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Third Semester B.E. Degree Examination, Dec. 07 / Jan. 08
Object Oriented Programming with C++

Time: 3 hrs.   Max. Marks:100

Note : *Answer any FIVE full questions.*

1. a. Distinguish between procedural oriented and object oriented programming. **(06 Marks)**
   b. With the help of examples explain:
      i) # if def and # else
      ii) new
      iii) enumeration type **(07 Marks)**
   c. Explain how C++ supports encapsulation and polymorphism. **(07 Marks)**

2. a. With example explain the different types of parameter passing mechanisms. **(06 Marks)**
   b. When will you make a function inline? Why? How is it defined in C++? **(06 Marks)**
   c. Write a function power ( ) to raise a number 'm' to a power 'n'. The function takes a double value for 'm' and integer value for 'n'. Use a default value of 2 for 'n' when argument is omitted. Write a main that gets the values of 'm' and 'n' from the user to test the function. **(08 Marks)**

3. a. What is function overloading? Illustrate with an example. **(08 Marks)**
   b. What is a generic function? Write a generic function to swap two data elements and demonstrate for float and character type data. **(08 Marks)**
   c. Distinguish between local and global objects. **(04 Marks)**

4. a. Define a class by name complex. Write a member function to add two complex number and a friend function to subtract two complex number. **(10 Marks)**
   b. Define a class called student with register number, name, subject, test 1, test 2 and test 3 marks. Create an array of objects and display the students details with average test marks. **(10 Marks)**

5. a. What is a constructor? How to invoke a constructor? With an example distinguish between parameterized constructor and a copy constructor. **(10 Marks)**
   b. List the operators that cannot be overloaded. Define a complete class by name distance with feet and inches as data members and overload + = operator to add two objects. **(10 Marks)**

6. a. What is inheritance? Explain the different forms of inheritance with block diagram. How does C++ support single inheritance? **(10 Marks)**
   b. In what order are the class constructors invoked when a derived class object is created? Explain with an example. **(10 Marks)**

7. a. Illustrate the use of writing virtual functions with an example program. **(10 Marks)**
   b. Define a class string that could work as a user-defined string type. Overload the operator >> and <<. **(10 Marks)**

8. Write short notes on:
   a. This pointer
   b. Protected and private data members
   c. Static data members
   d. Nested classes. **(20 Marks)**

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USN ☐☐☐☐☐☐☐☐☐☐   CS36

Third Semester B.E. Degree Examination, June / July 08
OOP with C + +

Time: 3 hrs.   Max. Marks:100

Note : *Answer any FIVE full questions.*

1 a. What is object oriented programming? Bring out the salient features of procedure – oriented programming and object - oriented programming.   (08 Marks)
   b. Explain the different characteristics of oop.   (08 Marks)
   c. Explain 'volatile' qualifier and 'const' qualifier with example.   (04 Marks)

2 a. Discuss the following with an example.
       i) Function prototyping
       ii) Call by reference
       iii) Default arguments
       iv) Return by reference.   (12 Marks)
   b. With is an inline function? Explain its general syntax, merits and demerits. (04 Marks)
   c. Explain new and delete operators with examples.   (04 Marks)

   a. What is function overloading? Explain with an example.   (06 Marks)
   b. What are function templates and function instantiation? Explain.   (06 Marks)
   c. Write a program to create a template function for bubble sort and demonstrate the sorting of integers and characters.   (08 Marks)

   a. What is class? Explain the structure of a class with the help of an example. Differentiate between a class and a structure.   (08 Marks)
   b. What are constructors? Explain the different types of constructors with suitable examples. (08 Marks)
   c. What is a static data member? Explain its general syntax, rules and example. (06 Marks)

   a. What are friend functions? Why it is required? Explain with the help of a suitable example. (06 Marks)
   b. What is operator overloading? Explain its general syntax and rules along with an example. (06 Marks)
   c. Write a C++ program to perform arithmetic operation like addition and subtraction of two complex numbers. Overload the operators + and –.   (08 Marks)

   a. What is inheritance? Explain different types of inheritance with suitable diagram and syntax. (12 Marks)
   b. Discuss the importance of abstract classes with example.   (08 Marks)

   a. What are virtual functions? With an example demonstrate the usage of virtual functions. (10 Marks)
   b. What are the various I/ O streams in C++? Give the stream class hierarchy. (10 Marks)

Write short notes on :
a. 'this' pointer
b. Handling of strings in C++
c. Nested classes
d. Static function.   (20 Marks)

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USN ☐☐☐☐☐☐☐☐☐☐

NEW SCHEME

Third Semester B.E. Degree Examination, Dec. 06 / Jan. 07
CS / IS
OOP with C++

Time: 3 hrs.]

