Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**B. E. V$^{th}$ Semester–Examination – Nov-Dec- 2011**

**Subject code: 150704**

**Subject Name: Object Oriented Programming with Java**

**Date:29/11/2011** **Time: 02:30 pm – 05:30 pm**

**Total Marks: 70**

## Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

**Q.1** **(a)** Differentiate the followings: **06**

(i) Checked and Unchecked Exceptions

(ii) Constructor and method

(iii) Text I/O and Binary I/O

**(b)** Explain the followings: **06**

(i) Dynamic Method Dispatch with example

(ii) this, super, final

**(c)** What are the benefits of using generic types? **02**

**Q.2** **(a)** Answer the following questions: **07**

(i) Which methods are called by an applet viewer or browser during the lifetime of an applet? When are they invoked?

(ii) Explain interprocess communication mechanism (wait(), notify() and notifyall()) being used by java to avoid polling.

**(b)** Design a class named Fan to represent a fan. The class contains: **07**

- Three constants named SLOW, MEDIUM and FAST with values 1,2 and 3 to denote the fan speed.
- An int data field named speed that specifies the speed of the fan (default SLOW).
- A boolean data field named f_on that specifies whether the fan is on(default false).
- A double data field named radius that specifies the radius of the fan (default 4).
- A data field named color that specifies the color of the fan (default blue).
- A no-arg constructor that creates a default fan.
- A parameterized constructor initializes the fan objects to given values.
- A method named display() will display description for the fan. If the fan is on, the display() method displays speed, color and radius. If the fan is not on, the method returns fan color and radius along with the message "fan is off".

Write a test program that creates two Fan objects. One with default values and the other with medium speed, radius 6, color brown, and turned on status true. Display the descriptions for two created Fan objects.

**OR**

**(b)** Define the Rectangle class that contains: **07**

Two double fields x and y that specify the center of the rectangle, the data field width and height ,

A no-arg constructor that creates the default rectangle with (0,0) for (x,y) and 1 for both width and height.



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A parameterized constructor creates a rectangle with the specified x,y,height and width.
A method getArea() that returns the area of the rectangle.
A method getPerimeter() that returns the perimeter of the rectangle.
A method contains(double x, double y) that returns true if the specified point (x,y) is inside this rectangle.
Write a test program that creates two rectangle objects. One with default values and other with user specified values. Test all the methods of the class for both the objects.

**Q.3** **(a)** Answer the following questions: **07**

(i) Explain the life cycle of a thread.
(ii) Explain Java garbage collection mechanism.

**(b)** State whether the following statements are true or false: **04**

(i) The elements in an array must be of primitive data types.
(ii) When invoking a constructor from a subclass, its super class's no-arg constructor is always invoked.
(iii) A protected data or method can be accessed by any class in the same package.
(iv) A method can change the length of an array passed as a parameter.

**(c)** State whether any error exists in the following code. If so, correct the error and give output. **03**

```
class Test {
  public static void main(String args[])  {
    A a = new A();
    a.print();
   }
 }

class A {
  String s;
  A(String s)  {
    this.s=s;
  }
  public void print() {
    System.out.println(s);
  }
}
```

**OR**

**Q.3** **(a)** Answer the following questions: **07**

(i) Name three types of layout managers and briefly explain their operations.
(ii) What is an event source? What are the three responsibilities of event sources?

**(b)** State whether the following statements are true or false: **04**

(i) An abstract class contains constructors.
(ii) The catch block is the preferred means for releasing resources to prevent resource leaks.
(iii) If capacity increment is not specified for Vector, the system will double the size of Vector each time additional capacity is needed.
(iv)An interface can extend an abstract class.

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**(c)** Give output of the following program: **03**

```
public class Test {
  public static void main(String args[])  {
    Count myCount = new Count();
    int times=0;
    for(int i=0;i<100;i++)
      increment(myCount,times);

    System.out.println("count is "+myCount.count);
    System.out.println("times is "+times);
  }
  public static void increment(Count c,int times)  {
    c.count++;
    times++;
  }
}
class Count {
  public int count;
  Count(int c){   count=c;  }
  Count(){   count=1;  }
}
```

**Q.4** **(a)** Answer the following questions: **07**

(i) What is an inner class?

(ii) Differentiate Application and Applet

(iii) Explain Cosmic superclass and its methods.

(iv) Ragged Array

**(b)** The abstract Vegetable class has three subclasses named Potato, Brinjal and Tomato. Write an application that demonstrates how to establish this class hierarchy. Declare one instance variable of type String that indicates the color of a vegetable. Create and display instances of these objects. Override the toString() method of Object to return a string with the name of the vegetable and its color. **07**

**OR**

**Q.4** **(a)** Answer the following questions: **07**

(i) Describe the Java Collections Framework. List the interfaces, abstract classes and concrete classes of collection hierarchy.

(ii) Give output of the following program for value of y=0 and y=2:

```
public class Test {
  public static void main(String args[])  {
   try   {
          System.out.println("calling method a");
          a();
          System.out.println("return from method a");
   } catch(ArithmeticException e)   {
          System.out.println("main: catch");
   }   finally   {
          System.out.println("main: finally");
   }
  }
  public static void a()  {
   try    {
     int x=8,y=0;
     int z=x/y;
```



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```
  System.out.println("value of z="+z);
} catch(NumberFormatException e)    {
      System.out.println("method a:catch");
} finally    {
      System.out.println("method a:finally");
} }}
```

**(b)** Write a program that takes input for filename and search word from command-line arguments and checks whether that file exists or not. If exists, the program will display those lines from a file that contains given search word. **07**

**Q.5** **(a)** Write an applet that draws four horizontal bars of equal size & of different colors such that they cover up the whole applet area. The applet should operate correctly even if it is resized. **07**

**(b)** The Transport interface declares a deliver() method. The abstract class Animal is the superclass of the Tiger, Camel, Deer and Donkey classes. The Transport interface is implemented by the Camel and Donkey classes. Write a test program that initialize an array of four Animal objects. If the object implements the Transport interface, the deliver() method is invoked. **07**

**OR**

**Q.5** **(a)** Write an applet that tracks the position of the mouse when it is dragged or moved. At the current mouse position, it displays message (x, y) showing current position of the mouse. The message should disappear as soon as the user releases the mouse. **07**

**(b)** Write a program that counts the no. of words in a text file. The file name is passed as a command line argument. The program should check whether the file exists or not. The words in the file are separated by white space characters. **07**

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