

FOURTH SEMESTER B.E. (COMPUTER SCIENCE AND ENGINEERING/
INFORMATION SCIENCE AND ENGINEERING) DEGREE EXAMINATION
MARCH 2001

OBJECT ORIENTED PROGRAMMING WITH C++

Time : Three Hours

Maximum : 100 Marks

Answer any five questions.

1. (a) Bring out the salient features of structured programming and object-oriented programming. (8 marks)
- (b) State the importance of object-oriented programming on software development. (2 marks)
- (c) Discuss the following C++ operators with illustrations :—
(i) new ; (ii) delete. (6 marks)
- (d) Explain a method of declaring symbolic constants without using pre-processor directive. (2 marks)
- (e) Write an interactive program to find "elder" among "you" and "me" using the ternary operator. (2 marks)
2. (a) Write a C++ program to find the sum and average of an array A with n integer values. Provide a feature for dynamic initialisation of variables. (8 marks)
- (b) Discuss how call by reference method of passing parameters can be achieved using reference variables. Illustrate this through a program to find the GCD of two positive integers. (6 marks)
- (c) Write a C++ program to find the sum of first n natural numbers using recursion. (6 marks)
3. (a) Write a note on Inline function with illustrations. (6 marks)
- (b) Discuss the concept of storage classes associated with the variables. (6 marks)
- (c) Write a program to implement the linked list class with the following operations :—
(i) Create ; (ii) Insert-beg ; (iii) Delete-beg. (8 marks)
4. (a) What are function templates ? Write a program to demonstrate the function template square () to find the square of the given numbers with different data types such as integers, floating point numbers and double. (8 marks)

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Fourth Semester B.E. Degree Examination, July/August 2002
Computer Science and Information Science Engineering
Object Oriented Programming with C++

Time: 3 hrs.]

[Max.Marks : 100

Note: Answer any FIVE full questions.

1. (a) Describe the data types that are supported by C++ but not by C. (5 Marks)
 (b) Distinguish between lvalue and rvalue of a variable. Give an example. (5 Marks)
 (c) Explain the following with examples : (10 Marks)
 i) typed of names ii) volatile qualifier iii) reference types iv) comma operator.
2. (a) Describe the facilities for dynamic memory management available in C++. (5 Marks)
 (b) What are the advantages of using functions? Explain function prototyping and the parameter passing mechanisms. (10 Marks)
 (c) Explain the different kinds of local objects. (5 Marks)
3. (a) What is function overloading? Explain the overload resolution scheme. (5 Marks)
 (b) Explain function template and function instantiation with an example. (10 Marks)
 (c) Briefly explain the template compilation models. (5 Marks)
4. (a) Explain the scope resolution operator. (5 Marks)
 (b) What is object oriented programming? Explain the features of OOP. (10 Marks)
 (c) Describe the class definition. (5 Marks)
5. (a) Distinguish between inline and non-inline functions. (5 Marks)
 (b) What are constructors? Explain the different types of constructors. (10 Marks)
 (c) Explain briefly Space saving class and Space saving member. (5 Marks)
6. (a) What is operator overloading? Why is it necessary? How is it done? (5 Marks)
 (b) Write a C++ program to add two complex numbers by overloading the + operator. (10 Marks)
 (c) Explain the idea of class templates with an example. (5 Marks)
7. (a) What is inheritance? Bring out the different forms of inheritance. (5 Marks)
 (b) Write a C++ program defining a class - student, having Register Number and Name as members, and another class - result derived from student and with marks in three subjects (Max. in each is 100) as its members. The program must accept the data at the runtime and display them along with the percentage of marks. (10 Marks)
 (c) Explain virtual functions. (5 Marks)
8. Write explanatory notes on the following :
 i) String handling in C++
 ii) Type conversion.
 iii) Friend functions
 iv) Iostream library.

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Fourth Semester B.E. Degree Examination, January/February 2003
Computer Science and Information Science Engineering
Object Oriented Programming with C++

Time: 3 hrs.]

[Max.Marks : 100

Note: Answer any FIVE full questions.