[Max. Marks:100

Note: *Answer any FIVE full questions.*

1 a. What is the essential purpose of using volatile quantifier? How it is declared? Give one example. **(05 Marks)**

  b. What is the need for enumeration types? Give one example. Mention any two operations that we cannot perform with enumerator. **(05 Marks)**

  c. How reference type is different when compared to pointer? **(05 Marks)**

  d. What are the benefits of using typedef names? Give one example. **(05 Marks)**

2 a. Is it possible to call functions declared in other languages? Justify your answer by taking an example. **(05 Marks)**

  b. Write recursive functions to compute: i) a^b ii) n! **(04 Marks)**

  c. Write a C++ program to print the command line arguments for the input
   $ testcommand one two
   Where $ indicates the prompt of the operating system. **(05 Marks)**

  d. Write a C++ program to add two complex numbers with + operator overloading. **(06 Marks)**

3 a. What is a generic function? Write a C++ program to sort a set of integers and float numbers in ascending order using generic bubble sort. **(10 Marks)**

  b. What is meant by explicit specialization? Write a C++ program to overload template specification itself taking suitable example. **(10 Marks)**

4 a. What is a anonymous union? List any three restrictions on anonymous union. **(05 Marks)**

  b. What is a friend class? With an example explain the working of friend class. **(08 Marks)**

  c. What is an inline function? Mention its advantage? How are inline functions declared within a class? Give one example. **(07 Marks)**

5 a. How can a data member be declared as a static member? What exactly is its impact? Explain with an example. **(08 Marks)**

  b. How is a local class declared? What are the restrictions that apply to local class? **(07 Marks)**

  c. What is a parameterized constructor? Give one example. **(05 Marks)**

6 a. Write a C++ program to calculate the average marks scored in three subjects by students X, Y, Z. Use both initialized and uninitialised arrays of objects. **(08 Marks)**

  b. Create a class FLOAT that contains two float data members. Write a C++ program to overload all the four arithmetic operators so that they operate on the objects of FLOAT. **(12 Marks)**

7 a. What does inheritance mean in C++? When do we use the protected visibility specifier to a class member? Give one example. **(08 Marks)**

  b. When do we make a virtual function pure? What are the implications of making a function pure virtual function? **(07 Marks)**

  c. What is the difference between early and late binding? Explain. **(05 Marks**

8 a. Write a C++ program that reads a text file a.dat and creates another file b.dat that is identical except that every sequence of consecutive blank spaces is replaced by a single space. **(10 Marks)**

  b. What is a stream? Why Cin and Cout are not considered as keywords? **(05 Marks)**

  c. What is a scope resolution operator? Why it is required? **(05 Marks)**

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USN ☐☐☐☐☐☐☐☐☐☐

NEW SCHEME

Third Semester B.E. Degree Examination, July 2007
CSE / ISE
OOP with C++

Time: 3 hrs.]   [Max. Marks:100

Note : *Answer any FIVE full questions.*

1 a. What is object oriented programming (OOP)? Explain advantages of OOP. **(06 Marks)**
   b. With examples explain : i) Implicit and Explicit conversion ii) Enumeration and type defination.
                                                                                    (08 Marks)
   c. Explain new and delete operators with examples.   **(06 Marks)**

2 a. Explain with examples default arguments and function overloading. Discuss how a function over loading is resolved during compile time. **(10 Marks)**
   b. With suitable examples, explain various parameter-passing techniques supported by C++.
                                                                                    (06 Marks)
   c. What is recursion? Write a recursive function to compute n^{th} term of Fibonacci series
                                                                                    (04 Marks)

3 a. Illustrate different storage class specifiers supported by C++ and life span of each.
                                                                                    (10 Marks)
   b. What are command line arguments? Write a C++ program to compute GCD and LCM of two numbers passed as command line arguments. **(10 Marks)**

4 a. Explain the advantages of function template. Write a C++ program to find maximum element in an integer and in float array using function template. **(10 Marks)**
   b. Write a C++ program to demonstrate stack operation on integer and float data type using template function. Provide push, pop and display functions. **(10 Marks)**

