Name : ....

Roll No. : ....

Invigilator's Signature : ....

CS/B.TECH(IT)/SEM-5/IT-501/2011-12

2011

OBJECT TECHNOLOGY & UML

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 × 1 = 10

    i) Consider the class

        1. public class over {

        2. public int test (int a, int b)

        3. }

        4. //add here

        5. }

    Which of the following overloaded methods would be legal is added at line 4 ?

    a) public float test (float a, float b) { }

    b) public int test (float a, float b) { }

    c) public int test (int x, int y) { }

    d) public float test (int a, int b) { }

ii) Which code declares class A to belong to the mypackage. financial package ?

a) package mypackage;

package financial;

b) import mypackage.*;

c) package mypackage. financial. A;

d) import mypackage. financial.*;

e) package mypackage.financial.

iii)

1. class Class 1 {

2. public static void main (String args [ ]) {

3. int total = 0;

4. int [ ] i = new int [3] ;

5. for (int j = 1; j < = i. length; j++)

6. total + = (i [j] = j);

7. System.out.println (total);

8. }

9. }

What is the output of the program above ?

a) 3

b) 4

c) 6

d) None. The system will throw an Array Index Out Of Bounds Exception.

e) None. The compiler will throw a syntax error on line 6.

iv) Which one of the following is the equivalent of main ( ) in a thread ?

 a) start ( )

 b) go ( )

 c) run ( )

 d) begin ( )

 e) The class constructor.

v) The use of protected keyword to a member in a class will restrict its visibility as

 a) Visible only in the class and its subclass in the same package.

 b) Visible only inside the same package.

 c) Visible in all classes in the same package and subclasses in other packages.

 d) None of these.

vi) A package is a collection of

 a) Classes   b) Interfaces

 c) Editing tools d) both (a) and (b).

vii) Which of the following statements is valid array declaration ?

 a) int number ( ) b) float average [ ]

 c) int marks   d) count int [ ].

5102   3   [Turn over

viii) Which of the following is a Wrapper class ?

    a)   Byte   b)   Random

    c)   Vector   d)   String.

ix) The methods wait ( ) and notify ( ) are defined in

    a)   java.lang.string   b)   java.lang.runnable

    c)   java.lang.object   d)   java.lang.thread.

x) The set Background ( ) method is part of which class ?

    a)   Graphics   b)   Applet

    c)   Component   d)   Object.

GROUP – B

(Short Answer Type Questions)

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

2. Differentiate between Composition and Aggregation with suitable examples.   2 + 3

3. Draw a use case diagram for courses offered by a university. In particular, assume that courses are taught by instructors, while registrars can enrol or remove students from a course. Students take a course, provided they are enrolled in it.

4. What is applet ? How does applet differ from an application program ?

5. What is Implicate and Explicit Casting ? Explain with the help of an example.   2 + 3

6. What is meant by package statement ? Write a Java program to implement the following :

Create a class named as FIRST and keep it in a package named MY_FIRST_PACKAGE

Create another class named as SECOND, this class should be able to access every method and variables declared within the FIRST class. 1 + 4

GROUP – C
(Long Answer Type Questions)
Answer any *three* of the following. 3 × 15 = 45

7. a) Explain function of a JVM in brief.

   b) What might be the difference in functionality between a machine with only JDK installed and another machine with only JRE installed.

   c) Discuss the requirement of each keyword in the following Java program statement.

   "public static void main (String args [ ])"

   d) i) Multiple inheritance can be performed in Java. Explain how ?

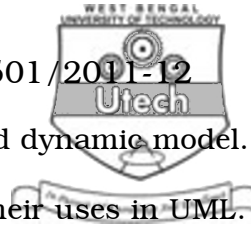   ii) Write a Java program in support of your views.

   3 + 2 + 3 + (4 + 3)

8. a) Describe the complete life cycle of a thread.

   b) Mention two methods by which you can stop a thread.

   c) How Throws and Throw are different ? Explain.

   d) Explain the use of 'finally', 'final' and 'finalize' keyword in Java. 3 + 2 + 4 + 6

9. a) Differentiate between any *two* of the following :

   i) Interface and Abstract class

   ii) Method overloading and Method overriding

   iii) Data Abstraction and Encapsulation.

   b) What is a constructor ? How a constructor is invoked in a class ?

   c) Explain applet life cycle with state transition diagram.

   d) Write an applet program to print "Welcome to my World" at any place on the screen. (3 × 2) + 3 + 3 + 3

10. a) What is the difference between static binding and dynamic binding ?

    b) Why does the compiler generate Exception in thread "main" java.lang. No Such Method Error : main

    c) When do we declare a variable, method and class final ?

    d) Differentiate between String and String Buffer.

    e) Write an application that illustrates variable hiding. Class *S* declares an instance named *x* of type integer. Class *T* extends *S* and declares an instance variable named *x* of type String Buffer. Instantiate both of these classes. Initialize and display the variable named *x* in such of these objects (use **this** keyword).
       4 + 1 + 3 + 2 + 5

11. a) Differentiate between static model and dynamic model.

    b) Mention the different diagrams and their uses in UML.

    c) Draw the

        i) class diagram and

        ii) sequence diagram of the following case study.

        In a hospital there are different departments. Patients are treated in these departments by the doctors assigned to patients. Usually each patient is treated by a single doctor, but in rare cases they will have two or three. Health care assistants will also attend to patients; every department has many health care assistants. Each patient is required to take a variety of drugs during different parts of the day such as morning, afternoon and night.   3 + 5 + 7