1. (a) Explain the different operators available in C++ with examples & give their precedence. (10 Marks)
- (b) Explain the importance of "const" type qualifier with example. (6 Marks)
- (c) What are reference types used in C++? (4 Marks)
2. (a) Explain the looping constructs in C++ with examples. (8 Marks)
- (b) What is object oriental programming? Explain its characteristics. (8 Marks)
- (c) Explain function prototyping & function definition with an example. (4 Marks)
3. (a) What is function overloading? Discuss overload resolution. (10 Marks)
- (b) Write a C++ program to create a template function for quick sort & demonstrate sorting of integers & double data types. (10 Marks)
4. (a) What are scope & life time of an object? explain briefly. (10 Marks)
- (b) Write a C++ program to show the overloading of ++ & -- operators. (10 Marks)
5. (a) Explain with an example the concept of static data member in C++ (8 Marks)
- (b) Explain the concept of constructors & destructors. (8 Marks)
- (c) What is polymorphism? explain. (4 Marks)
6. (a) What are friend functions? Why are they used? Explain with an example. (10 Marks)
- (b) What is class template & class template instantiation. (10 Marks)
7. (a) Write a note on Nested classes. (6 Marks)
- (b) Explain the use of abstract classes in C++. (4 Marks)
- (c) What in Inheritance? Bring out the concept of various types of inheritances. (10 Marks)
8. (a) What are iostreams in C++. Give the steam class hierarchy. (10 Marks)
- (b) Write a C++ program to create a base class called a STUDENT (Name, Reg No., Age) & using inheritance create classes Ug student & Pg student having fields as semester, fee & stipend. Enter the data of 5 students. Find the average age, semester wise for all UG & PG students separately. (10 Marks)

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Fourth Semester B.E. Degree Examination, July/August 2003
Computer Science and Information Science Engineering
Object Oriented Programming with C++

Time: 3 hrs.]

[Max.Marks : 100

Note: Answer any FIVE full questions.

1. (a) Explain the following with examples :
 - i) Const qualifier
 - ii) Reference types
 - iii) Enumeration types
 - iv) Volatile qualifier. (10 Marks)
- (b) What is type conversion? With examples illustrate implicit and explicit type conversions. (5 Marks)
- (c) Describe the new and delete operators with examples. (5 Marks)
2. (a) Given $a = 0 \times 1234$, $b = 0 \times ABCD$, Evaluate :
 - i) $a \& b$ ii) a/b iii) $a >> 5$ iv) $a \wedge b$ (8 Marks)
- (b) Explain the 'break' statement and 'continue' statements with examples. (6 Marks)
- (c) Write C++ program segments to find the factorial of a number using the looping structures of C++ (6 Marks)
3. (a) What are the benefits of using functions? Write C++ functions to swap the contents of two variables a and b using different parameter passing mechanisms. (8 Marks)
- (b) Explain the default arguments to a function with an example. (4 Marks)
- (c) What is function overloading? Describe the overload resolution with an example. (8 Marks)
4. (a) What is a function template? Give the general algorithm for template argument deduction. (10 Marks)
- (b) Write a C++ program to find the biggest two given numbers of different data types using a function template. (5 Marks)
- (c) Briefly explain the template compilation models. (5 Marks)
5. (a) Distinguish between procedure oriented programming and object oriented programming. What are the advantages of OOP? (8 Marks)
- (b) How is formation hiding achieved in OOP? (6 Marks)
- (c) What is operator overloading? What are the differences between overloading an operator using a non-static member function and a friend function? (6 Marks)

6. (a) Write a C++ program to find the sum of two time quantities in hours and minutes (HH:MM) by overloading the operator+. (8 Marks)
- (b) What are the advantages of inheritance? Give the relationship between the member visibility and the inheritance modes. (6 Marks)
- (c) Explain the concept and use of the implicit 'this' operator? Give an example. (6 Marks)
7. (a) Describe the different forms of polymorphisms achieved in OOP? What are pure virtual functions? (6 Marks)
- (b) Write a C++ program to create a class - string that can hold a string. Create two objects of this class using copy constructor. Concatenate the objects by overloading the + operator. Display the result by overloading the << operator. (10 Marks)
- (c) Write a note on condition states. (4 Marks)
8. Write explanatory notes on the following :
- a) Local objects.
 - b) Space saving class and member.
 - c) Class templates.
 - d) Object composition. (4×5=20 Marks)

