# ICSE 2025 EXAMINATION

## Sample Question Paper – 5

## Computer Applications

**Time: 2 Hours** **Max. Marks: 100**

**General Instructions:**

1. Answers to this Paper must be written on the paper provided separately.
2. You will not be allowed to write during the first 15 minutes.
3. This time is to be spent in reading the question paper.
4. The time given at the head of this Paper is the time allowed for writing the answers.
5. This Paper is divided into two Sections.
6. Attempt all questions from Section A and any four questions from Section B.
7. The intended marks for questions or parts of questions are given in brackets [ ].

## SECTION A

Attempt all questions from this part.

**QUESTION 1.**
**Choose the correct answer and write the correct option.**

(Do not copy the question, write the correct answers only.)

**(i) Give the result produced by executing the following code."**

```
String str1 = "Information
                        Technology";
String str2 = "information
                        technology";
boolean p =
str1.equalsIgnoreCase(str2);
System.out.println("The result is
                              " p);
```

(a) True
(b) False
(c) Error
(d) Cannot define

**Answer:** (a) True

**(ii) Which of the following is an advantage of using arrays in Java?**

(a) Random access
(b) Code optimization
(c) Both (a) and
(b) (d) Size (no limit)

**Answer:** (a) Random access

**(iii) Which of the following serves as the universal class for exception handling?**

(a) Objects
(b) Errors
(c) Exceptions
(d) Maths

**Answer:** (c) Exceptions

**(iv) What will be the output of the following Java program?**

```
class String_demo
{
  public static void main
                    (String args[])
  {
    int ascii[] = {65, 66, 67, 68};
    String s = new String(ascii, 1,3);
    System.out.println(s);
  }
}
```

(a) ABC
(b) BCD
(c) CDA
(d) ABCD

**Answer:** (b) BCD

**(v) What is the value returned by function compareTo(), if the invoking string is less than the string compared?**

(a) Zero
(b) Value greater than zero
(c) Value less than zero
(d) None of the above

**Answer:** (c) Value less than zero

**(vi) while omitting background details or explanations.**

(a) Encapsulation
(b) Polymorphism
(c) Inheritance
(d) Abstraction

**Answer:** (d) Abstraction

**(vii) What is the process that allows control over which parts of a program can access a class's members?**

(a) Polymorphism (b) Abstraction
(c) Encapsulation (d) Recursion

**Answer:** (c) Encapsulation

**(viii) Which class is inherited by the character and Boolean wrapper class?**

(a) Object (b) Number
(c) Both (a) and (b) (d) None of these

**Answer:** (a) Object

**(ix) The time complexity of the linear search algorithm is____.**

(a) O(n) (b) O(logn)
(c) $O(n^2)$ (d) O(n logn)

**Answer:** (a) O(n)

**(x) This is a group of similar type of classes.**

(a) package (b) void
(c) extends (d) import

**Answer:** (a) package

**(xi) trim( ) is used for____.**

(a) Remove leading and trailing spaces in a string
(b) Removes character
(c) Shorten string
(d) None of the above

**Answer:** (a) Remove leading and trailing spaces in a string

**(xii) Choose the odd one**

(a) if-else (b) if
(c) switch case (d) while()

**Answer:** (d) while()

**(xiii) Which of the following are non-executable statements that are ignored by the compiler or interpreter?**

(a) Blocks (b) Variables
(c) Statements (d) Comments

**Answer:** (b) Variables

**(xiv) Array data access using____.**

(a) operator (b) index
(c) variable (d) pointer

**Answer:** (c) variable

**(xv) Which of the following loop checks the condition first before entering in a loop?**

(a) while (b) do-while
(c) Both (a) and (b) (d) None of these

**Answer:** (a) while

**(xvi) Assertion (A) :** Local variables are defined within a method, constructor, or block.
**Reason (R) :** Local variables are not visible outside the method, constructor or block.

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

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

**(xvii) Read the following text and choose the correct answer.**
A class is a grouping of objects of the same type, where each object shares the same attributes and common behaviors defined within the class.

