

MAR THOMA RESIDENTIAL SCHOOL, TIRUVALLA
SECOND TERMINAL EXAMINATION-DECEMBER 2017

COMPUTER APPLICATIONS

Marks:100

STD 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) What do you mean by Byte code? [2]
- (b) Arrange the following operators in hierarchical order. [2]
- (i) ? : (ii) ++ (iii) == (iv) % (v) [] (vi) /= [2]
- (c) State the number of bytes occupied by char and int data types. [2]
- (d) Write one difference between \t and \n characters. Explain it by using an example. [2]
- (e) `int x[] = {1,4,9,16,25,36,49};`

Give the output of the following statements:

- (i) `System.out.println(x[x.length-1]/x.length);`
- (ii) `System.out.println(x[3]+x[2]-Math.pow(x[4],x[0]));` [2]

Question 2

- (a) Give two differences between the **switch** statement and the **if-else** statement. [2]
- (b) What is an infinite loop? Write an infinite loop statement. [2]
- (c) What is a constructor? When is it invoked? [2]
- (d) 1) Name the keyword that stores the address of the currently calling object.
- 2) Name the variable which is global in the class and used commonly by all the objects of that class. [2]
- (e) Give the output of the following:
- 1) `APTITUDE.compareTo("ATTITUDE")`
- 2) `"APTITUDE".indexOf('T') + "ATTITUDE".lastIndexOf('T')` [2]

Question 3

[2]

(a) Give the output of the following:

```
{ int a = 5;
  System.out.println(a++);
  a -= (a--) - (--a) * a++;
  System.out.println(++a); }
```

(b) Write down the difference between call by value and call by reference.

[2]

(c) What is the output of the following statements when executed?

```
char ch[]={'T','N','T','E','L','P','E','N','T','I','U','M'};
String str=new String(ch);
String st=new String(ch,5,3)+" "+new String(ch,6,3);
System.out.println(st);
System.out.println(str);
```

[2]

(d) Write a valid java expression for the following:

[2]

$$A = \frac{1}{2}ab\sin C$$

(e) Write down the output of the following:

[2]

```
int num=96258,n=0;
int b[]=new int[6];
while(num>0)
{ b[++n]=num%10;
  num/=100;
  System.out.println(b[n--]);}
```

(f) What is the difference between selection sort and bubble sort?

[2]

(g) Give the output of the following:

[2]

```
1) char a= "dream".charAt(3);
   a+=3;
   int b=a-32;
   System.out.println(a+ " "+b);
```

```
2) Math.ceil(-28.25)+ Math.sqrt(Math.floor(144.99))*Math rint(3.5)
```

(h) Write a function prototype of the following: [2]

A function Poschar which takes a string argument str and an character argument which is used to check whether the character is present in the string and returns true or false.

(i) Study the following program segment and answer the following: [2]

```
public void format()  
    { String a, b;  
      a="WORK";  
      b="HARD";  
      int m=a.length();  
      int n= b.length();  
      for(int i=0,j=n-1;i<m;i++,j--)  
      {   System.out.print(a.charAt(i)+b.charAt(j));  
          System.out.println(" "+a.charAt(i)+b.charAt(j)); } }
```

1) How many times the loop will execute and what is the output?

2) Convert the following into corresponding while loop.

(j) State the data type and value of res1 and res2 after the following is executed. [2]

```
res1= "matter".replace('t', 'n');  
res2= "capable".endsWith("ABLE");
```

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

Question 4

A class Sales has been defined to store the details of a product sold by a wholesaler to a retailer with the following specifications:

Class Sales

Instance variables / data member:

name	stores the name of the product
code	integer to store the product code
amount	stores the total sale amount of the product (in decimals)
day	stores number of days taken to pay the sale amount
tax	to store the service tax (in decimals)
totamt	to store the total amount (in decimals)

Member methods:

- Sales() initialise data members with default values.
- void accept() to accept the name of the customer , product code, total sale amount, number of days taken to pay the amount.
- void compute() calculates the service tax @ 12.4% of the actual sale amount
calculates the fine @ 2.5% of the actual sale amount only if the amount paid by the retailer to the wholesaler exceeds 30 days
calculates the total amount paid by the retailer as (actual sale amount + service tax + fine)
- void show() displays the data members of class and the total amount

Write a main method to create an object of the class and call the above member methods. [15]

Question 5

Using a switch statement write a menu driven program to do the following

1) to display the following pattern

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

2) to display the following inverted *TRIANGLE*

```
T R I A N G L E
T R I A N G L
T R I A N G
T R I A N
T R I A
T R I
T R
T
```

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

$$S = \frac{a}{3} - \frac{a^3}{5} + \frac{a^5}{7} - \frac{a^7}{11} \dots \dots \dots \text{---to n terms} \quad [15]$$

Question 6

A number is said to be a Masahiko number ,if its digits are added together, produces a sum which, when multiplied by its reversal, yields the original number:

Eg: 1729 is a Masahiko number $1 + 7 + 2 + 9 = 19$
 $19 \times 91 = 1729$

Write a Java program to input a number and check whether it is a Masahiko number. [15]

Question 7

Write a java program to input a word and convert it into uppercase and do the following

- 1) Interchange/swap the first and last characters of the word in and stores the new word in 'swapwrđ'.
- 2) Sorts the characters of the original word in alphabetical order and stores it in 'sortwrđ'.
- 3) Shifts all the consonants of the word at the beginning followed by the vowels (e.g. spoon becomes SPNOO)
- 4) Display the original word, swapped word, the sorted word and the shifted word. [15]

Question 8

Design a class *triangle* to overload a function *area()* as follows:

double area(int s) with one integer argument, returns the area of an equilateral triangle

using the formula: $\text{Area} = \frac{\sqrt{3}}{4} s^2$, where *s* is the side of an equilateral triangle

double area(int a, int b) with two integer arguments, returns the area of an isosceles triangle

using the formula: $\text{Area} = \frac{1}{4} b\sqrt{4a^2 - b^2}$, where *a, b* are the sides of an isosceles triangle

double area(int m, int n, int p) with three integer arguments, returns the area of a scalene

triangle using the formula: $\text{Area} = \sqrt{s(s-m)(s-n)(s-p)}$ where *m, n, p* are the

sides of a scalene triangle and $s = \frac{m+n+p}{2}$ [15]

Question 9

Write a program to accept the admission number of a student as an integer value from the user. Using the Binary Search technique on the sorted arrays given below, output the message "Record exists" and print the name of the student if the value input is located in the array. If not, output the message "Record does not exist". [15]

Admission number	Name of the student
------------------	---------------------

5982	Souparnika,
------	-------------

5987	Madhavi
------	---------

5993	Manohar
------	---------

5996	Sreejith
------	----------

5999	Mohan
------	-------

6003	Himanshu
------	----------

6006	Rohit
------	-------

6007	Rishi
------	-------

6009	Indrani
------	---------

6010	Piyush
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