5 a. Explain class and object. With the help of example explain how data hiding and encapsulation characteristic of OOP is achieved in C++. **(08 Marks)**
   b. Write a C++ program to create a class with 3 data members. Sign of type bool , Rupee and Paisa of type unsigned integer and 4 functions, set data function to set data, parameterized constructor, Add function to add two objects, and display the object by over loading < < operator using friend function. Also include default constructor and destructor. Write main program to declare the objects and perform the operation using member functions of the class. **(12 Marks)**

5 a. What are the advantages of operator over loading? Write a C++ program to over load '+' and '=' operator to concatenate two strings and assign one string to another.
                                                                                    (10 Marks)
   b. Explain static data members and static member functions.   **(06 Marks)**
   c. With example, explain 'this' pointer.   **(04 Marks)**

7 a. What is inheritance? With suitable examples discuss various inheritances supported by C++.
                                                                                    (10 Marks)
   b. Explain virtual function and run time polymorphism. Write a program to demonstrate dynamic polymorphism.
                                                                                    (10 Marks)

   a. What is pointer function? Write a C++ program to sort an integer array in ascending and descending order using pointer function. (Any sorting technique may be used).
                                                                                    (08 Marks)
   b. What is pure virtual function and abstract class, explain with an example.   **(04 Marks)**
   c. Write explanatory notes on:
       i) I/O stream classes of C++   ii) File input and output.   **(08 Marks)**

NEW SCHEME

CS36

Reg. No.

Third Semester B.E. Degree Examination, January/February 2006
Computer Science/Information Science and Engineering
Object Oriented Programming with C^{++}

Time: 3 hrs.)

(Max.Marks : 100

Note: 1. Answer any FIVE full questions.
2. All questions carry equal marks.

1. (a) Define object oriented programming. Differentiate procedural structural and object-oriented programming.
(6 Marks)

(b) Explain the different characteristics of OOP.
(8 Marks)

(c) Write a program to illustrate the use of enumerated constants.
(6 Marks)

2. (a) Discuss the following with an example
   i)   Function prototype
   ii)   Recursive function
   iii) Actual and formal parameters
   iv)   Inline function
(12 Marks)

(b) Write a program to find nC_r using recursion.
(8 Marks)

3. (a) Define class and object. Write a class "rectangle" containing two data items "length" and "breadth" and four functions setdata( ), getdata( ), display data ( ) and area ( ) to set the length and breadth, to get the user inputs, to display and to find the area of the rectangle respectively. Also write a main program which declares the objects and uses the member functions of the class.
(10 Marks)

(b) What do you mean by function overloading ? Explain with an example. (6 Marks)

(c) Write a note on new and delete operators.
(4 Marks)

4. (a) Write a C^{++} program to add and multiply two complex numbers with operator overloading.
(10 Marks)

(b) Define function templates. Discuss the need of function templates with suitable examples.
(10 Marks)

5. (a) What is a "friend function" ? Write a program that has friend function to compute GCD and LCM of two numbers.
(8 Marks)

(b) Create a class STRING and implement the following :
The results are to be displayed by overloading operator after every operation. Use constructors in the program.

   STRING s_1 = "INFOSYS"

   STRING s_1 = "WIPRO"

   STRING $s_3 = s_1 + s_2$

(8 Marks)

CS36

(c) Write a note on "this pointer". **(4 Marks)**

6. (a) Discuss the importance of abstract classes with example. **(7 Marks)**

(b) Explain the following :

   i)   Object assignment

   ii)   Pointers to object

   iii) Static member function **(9 Marks)**

(c) How default argument concept is useful in C^{++} programming ? Justify with an example. **(4 Marks)**

7. (a) What is inheritance ? Discuss the different types of inheritances. **(10 Marks)**

(b) What is runtime polymorphism ? How virtual functions can be used to implement the runtime polymorphism ? Explain with an example. **(10 Marks)**

8. Write short notes on :

   a)   Volatile qualifiers

   b)   Passing by reference

   c)   Parameterised and copy constructors

   d)   Dynamic binding **(20 Marks)**

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USN ☐☐☐☐☐☐☐☐☐☐

NEW SCHEME

Third Semester B.E. Degree Examination, July 2006
CS / IS
Object Oriented Programming with C++