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Fourth Semester B.E. Degree Examination, January/February 2004
Computer Science and Information Science 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) Discuss with appropriate examples, how strings are handled in C++?
(b) Explain enumerated and user defined data types. Demonstrate the usage of enumeration constants. (6 Marks)
(c) What are the differences between break and continue statement? Illustrate differences with a program. (6 Marks)
2. (a) What is parameter passing? Explain parameter passing schemes supported by C++. (8 Marks)
(b) What are default arguments? Explain with an illustration. (6 Marks)
(c) With illustration explain function overloading. Discuss overload resolution. (6 Marks)
3. (a) Define terms; Scope and Extent. Explain different storage classes supported by C++. Also explain their scope and extent. (8 Marks)
(b) What are function templates? Write a template based program for sorting numbers. (8 Marks)
(c) Discuss the following :
 - i) Local objects
 - ii) Dynamically allocated objects. (4 Marks)
4. (a) What are objects? Describe the syntax for defining objects with examples. Explain how C++ supports encapsulation and data abstraction. (8 Marks)
(b) Explain the importance of abstract classes. Give examples. (6 Marks)
(c) Explain with an example constructors and destructors in C++. (6 Marks)
5. (a) What are friend functions? Why are they used? Explain with an illustration. (6 Marks)
(b) Discuss with an illustration the overloading of new and delete operators. (8 Marks)
(c) Explain static data members of class templates and nested types of class templates. (6 Marks)
6. (a) What is polymorphism? Illustrate the polymorphism concept with a C++ program. (8 Marks)
(b) What are virtual classes? Explain the need for virtual classes while building a class hierarchy. (4 Marks)
(c) Explain how base class member functions can be involved in a derived class if the derived class also has a member function with the same name. (8 Marks)

7. (a) What are virtual functions? Explain the need for virtual functions. (6 Marks)
- (b) Explain any two C++'s predefined parameterized manipulators. (4 Marks)
- (c) Illustrate with an example the use of an extraction operator >> and insertion operator << overloading. (10 Marks)
8. Write short notes on the following : (5×4=20 Marks)
- Hierarchy of file stream classes
 - Hybrid inheritance
 - Inline functions
 - Assignment operator overloading.

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Fourth Semester B.E. Degree Examination, July/August 2004
Computer Science and Information Science Engineering
(Old Scheme)

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) Explain the following data types of C++
 a) Structures b) Classes, with differences. (10 Marks)
 (b) Explain the scope resolution operator through an example or examples (if required). (10 Marks)
2. (a) Explain the advantages of call by reference through an example with cover call by value. (10 Marks)
 (b) What are default arguments? Explain with suitable examples. State and explain the rules applying the default arguments. (10 Marks)
3. (a) Explain function overloading. Give example for function over loading. (10 Marks)
 (b) Explain the need for a friend function through an example. (10 Marks)
4. (a) What is a function template? Explain example of a function template. (10 Marks)
 (b) Explain function template explicit specialization through an example. (10 Marks)
5. (a) Explain through an example each :
 i) Static data member and ii) Constant member function. (10 Marks)
 (b) With the help of a suitable example, explain the use of "this" pointer. (10 Marks)
6. (a) What is the purpose of inheritance? Explain with examples. (8 Marks)
 (b) Explain with examples :
 i) Abstract classes and ii) Virtual functions. (6+6=12 Marks)
7. (a) Write the classes using C++ for the following :
 i) Without user defined destructor and explain
 ii) With destructor and explain. (10 Marks)
 (b) Explain the overloading of the output operator (<<) through an example. (10 Marks)
8. Write short notes with suitable examples.
 a) Inline function
 b) Constant (modifier) Vs # define
 c) Free Vs delete
 d) Malloc Vs new. (5×4=20 Marks)

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

Time: 3 hrs.]

[Max.Marks : 100

Note: Answer any FIVE full questions.

