INDIAN CERTIFICATE OF SECONDARY EDUCATION (ICSE) 2026 FORMAT

COMPUTER APPLICATIONS (86)

QUESTION BANK: CLASS X SYLLABUS

Maximum Marks: 100 **Time allowed: Two hours**

Instructions (as in the ICSE 2026 paper)

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. This time is to be spent in reading the question paper.
3. The time given at the head of this paper is the time allowed for writing the answers.
4. This paper is divided into two Sections.
5. Attempt all questions from Section A and any four questions from Section B.
6. The intended marks for questions or parts of questions are given in brackets [ ].

How this bank is organised

Section A, Question 1 (20 marks): choose the correct answer. Each item carries 1 mark. A paper selects 20 of the items in Part I.

Section A, Question 2 (20 marks): ten short-answer items of 2 marks each. A paper selects 10 of the items in Part II.

Section B (60 marks): answer any four of the questions in Part III, each of 15 marks. Programs may be written in BlueJ or any Java environment, with variable descriptions or mnemonic codes. Flowcharts and algorithms are not required.

Items are grouped by Class X syllabus topic so a paper can be assembled with the distribution the paper requires. The source paper for each item is shown in brackets. Source key: *T26 861, T25 861, T24 861, T23 861* (paper codes); *ICSE Specimen 2020+* (ICSE Specimen Paper 2020 onwards); *ICSE Specimen QP* (ICSE Specimen Question Paper, pp. 140–143); *ICSE 2023, 2024, 2025 Specimen*.

Coverage of the bank

No.	Class X syllabus area	Section A Q1 (MCQ)	Section A Q2 (2 marks)	Section B (15 marks)
1	Revision of Class IX syllabus: Java basics, operators, input, Math library, conditional and iterative constructs	5	8	4
2	Class as the basis of all computation: objects and classes	3	2	2
3	User-defined methods: overloading, call by value / reference, static and pure methods	4	3	2
4	Constructors: default, parameterized and overloaded constructors	4	2	1
5	Library classes: wrapper classes, parse and Character methods, autoboxing and unboxing	5	2	1
6	Encapsulation: access specifiers and scope of variables	3	3	2

No.	Class X syllabus area	Section A Q1 (MCQ)	Section A Q2 (2 marks)	Section B (15 marks)
7	Arrays: single and double dimensional arrays, sorting (selection and bubble) and searching (linear and binary)	4	2	7
8	String handling: String class methods and their use in programs	5	3	3
	Total items in bank	**33**	**25**	**22**

PART I — SECTION A, QUESTION 1: Multiple choice (1 mark each)

Choose the correct answers to the questions from the given options. (Do not copy the question, write the correct answers only.)

Topic 1: Revision of Class IX syllabus: Java basics, operators, input, Math library, conditional and iterative constructs

1.1 The full form of JVM is: *[T26 861]*

(a) Java Visible Machine
(b) Java Virtual Mode
(c) Java Virtual Machine
(d) Java Visible Mode

1.2 What is the output of System.out.println(Math.round(6.6) + Math.ceil(3.4)); *[ICSE 2024 Specimen]*

(a) 9.0
(b) 11.0
(c) 10.0
(d) 11

1.3 Select the infinite loop: *[T25 861]*

(a) for(int i=1; i<=10; i++)
(b) for(int i=2; i!=0; i-=3)
(c) for(int i=5; i<=5; i++)
(d) for(int i=1; i>=1; i--)

1.4 Which of the following is a valid integer constant? 1. 4 2. 4.0 3. 4.3f 4. "four" *[ICSE 2024 Specimen]*

(a) Only 1
(b) 1 and 3
(c) 2 and 4
(d) 1 and 2

1.5 Which of the following is an escape sequence character in Java? *[T24 861]*

(a) /n
(b) \t
(c) /t
(d) //n

Topic 2: Class as the basis of all computation: objects and classes

2.1 Consider the statement: Game cricket = new Game(); Which of the following is true? *[T25 861]*

(a) Game is an object of cricket class
(b) New keyword creates object Game
(c) Game is a class and cricket is an object
(d) Game and cricket are objects

2.2 A picture shows the word Polygon at the top, with three children below it: a triangle, a parallelogram and a pentagon. Choose the correct statement: *[T24 861]*

(a) Polygon is the object and the pictures are classes
(b) Both polygon and the pictures are classes
(c) Polygon is the class and the pictures are objects
(d) Both polygon and the pictures are objects

2.3 Consider the statements: Computer desktop = new Computer( ); Computer Mainframe = new Computer( ); Name the objects of the class given above: *[T26 861]*

(a) Desktop, Mainframe
(b) desktop, Mainframe
(c) Computer, Mainframe
(d) Computer, desktop

Topic 3: User-defined methods: overloading, call by value / reference, static and pure methods