Time: 3 hrs.]   [Max. Marks:100

Note: *Answer any Five full questions.*

1   a.   What are Reference types, The Bool type and Enumeration data types with examples and describe its usage.   **(08 Marks)**
    b.   What are new and delete expression? Give examples.   **(08 Marks)**
    c.   Define scope of resolution operator with an example and its related use.   **(04 Marks)**

2   a.   What are inline member functions and recursive functions? Give examples.   **(08 Marks)**
    b.   Define scope and life time, global objects and local objects.   **(04 Marks)**
    c.   Discuss the three steps involved in the function over load resolution with an illustration.   **(08 Marks)**

3   a.   What are the Generic functions? Explain how do you overload a function template with an example.   **(10 Marks)**
    b.   Write a program to conduct a generic sort using class template.   **(10 Marks)**

4   a.   What is static data member and static member functions? What are its merits and demerits? Give examples.   **(08 Marks)**
    b.   Bring out the differences between C++ structure and C++ class.   **(04 Marks)**
    c.   Explain the concept of pointers to objects with an example.   **(08 Marks)**

5   a.   Discuss with examples constructors and destructors in C++. What is the order of execution?   **(08 Marks)**
    b.   What are the needs and usage of friend functions? Write a program that has over loaded operator to illustrate multiplication of two matrics.   **(12 Marks)**

6   a.   What are the multiple and multi level inheritance illustrate with examples?   **(12 Marks)**
    b.   What are virtual functions? Explain with an example its usage.   **(08 Marks)**

7   a.   Write a program that has a class called MATRIX. Check the two matrics by using = = overloaded operator. Perform the following operations :

```
if  ( m1 == m2 )
  {
    m3 = m1 + m2
    m4 = m1 - m2
  {
```

Where m1, m2, m3 and m4 are MATRIX objects. Display the result by overloaded operator <<.   **(14 Marks)**
    b.   Discuss the importance of abstract classes. Give examples.   **(06 Marks)**

8   Write critical notes on the following :
    a.   Polymorphism.   b.   Nested classes   c.   IO Streams in C++   d.   'this' pointer in C++   **(20 Marks)**

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USN

NEW SCHEME

Third Semester B.E. Degree Examination, July 2006
CS / IS
Object Oriented Programming with C++

Time: 3 hrs.]

[Max. Marks:100

Note: *Answer any Five full questions.*

1. a. What are Reference types, The Bool type and Enumeration data types with examples and describe its usage. **(08 Marks)**
   b. What are new and delete expression? Give examples. **(08 Marks)**
   c. Define scope of resolution operator with an example and its related use. **(04 Marks)**

2. a. What are inline member functions and recursive functions? Give examples. **(08 Marks)**
   b. Define scope and life time, global objects and local objects. **(04 Marks)**
   c. Discuss the three steps involved in the function over load resolution with an illustration. **(08 Marks)**

3. a. What are the Generic functions? Explain how do you overload a function template with an example. **(10 Marks)**
   b. Write a program to conduct a generic sort using class template. **(10 Marks)**

4. a. What is static data member and static member functions? What are its merits and demerits? Give examples. **(08 Marks)**
   b. Bring out the differences between C++ structure and C++ class. **(04 Marks)**
   c. Explain the concept of pointers to objects with an example. **(08 Marks)**

5. a. Discuss with examples constructors and destructors in C++. What is the order of execution? **(08 Marks)**
   b. What are the needs and usage of friend functions? Write a program that has over loaded operator to illustrate multiplication of two matrics. **(12 Marks)**

6. a. What are the multiple and multi level inheritance illustrate with examples? **(12 Marks)**
   b. What are virtual functions? Explain with an example its usage. **(08 Marks)**

7. a. Write a program that has a class called MATRIX. Check the two matrics by using = = overloaded operator. Perform the following operations :

   ```
   if ( m1 == m2 )
   {
       m3 = m1 + m2
       m4 = m1 – m2
   {
   ```

   Where m1, m2, m3 and m4 are MATRIX objects. Display the result by overloaded operator <<. **(14 Marks)**
   b. Discuss the importance of abstract classes. Give examples. **(06 Marks)**

8. Write critical notes on the following :
   a. Polymorphism. b. Nested classes c. IO Streams in C++ d. 'this' pointer in C++ **(20 Marks)**

