

MAR THOMA RESIDENTIAL SCHOOL, TIRUVALLA
FIRST TERMINAL EXAMINATION-August 2017
COMPUTER APPLICATIONS

Std X

Marks:100

(Theory)
(Two hours)

Answers to this Paper must be written on the paper provided separately.

You will **not** be allowed to write during the first 15 minutes.

This time is to be spent in reading the question paper.

The time given at the head of this Paper is the time allowed for writing the answers.

This Paper is divided into two Sections.

Attempt **all** questions from **Section A** and **any four** questions from **Section B**.

The intended marks for questions or parts of questions are given in brackets [].

SECTION A (40 Marks)

Attempt all questions

Question 1

(a) (i) What are the default values of primitive data type **long** and **double**?

(ii) Write one similarity and the differences between the primitive data types

double and **long**

[2]

(b) Name any two jump statements in java and write their use.

[2]

(c) What are identifiers?

[2]

(d) List the variables from those given below that are composite data types.

(i) int x;

(iv) boolean b;

(ii) arr[i]=10;

(v) private char chr;

(iii) obj.display();

(vi) String str;

[2]

(e) Name the wrapper classes of **int** type and **char** type.

[2]

Question 2

(a) What is the difference between *class* variable and *instance* variable?

[2]

(b) int x = 5, y = 9; What is the value of x in

$x + = x ++ - y -- + y * ++ x$? Show the steps.

[2]

(c) Why a class is called an object factory?

[2]

(d) Give the differences between *constructor* and *method*.

[2]

(e)) State the value of n and ch.

[2]

char ch='F';

int n=ch++ +32;

ch=(char) n++;

Question 3

a) Answer the questions on the basis of the following function:

```
public void display(int num, char ch)
{
    double y=3.2 + num++;
    num++;
    ch+=2;
    System.out.println(num+" "+y+" "+ch);
}
```

(i) Name the *formal parameter*

(ii) Name the *local variables*

(iii) give the *output* when the function display() is invoked with num=7,ch='B'

(b) Write a function prototype of the function check which receives single dimensional array num which stores 10 integer numbers and an integer n and returns true or false.

(c) Write down the differences between *Call by value* and *Call by reference*.

(d) . Name the search or sort algorithm that:

(i) Makes several passes through the array, selecting the next smallest item in the array each time and placing it where it belongs in the array.

(ii) At each stage, compares the sought key value with the key value of the middle element of the array.

(e) What is the difference between pure and impure functions?

(f) Give the output of the following code

```
long x=30, y=40;
String A,B,S;
A=String.valueOf(x);
B=String.valueOf(y);
System.out.println("output 1="+x+y);
System.out.println("output 2="+A+B);
S=A+B;
System.out.println("output 3="+x+y);
System.out.println("output 4="+S);
```

(g) Write a statement to check if the second last character of a string str is a digit. [2]

(h) String str[]={“SINGAPORE”, MUMBAI”, ”DELHI”, “BANGALORE”};

(i) What is the size of the array?

(ii) What is the value of str[3].length() - str[0].length()

(iii) What is the output of

```
System.out.println(str[1]. toLowerCase(st[1].replace(‘M’,’H’)));
```

(iv) System.out.println(st[st.length-1].compareTo(“BENGALURU”)); [2]

(i) Write java expression for the following $ax^2 + bx^3 + c(x + 5)$ [2]

(j) Name the keywords that: [2]

(i) make a value constant that never changes at any stage in the program

(ii) shows the function does not return a value.

(iii) create an instance of a class

(iv) to call a package in the program

SECTION B (60 Marks)

Attempt any four questions from this Section.

*The answers in this Section should consist of the Programs in either Blue J environment or an program environment with Java as the base. Each program should be written using **Variable descriptions/Mnemonic Codes** such that the logic of the program is clearly depicted. Flow-Cha and Algorithms are not required.*

Question 4

Define a class called **Parking Lot** with the following description :

Instance variables/data members :

int vno - To store the vehicle number

int hours - To store the number of hours the vehicle is parked in the parking lot

double bill - To store the bill amount

Member methods :

Parking Lot() – default constructor to initialise data members.

void input() - To input and store the vno and hours.

void calculate() - To compute the parking charge at the rate of 5 for the first hour or part thereof, and 2.50 for each additional hour or part thereof.

A surcharge of 2.5% charged if the number of hours the vehicle is parked is above 5 hour

void display() - To display the details as follows

Vehicle number:

Number of hours :

Bill amount :

Write a main method to create an object of the class and call the above methods.

Question 5

Write a Program in Java to input a number and check whether it is a **Disarium Number** [15]
or not.

Note: A number will be called **DISARIUM** if sum of its digits powered with their respective position is equal to the original number.

For example 135 is a **DISARIUM** ; $135 = 1^1 + 3^2 + 5^3$
some other **DISARIUM** are 89, 175, 518

Question 6.

Special words are those words which starts and ends with the same letter. [15]

Examples:

EXISTENCE

COMIC

WINDOW

Palindrome words are those words which read the same from left to right and vice-versa

Examples:

MALAYALAM

MADAM

LEVEL

ROTATOR

CIVIC

All palindromes are special words, but all special words are not palindromes.

Write a program to accept a word check and print whether the word is a palindrome or only special word.

Question 7

Design a class to overload a function area() as follows: [15]

(i) *double area(double a, double b, double c)* with three double arguments, returns the area of a scalene triangle using the formula:

$$\text{area} = \sqrt{s(s-a)(s-b)(s-c)} \quad \text{where } s = \frac{a+b+c}{2}$$

(ii) *double area(int a, int b, int height)* with three integer arguments, returns the area of a trapezium using the formula: $\text{area} = \frac{1}{2} \text{height}(a+b)$

(iii) *double area(double diagonal1, double diagonal2)* with two double arguments, returns the area of a rhombus using the formula: $\text{area} = \frac{1}{2} \text{diagonal1} * \text{diagonal2}$

Question 8

Using the *switch* statement , write a *menu driven* program for the following:

[15]

(i) to find and display the sum of the series given below:

$$S = \frac{x^1}{2} - \frac{x^2}{3} + \frac{x^3}{4} - \frac{x^4}{5} + \dots + \frac{x^{19}}{20} - \frac{x^{20}}{21}, \text{ where } x=3$$

(ii) To display the following series

1 12 123 1234 12345

Question 9.

Write a program to initialize the countries in the world along with the capital of that country in two different arrays. Search for a name of the country input by the user. If found, display the name of the country along with its capital, otherwise display "Sorry Not Found!"

Country : AFGHANISTAN, BANGLADESH ,BRAZIL, CANADA, EGYPT, INDIA, ITALY

Capital: KABUL, DHAKA ,BRASILIA, OTTAWA, CAIRO, NEW DELHI , ROME

Example - Country Name : INDIA Output : INDIA - NEW DELHI

Country Name : JORDAN Output : Sorry Not Found!

[1