3.1 A method which does not modify the value of variables is termed as: *[T23 861]*

(a) Impure method
(b) Pure method
(c) Primitive method
(d) User defined method

3.2 Which of the following pairs of methods will cause a compile-time error due to incorrect method overloading? *[T25 861]*

(a) void test(int a, int b) and void test(double a, double b)
(b) void test(int a, double b) and void test(double a, int b)
(c) void test(int a, double b) and void test(int a)
(d) void test(int a) and int test(int a)

3.3 The number of values that a method can return is: *[T23 861]*

(a) 1
(b) 2
(c) 3
(d) 4

3.4 Invoking a method by passing the objects of a class is termed as: *[T24 861]*

(a) Call by reference
(b) Call by value
(c) Call by method
(d) Call by constructor

Topic 4: Constructors: default, parameterized and overloaded constructors

4.1 A method with the same name as the class, with arguments and no return data type, is termed as: *[ICSE 2023 Specimen]*

(a) Parameterized constructor
(b) Default constructor
(c) Non-parameterized constructor
(d) Wrapper class method

4.2 Constructor overloading follows which principle of Object Oriented Programming? *[ICSE 2024 Specimen]*

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

4.3 In constructor overloading, all constructors should have the same name as the class but a different set of _____. *[T26 861]*

(a) Access specifiers
(b) Classes
(c) Return type
(d) Parameters

4.4 If the name of the class is 'Yellow', which of these can be a possible name for its constructor? *[T24 861]*

(a) yellow
(b) YELLOW
(c) Yell
(d) Yellow

Topic 5: Library classes: wrapper classes, parse and Character methods, autoboxing and unboxing

5.1 Which of the following converts "25" to 25.0? *[T25 861]*

(a) Double.Parsedouble("25")
(b) Double.parse("25")
(c) Double.parseDouble("25")
(d) Double.parseDouble(25)

5.2 When an object of a wrapper class is converted to its corresponding primitive data type, it is called: *[T23 861]*

(a) Boxing
(b) Explicit type conversion
(c) Unboxing
(d) Implicit type conversion

5.3 Predict the output of: System.out.print(Character.toLowerCase('1')); *[ICSE 2024 Specimen]*

(a) 0
(b) 1
(c) A
(d) true

5.4 The wrapper class for the data type char is: *[ICSE 2024 Specimen]*

(a) String
(b) Char
(c) Character
(d) Float

5.5 Character class methods are found in the package called: *[T25 861]*

(a) java.util
(b) java.lang
(c) java.awt
(d) java.io

Topic 6: Encapsulation: access specifiers and scope of variables

6.1 Wrapping up of data and methods together as one unit is termed as: *[ICSE 2023 Specimen]*

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

6.2 The access specifier that gives the least accessibility is: *[T24 861]*

(a) package
(b) public
(c) protected
(d) private

6.3 Which of the following is NOT an access specifier? *[T26 861]*

(a) private
(b) protected
(c) package
(d) public

Topic 7: Arrays: single and double dimensional arrays, sorting (selection and bubble) and searching (linear and binary)

7.1 Java statement to access the 5th element of an array X is: *[ICSE 2024 Specimen]*

(a) X[4]
(b) X[5]
(c) X[3]
(d) X[0]

7.2 The index (subscript) of the last element of an array ar[ ] is: *[T25 861]*

(a) ar.length( )
(b) ar[ ].length
(c) ar.length()-1
(d) ar.length-1

7.3 A two-dimensional array P[2][3] holds the peripherals shown: row 1 has Mouse, Keyboard, Printer; row 2 has Scanner, Barcode Scanner, Microphone. The index of Barcode Scanner is: *[T25 861]*

(a) P[1][1]
(b) P[0][1]
(c) P[1][2]
(d) P[0][0]

7.4 The number of bytes occupied by a character array of 10 elements is: *[ICSE 2024 Specimen]*

(a) 20 bytes
(b) 60 bytes
(c) 40 bytes
(d) 120 bytes

Topic 8: String handling: String class methods and their use in programs

8.1 What is the output of "Remarkable".substring(6)? *[ICSE 2024 Specimen]*

(a) mark
(b) emark
(c) marka
(d) able

8.2 The output of "COMPOSITION".substring(3, 6) is: *[T23 861]*

(a) POSI
(b) POS
(c) MPO
(d) MPOST

8.3 What is the output of "ANGER".compareTo("ANGEL")? *[T25 861]*

(a) 3
(b) -6
(c) 6
(d) 0

8.4 The output of "CONCENTRATION".indexOf('T') is: *[T24 861]*

(a) 9
(b) 7
(c) 6
(d) (-1)

8.5 Which of the following returns a String? *[ICSE 2025 Specimen]*

(a) length()
(b) charAt(int)
(c) replace(char, char)
(d) indexOf(String)

PART II — SECTION A, QUESTION 2: Short answers (2 marks each)

Attempt all questions from this section.

