulation

7. (a) What is the purpose of IOS class ? List IOS class flags and explain their use by giving examples. 6

(b) How can you create insertors of your own ? Write the syntax of insertor function. 6

(c) Using seekg ( ) and telg ( ) functions write a program to seek particular record in an existing file. 8

8. (a) What are the different steps involved in object oriented analysis ? Explain. 6

(b) Discuss about various components of object oriented design method. 6

(c) Write notes on the following : 8

(i) Association

(ii) Aggregation

Total No. of Questions : 8] [Total No. of Printed Pages : 3

MCA–303

M. C. A. (Third Semester)
EXAMINATION, Dec., 2005

OBJECT ORIENTED METHODOLOGY AND C++

(MCA–303)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

Note : Attempt any *five* questions. All questions carry equal marks.

1. (a) What are the basic concepts of object oriented programming ? Discuss them in detail. 4

   (b) Compare classes and structures in C++. 4

   (c) What is meant by inline functions ? Write its advantages and restrictions imposed on it. Write a program that defines an inline function containing two arguments, first is for salary of an employee and second is the percent value by which salary is to be increased. Main program passes these two values to the function and receives increased salary for printing 12

2. (a) Explain the concept of Information hiding. 4

   (b) What are overloaded constructors ? Give a suitable example to explain it. 6

P. T. O.

(c) Write a program in C++ that includes a class date, with data members day, month and year. It should include a constructor with defaults, member functions to accept a date, display a date and nextday ( ) function that increments a date by one day. 10

3. (a) How are objects passed to functions ? Explain with an example. 10

(b) What is meant by copy constuctor ? What type of operations will cause the copy constructor to be invoked ? Write a program to display the use of copy constructor. 10

4. (a) What is function overloading ? Write a program that uses a function AREA ( ) containing two arguments double length and double width. Default the second argument in such a way that it calculates the area of a rectangle when called with both the arguments and calculates area of square when called with only first argument. 8

(b) Explain the purpose of the following : 6

(i) Private member functions

(ii) Static member functions

(c) Compare various access specifiers. 6

5. (a) What is a friend functions ? When and how do we declare a class a friend class ? A friend function cannot be used to overload the assignment operator = . Explain why ? 10

(b) What are operator functions ? Define a equal to relational operator function named operator = = ( ) that can be used to compare two date classes with data members day, month and year. 10

6. (a) What are the different forms of inheritances ? Give an example of each. 10

   (b) Define the four data type conversions available in C++ and the method of accomplishing each conversion. 10

7. (a) What are virtual functions ? Create a base class named rectangle that contains data members length and width and member functions AREA ( ) and a constructor. From this class derive a class named box with a data member depth, an override function AREA ( ) that returns the surface area of the box and a volume ( ) function.

   Include this class in a working C++ program. Explain athe result of calling all functions using a box object. 10

   (b) Write a program in C++ that returns the size in bytes of a program entered on the command line. 10

   C > filesize program.txt.

8. (a) Give name and description of various fstream methods. Give examples of its usage. 5

   (b) What are manipulators ? Give the use of any *five* mainpulators with examples. 5

   (c) What is the difference between OOA and OOD ? Give graphical notations for the following : 10

   (i) Class and Objects
   (ii) Instances of Objects
   (iii) Message Communication between Objects
   (iv) Inheritance relationship
   (v) Classification relationship
   (vi) Process layering

Total No. of Questions : 8] [Total No. of Printed Pages : 3

MCA–303

M. C. A. (Third Semester) EXAMINATION, June, 2004

OBJECT ORIENTED METHODOLOGY AND C++

(MCA–303)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

Note : Attempt any *five* questions. All questions carry equal marks.

1. (a) Write a program to create a base class containing int *i* and virtual fun ( ), which prints twice of *i*. Create two classes C1 and C2, redefine virtual function in them to print square of *i* and square root of *i* respectively.

   (b) "The effect of a default argument can be alternatively achieved by overloading." Comment.

2. (a) Write a program in C++ that the uses functions overloading to do the following tasks :

   (i) Compute the area of a circle for a given value of radius.

   (ii) Compute the area of a rectangle for a given values of length and width.

   (b) Write a program to multiple two matrices using '*' as operator overloading.

P. T. O.

3. (a) Does the expression delete *p* delete the pointer or the object being pointed to by *p* ? 6

(b) Point out the reasons why using new is a better idea than using malloc ( ) ? 6

(c) Write a C++ program using classes and objects to find the result preparation system for a student. The data available for each students includes : Rollno, name and marks of five subjects. The percentage marks and grade are to be calculated from the above information. 8

4. (a) If a class D is derived from two base classes B1 and B2, then write these classes each containing a zero-argument construction. Ensure that while build an object of type D, firstly the constructor of B2 should get called followed by heat of B1. Also provide a destructor in each class. In what order would these destructors get called ?

