

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. A variable declared within a block { } has the following scope:

- | | |
|-----------------|------------------|
| (A) File scope | (B) Class scope |
| (C) Local scope | (D) Global scope |

b. Identify the operator that cannot be overloaded in C++

- | | |
|---------|----------|
| (A) ?: | (B) + |
| (C) new | (D) none |

c. Consider the following class definition

```
class sample {  
    static int a;  
    int b;  
    void c(void); } sample m1,m2,m3;
```

How many copies of variable a and b, and function c(), exists in the memory

- | | |
|-----------|-----------|
| (A) 3,3,3 | (B) 1,1,1 |
| (C) 1,3,1 | (D) 3,3,1 |

d. The function overloading and operator overloading resolve the necessary conversions at

- | | |
|------------------|--------------------------|
| (A) Compile time | (B) Execution time |
| (C) Linking time | (D) All of these options |

e. Consider the following statements:

```
int x=22, y=15;  
x=(x<y) ? (x+y) : (x-y)
```

What will be the value of x after executing these statements?

- | | |
|--------|------------------------------|
| (A) 22 | (B) 37 |
| (C) 7 | (D) Error cannot be executed |

- f. Reference to an object behaves like
- (A) A pointer and can be used in call-by reference in function call
 - (B) An alias
 - (C) A constant pointer
 - (D) A pointer to the object
- g. A value that is automatically passed to a function when no explicit argument is specified in the function call is called
- (A) Call-by value
 - (B) Default argument
 - (C) Constant argument
 - (D) Virtual function
- h. Which of the following is method which belong to “string” class
- (A) Equals ()
 - (B) Length ()
 - (C) Compare ()
 - (D) Substring ()
- i. An exception is caused by
- (A) a hardware problem
 - (B) a problem in the operating system
 - (C) a syntax error
 - (D) a run time error
- j. Which of the following way is legal to access a class data member using this pointer?
- (A) this.x
 - (B) *this.x
 - (C) *(this.x)
 - (D) (*this).x

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

- Q.2** a. What are the salient features of Object-oriented programming? How does it differ from the ordinary programming concepts? (8)
- b. Compare new operator with memory allocation function malloc (). (4)
- c. What are the applications of void data type in C++? (4)
- Q.3** a. Create the equivalent of four-function calculator. The program should request the user to enter two floating numbers, and an operator. It should then carry out the specified arithmetic operation: Addition, Subtraction, Multiplication and division of two numbers. Use switch statement to select the operation. Finally display the result and when it finishes calculation, the program should ask if the user wants to do another calculation? (8)
- b. What are the differences between pointers to constants and constant pointers? Give examples. (8)
- Q.4** a. Illustrate with example the use of default arguments in a function. What are the constraints on them? (4)
- b. Write a note on macros and inline functions. (4)

- c. Assume that an object has a name being accessed by the pointer. Write a C++ program using reference variable for interchanging the names of two objects. (8)
- Q.5** a. Define a class “complex_no” which has two real numbers as private variables one representing real part and one for imaginary part. Define constructors to initialize the object. Also write a C++ program, which takes two objects of the type complex_no and returns an object of the same type, which is the sum of two complex numbers. (10)
- b. What are the limitations on constructors and destructors? (6)
- Q.6** a. Write a program to concatenate two strings using operator overloading. (8)
- b. Can a ‘friend’ function be used for overloading the assignment operator? Justify your answer. Illustrate with an example overloading of ++ operator for incrementing. (8)
- Q.7** a. Describe the syntax of multiple inheritances. When do we use such an inheritance? Also explain the ‘Ambiguity Resolution in Multiple Inheritance’. (9)
- b. Explain the meaning of polymorphism. Describe how polymorphism is accomplished in C++ programming, taking a suitable example. (7)
- Q.8** a. What is an exception? How is an exception handled in C++? (5)
- b. Write a program that illustrates the application of multiple catch statements. (5)
- c. What is a class template? Write a template-based complete program for adding two objects of the vector class. (6)
- Q.9** a. Explain stream classes, stream class hierarchy and stream manipulators. (8)
- b. Explain by a suitable example the difference in working of cin() and getline() functions. (8)