**What does a class?**
(a) Takes different forms from one.
(b) Binds data and methods in a single unit.
(c) Hides the necessary details of the object.
(d) Shares common properties and relationship.

**Answer:** (d) Shares common properties and relationship.

**(xviii) This error is when your program compiles and runs, but does the wrong thing.**

(a) Logic error
(b) Runtime error
(c) Syntax error
(d) Checked error

**Answer:** (c) Syntax error

**(xix) Assertion (A) :** Wrapper class is used to convert any primitive data type into object.
**Reason (R) :** To achieve call by reference, we use the wrapper class.

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

**Answer:** (b) Both Assertion (A) and Reason (R) are true but Reason (R) is not a correct explanation of Assertion (A).

**(xix) Java source code is compiled into____by Java compiler.**
(a) byte code
(b) JVM
(c) Java interpreter
(d) JRE

**Answer:** (c) Java interpreter

**QUESTION 2.**

**(i) Write a statement to increase the value assigned to variable K by 2 and then to display the value.**

**Answer:**

```
int K = 0;
K = K+2;
System.out.printIn(K);
```

**(ii) Write the statement in Java for the following mathematical expression.**

$$p^3 + q^4 - \frac{1}{2}r$$

**Answer:**

```
Math.pow(p, 3)+ Math.pow(q, 4) -
                              (0.5)*r;
```

**(iii) If arr[ ] = {10, 20, 30, 40};**

(a) What is arr. length?
(b) What is arr[1]?

**Answer:**

(a) arr.length is 4.

(b) arr[1] is 20.

**(iv) Determine the output.**

(a)
```
a1 = "good";
a2 = "bye";
System.out.println(a1.concat(a2));
```

(b)
```
s1 = "HELLO";
s2 = "hello";
s1.compareToIgnoreCase(s2);
```

**Answer:** (a) goodbye
(b) zero

**(v) Determine the value of m after evaluating the following expression.**

m+=10%++n+n++/ 4; when int m=12, n=3?

**Answer:**

$$
\begin{aligned}
m+= 10\%++n+n++/4 \\
m= m + 10\%++n+n++/4 \\
= 12+ 10\% 4+ 4/4 \\
= 12+ 2 + 4/4 \\
= 12+2+1 \\
\text{So,} \quad m= 15
\end{aligned}
$$

**(vi) How many times the following loop will execute?**

```
int n = 1, i = 1;
do
{
     n + +;
     i + +;
     if(i = = 4)
     {
        n = 1;
        break;
     }
} while(i < 5);
```

**Answer:** The Loop executes 3 times before break is encountered, terminating the loop.

**(vii) What is the output of the following code ?**

```
String s1 = "Sachin";
String s2 = "Sachin";
if(s1.equals(s2))
  System.out.println("s1 is equal
                              to s2");
if(s1= = s2)
  System.out.println("s1 and s2
                            are equal");
```

**Answer:**
Output
s1 is equal to s2
s1 and s2 are equal

**(viii) Determine the number of bytes and bits used by an integer array with 5 elements.**

**Answer:** The number of bytes and bits used by an integer array with 5 elements depends on the size of each integer. Typically, an integer in most programming languages (like C, Java, Python) takes 4 bytes (32 bits).

For 5 integers:

- Bytes: 5 elements × 4 bytes = 20 bytes
- Bits: 5 elements × 32 bits = 160 bits

Thus, the integer array uses 20 bytes or 160 bits.

**(ix) What will be the output of the following code?**

```
String s = "Unity\n In\n
                  Diversity\tIndia";
System.out.print(s);
```

**Answer:**

Unity
In
Diversity India

**(x) What will be the output after executing the following code?**

```
for(int i=4;i<20;i+=4)
System.out.print(" " +Integer
                    .toString(2*i));
```

**Answer:** 8 16 24 32

## SECTION – B

Attempt any four questions from this section.