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CS 36

USN

Third Semester B.E. Degree Examination, July 2006
CS / IS
Object Oriented Programming with C++

Time: 3 hrs.]   [Max. Marks:100

Note: *Answer any Five full questions.*

1 a. What are Reference types, The Bool type and Enumeration data types with examples and describe its usage. **(08 Marks)**
   b. What are new and/delete expression? Give examples. **(08 Marks)**
   c. Define scope of resolution operator with an example and its related use. **(04 Marks)**

2 a. What are inline member functions and recursive functions? Give examples. **(08 Marks)**
   b. Define scope and life time, global objects and local objects. **(04 Marks)**
   c. Discuss the three steps involved in the function over load resolution with an illustration. **(08 Marks)**

3 a. What are the Generic functions? Explain how do you overload a function template with an example. **(10 Marks)**
   b. Write a program to conduct a generic sort using class template. **(10 Marks)**

4 a. What is static data member and static member functions? What are its merits and demerits? Give examples. **(08 Marks)**
   b. Bring out the differences between C++ structure and C++ class. **(04 Marks)**
   c. Explain the concept of pointers to objects with an example. **(08 Marks)**

5 a. Discuss with examples constructors and destructors in C++. What is the order of execution? **(08 Marks)**
   b. What are the needs and usage of friend functions? Write a program that has over loaded operator to illustrate multiplication of two matrics. **(12 Marks)**

6 a. What are the multiple and multi level inheritance illustrate with examples? **(12 Marks)**
   b. What are virtual functions? Explain with an example its usage. **(08 Marks)**

7 a. Write a program that has a class called MATRIX. Check the two matrics by using = = overloaded operator. Perform the following operations :

       if (m1 == m2)
         {
         m3 = m1 + m2
         m4 = m1 – m2
         {

   Where m1, m2, m3 and m4 are MATRIX objects. Display the result by overloaded operator <<. **(14 Marks)**
   b. Discuss the importance of abstract classes. Give examples. **(06 Marks)**

8 Write critical notes on the following :
   a. Polymorphism. b. Nested classes c. IO Streams in C++ d. 'this' pointer in C++ **(20 Marks)**

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NEW SCHEME

MCA35

USN ☐☐☐☐☐☐☐☐☐☐

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.

1. (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)

2. (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)

3. (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)**

4. (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)**

5. (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)**

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)**

    i) Inline function

    ii) Pure virtual function

    iii) Use of abstract classes in C^{++}

    iv) This pointer with an example.

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NEW SCHEME

CS36

USN ☐☐☐☐☐☐☐☐☐☐

Third Semester B.E. Degree Examination, January/February 2005
Computer Science/Information Science and Engineering
Object Oriented Programming with $C++$

Time: 3 hrs.]

[Max.Marks : 100

Note: *Answer any FIVE full questions.*

1. (a) With the help of examples, explain the following :
   i) Data abstraction and encapsulation
   ii) Polymorphism
   (6 Marks)

   (b) Explain the following data types used in $C++$, with examples.
   i) Pointer types
   ii) String types
   iii) Boolean types
   (9 Marks)

   (c) Explain new and delete expressions with examples.
   (5 Marks)

2. (a) What is parameter passing ? Explain. Discuss the various parameter passing schemes supported by $C++$.
   (8 Marks)

   (b) What is an inline function ? Why is it necessary to make a function an inline function ? Write a program using an inline function to find the maximum of 2 numbers.
   (8 Marks)

   (c) Explain dynamically allocated objects with examples.
   (4 Marks)

3. (a) What is the use of function overloading ? Explain. Write a program using function overloading to find the area of a circle and the area of a triangle. (8 Marks)

   (b) Explain function templates with its general syntax and examples. (6 Marks)

   (c) Write a $C++$ program to swap 2 integer type data and 2 float type data using a generic function.
   (6 Marks)

4. (a) What is a class ? Explain the structure of a class with the help of an example. Differentiate between a class and a structure. (8 Marks)

   (b) What are constructors ? Explain the different types of constructors with suitable examples.
   (6 Marks)

   (c) Write a $C++$ program to accept 2 complex numbers, add them and display their output.
   (6 Marks)

5. (a) What are friend functions ? Explain with the help of general syntax and suitable examples.
   (6 Marks)

   (b) What is operator overloading ? Explain with its general syntax, rules and examples.
   (8 Marks)

