

## **SECTION 1**

**(40 MARKS)**

### **WRITE A JAVA APPLICATION TO ACCOMPLISH THE FOLLOWING:**

- a) Write Java statements to declare an array that will store the monthly average rainfall values (double) for a city for one year. (3)
- b) Write Java statements to declare another array and initialize it with the names of the months of the year. (2)

### **NOW FILL THE ARRAY WITH FICTITIOUS VALUES AND:**

- c) Write Java statements to determine and display the highest average rainfall value, and the month in which it occurred. (8)

### **WRITE A JAVA APPLICATION FOR:**

- d) Write the declaration of an integer array myTable that has 3 rows and 4 columns. (2)
- e) Initialize the array myTable with random numbers in the range 50 to 100 inclusively. (5)
- f) The user enters a value, rowNum, representing a row of the array myTable. Write the statements to calculate and display the sum of the elements in that row. (5)

```
public static void main(String[] args)
{
a)   double[] rain = new double[12]; ✓✓

b)   String[] month =
      {"Jan","Feb","Mar","Apr","May","Jun","Jul","Aug","Sep","Oct","Nov","Dec"}; ✓✓

c)   double highest = 0; ✓
      int monthNum=0; ✓
      for(int x =0; x<rain.length; x++) ✓
      {
        if(rain[x] > highest) ✓
        {
          highest = rain[x]; ✓
          monthNum = x; ✓
        }
      }
      System.out.printf("%s had most rain: %.1f", month[monthNum], highest); ✓✓
}

d)   int myTable[][] = new int[3][4]; ✓✓

e)   Random rnd = new Random(); ✓
```

```

        for (int row = 0; row < myTable.length; row++) ✓
            for (int col = 0; col < myTable[row].length; col++) ✓
                myTable[row][col] = 50 + rnd.nextInt(51); ✓✓

f)    int sum=0; ✓
        for (int y = 0; y < myTable[rowNum-1].length; y++) ✓
        {
            sum += myTable[rowNum-1][y]; ✓✓
        }
        System.out.print("Sum:"+sum); ✓

```

## **SECTION 2**

**(10 MARKS)**

Write a Java Application with a method called “daysInMonth”, to be called from the main method, which resides in the Java application class with the following functionality.

- The method will have two parameters month (int) and year (int).
- The method will return an integer value, which will be the number of days of a month for that year, e.g. daysInMonth(6,2000) will return a value of 30 and so on. If the year is a leap year then for the month of February should return 29 days. The formula for a (Gregorian) leap year must be used, i.e. the year must be divisible by 4, but not by a 100 (except if divisible by 400)

```

public static ✓ int ✓ daysInMonth (int month, int year) ✓
{
    if ((month == 4) || (month == 6) || (month == 9) || (month == 11)) ✓✓
        return 30;

    if (month == 2)
        if ((year%400)== 0) || ((year%100 != 0) && (year%4==0)) ✓✓
            return 29; ✓
        else
            return 28; ✓
    return 31; ✓
}

```

**SECTION 3****(15 MARKS)**

Write an application to simulate the rolling of two dice. The application should use an object of class Random once to roll the first die and again to roll the second die. Each die can show an integer value from 1 to 6. Your application should roll the dice 40,000 times. The following prerequisites are of the essence:

