Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.Tech/ICE(O)/SEM-5/IC-502/2012-13

2012

OBJECT ORIENTED PROGRAMMING AND DESIGN

Time Allotted : 3 Hours *Full Marks :* 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(*True* / *False* Type Questions)

1. State whether the following statements are *True or False* (any *ten*) : $10 \times 1 = 10$

   i) In C++ re-definition of variables is not allowed whereas re-declaration is allowed.

   ii) In C++ a union can contain data members as well as member functions.

   iii) In C++ a structure can contain data members, as well as member functions.

   iv) If a function is defined before calling it, there is no need to mention its prototype.

   v) *cin* and *cout* are objects.

vi) C++ permits the use of anonymous structures.

vii) When an object goes out of scope, its destructor gets called automatically.

viii) Size of an object is equal to sum of sizes of data members and member functions within the *class*.

ix) Constructor is a member function of the *class*.

x) The ++ operator can be overloaded to perform decrement of the value of a variable.

xi) It is possible to create an array of references.

xii) Multiple inheritance is different from multiple levels of inheritance.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. a) What is access specifier in C++ ? 2

   b) What do you mean by Data Abstraction and Message Passing ? 3

3. a) Why did modern programming concept change from structured programming to Object Oriented Programming ? 2

   b) What is the difference between a class and an object ? 2

   c) What do you mean by dynamic binding in C++ ? 1

4. a) What do you mean by Constructor in C++ ? 1

   b) What are their types ? Explain with proper examples. 2 + 2

5. a) What is a friend function ? 1

b) What are the merits and demerits of using friend functions ? 4

6. a) What is a constructor ? 1

b) List some of the special properties of constructors. 4

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. a) What does Architectural Design mean ? 4

b) "Coupling increases as module size decreases". Comment. 3

c) State the underlying Philosophy of JAD. 3

d) What is a JAD team ? 3

e) What are the advantages of JAD ? 2

8. a) Explain how requirements should be reviewed before accepting these as final requirements. 3

b) What are the non-functional requirements ? 3

c) Why do requirements change even during software development ? 3

d) How can you manage the changing requirements ? 3

e) In which way we investigate about the authenticity of requirements ? 3

9. a) "COCOMO' supports the common sense view that putting more people in a project does not reduce the development time.' Justify. 4

   b) Assume that the size of an organic type software product has been estimated to be 32,000 lines of C++ source code. Assume that the average salary of software engineers is Rs. 15,000/- per month.

   Determine the effort required to develop the software product, the nominal development time and the probable cost. 4

   c) In the exercise (b), if the software product is of embedded type, then calculate Effort, Development time and Cost. Comment on the variations in results. 4 + 3

10. Write short notes on any *three* of the following : 3 × 5

   a) Prototype Model in Software Design.

   b) Software Requirements Specifications.

   c) Cohesion.

   d) Polymorphism.

   e) Encapsulation.

11. a) What does inheritance mean in C++ ? 2

   b) What are the different forms of inheritance ?

   Give an example for each. 10

   c) How do the properties of the following two derived classes differ ? 3

   i) class D1 : private B { // ... };

   ii) class D2 : public B { // ... };