    (c) Write a C^{++} program using operator overloading to compare two data values representing distances in feet and inches.   (6 Marks)

6. (a) What is a derived class ? Explain with examples the 3 ways in which a class can be inherited.   (8 Marks)

    (b) Explain how pointers are used in base and derived classes, with examples.   (6 Marks)

    (c) Explain multilevel inheritance and multiple inheritance with examples.   (6 Marks)

7. (a) What are virtual functions ? Explain the usage of virtual functions with examples.   (8 Marks)

    (b) Define the concept of iostreams provided in C^{++}. Explain in detail its stream class hierarchy.   (8 Marks)

    (c) What is an abstract class ? Explain with an example.   (4 Marks)

8.   Write short notes on :
   a) Early and late binding
   b) Hybrid inheritance
   c) Role of protected section
   d) Unary operator overloading   (4×5=20 Marks)

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NEW SCHEME

CS36

USN ☐☐☐☐☐☐☐☐☐☐

Third Semester B.E. Degree Examination, July/August 2005
Computer Science/Information Science and Engineering
OPP with C++

Time: 3 hrs.]

[Max.Marks : 100

Note: *Answer any FIVE full questions.*

1. (a) Bringout the salient features of structural programming and object oriented programming.

    (8 Marks)

    (b) Explain volatile and const qualifiers.

    (4 Marks)

    (c) How are strings handled in C++? Discuss with appropriate examples. (8 Marks)

2. (a) What is dynamic memory management? How is it handled in C++? Give examples.

    (8 Marks)

    (b) What are 'inline functions'? Explain briefly.

    (4 Marks)

    (c) What are the advantages of using functions? Explain function prototyping and function definition with example.

    (8 Marks)

3. (a) What is function overloading? Discuss three steps of overload resolution with examples.

    (8 Marks)

    (b) What are function templates and function instantiation? Explain. (4 Marks)

    (c) Write a C++ program to demonstrate function templates. Let 'minimum ( )' be function. The program finds minimum of given two numbers with different data types such as integer, floating point and double.

    (8 Marks)

4. (a) Define 'class' and 'object'. With an example, explain the concept of data encapsulation and accessing of member elements.

    (8 Marks)

    (b) Write a note on parameterised constructor and constructor with default arguments.

    (4 Marks)

    (c) Create a class date which has dd, mm and yy, integer member variables. A constructor with three arguments to initialize it. Member functions

    i)   to display date in dd: mm : yy format

    ii) to find difference between two dates and display the total number of days.

    Also a main ( ) to initialize two objects to two different dates and display the number of days between them.

    (8 Marks)

5. (a) Write a C++ program to perform arithmetic operations like add and subtract two complex numbers. Overload the operators + and −.

    (8 Marks)

    (b) Explain space saving class.

    (4 Marks)

    (c) Explain different parameter passing methods used in C++.

    (8 Marks)

6. (a) What is INHERITANCE? Bring out the concept of various types of inheritances. (8 Marks)

(b) Explain virtual function. (4 Marks)

(c) Write a note on the visibility of member functions based on private and protected derivations with an example each. (8 Marks)

7. (a) What are IO streams in C++? Give the stream class hierarely. (8 Marks)

(b) Explain the use of abstract classes. (4 Marks)

(c) Write a C++ program to read a text file and display the contents, number of lines, number of words and number alphabets on the screen. (8 Marks)

8. Write short notes on :

a) Friend function

b) 'this' pointer

c) Static members

d) Nested classes

(5×4=20 Marks)

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NEW SCHEME

CS36

USN

Third Semester B.E. Degree Examination, January/February 2004
Computer Science/Information Science and Engineering
OOP with C^{++}

Time: 3 hrs.]

[Max.Marks : 100

Note: *Answer any FIVE full questions.*

1. (a) What is Object Oriented Programming? Explain the characteristics of OOP languages.
   (10 Marks)

   (b) Explain :

   i) Implicit and Explicit type conversions .

   ii) Typed-ef names and their advantages.,
   (6 Marks)

   (c) What is a pointer? If ia is an integer array, what is the difference between $*(ia+1)$ and $*ia + 1$.
   (4 Marks)

2. (a) What is a function prototype? Why is C^{++} called a strongly typed language?
   (5 Marks)

   (b) Write the function definitions and function calls to swap the contents of two integer variables i and j using :

   i) Value parameters ii) Pointer parameters, and iii) Reference parameters.
   Comment on the result when value parameters are used.
   (10 Marks)

