THE FIRST PRE-BOARD EXAMINATION 2023-24

Class X (ICSE)

COMPUTER APPLICATIONS

Time: Two hours **Maximum marks: 100**

Instructions:

* *Answers to this paper must be written on the answer script provided separately.*
* *All subsections of each question are to be answered in the correct order.*
* *All working including rough work should be done on the same sheet as the rest of the answer.*
* *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 the paper is the time allowed for writing the answers.*
* *Please do not write anything on the question paper except your name and roll number.*
* *The intended marks for questions or parts of questions are given in brackets [ ].*
* *Attempt **all** questions from **Section A** and any **four** questions from **Section B.***

SECTION A [40 marks]

(Attempt all questions from this section.)

Question 1

Choose the correct answers to the questions from the given options. (Do not copy the questions, write the correct answer only.) [20]

(i) Name the feature of Java whose example is depicted in the above picture.

(a) encapsulation (b) inheritance

(c) abstraction (d) polymorphism

(ii) Assertion (A): do-while loop is an exit controlled loop.

Reason (R): As many statements can be written inside the loop body as required.

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation of Assertion (A).

(c) Assertion (A) is true and Reason (R) is false.

(d) Assertion (A) is false and Reason (R) is true.

(iii) Which of the following represents the constructor of the class cms?

(a) cms
(b) void cms( )
(c) class( )
(d) cms( )

(iv) Which of the following is the correct order of data types in the increasing order of their size?

(a) short < boolean < float < long
(b) long < float < short < boolean
(c) boolean < short < float < long
(d) float < boolean < short < long

(v) Choose the odd one from among the following:

(a) !
(b) ? :
(c) ||
(d) &&

(vi) Name the type of error in the program part given below:

```
String str = "KSHITIJ";
int House_No = 256;
String join = str + House_No ;
for (int i = 0; i <= join.length( ) ; i++)
System.out.print(join.charAt(i));
```

(a) syntax error
(b) runtime error
(c) logical error
(d) no error

(vii) What will be the data type of the value returned by the method Math.max( ) after executing the following statements:

```
int x = 5; double y = 25.08;
a = Math.max (x, y);
```

(a) int
(b) float
(c) double
(d) will give an error

(viii) Which of the following statement is used to stop the execution of a program immediately?

(a) return
(b) break
(c) System.exit(0)
(d) continue

(ix) In which of the following constructs, continue statement is NOT used?

(a) do-while
(b) while
(c) switch
(d) for

(x) What will be the output of the following program snippet?

```
double a = 15.4;
if (a = = 15)
    System.out.print("India");
    System.out.print ("New Delhi");
else
    System.out.print("LUCKNOW");
```

(a) IndiaNew Delhi
(b) India New Delhi
(c) LUCKNOW
(d) it will give an error

(xi) A _____ method needs to be called with the help of an object.

(a) void
(b) class
(c) non-static
(d) static

(xii) The variable whose only one copy is created for all the objects of the class.

(a) instance variable
(b) local variable
(c) argument variable
(d) static

(xiii) In which of the following any change in the formal parameter is reflected in the actual parameter as well?

(a) pure method
(b) call by reference
(c) call by value
(d) constructor

(xiv) What can be the possible return type of a constructor?

(a) primitive data types only
(b) numeric data types only
(c) alphanumeric data types only
(d) it should not have a return type.

(xv) Which of these is the wrapper class to convert the primitive data type char into objects?

(a) char
(b) Char
(c) Character
(d) character

(xvi) Which of the following method is used to convert a string value to an integer value?

(a) convertToInt( )
(b) convertInt( )
(c) parseInt( )
(d) parseToInt( )

(xvii) If int arr[ ] = {2, 1, 6, 7, 3}; then what is the value of variable a, if a = arr.length + arr[4];

(a) 7
(b) 8
(c) 9
(d) 12

(xviii) String name[ ] = {"Tiya", "Som", "Anu"}; what will be the output of the statement: System.out.println(name.length);

(a) 2
(b) 3
(c) 9
(d) 10

(xix) In this searching technique, an array has to be arranged in ascending or descending order. The sorted array has to be divided into two equal halves. Then the value to be searched is compared with the middle element. If it matches the loop breaks, else it checks whether the value is larger or smaller than the middle element. The side of the array in which it is present is again divided into two equal halves, the other half is discarded and the process continues.