1. (a) Bringout the salient features of structured programming and object oriented programming. (10 Marks)
 (b) How are strings handled in C++ ? Discuss with appropriate example. (10 Marks)
2. (a) What is dynamic memory management? How is it handled in C++? Explain with suitable example. (8 Marks)
 (b) Write a program to implement the linked list class with following operations
 i) create ii) insert - front iii) delete-end (12 Marks)
3. (a) Discuss function overloading and operator overloading and inline function with example. (10 Marks)
 (b) Write a C++ program to perform arithmetic operations on two complex numbers with operator overloading. (10 Marks)
4. (a) What are function templates? Write a program to demonstrate the function template SQUARE () to find square of the given number with different data type such as integers, floating point. (10 Marks)
 (b) What is class template and class template instantiation? Give suitable examples. (10 Marks)
5. (a) What are implicit this pointer and static class members? Explain with examples.
 (b) What are space saving class and space saving members? Explain with examples. (10 Marks)
6. (a) Discuss the concept of friend functions. Write a program to overload binary operator '+' using friend function. (14 Marks)
 (b) Write a note on nested classes. (6 Marks)
7. (a) What is inheritance? Bringout the concept of various types of inheritance and importance of derived class with example. (10 Marks)
 (b) Write a C++ program to implement a stack using overloading functions in base and derived class. (10 Marks)
8. (a) Draw console stream hierarchy and explain its members. (8 Marks)
 (b) Write a note on :
 i) Multiple Inheritance
 ii) Polymorphism (12 Marks)

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Fourth Semester B.E. Degree Examination, June-July 2009
Object Oriented Programming with C++

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting at least two from each part.

PART - A

- 1 a. Differentiate between procedure oriented and object oriented programming. (06 Marks)
 b. Why should default values be given to function arguments in function prototype and not in function definition? Write a program to add three numbers using function which has one or more default values. (09 Marks)
 c. What is data abstraction? How it is implemented in C++. Explain with an example. (05 Marks)
- 2 a. What is nested class? What is its use? Give an example and explain. (08 Marks)
 b. What are the points to remember about friend function? Write program to multiply two matrices using friend function devise a class MATRIX with a constructor, method to read and display the matrix. (12 Marks)
- 3 a. What are constructors? When they are called? What is their use? Define a suitable parameterized constructor with default values for the class TIME with data member hr, min, sec. (06 Marks)
 b. What is the draw back of static memory allocation? How it is overcome? How it is achieved in C++? Explain with an example? (06 Marks)
 c. Write program to add and multiply two complex numbers. Initialize the variables through writing constructor. Implement add and multiply operations using overloaded + and * operators. (08 Marks)
- 4 a. Explain different types of inheritance with block diagram and an example for each. (10 Marks)
 b. What are the benefits of inheritance; can a friendship be inherited? (04 Marks)
 c. What is the ambiguity that might arise in multiple inheritances. How to overcome this? Explain with an example. (06 Marks)

PART - B

- 5 a. What are virtual functions? What is their use? Give an example. How compilers resolve a call to a virtual function? (06 Marks)
 b. Describe briefly with a figure, class hierarchy provided by C++ for stream handling. (08 Marks)
 c. Explain how text O /P is achieved in C++. Give an example. (06 Marks)
- 6 a. Describe the use of following manipulators :
 i) set w () ii) set fill () iii) set precision () iv) set iosflags () v) reset iosflags (). (05 Marks)
 b. What are the rules for overloading operator? (05 Marks)
 c. Define a class DATE, use overloaded + operator to add two dates and display the result ante-date. Assume non - leap year dates. (10 Marks)
- 7 a. With syntax, explain the different methods of over loading relational operator. (06 Marks)
 b. Overload bit wise exclusive or operator (\wedge) for the class distance. The overloading function should return true if the value of either of the two objects that are passed to the operator is not equal to zero. For the rest of the cases, the function should return false. (08 Marks)
 c. With an example, explain how to overload the pointer - to - member (\rightarrow) operator. (06 Marks)
- 8 a. What are the new style casts operator. Explain the general syntax of these operators. Give one example. (04 Marks)
 b. What are class templates? What is the need for class templates? How are they created? Create a template for bubble sort function. (10 Marks)
 c. Which three key words are provided by C++ for implementing exception handling? What is the need to those class objects instead of values of fundamental types? Give example. (06 Marks)

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