   (c) Describe : i) Register automatic objects ii) Static local objects.
   (5 Marks)

3. (a) What is function overloading? What is its advantage? How is overload resolution done?
   (6 Marks)

   (b) Explain Promotions and Standard conversions with respect to argument type conversion.
   (8 Marks)

   (c) Write a C^{++} program to swap two integer, float and character type data using a generic function.
   (6 Marks)

4. (a) Explain the structure and definition of a class with an example. How is a class different form a structure?
   (6 Marks)

   (b) What are constructors? Describe the different types of constructors.
   (6 Marks)

   (c) Describe Friend functions and inline functions.
   (8 Marks)

5. (a) Why and how are static data members used?
   (6 Marks)

   (b) Write a note on 'this' pointer. When can this not be used?
   (6 Marks)

   (c) Discuss on the use of pointers to derived classes and pointers to class members.
   (8 Marks)

6. (a) What is the use of operator overloading? Write a C^{++} program to add two complex numbers by overloading the operator +. (8 Marks)

   (b) What is the difference between overloading an operator using a member function and using a friend function? What is the advantage of overloading the subscript operator ☐ ? (6 Marks)

   (c) What are the advantages of inheritance? Tabulate the effect on the accessibility of members when a base class is derived using different access specifiers.(6 Marks)

7. (a) How can a member function declared in the base class be redefined in the derived class? Demonstrate this with an example. (10 Marks)

   (b) How are input and output facilities provided in C^{++}? Write a C^{++} program to overload << to display complex numbers. (10 Marks)

                                                                  (4×5=20 Marks)

8. Write explanatory notes on :

   i)   Dynamic memory management

   ii) Abstract classes

   iii) Early and Late binding

   iv) File input and output

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NEW SCHEME

CS36

USN

Third Semester B.E. Degree Examination, July/August 2004
Computer Science/Information Science and Engineering
Object Oriented Programming with $C++$

Time: 3 hrs.]

[Max.Marks : 100

Note: *Answer any FIVE full questions.*

1. (a) What is object oriented programming? Explain the following terms with example.

   (10 Marks)

   i) Class and objects   ii) Inheritance

   iii) Polymorphism   iv) Data abstraction and encapsulation.

   (b) What is reference variable? Write a $C++$ program to find the sum of two numbers using reference variable.

   (5 Marks)

   (c) Describe the new and delete operator with example.

   (5 Marks)

2. (a) What is inline function? List its merits and demerits. Write program to find the smallest of two numbers using inline function and the ternary operator. (6 Marks)

   (b) What is function overloading? Explain three steps of overload resolution with an example.

   (10 Marks)

   (c) Explain the use of scope resolution operator with an example. (4 Marks)

3. (a) What is a generic function? Write a program to create a template function for bubble sort and demonstrate the sorting of integers and characters. (10 Marks)

   (b) What are friend functions? Why is it required? Write a program using a bridge friend function for swapping two numbers. (10 Marks)

4. (a) Explain the static data members in $C++$ with an example. (6 Marks)

   (b) Can you :

   i) Overload constructor   ii) Overload destructor.

   Justify your answer with an example. (10 Marks)

   (c) Write a program to count the number of objects created using constructor?(4 Marks)

5. (a) Describe operator overloading. Why is it necessary? Explain the restrictions of overloading of an operator with an example. (12 Marks)

   (b) Write a program to overload the operator += and [ ]. (8 Marks)

6. (a) What is inheritance? Explain different types of inheritance with suitable diagram and syntax.   (12 Marks)

    (b) Explain how constructor and destructor functions are executed with example.
                                                                                 (8 Marks)

7. (a) What is virtual function? Demonstrate the usage of virtual functions with an example.   (10 Marks)

    (b) What are iostreams in C^{++} ? Give a stream class hierarchy.   (10 Marks)

8. (a) Write a program to add two complex numbers by overloading the operatiors +, $>>$ and $<<$ with suitable messages.   (10 Marks)

    (b) Write a note on :

         i)   Handling of strings in C^{++}

         ii) Protected and public access specifier.   (10 Marks)

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NEW SCHEME

MCA35

USN ☐☐☐☐☐☐☐☐☐☐

Third Semester M.C.A Degree Examination, July/August 2004
Master of Computer Applications
Object Oriented Programming with C++

Time: 3 hrs.]

