Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.TECH(CSE-OLD)/SEM-3/CS-301/2012-13

2012

PRINCIPLES OF PROGRAMMING LANGUAGE

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
(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : $10 \times 1 = 10$

   i) Which of the following is a pure object-oriented language ?

   a) C++ b) Smalltalk

   c) Object Pascal d) Objective C.

   ii) Which of the following statements is true with respect to object-oriented programming ?

   a) Emphasis is on algorithms rather than data

   b) Data can move freely from function to function

   c) Programs are divided into small programs called functions

   d) Data and functions that operate on them are tied together.

iii) Which of the following issues is considered as the major drawback of the procedure-oriented programming ?

a) Employs top-down approach in program design

b) Emphasis is an algorithms

c) Most of the functions share global data

d) Large programs are divided into functions.

iv) One of the major advantages of object-oriented programming approach is

a) it can easily map real-world problems

b) data can move freely around the system

c) any language can be used for programming

d) structured programming concept can be easily incorporated.

v) The wrapping up of data and functions into a single unit is known as

a) Function overloading b) Static binding

c) Abstraction d) Encapsulation.

vi) The process by which objects of one class can acquire the attributes of objects of another class is known as

a) Attribute passing b) Inheritance

c) Abstraction d) Polymorphism.

vii) The following examples show that the class *C* is derived from classes *A* and *B*. Which one of them is legal ?

a) class *C* : private *A*, public *B*

b) class *C* :: private *A*, public *B*

c) class *C* : public *A* : public *B*

d) class *C* : class *A*, *B*

e) class *C* : private *A*, public *B*.

viii) The casing operator function can be used to accomplish the conversion

a) class type to structure type

b) basic type to class type

c) float type to long type

d) class type to basic type.

ix) Identify error, if any, in the following code segment :

```
1. class Sample
2. {
3. int m;
4. Sample ( );
5. Sample (int);
6. };
```

a) line 6 should not have semicolon

b) in line 5 parameter name is missing

c) in line 4, argument should be of type void

d) constructors should be declared in public section.

x) In a class, a member declared as public is accessible

a) only to public members of the class

b) only to member functions of the class

c) to any function in the program

d) without using objects of the class.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following $3 \times 5 = 15$

2. a) What is call by value and call by address ?

b) Write down a program in C which will calculate the GCD of the given numbers ? 2 + 3

3. a) What do you mean by void pointer ? Give an example.

   b) What do you mean by null pointer ? 3 + 2

4. a) What do you mean by Dynamic Memory allocation in C ?

   b) What is an *L* value and *R* value in C ? 3 + 2

5. a) Define the term inheritance and encapsulation.

   b) What is insertion and extraction operator ? 3 + 2

6. a) Write a C++ program that simulate the class and object concept in terms of OOP.

   b) What are the differences between auto and static storage class ? 3 + 2

GROUP – C
(Long Answer Type Questions)

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

7. a) What is stack, heap and how it is used in programming ?

   b) Discuss the use of pointer in C/C++ language.

   c) When malloc( ), calloc( ) and realloc( ) is used ? Show that with the proper example in C. 5 + 4 + 6

8. a) What is access specifier in C++ ? Discuss with example.

   b) What is friend function and virtual function ?

   c) What do you mean by function overloading ? Give an example. 3 + 6 + 6

9. a) What is dereferencing operator in C ? Write a program using dereferencing operator.

   b) What do you mean by constructor and destructor ?

   c) Distinguish between strut and class in C++. 6 + 4 + 5

10. a) Solve the initial value problem $u' = -2tu^2$, $u(0) = 1$ with h = 0·2 on the interval [0, 0, 4]. Use the fourth order classical Runge-Kutta methods.

    b) Given the following equations :

    i) $x^4 - x - 10 = 0$

    ii) $x - e^{-x} = 0$

    Determine the initial approximations to find the smallest positive root. Use these to find the roots correct to three decimal places with the Regula-Falsi method.

    8 + 7

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

a) Actual and Formal parameter

b) Operator overloading

c) Dynamic binding

d) Scope resolution operator.

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