Topic 1: Revision of Class IX syllabus: Java basics, operators, input, Math library, conditional and iterative constructs

SA 1.1 Name any four tokens of Java. *[ICSE Specimen QP]* **[2]**

SA 1.2 Write an expression in Java for cos x + √(a² + b²). *[ICSE Specimen QP]* **[2]**

SA 1.3 What is the result produced by 2 – 10*3 + 100/11? Show the steps. *[ICSE Specimen QP]* **[2]**

SA 1.4 int x = 20, y = 10, z; Find the value of z in z = ++x * (y--) – y. Show the steps. *[ICSE Specimen QP]* **[2]**

SA 1.5 Give the difference between break and System.exit(0). *[ICSE Specimen 2020+]* **[2]**

SA 1.6 Give the difference between the = and == operators. *[ICSE Specimen 2020+]* **[2]**

SA 1.7 Predict the output of: (i) Math.pow(25, 0.5) + Math.ceil(4.2) (ii) Math.round(14.7) + Math.floor(7.9) *[ICSE Specimen 2020+]* **[2]**

SA 1.8 Write a Java expression to find the sum of the cube root of x and the absolute value of y. *[T26 861]* **[2]**

Topic 2: Class as the basis of all computation: objects and classes

SA 2.1 What is the purpose of using the 'new' keyword in a Java program? *[ICSE Specimen 2020+]* **[2]**

SA 2.2 Write the Java statement to create an object named sifra of the class Robot, which takes three double parameters. *[T25 861]* **[2]**

Topic 3: User-defined methods: overloading, call by value / reference, static and pure methods

SA 3.1 Give the difference between actual parameter and formal parameter. *[ICSE Specimen QP]* **[2]**

SA 3.2 Write the prototype of a function search which takes two arguments, a string and a character, and returns an integer value. *[ICSE Specimen 2020+]* **[2]**

SA 3.3 What is the difference between a static member function and a member function which is not static? *[ICSE Specimen QP]* **[2]**

Topic 4: Constructors: default, parameterized and overloaded constructors

SA 4.1 What is the difference between a constructor function and a member function of a class? *[ICSE Specimen QP]* **[2]**

SA 4.2 Explain the concept of constructor overloading with an example. *[ICSE Specimen QP]* **[2]**

Topic 5: Library classes: wrapper classes, parse and Character methods, autoboxing and unboxing

SA 5.1 Differentiate between boxing and unboxing. *[ICSE Specimen 2020+]* **[2]**

SA 5.2 Differentiate between isUpperCase(char) and toUpperCase(char). *[ICSE Specimen QP]* **[2]**

Topic 6: Encapsulation: access specifiers and scope of variables

SA 6.1 Define encapsulation. *[ICSE Specimen 2020+]* **[2]**

SA 6.2 Mention the types of access specifiers. *[ICSE Specimen 2020+]* **[2]**

SA 6.3 What is the difference between a local variable and an instance variable? *[ICSE Specimen QP]* **[2]**

Topic 7: Arrays: single and double dimensional arrays, sorting (selection and bubble) and searching (linear and binary)

SA 7.1 Differentiate between linear search and binary search. *[ICSE Specimen QP]* **[2]**

SA 7.2 State the number of bytes and bits occupied by a character array of 10 elements. *[ICSE Specimen 2020+]* **[2]**

Topic 8: String handling: String class methods and their use in programs

SA 8.1 Give the output of: "TRANSPARENT".toLowerCase(); and "TRANSPARENT".compareTo("TRANSITION") *[ICSE Specimen 2020+]* **[2]**

SA 8.2 Write a Java statement to find and display the position of the last space in a string str, and another statement to extract the second character of str. *[ICSE Specimen 2020+]* **[2]**

SA 8.3 String s = "application"; int p = s.indexOf('a'); System.out.println(p); System.out.println(p + s); Predict the output. *[ICSE Specimen QP]* **[2]**

PART III — SECTION B: Programs (15 marks each; answer any four)

The answers in this section should consist of programs in either BlueJ environment or any program environment with Java as the base. Each program should be written using variable descriptions or mnemonic codes so that the logic is clearly depicted. Flowcharts and algorithms are not required.

Topic 1: Revision of Class IX syllabus: Java basics, operators, input, Math library, conditional and iterative constructs

P 1.1 [15 marks] *[ICSE Specimen QP]*

Write a menu-driven program, using switch-case, that lets the user choose one of two series and prints its sum: (1) S = 1/4 + 1/8 + 1/12 + … up to n terms; (2) S = 1/1! − 2/2! + 3/3! − … up to n terms. (! denotes factorial.)