**QUESTION 3.**

**Create a class named Armstrong with a main function to determine if a user-entered number is an Armstrong number. An Armstrong number is a number that equals the sum of the cubes of its digits.**

**Examples of Armstrong numbers include 0, 1, 153, 370, 371, and 407.**

**Answer:**

```java
public class Armstrong {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter a number: ");
        int number = scanner.nextInt();

        int originalNumber = number;
        int sum = 0;

        while (number > 0) {
            int digit = number % 10;
            sum += digit * digit * digit;
            number /= 10;
        }
```

```java
if (sum == originalNumber) {
    System.out.println(originalNumber
} else {
    System.out.println(originalNumber
}
```

```java
+ " is an Armstrong number.");

+ " is not an Armstrong number.");
```

**QUESTION 4.**

**Write a Java program that prompts the user to enter the elements of an array and checks for the occurrences of positive numbers, negative numbers, and zeros.**

e.g. Input Array : 12, – 89, – 56, 0, 45, 56

Output

3 Positive Numbers

2 Negative Numbers

1 Zero

**Answer:**

```java
import java.util.Scanner;

public class ArrayAnalysis {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        System.out.print("Enter the size of the array: ");
        int size = scanner.nextInt();
```

```
        int[] array = new int[size];

        System.out.println("Enter the elements of the array:");
        for (int i = 0; i < size; i++) {
            array[i] = scanner.nextInt();
        }

        int positiveCount = 0, negativeCount = 0, zeroCount = 0;
```

```
        for (int i = 0; i < size; i++) {
            if (array[i] > 0) {
                positiveCount++;
            } else if (array[i] < 0) {
                negativeCount++;
            } else {
                zeroCount++;
            }
        }

        System.out.println("Output:");
        System.out.println(positiveCount + " Positive Numbers");
        System.out.println(negativeCount + " Negative Numbers");
        System.out.println(zeroCount + " Zero");

        scanner.close();
    }
}
```

**QUESTION 5.**

**Define a class Anagram which will check that entered string is anagram or not.**

An anagram is a string, which contains same characters but in different order.

e.g. army and mary.

**Answer:**

```
import java.util.Arrays;
import java.util.Scanner;

public class Anagram {

    private String str1;
    private String str2;

    // Constructor to initialize the strings
    public Anagram(String str1, String str2) {
        this.str1 = str1;
        this.str2 = str2;
    }
```

```
    // Method to check if the strings are anagrams
    public boolean isAnagram() {
        // Remove spaces and convert to lowercase
        String cleanedStr1 = str1.replaceAll("\\s+", "").toLowerCase();
        String cleanedStr2 = str2.replaceAll("\\s+", "").toLowerCase();

        // Convert strings to character arrays
        char[] charArray1 = cleanedStr1.toCharArray();
        char[] charArray2 = cleanedStr2.toCharArray();

        // Sort the character arrays
        Arrays.sort(charArray1);
        Arrays.sort(charArray2);

        // Compare sorted arrays
        return Arrays.equals(charArray1, charArray2);
    }

    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        // Input strings from user
        System.out.print("Enter the first string: ");
        String string1 = scanner.nextLine();

        System.out.print("Enter the second string: ");
        String string2 = scanner.nextLine();

        // Create an instance of Anagram
        Anagram anagramChecker = new Anagram(string1, string2);

        // Check if they are anagrams and print the result
        if (anagramChecker.isAnagram()) {
            System.out.println("\"" + string1 + "\" and \"" + string2 +
"\" are anagrams.");
        } else {
            System.out.println("\"" + string1 + "\" and \"" + string2 +
"\" are not anagrams.");
        }

        scanner.close();
    }
}
```

**QUESTION 6.**

**A class Tel call calculates the monthly phone bill of a consumer. Some of the members of the class are given below:**

| **Class name** | **Tel call** | |
|---|---|---|
| **Data members/Instance variables** | | |
| Phone no. | Phone number | |
| Name | Name of consumer | |
| N | Number of calls made | |
| Amt | Bill amount | |
| **Member functions/Methods** | | |
| Tel call(...) | Parameterized constructor to assign values to data members | |
| Void compute() | To calculate the phone bill amount based on the slabs given below: | |
| | **Number of calls** | **Rate** |
| | 1-100 | Rs. 500/- rental charge only |
| | 101-200 | Rs. 1.00/- per call rental charge |
| | 201-300 | Rs. 1.20/- per call rental charge |
| | above 300 | Rs. 1.50/- per call rental charge |
| void dispdata() | | To display the details in the specified format |