Which searching technique has been discussed in the above passage?

(a) bubble
(b) selection
(c) linear
(d) binary

(xx) Assertion (A): A class is called as an object factory.

Reason (R): From a given class any number of objects of same kind can be created.

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation of Assertion (A).

(c) Assertion (A) is true and Reason (R) is false.

(d) Assertion (A) is false and Reason (R) is true.

Question 2

(i) Write two differences between primitive and non primitive data types. [2]

(ii) What will be the value of variable a after executing the following when value of a = 7 initially.

```
a += a++ + ++a + --a + a--;
```

[2]

(iii) Write the Java expression for:

$$\sqrt{a^{15} + b^{60} + \frac{c}{12}}$$

[2]

(iv) From the code given below write the statement that contains:

(a) an error

(b) an implicit type conversion

```
char c = 'A';
int n = c + 1;
char ch = n;
```

[2]

(v) Write an example of an infinite loop. [2]

(vi) Write the output of the following program snippet:

```
String str = "EXPLANATIONS";
System.out.println(str.substring(5, 11).indexOf('A'));
System.out.println(str.lastIndexOf('N'));
```

[2]

(vii) What will the following program part display?

```
int a[ ] = {15, 2, 8, 100, 64};
System.out.println (Math.pow (Math.cbrt (a[2]), a[1]));
```

[2]

(viii) To print the sum of first ten whole numbers, Manisha has written the following code. Rewrite the code after removing errors from it.

```
int sum = 0;
for (int i = 0; i < 10; i ++)
{
    sum += i ;
    System.out.println ("Sum = " + Sum);
}
```

[2]

(ix) // loop to print the first 10 even numbers

```
for (int i = 1; i <= 20; i ++)
{   System.out.println(i);
    i = i + 2;
}
```

Name the type of error(s) present in the above code. Rewrite the code after correcting the errors. [2]

(x)
```
int A[ ] = {2, 4, 6, 8};
int B[ ] = {2, 4, 6, 8};
if (A = = B)
    System.out.println ("Arrays are equal");
else
    System.out.println ("Array A is NOT equal to array B");
```

What will be the output of the above code? [2]

SECTION B [60 marks]

Attempt any four questions from this Section.

Question 3

Design a class named buyLaptop with the following descriptions:

Instance Variables / data members:

String name	: stores the name of the customer
long mob	: stores the mobile number of the customer
double cost	: stores the cost of the laptop purchased
double dis	: stores the discount amount
double amt	: stores the amount to be paid after discount.

Member methods:

buyLaptop( )	: default constructor to initialize data members
void accept( )	: accepts the customer's name, mobile number and cost of the laptop
void calculate( )	: calculates the discount on the cost of laptop purchased based on the following criteria:

Cost (Rs)	Discount
up to 30000	5%
above 30000 up to 60000	10%
above 60000 up to 100000	15%
above 100000	20%

void print( ) : displays the customer's name, mobile number, and the amount to be paid after discount.

Write a main( ) method to create an object of class and call methods in logical order to accomplish the task. [15]

Question 4

Define a class in Java to accept the average marks scored by 40 students of a class. Sort these marks in descending order using Bubble sort technique. Print the sorted array. [15]

Question 5

Define a class in Java to accept two strings of same length. Using these two strings form a new word in such a way that the first character of the first word is followed by the first character of the second and so on.

Example string 1 = SAME
string 2 = WITH

Output SWAIMTEH [15]

Question 6

Write a program in Java to accept 16 integer values in a double dimensional array of order 4 × 4. Calculate and print the sum of all the even numbers present in the diagonals (Left and Right) of the array.

For example if the array entered is:

0	5	2	9	1
1	6	8	5	9
2	3	2	1	17
3	12	1	80	2

Then the sum of all even integers present in the diagonals is:

= 8 + 2 + 12 + 2 = 24 [15]

Question 7

Define a class in Java to overload the method display( ) as follows:

void display(String str) : to print the pattern from the string in str

Example: str = LUCKNOW

Output
L
LU
LUC
LUCK
LUCKN
LUCKNO
LUCKNOW

void display(int n) : to print 10 random numbers between n-1 and n. [15]

Question 8

Write a program in Java to accept 50 integers (without using arrays). From the integers entered print the following:

(a) the largest integer

(b) the smallest integer

(c) the sum of all integers. [15]