Subject: OBJECT ORIENTED PROGRAMMING WITH C++

Time: 3 Hours

Max. Marks: 100

JUNE 2011

NOTE: There are 9 Questions in all.

- **Question 1 is compulsory and carries 20 marks. Answer to Q.1 must be written in the space provided for it in the answer book supplied and nowhere else.**
- **The answer sheet for the Q.1 will be collected by the invigilator after 45 Minutes of the commencement of the examination.**
- **Out of the remaining EIGHT Questions, answer any FIVE Questions. Each question carries 16 marks.**
- **Any required data not explicitly given, may be suitably assumed and stated.**

Q.1 **Choose the correct or the best alternative in the following:** (2×10)

    a. What will be the values of x, m, and n after execution of the following statements?

      int x, m ,n;
      m = 10;
      n = 15;
      x = ++m + n++;

      (A) x = 25, m = 10, n = 15
      (B) x = 27, m = 10, n = 15
      (C) x = 26, m = 11, n = 16
      (D) x = 27, m = 11, n = 16

    b. A variable is defined within a block in body of a function. Which of the following is true?

      (A) It is visible throughout the function.
      (B) It is visible from the point of definition to the end of the program.
      (C) It is visible from the point of definition to the end of the block.
      (D) It is visible throughout the block.

    c. When the continue statement is executed within a loop, the control goes to

      (A) the next statement in the loop
      (B) the top of the loop
      (C) the statement immediately after the loop
      (D) the beginning of the program

d. In a protected derivation, accessibility of the base members undergo the following changes in the derived class.

(A) public becomes protected, protected becomes protected and private is not inherited.
(B) public becomes protected, protected becomes public and private becomes protected.
(C) public becomes private, protected is not inherited and private is not inherited.
(D) None of these.

e. When you overload an arithmetic assignment operator, the result

(A) goes in the object to the right of the operator
(B) goes in the object to the left of the operator
(C) goes in the object of which the operator is a member
(D) must be returned

f. We can make a class abstract by

(A) Declaring it abstract using the static keyword
(B) Declaring it abstract using the virtual keyword
(C) Making at least one member function as virtual function
(D) Making at least one member function as pure virtual function

g. The actual source code for implementing a template function is created when

(A) the function is actually executed
(B) the declaration of the function appears
(C) the function is invoked
(D) the definition of the function appears

h. To write data that contains variables of type **float**, to an object of type **ofstream**, we should use

(A) The insertion operator   **(B)** **seekg()**
(C) **write()**   **(D)** **put()**

i. A _____ is a constructor that creates a new object using an existing object of the same class and initializes each data member of the newly created object with its corresponding data members of an existing object passed as argument.

(A) Copy constructor   **(B)** Overloaded constructor
(C) Parameterized constructor   **(D)** Default constructor

j. Which of the following way is legal to access a class data member using the **this** pointer.

(A) this.x   **(B)** *this.x
(C) *(this.x)   **(D)** (*this).x

Q.2 a. Discuss the fundamental features of the object oriented programming. **(6)**

b. What are the guidelines that need to be followed for deciding whether to the member function inline or not? **(6)**

c. Explain the use of *break* statement in *switch-case* statement. **(4)**

Q.3 a. Write the syntax for *initialization at definition* of a two-dimensional array. Give one example also. **(4)**

b. Write the syntax for accessing structure members in C++. Also construct a structure called *"Student"* whose members are roll_no, name, branch and marks. Use this structure in your program that will read student information and then display that information? **(8)**

c. Define pointers for the following:
(i) a pointer to a pointer
(ii) an array of pointers
(iii) a pointer to an array
(iv) a pointer which can point to an array as integers. **(4)**

Q.4 a. Is it possible that a function is friend of two different classes? If yes, then how it is implemented in C++? **(6)**

b. Design a class to represent "account" information of an individual that includes the following members:-
Data Members
  • Name of account holder -------- String
  • Account number ---------- int
  • Type of Account --------- char
  • Balance Amount ---------- float
Member Functions
  • To assign initial values (using constructor)
  • To display the name of account holder, account number, account type and balance amount in the account.
  • To deposit an amount in the account.
  • To withdraw an amount.

Use the above class to write an interactive program. **(10)**

Q.5 a. Why is destructor function required in class? What are the special rules that should be considered while defining a destructor function for a class? **(4)**

b. Is it possible to overload the ternary (? :) operator? Support your answer with proper reason? List some C++ operators that cannot be overloaded. **(4)**

c. Give the syntax for overloading a binary operator. Write a program to overload the binary operator + in order to perform addition of complex numbers. **(8)**

Q.6 a. What is inheritance? Discuss the different forms of inheritance. **(4+6)**

b. Explain the difference between inheriting a class with public and private visibility mode? **(6)**

Q.7 a. Explain the term polymorphism. What are the different forms of polymorphism? What are the rules that need to be kept in mind while deciding virtual functions? **(8)**

b. Explain exception handling model of C++ with various constructs supported by it. **(8)**

Q.8 a. Write a program using function template to find the cube of a given integer, float and a double number. **(8)**

b. What is class template? Explain the syntax of a class template with suitable examples. **(8)**

Q.9 a. Explain the following:

(i) ifstream **(3)**
(ii) ofstream **(3)**
(iii) fstream **(2)**

b. Write a program to display the contents of a file whose name is passed as command line argument. **(8)**