[Max.Marks : 100

Note: *Answer any FIVE full questions.*

1. (a) Explain the concept of object oriented programming. Also explain its features.

   (10 Marks)

   (b) What is a volatile qualifier? Give an example.

   (4 Marks)

   (c) Explain how new and delete expressions manage memory allocation dynami-br cally.

   (6 Marks)

2. (a) What are the advantages of using functions? Explain function prototyping and parameter passing mechanisms.

   (10 Marks)

   (b) Write a note on inline functions with illustrations.

   (6 Marks)

   (c) Explain the meaning of scope and life time of an object.

   (4 Marks)

3. (a) What is function overloading? Discuss overload resolution.

   (10 Marks)

   (b) Write a C++ program to errate a template function for quick sort and demonstrate sorting of integers and doubles.

   (10 Marks)

4. (a) Define class and object. With an example explain the concept of data encapsulation and accessing of member elements.

   (10 Marks)

   (b) Explain the concept of constructors and destructors with examples. (6 Marks)

   (c) Write a note on scope resolution operator.

   (4 Marks)

5. (a) Write a note on nested classes.

   (5 Marks)

   (b) What are friend functions? Why are they used? Explain with an example.

   (10 Marks)

   (c) Explain static data members and static member functions.

   (5 Marks)

6. (a) Explain the following with examples :
   i) Implicit 'this' pointer
   ii) Pointers to class members.

   (10 Marks)

   (b) Write a program to perform addition and multiplication of two complex numbers by overloading + and * operators.

   (10 Marks)

7. (a) What is inheritance? Briefly explain the different types of inheritances.

   (10 Marks)

   (b) Write a note on virtual functions.

   (6 Marks)

   (c) Explain the use of abstract classes in C++.

   (4 Marks)

8. (a) What are iostreams in C^{++} ? Give the stream class hierarely.   (10 Marks)

(b) Write a C^{++} program to create a class called STRING and implement the following. Display the results by overloading the operator $<<$ after every operation.

(a) STRING S1="VTU"

(b) STRING S2 = "BELGAUM"

(c) STRING S3 = S1+S2

Use copy constructor.   (10 Marks)

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USN ☐☐☐☐☐☐☐☐☐☐

Third Semester M.C.A Degree Examination, July/August 2004
Master of Computer Applications
(Old Scheme)
Object Oriented Programming & Design

Time: 3 hrs.]   [Max.Marks : 100

Note: *Answer any FIVE full questions.*

1. (a) Explain the different stages involved in the methodology for object oriented development.
   (10 Marks)
   (b) List and explain the different themes involved in object oriented technology.
   (10 Marks)

2. (a) With suitable examples, differentiate between object diagram, class diagram and instance diagram.
   (10 Marks)
   (b) Explain the meaning of aggregation. How do you compare aggregation with association and with generalization ?
   (10 Marks)

3. (a) Explain the following concepts :
   i) Events   ii) Scenarios   iii) States
   (12 Marks)
   (b) Explain the importance of state diagram in dynamic modelling with suitable example.
   (8 Marks)

4. (a) Explain the following with respect to DFD :
   i)   Process   ii) Data flow   iii) Actors   iv) Data stores
   (12 Marks)
   (b) Design a DFD for a restaurant management system.
   (8 Marks)

5. (a) Describe the analysis process in OMT.
   (8 Marks)
   (b) On what criteria does unnecessary attributes eliminated ? Explain with suitable examples.
   (12 Marks)

6. (a) What is the use of inline functions ? Explain with an example.
   (4 Marks)
   (b) Explain the difference between overloading and overriding.
   (6 Marks)
   (c) What is containership ? How does it differ from inheritance ?
   (6 Marks)
   (d) Why do we need virtual functions ?
   (4 Marks)

7. (a) Write a program in C^{++} to create a class STRING with member functions by overloading $<<$ operator.
   i)   STRING S1 = "MCA"
   ii) STRING S2 = "3rd SEMESTER"
   iii) STRING S3 = S1 + S2
   Use copy constructor.
   (12 Marks)
   (b) With an example explain file stream operations in C^{++}.
   (8 Marks)

8.   Write short notes on :
   a)   Link attributes
   b)   Meta Data
   c)   Nested state diagram
   d)   Interactive Interface

   ($4 \times 5 = 20$ Marks)

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