Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.Tech(ICE)/SEM-5/IC-502/2009-10

2009

OBJECT ORIENTED PROGRAMMING & 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
(Multiple Choice Type Questions)

1. Choose the correct alternatives of the following : 10 × 1 = 10

   i) Which of the following are true about the Error and Exception classes ?

      a) Both classes extend Throwable

      b) The Error class is final and the Exception class is not

      c) The Exception class is final and the Error is not

      d) Both classes implement Throwable.

ii) Which of the following statements are true ?

a) The String class is implemented as a char array, elements are addressed using the stringname[ ] convention

b) Strings are a primitive type in Java that overloads the + operator for concatenation

c) Strings are a primitive type in Java and the StringBuffer is used as the matching warpper type

d) The size of a String can be retrieved using the length property.

iii) What is an example of polymorphism ?

a) Inner class b) Anonymous classes

c) Method overloading d) Method overriding.

iv) When might your program wish to run the garbage collector ?

a) Before it enters a compute-intense section of code

b) Before it enters a memory-intense section of code

c) Before objects are finalized

d) When it knows there will be some idle time.

v) Which of the options matches the following line :

The scheme for representing the relationships between classes

a) method b) inheritance

c) message d) polymorphism.

vi) The qualifier is a part of the

a) classb) association class

c) association path d) none of these.

vii) Encapsulation can be done by key word

a) static b) protected

c) final d) try.

viii) Generalization / Specialization can be implemented by

a) method overriding b) inheritance

c) interface d) all of these.

ix) Threads can be interpreted by

a) process abstraction b) concurrent objects

c) modularity d) all of these.

x) Actor component is related to

a) Sate chart diagram b) Use case diagram

c) Activity diagram d) Collaboration diagram.

GROUP – B
(Short Answer Type Questions)

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

2. What is the difference between pointer and reference variable ? What are constant arguments ? 3 + 2

3. What do you mean by overloading of constructors ? What is copy constructor ? 3 + 2

4. What is thread ? Described briefly the life cycle of threads. 2 + 3

5. What is JVM ? What do you mean by Java is a platform dependent language ? 2 + 3

6. What is polymorphism ? What are the types of polymorphism ? 2 + 3

GROUP – C
(Long Answer Type Questions)

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

7. a) The sum of the square of the first n natural numbers is calculated by the formula sum = $n (n + 1) * (2n + 1) / 5$. Read value of n through the keyboard and calculate the sum of square of first n natural numbers. 4

   b) What do you mean by function prototype ? 3

c) What is inline function ? Discuss its advantages and disadvantages. 2 + 2

d) What is the difference between call by value and call by reference ? 2 + 2

8. a) What is the difference between local and global functions and variables ? 3

b) What is the concept of data hiding ? What are the advantages of its application ? 2 + 2

c) Write a program to declare three classes S1, S2 and S3. The classes have a private data member variable of character data type. Read strings for the classes S1 and S2. Concatenate the strings read and assign it to the data member variable of class S3. 4

d) Write a program to enter positive and negative numbers. Enter 10 numbers. Count the positive and negative numbers. Use classes and objects. 4

9. a) What is the use of virtual keyword ? 2

b) What do you mean by virtual and abstract classes ? 3

c) What is the difference between private and protected access specifiers ? 3

d) What are the advantages and disadvantages of inheritance ? 3

e) Write a program to declare classes *X*, *Y* and *Z*. Each class contains one character array as a data member. Apply multiple inheritances. Concatenate strings of classes *X* and *Y* and store it in the class *Z*. Show all the three strings. Use constructors and destructors. 4

10. a) What is the difference between the nested class and inner class ? Give an example of both classes. 8

b) Discuss about Vector class. "Vector objects cannot store primitive type data directly." Is it true ? 3

c) What are wrapper classes ? How can they be used to convert a data of primitive type to object type ? 4

11. a) What is the difference between method overloading and method overriding ? Illustrate with an example. 4

b) Write a class ComLineTest to print the number of arguments passed on the command line as well as the 1st letter of the arguments. For example, if the command line arguments are "Simple Object Robust" the output will be

No. of arguments - 3

SOR

Write a main method to test the class. 8

c) How do we define try and catch block ? 3