

Time: 3 Hours

**DECEMBER 2012**

Max. Marks: 100

**PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.**

**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 is a Constructor?

- (A) A function called when an instance of a class is initialized.
- (B) A function that is called when an instance of a class is deleted.
- (C) A special function to change the value of dynamically allocated memory.
- (D) A function that is called in order to change the value of a variable.

b. Inline functions are invoked at the time of

- (A) Run time
- (B) Compile time
- (C) Depends on how it is invoked
- (D) Both (B) and (C)

c. The sizeof() operator accepts \_\_\_\_\_ parameter

- (A) None
- (B) One
- (C) Size
- (D) More than two

d. What is a virtual member?

- (A) A member of a friend class that can be redefined in its derived classes
- (B) A member of a virtual class that cannot be redefined in its derived classes
- (C) A member of a static class that can be redefined in its derived classes
- (D) A member of a class that can be redefined in its derived classes

e. How do we check if the file has reached its end?

- (A) use if\_file\_end()
- (B) use end\_of\_file()
- (C) use eof()
- (D) both (A) and (C)

- f. Which one of the following is not a valid reserved keyword in C++
- (A) Explicit
  - (B) Public
  - (C) Protected
  - (D) Private
- g. The return value of the following code is
- ```
Class1& test(Class1 obj)
{
    Class1 *ptr = new Class1();
    .....
    return ptr;
}
```
- (A) object of Class1
  - (B) reference to ptr
  - (C) reference of Class1
  - (D) object pointed by ptr
- h. To move the get pointer to a Specified Location \_\_\_\_\_ function is used.
- (A) tellg ()
  - (B) seekp ()
  - (C) tellp ()
  - (D) seekg ()
- i. What defines a general set of operations that will be applied to various types of data?
- (A) Template class
  - (B) Function template
  - (C) Class template
  - (D) Both (A) and (C)
- j. If a catch statement is written to catch exception objects of a base class type, it can also catch all \_\_\_\_\_ derived from that base class
- (A) Exceptions for objects
  - (B) Objects of classes
  - (C) Arguments
  - (D) Errors

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**Answer any FIVE Questions out of EIGHT Questions.**  
**Each question carries 16 marks.**

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- Q.2**
- a. Briefly explain the features of OOP. (5)
  - b. What is a reference variable? Write a C++ program to find the sum of two numbers using reference variables (5)
  - c. Describe the new and delete operators with examples. (6)

- Q.3** a. What is an inline function? List its merits and demerits. Write a program to find the smaller of two numbers using inline function and the ternary operator. (6)
- b. What is function overloading? Explain 3 steps of overload resolution with an example. (6)
- c. Explain the use of scope resolution operator with an example. (4)
- Q.4** a. Define “class” and “object”. With an example, explain the concept of data encapsulation and accessing of member elements. (4)
- b. Write a note on parameterized constructor and destructor with default arguments. (4)
- c. Create a class Date has dd, mm and yy as its member variables. Write a constructor with 3 arguments to initialize data members and member functions, to:-
- Display date in **dd:mm:yy** format
  - Find the difference between two dates and display the total number of days. Also provide the main function to initialize 2 different date objects and display the number of days between them. (8)
- Q.5** a. Write a C++ program to create a class called MATRIX using 2-dimensional array of integers. Implement the following by overloading the operator == which checks the compatibility of two matrices to be added and subtracted. Perform the following by overloading + (**plus**) and – (**Minus**) operators. Display the result by overloading the operator <<.
- ```
if ( m1== m2) {  
    m3=m1+m2;  
    m4=m1-m2;  
}  
else  
    Display error.
```
- Where m1, m2, m3 and m4 are MATRIX class objects. (10)
- b. Write a program to overload new and delete operators. (6)
- Q.6** a. What is a derived class? Explain with examples the three ways in which a class can be inherited. (5)
- b. Explain how pointers are used in base and derived classes with an example. (5)
- c. What are virtual functions? Explain the usage of virtual functions with examples. (6)
- Q.7** a. Mention any two functions for each of the following :- (4)
- I/P Stream
  - O/P Stream

- b. Give the Structure of Stream class hierarchy. (4)
- c. Write a C++ program demonstrate reading from and writing to a text file. (8)
- Q.8** a. What is a class template? With syntax, explain the purpose of the class template with multiple parameters. (6)
- b. Write a C++ program to overload a template function called swap (). (4)
- c. Explain the exception handling mechanism with an example. (6)
- Q.9** a. Explain various control Statements used in C++. (4)
- b. Write a program to illustrate pointers to pointers. (4)
- c. Explain the role of pointer constants and pointer arithmetic. Give an example. (8)