**The calculations need to be done as per the slabs.**

Specify the class Tel call giving the details of the constructor, void compute( ) and void dispdata( ). In the main() function, create an object of type Telcall and display the phone bill in the following format:

| | |
|---|---|
| Phone Number | XXXXXXXXX |
| Name | XXX |
| Total calls | XXXXX |
| Amount | XXXX |

**Answer:**

```java
import java.util.Scanner;

class TelCall {
    private long phoneNo;
    private String name;
    private int n;
    private double amt;

    public TelCall(long phoneNo, String name, int n) {
        this.phoneNo = phoneNo;
        this.name = name;
        this.n = n;
    }

    public void compute() {
        if (n <= 100) {
            amt = 500;
        } else if (n <= 200) {
            amt = 500 + (n - 100) * 1.0;
        } else if (n <= 300) {
            amt = 500 + 100 + (n - 200) * 1.2;
        } else {
            amt = 500 + 100 + 120 + (n - 300) * 1.5;
        }
    }

    public void dispdata() {
        System.out.println("Phone Number: " + phoneNo);
        System.out.println("Name: " + name);
        System.out.println("Number of Calls: " + n);
        System.out.println("Bill Amount: Rs. " + amt);
    }

    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);

        System.out.print("Enter phone number: ");
        long phoneNo = sc.nextLong();

        System.out.print("Enter name: ");
        String name = sc.next();

        System.out.print("Enter number of calls: ");
        int n = sc.nextInt();

        TelCall telCall = new TelCall(phoneNo, name, n);
        telCall.compute();
        telCall.dispdata();

        sc.close();
    }
}
```

**QUESTION 7.**
**Write a Java program to print the following pattern.**

(i)
```
5
5 4
5 4 3
5 4 3 2
5 4 3 2 1
```

(ii)
```
H E L L O
H E L L
H E L
H E
H
```

**Answer:**

```
import java.util.*;
import java.io.*;
public class Pattern
{
  public static void main(String
         args[]) throws IOException
  {
    InputStreamReader IR=new
       InputStreamReader(System.in);
    BufferedReader br=new Buffered
                          Reader(IR);
    System.out.println("Choose the
                   correct choice:");
    System.out.print("1. To print
               the first pattern...");
    System.out.println("2. To print
            the second pattern...");
    int ch=Integer.parseInt(br.read
                               Line());
    switch(ch)
    {
      case 1:
```

```
    Scanner sc = new Scanner
                        (System.in);
    System.out.print("How many
          rows you want in this
                         pattern?");
    int rows = sc.nextInt();
    System.out.println("Here is
              your pattern...!!!");
    for(int i=rows; i>=1; i--)
    {
      for(int j=rows; j>=i; j--)
      {
        System.out.print(j+ " ");
      }
      System.out.println();
    }
    break;
  case 2:
    System.out.println("Enter a
                         String: ");
    Scanner scr = new Scanner
                        (System.in);


        String s = scr.nextLine();
        int length = s.length();
        char [] a = s.toCharArray();
        System.out.println("\nPrinting
                         the pattern: ");
        for(int i=length-1; i>=0; i--)
        {
          for(int j=0; j<=i; j++)
          {
            System.out.print(a[j]);
          }
          System.out.println();
        }
        break;
      default:
        System.out.println("Wrong
                               choice");
    }
  }
}
```

**QUESTION 8.**

**Write a Java program to read two strings append them together and return the result. If the strings are different lengths, remove characters from the beginning of longer string and make them equal length.**

[Hint If two strings are: "Arihant", "Publications", then output would be: "Arihantcations"]

**Answer:**

```
import java.util.*;
public class Main
{
  public String Concat(String st1,
                       String st2)
  {
    if(st1.length() == st2.length())
                     return st1+st2;
    if(st1.length()>st2.length())
    {
      int diff = st1.length()
                     - st2.length();
```