(b) Differentiate between the following :

(i) Inline and Macros

(ii) Virtual functions and Pure virtual functions

(iii) Structure and Classes

5. (a) Write a program to add two times (hrs. min. and secs.). Illustrate the use of friend function in this program. 8

(b) Write a program to define two classes Polar and Rectangle to represent points in the Polar and rectangle systems. Use conversion routines to convert from one system to the other. 12

6. (a) What do you mean by static variables ? What is the basic difference between normal function and static function ? Illustrate with the help of an example.

   (b) What are the basic models used in object-oriented methodology ? Explain each of them with the help of an example.

7. (a) Write a program to create a manipulator with arguments. If row number and column number are passed as arguments to this manipulators, it should position the cursor at that row and column.

   (b) Write brief notes on the following :

   (i) Hierarchy as used in OOD

   (ii) Object state and behaviour

8. Write short notes on any *four* of the following :

   (a) Files

   (b) Abstract Classes

   (c) OOD

   (d) Links and Associations

   (e) Exceptional Handling

   (f) Types of Inheritance

Total No. of Questions : 8] [Total No. of Printed Pages : 3

MCA–303

M. C. A. (Third Semester) EXAMINATION, Dec., 2004

OBJECT ORIENTED METHODOLOGY AND C++

(MCA–303)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

Note : Attempt any *five* questions. All questions carry equal marks.

1. (a) Differentiate between the following : 12
   (i) Objects and Classes
   (ii) Data Abstraction and Data Encapsulation
   (iii) Inheritance and Polymorphism
   (iv) Dynamic Binding and Message Passing
   (b) How does an inline function differ from a preprocessor macro ? 4
   (c) In C++ a variable can be declared anywhere in the scope. What is the significance of this feature ? 4

2. (a) What is the purpose of class diagram ? Describe icons used for class relationships. 10
   (b) Differentiate between object analysis, object design and object implementation with the help of an example. 10

P. T. O.

3. (a) When do we declare a member of a class static ? Explain with the help of an example. 5

(b) We have two classes x and y. If 'a' is an object of x and 'b' is an object of y. Implement the following statement

$$a = b$$ 5

(c) Distinguish between the following two statements

distance D2 (D1) and distance D2 = D1;

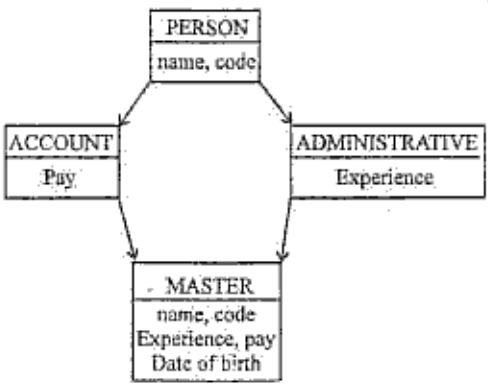
where D1 and D2 are objects of distance class. 5

(d) What is a friend function ? What are the merits and demerits of using friend functions ? 5

4. (a) Create a class MATRIX of size $m \times n$. Define matrix addition, matrix subtraction and matrix multiplication using the concept of operator overloading. Make the program with suitable constructors, member functions etc. 12

(b) Create the class STRING. Use the operator = = to be overloaded to compare two strings. 8

5. (a) Consider a class network of the following figure. Define all the four classes and write a program to create, update and display the information contained in master objects. 15



(b) Explain with an example, how would you create space for an array of objects using pointers. 5

6. (a) What is an abstract base class ? What is its use ? 5

(b) Why are protected members said to be "Inheritance Ready" ? 5

(c) Write a program that reads a text file and creates another file that is identical except that every sequence of consecutive blank spaces is replaced by a single space. 10

7. (a) Explain the following terms with the help of an example : 10

(i) Throw an exception

(ii) Catching an exception

(iii) Try and Catch block

(b) "No program works correctly first time." Comment. 5

(c) Explain with help of an example Seeky ( ) and tellp ( ). 5

8. Write short notes on any *two* of the following : 20

(a) Steps in Object Oriented Analysis

(b) Destructors

(c) Ostream

(d) Design of Associations

Total No. of Questions : 8] [Total No. of Printed Pages : 3

MCA–303

M. C. A. (Third Semester) EXAMINATION, June, 2003

OBJECT ORIENTED METHODOLOGY AND C++

(MCA – 303)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

Note : Attempt any *five* questions. All questions carry equal marks.

