

MAR THOMA RESIDENTIAL SCHOOL, TIRUVALLA  
SECOND MODEL EXAMINATION-2020  
COMPUTER APPLICATIONS

X

(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) Define Inheritance. [2]
- (b) Explain the purpose of using *import* keyword in a Java program. [2]
- (c) What do you mean by operator precedence? [2]
- (d) Mention the types of variables used in java. [2]
- (e) What is the use of this keyword?. [2]

**Question 2.**

- (a) Rewrite the following condition using logical operators:

```
if ( a >= 10 )
{ if( a < 100 )
  c = a * a; }
else c = a * a * a;
```

- (b) (i) Rewrite the following loop using while loop:

```
for ( ; ; )
  System.out.print("&");
```

- (ii) What do you mean by Empty loop? [2]

(c) Differentiate between Math rint() and Math.round(). [2]

(d) Analyse the following program segment and determine how many times the loop will be executed . What will be the output of the program segment?

```
int k=2,i=3;
```

```
while(++i<10)
```

```
 k*=i++;
```

```
System.out.println(k+i);
```

[2]

(e) Differentiate between equalsIgnoreCase() and compareToIgnoreCase(). [2]

### Question 3.

(a) State the number of bytes and bits occupied by an array which contains of 10 elements of double data type. [2]

(b) Differentiate between Bubble sort and Selection sort techniques. [2]

(c) What is the output of the following?

```
String a="Java is programming language \n developed by \t\James Gosling\";
```

```
System.out.println(a);
```

[2]

(d) Differentiate between break and continue statements in java. [2]

(e) Write a statement in Java to find the modulus of  $\frac{\sqrt{a^2+b^2}}{2ab}$  [2]

(f) What is the value of m after evaluating the following expression:

```
m += 9%++n + ++n/2; when int m=8,n=12
```

[2]

(g) Predict output of the following:

(i) Math.pow("1525".indexOf('2'),3)+Math.ceil(4.2)

(ii) Math.min(Math.sqrt(6.25), Math.floor(-2.5))

[2]

(h) Give the output of the following java statements

(i) "TRANSPARENT".endsWith("ent");

(ii) "TRANSPARENT".compareTo("TRANSITION")

(iii) form the word RATION from TRANSITION

[2]

(i) Write a java statement for each to perform the following task:

(i) Find and display the position of the last uppercase vowel in a string stored in a variable txt.

(ii) Convert number stored in a string variable num into long integer type.

(j) Name the keywords that

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

(ii) input a string without any space.

[2]

### 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 any program environment with Java as the base.

Each program should be written using Variable descriptions/Mnemonic Codes so that the logic of the program is clearly depicted.

Flow-Charts and Algorithms are not required.

#### Question 4.

Define a class as per the following description

Class name : Telephone

Member variables:

String name – to store the name of the customer

int prv,pre – to store the previous and present meter readings

int call – to store calls made (pre-prv)

double amt – to store the amount

double total – to store the total amount to be paid.

Member functions:

void accept ( ) – to accept the name of the customer, previous reading and present reading from the user (using Scanner class)

void calculate ( ) – to calculate the total amount to be paid as per the following criteria.

<b>Calls made</b>	<b>Rate</b>
Upto 100 calls	No charge
For the next 100 calls	90 paise per calls
For the next 200 calls	80 paise per calls
More than 400 calls	70 paise per calls

However every consumer has to pay Rs. 250 per month as monthly rent for availing the service.

void print ( ) – to print the name of the customer, calls made , amount and total amount to be paid in a tabular form in the following format

:

Name	Calls made	Amount	Amount to be paid
-----	-----	-----	-----

Define a class with the above-mentioned specifications, create the main method, create an object and invoke the member methods. [15]

**Question 5.**

Write a program to perform binary search on a list of integers given below, to search for an element given by the user. If it is found display the element along with its position. Otherwise display the message 'Search element not found'.

101,105,107,206,305,345,543,567,765,777 [15]

**Question 6.**

Design a class to overload a function Sum( ) as follows:

(i) double area(int s) -- to find the area of an equilateral triangle.

$$A = \frac{\sqrt{3}}{4} s^2$$

(ii) double area( int a, int b ) -- to find the area of an Isosceles triangle

$$A = \frac{1}{4} b \sqrt{4a^2 - b^2}$$

(iii) double area (int a, int b, int c) --to find the area of a scalene triangle

$$A = \sqrt{s(s - a)(s - b)(s - c)}$$

Write the main method to create an object and invoke the above methods. [15]

**Question 7.**

Using the switch statement, write a menu driven program to perform following operations:

(i) To Print the value of Z where  $Z = \frac{0.05 x^3 - y^2}{x - y}$

where x ranges from - 10 to 10 with an increment of 3 and Y remains constant at 5.5.

(ii) To print the Floyds triangle with N rows.Example: If N = 5, Output:

```

1
2   3
4   5   6
7   8   9   10
11  12  13  14  15

```

(iii) to check whether a number is Disarium number or not.

A Disarium number is a number defined by the following process:

Sum of its digits powered with their respective position is equal to the original number.

For example 135 is a Disarium number:  $1^1 + 3^2 + 5^3 = 135$  [15]

### Question 8.

Write a program to input and store integer elements in a double dimensional array of size  $4 \times 4$  and find the

1. sum of all the elements
2. the sum of corner elements ( $7+5+5+3$ )
3. sum of all even numbers present in the array
4. sum of all odd numbers present in the array

```
7 3 4 5
5 4 6 1
6 9 4 2
3 2 7 5
```

[15]

### Question 9.

Write a program to input a string and perform the following

1. frequency of a word input by the user. If the word is not present display word is not present in the string.
2. Frequency of each character in the string.

[15]