THE SECOND PRE-BOARD EXAMINATION 2020-21
Class X (ICSE)
COMPUTER APPLICATIONS (Theory)

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 must 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. The time is to be spent in reading the question paper.
* 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 the 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

(a) Encapsulation and Inheritance are both, the principals of Object Oriented Programming. How are they different? [2]

(b) How is Java compilation process different from normal (traditional) compilation process? [2]

(c) Which of the following are keywords? [2]

    (i) continue   (ii) main   (iii) switch   (iv) print

(d) Is the following statement valid or not? If invalid give reason. If valid then what will be stored in variable x? [2]

    int x = 'c';

(e) Explain the syntax of ternary operator. [2]

Question 2

(a) Give an example of each of the following: [2]

    (i) binary operator   (ii) logical operator.

(b) Write the difference between formal parameters and actual parameters. [2]

(c) How is a runtime error different from a logical error? [2]

(d) Explain the purpose of the following methods of Java with the help of an example for each: [2]

    (i) ceil( )   (ii) random( ).

(e) Give two differences between *switch case* statement and *if else* statement. [2]

Question 3

(a) Explain fall through with the help of an example. [2]

(b) Write the output of the following statements:

   (i) System.out.println("House No. 25".toUpperCase());

   (ii) System.out.println(Character.isUpperCase('T')); *true* [2]

(c) Write the statement to print the second element of the array Arr having 10 elements. [2]

   int S = Arr.charAt (1) i

   Sop (Arr [1]) i [2]

(d) Explain the purpose of the method isWhitespace( ).

(e) Write the output of the following program part: [2]

   String Str = "Today is Exam"; *(56789 / 01234)*

   System.out.println(Str.substring (0, 5) + " " +Str.substring(9) + " is Easy"); [2]

(f) Write the difference between the Scanner class methods next( ) and nextInt( ). [2]
   char — int

(g) Write the statement to print the sum of the numbers formed by last two digits (i.e. at tens and units place) of integers stored in variable num1 and in num2. [2]
   % 100   % 100

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

   String vov = "aeiou"; String VOW = "AEIOU";

   System.out.println(vov.compareToIgnoreCase(VOW)); *0*

   System.out.println(vov.equalsIgnoreCase(VOW)); *true* [2]

(i) Write the output of the following program part:

```
int c = 10;
for(int j = 1; j <= 5; j++, c++)
{     if (c++ > 2 && ++c < 15)
      System.out.println(c * 2);        24
}
```
[2]

(j) Explain Auto-Unboxing with the help of an example. [2]

   Integer myint = 20,

   () int myint 20 i

SECTION B [60 marks]

Attempt any four questions from this Section.

The answers in this Section should consist of the Program in BlueJ environment with Java.
Each program should be written using Variable descriptions/Mnemonic Codes such that the
logic of the program is clearly depicted.
Flow-charts and Algorithms are not required.

Question 4

A cloth manufacturing company offers discount to the dealers. The discount is calculated using the total length of the cloth purchased by the dealer as per the following table:

(Slabing next, day.day)

Not slabing.

Length of cloth (metres)	Dealer's Discount
up to 1000	20%
above 1000 but less than 2000	25%
more than 2000	30%

To calculate the discount, a class Discount with the following details is to be created:

Class name : **Discount**

Data members:

String name : stores dealer's name

double rate : stores rate of the cloth per metre

int length : stores total length of the cloth purchased by the dealer

double discount : stores the discount after calculation.

Member functions:

void input( ) : accepts the name of the dealer, rate and length of cloth purchased

void calculate( ) : calculates the discount as per the length of the cloth in the table given **above**.

void print( ) : displays the name of the dealer, length of cloth, rate per metre, discount and the amount to be paid by the dealer in the following format:

Dealer's Name	Length	Rate	Discount	Amount to be paid
—	—	—	—	—

Define the class Discount in Java. Write the main method to create an object of the class and invoke the member methods.   [15]

(i) = 0
SCORE

Question 5

Write a program in Java to accept 50 integers in an array named SCORE[ ]. Sort the integers in ascending order using bubble sort technique.

After sorting the array print the 3 lowest scores in descending order. [15]

Question 6

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

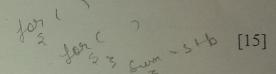(a) to generate and print letters from A to Z and their Unicode values:

Letter	Unicode
A	65
B	66
-	-
-	-
-	-
Z	90

(b) to print the sum of the following series:

$1! + 2! + 3! + 4! + \ldots + 10!$

Where ! represents the factorial of the number.

For example $4! = 1 \times 2 \times 3 \times 4 = 24$ [15]

Question 7

Write a program in Java to accept an integer and print its middle digit if it contains odd number of digits otherwise print the number formed by the two middle digits if the integer contains even number of digits.

For example, if an integer entered is 5108216 then middle digit is 8. If an integer entered is 214350 then number formed by 2 middle digits is 43. [15]

Question 8

Design a class in Java to overload the function large( ) as follows:

(a) void large (char, char) : prints the character with a larger Unicode value of the two

(b) void large (int a, int b) : prints the larger of the two integers.

(c) void large (double, double) : prints the larger of two fractional values. [15]

Question 9

Write a program in Java to print the following pattern:

```
1
2  4
3  6  9
4  8  12  16
5  10  15  20  25
```

[15]