1. (a) Give syntax of switch statement. Is it necessary to use break statement between two cases ? Demonstrate use of switch statement in a program. 5, 5

   (b) (i) Explain use of the following string functions : 4

   (1) strcat ( )

   (2) strcmp ( )

   (ii) Write a program to copy a string character by character (First read a string). 6

2. (a) Write a program that creates a class student containing roll number, students name and his semester as private data of the class. Create two public functions get-data ( ) and show ( ) to store and show values of an object. Accept values of three object and display them in three lines. 10

P. T. O.

(b) (i) Define constructor and destructor functions. Give an example to illustrate these functions. 5

(ii) Illustrate the use of this pointer in a small programming example. 5

3. (a) Write a program to create a class time containing data hours, minutes and seconds. Now overload binary + operator such that you can add two objects of the class time. Display the added object. 10

(b) What is a friend function ? Write a program using friend function to overload – – ( ) operator with respect to time class of question 3 (a). 10

4. (a) Define a class distance containing data members meter, centimeter and millimeter. Using new operator, dynamically store four objects of class distance. Now create a function add-distance ( ) to add these 4 objects, also print added value. 10

(b) (i) What are inline functions ? What are the restriction in these functions ? 5

(ii) What are static variables ? Give a small example illustrating use of static variable. 5

5. (a) What is the importance of protected access control ? Create a class acct. having protected data balance, now create two derived classes called sav-acct and curr-acct. The derived classes inherit acct. as public. Calculate interest on the balance assuming that interest is dependent on the rate of interest which is given in the respective derived classes. 10

(b) Write a program to create a file containing object records of the type employee number, basic salary and

allowances. Create ten such reocrds on the file, now close the file. Reopen the file and display records from 5th onwards. 10

6. (a) Explain the following terms and give suitable examples : 10
   (i) Object
   (ii) Object state and behaviour
   (b) Explain the following terms with suitable examples :
   (i) generalization
   (ii) aggregation 10

7. (a) Explain the following terms with suitable examples :
   (i) Data encapsulation
   (ii) Inheritance 10
   (b) What are *three* basic models used in object-oriented methodology ? Explain object model giving different symbols used. 10

8. Write short notes on any *four* of the following : 20
   (i) Links and associations
   (ii) Hierarchy as used in OOD
   (iii) Functional Model
   (iv) Polymorphism as used in C^{++}
   (v) Abstract classes
   (vi) I/O manipulators

Total No. of Questions : 8] [Total No. of Printed Pages : 3

MCA–303

M. C. A. (Third Semester) EXAMINATION, Dec., 2002

OBJECT ORIENTED METHODOLOGY AND C++

(MCA–303)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

Note : Attempt any *five* questions. All questions carry equal marks.

1. (a) Write a function using reference variables as arguments to swap the values of a pair of integers. 10

   (b) What are abstract classes ? Write a program having student as an abstract class and create the derived classes Engineering and Medical from the student class. Create their objects and process them. 10

2. (a) What is a friend function ? What are merits and demerits of using Friend functions ? 8

   (b) Design a base class "shape" having two double type values which are used for computing areas. Also design two inherited classes from shape namely triangle and circle. The class shape have member function get-dat ( ) to initialize base class members and display-area ( ) to compute the area. Design and

P. T. O.

create the appropriate get-dat ( ) and display-area ( ) functions of all the above classes. 12

3. (a) Describe the following terms with *one* example each in the context of C^{++} : 12

   (i) This pointer

   (ii) Type casting between two user defined classes

   (iii) Multiple Inheritance

   (b) Write a function Locate (S, pattern) which returns –1 if the string pattern does not exist in S, otherwise returns location at which it is found. Write main ( ) program also. 8

4. (a) Write a C^{++} program to find the factorial of a given number. 8

   (b) Write a C^{++} program which generates the sum of following series using inline member functions : 12

$$\text{Sum} = X + \frac{X^2}{2!} + \frac{X^4}{4!} + \frac{X^6}{6!} + ...$$

5. (a) Write a program which copies one file to another. Take the two file names as command line arguments. Make checks for the correct opening of the files. 10

   (b) What do you understand by Data abstraction and Procedural abstraction ? 10

6. (a) Implement the matrix class, where the dimensions are passed on as parameters to the constructor. Overload the '+' operator to do matrix addition. 10

   (b) Give an example to explain the notion of virtual base class in C^{++}. Illustrate what happens when the base class in not declared as virtual ? 10

7. (a) Define virtual functions. Why do we need virtual function ? 6

   (b) Explain how base class member functions can be invoked in a derived class, if the derived class also has a member function with the same name. 6

   (c) Write a program to merge two files into a third file. 8

8. (a) Prepare an object diagram for the dining philosophers problem. There are 5 philosophers and 5 forks around a circular table. Each Philosopher has access to 2 forks on either side. Each fork is shared by 2 philosophers. Each fork may be either on the table or in use by one philosopher. A philosopher must have 2 forks to eat. 10

   (b) What is Object Model ? How is it represented ? Discuss the relationship of Object Model with Dynamic Model and Functional Model. 10