

(Time: 2½ hours)

Total Marks: 75

- N. B.: (1) **All** questions are **compulsory**.
 (2) Make **suitable assumptions** wherever necessary and **state the assumptions** made.
 (3) Answers to the **same question** must be **written together**.
 (4) Numbers to the **right** indicate **marks**.
 (5) Draw **neat labeled diagrams** wherever **necessary**.
 (6) Use of **Non-programmable** calculators is **allowed**.

1. Attempt **any three** of the following:

15

- a. Write a note on:
 i) Autoboxing and unboxing
 ii) Java Development Kit(JDK).
- b. List and explain the components of Java Virtual Machine(JVM).
- c. Java is called as platform independent and strongly typed language. Justify your answer.
- d. Write a Java code to
 i) check whether the string “madam” is starting and ending with a same letter.
 ii) count all vowels in a string “welcome”.
 iii) replace ‘w’ with ‘W’ in a string “welcome”.
 iv) append “Welcome” and “MADAM”
- e. What do you mean by object reference variable in Java? Differentiate between object and reference of a class.
- f. Predict the output of the following code:

```

1)class PassArrArg
{
    public static void main(String [] args)
    {
        PassArrArg p = new PassArrArg();
        p.start();
    }
    void start()
    {
        long [] a1 = {3,4,5};
        long [] a2 = fix(a1);
        System.out.print(a1[0] + a1[1] + a1[2] + " ");
        System.out.println(a2[0] + a2[1] + a2[2]);
    }
    long [] fix(long [] a3)
    {
        a3[1] = 7;
        return a3;
    }
}

```

[TURN OVER]

```

II)class Test
{
    public static void main(String [] args)
    {
        int x= 0;
        int y= 0;
        for (int z = 0; z < 5; z++)
        {
            if (( ++x > 2 ) && (++y > 2))
            {
                x++;
            }
        }
        System.out.println(x + " " + y);
    }
}

```

2. Attempt **any three** of the following:

15

- Explain how memory is allocated to objects in Java?
- Discuss in detail the working of 'foreach' loop in Java.
- Explain the need of variable arguments with help of an example.
- What is garbage collection in Java? How it is helpful?
- When do we use keywords final and static? Explain the working of static member functions.
- What do you mean by method overloading? Write a program to implement the concept of constructor overloading.

3. Attempt **any three** of the following:

15

- Explain the use of keywords super and this. What are the facts based on which base class constructors will be called while creating derived class objects?
- What is an interface? How is an interface different from a class?
- Explain the concept of method overriding with the help of an example.
- What is the purpose of a package? Explain the steps to create user define packages in Java.
- Write a program to implement the concept of multilevel inheritance.
- Define an abstract class 'Shape' with an abstract method namely 'CircleArea' taking one parameter that is its radius to compute area of a circle. Now create another class 'Area' containing a method 'CircleArea' for printing the area of circle. Create an object of class 'Area' and test class 'Area'.

4. Attempt **any three** of the following:

15

- Why do we need to use vectors? Explain with the help of an example.
- Explain life cycle of thread with a neat labeled diagram.
- Can we handle multiple exceptions using a single catch block? Justify your answer with an example.
- Write a program to demonstrate the use of a class FileInputStream. Accept the input file name at command line.

[TURN OVER]

- e. What do you mean by streams? Explain the concept of streams and types of streams available in Java.
- f. Write a program that creates two threads. Each thread is instantiated from the same class. It executes a loop with 10 iterations. Each iteration displays “Welcome” message, sleeps for 200 milliseconds.

5. Attempt any three of the following:

15

- a. What is the use of adapter class in Java? Explain any one of the adapter classes defined in Java.
- b. What is the role of layout manager? What is the default layout of frame? Explain its working.
- c. How the concept of inner classes helps in Java to handle events? Explain with the help of interface MouseListener.
- d. Develop a frame that has three radio buttons Red, Green, Blue. On Click of any one of them background color of the frame should change accordingly.
- e. Explain any two overloaded constructors and three methods of class Scrollbar.
- f. Write a program to demonstrate the use of Canvas.