- a. Use a two-dimensional array called twoDim to tally the number of times each combination of the two die are thrown in that order only.
- b. Display the results in tabular format, by calling a Display method with the array as parameter. These results will be the number of times a combination was thrown, e.g. if a 5 is thrown thrice using Die\_1 and a 4 is thrown thrice using Die\_2, then the Java application must keep track of the number of times (three in this case) 5 and 4 occurred together, but which is not the same when 4 and 5 were thrown.

```

import java.util.*;
import javax.swing.*;

public class runDice
{
    static int twoDim[][]; ✓

    public static void main(String[] args)
    {
        twoDim = new int[6][6]; ✓
        JOptionPane.showMessageDialog(null,"FREQUENCIES");

        Random rdm = new Random(); ✓
        int A = 0;
        int B = 0;
        int correct=0;
        int result = 0;
        long count=1;
        while (count <=40000) ✓
        {

            A = rdm.nextInt(6) + 1; ✓
            B = rdm.nextInt(6) + 1; ✓

            ++twoDim[A-1][B-1]; ✓
            count++; ✓
        }

        Display (twoDim); ✓
        Most(twoDim);
    } //Main

    public static void Display(int twodim[][]); ✓
    {

        System.out.printf("\t %4s %6s %6s %6s %6s %6s \t\n\n",'1','2','3','4','5','6');
        for (int row = 0; row < twoDim.length; row++) ✓
        {
            System.out.printf("%4d \t",row+1);
            for (int col = 0; col < twoDim[row].length; col++) ✓
            {
                System.out.print(twoDim[row][col]); ✓
                System.out.print("\t");
            }
            System.out.println(); ✓
        }
    }
}

```

```

    }

} // end Display

public static void Most(int twodim[][])✓
{
    int Row=0;
    int Col=0;
    for (int row = 0; row < twoDim.length; row++)✓
    {

        for (int col = 0; col < twoDim[row].length-1; col++)✓
        {

            if (twoDim[row][col] >= twoDim[row][col+1]) ✓
            {
                System.out.println(twoDim[row][col]);
                Row = row;
                Col = col;
            } else { Row = row; Col = col+1;
                System.out.println(twoDim[row][col]);} ✓
            }
        }
    }
    Row++;✓
    Col++;
    System.out.println("Highest values thrown by Dice: "+Row+" and Dice "+Col + " = "
    +twoDim[Row-1][Col-1]); ✓

} // end Most
}

```

#### **SECTION 4**

**(20 MARKS)**

You are starting a business and need to write a program to keep track of all the customers. The customer class consists of attributes.Custnumb (Integer) and CustName (String). Assume the CUSTOMER class has been declared as follows:

Customer
-CustNumb : int -CustName : String
<<constructor>>+Customer(CNumb : int, CName : String) +setCustNumb( cnumb : int) : void

```

+setCustName(cname : String) : void
+getCustNumb( ) : int
+getCustName( ) : String
+toString( ) : String

```

**ONLY write Java code for the Java application considering the following prerequisites:**

1. Use the Scanner class as input device.
2. Declare an array for Customer, called CustList, which must be globally visible by all methods within the Java application.
3. Allow the user to specify how many Customers he/she wants to capture during runtime.
4. Use a for-loop and write code to capture Customers within CustList making use of the constructor in your code.
5. Write a separate for-loop to display these customers within CustList.

```

import java.util.Scanner; ✓
public class runCustomer ✓
{
    ✓static Customer [] ✓ CustList ;

    public static void main(String [] args)
    {
        Scanner input = new Scanner(System.in); ✓
        int Numb=0; String Cname = ""; int Size=0; ✓
        // 1 Mark if all three variables were declared

        System.out.println("How many Customers do you want to add ?:" ); ✓
        Size = input.nextInt( ); ✓

        CustList = new Customer[Size]; ✓✓

        For (int cnt = 0; ✓ cnt < CustList.length ✓ ; cnt++)
        {
            System.out.println("Please type in Customer number: ");
            Numb = Input.nextInt( );
            System.out.println("Please type in Customer Name: ");
            Cname = input.nextLine( );
            //*****// for all two inputs with display ✓✓
            ✓ CustList[cnt] = ✓ new Customer (Numb, Cname); ✓

```

```
} // End of for cnt 1
```

```
For (int cnt = 0; cnt < CustList.length cnt++) ✓  
{  
System.out.println("The Customer Details are: ");  
System.out.println(CustList[cnt]); ✓✓  
} // end of for cnt 2
```

```
} // End of main
```

```
} // End of App
```