P 1.2 [15 marks] *[ICSE 2024 Specimen]*

Define a class to accept a 3-digit number and check whether it is a Duck number, i.e. a number containing the digit zero. If the number is not a 3-digit number, display "Invalid". (Example: 103 is a Duck number.)

P 1.3 [15 marks] *[T24 861]*

Define a class to accept a number and check whether it is an EvenPal number. A number is EvenPal if it is a palindrome (equal to its reverse) and the sum of its digits is even. (Example: 121 is a palindrome and its digit sum 1+2+1 = 4 is even.)

P 1.4 [15 marks] *[T26 861]*

Write a program to accept a number and check whether it is a Mark number. A number is Mark if the sum of the squares of its digits is even and the last digit of that sum equals the last digit of the number. (Example: n = 246; sum = 4+16+36 = 56; 56 is even and both end in 6.)

Topic 2: Class as the basis of all computation: objects and classes

P 2.1 [15 marks] *[T26 861]*

Define a class StepTracker with members: name (user's name), sw (steps walked), cb (calories burned) and km (distance in km). Methods: accept() to input the name and steps using Scanner; calculate() to find calories burned (steps × 0.04) and distance (steps / 1300); display() to show calories, distance and name. Write a main method that creates an object and calls the methods.

P 2.2 [15 marks] *[ICSE 2023 Specimen]*

Define a class employee with eno, ename, age and basic. Methods: accept() using Scanner; calculate() for net = basic + hra + da − pf, where hra = 18.5% of basic, da = 17.45% of basic and pf = 8.10% of basic, with an additional allowance of Rs.5000 if age is above 50; print() the details in tabular form; and a main method.

Topic 3: User-defined methods: overloading, call by value / reference, static and pure methods

P 3.1 [15 marks] *[T24 861]*

Define a class to overload the method perform as follows: (i) double perform(double r, double h) returns the curved surface area of a cone, $\pi \times r \times l$, where $l = \sqrt{(r^2 + h^2)}$; (ii) void perform(int r, int c) prints an r × c grid of column numbers using nested for loops; (iii) void perform(int m, int n, char ch) prints the quotient of m ÷ n if ch is 'Q', otherwise prints the remainder if ch is 'R'. Write a main method.

P 3.2 [15 marks] *[T26 861]*

Define a class to overload the method format as follows: (i) void format() prints the pattern 1 2 3 4 5 / 2 3 4 5 / 3 4 5 / 4 5 / 5 using nested loops only; (ii) int format(String s) returns the sum of the ASCII codes of every character of s (e.g. CAB gives 67 + 65 + 66 = 198); (iii) void format(int n) displays the sum of natural numbers up to n using n(n+1)/2.

Topic 4: Constructors: default, parameterized and overloaded constructors

P 4.1 [15 marks] *[ICSE Specimen QP]*

Define a class taximeter with data members taxino (taxi number), name (passenger's name) and km (kilometres travelled). A constructor taximeter() initialises taxino to 0, name to an empty string and km to 0. Methods: input() to store taxino, name and km; calculate() to find the bill using the rate per km for the slab in which km falls (≤ 1 km: Rs 25; > 1 to 6: Rs 10; > 6 to 12: Rs 15; > 12 to 18: Rs 20; > 18: Rs 25); display() to print Taxino, Name, Kilometres travelled and Bill amount in tabular form. Create an object in main() and call all the methods.

Topic 5: Library classes: wrapper classes, parse and Character methods, autoboxing and unboxing

P 5.1 [15 marks] *[T23 861]*

Define a class to accept a String and print the number of digits, alphabets and special characters in it. (Example: S = "KAPILDEV@83" gives digits = 2, alphabets = 8, special characters = 1.)

Topic 6: Encapsulation: access specifiers and scope of variables

P 6.1 [15 marks] *[ICSE 2025 Specimen]*

Define a class Bank with double variables p (principal), n (time in years), r (rate of interest) and a (amount). Methods: accept() to input p and n using Scanner; calculate() to set the rate by time (up to ½ year: 9%; more than ½ to 1 year: 10%; more than 1 to 3 years: 11%; more than 3 years: 12%) and the amount $a = p(1 + r/100)^n$; display() to print Principal, Time, Rate and Amount in tabular form; and a main method.

P 6.2 [15 marks] *[ICSE 2024 Specimen]*

Define a class Eshop with name (item purchased) and price. Methods: accept() using Scanner; calculate() to find the net amount after discount: price 1000–25000 → 5.0%; 25001–57000 → 7.5%; 57001–100000 → 10.0%; more than 100000 → 15.0%; display() to print the item name and net amount; and a main method.

Topic 7: Arrays: single and double dimensional arrays, sorting (selection and bubble) and searching (linear and binary)

P 7.1 [15 marks] *[ICSE 2024 Specimen]*

Define a class to accept 10 integers in an array and arrange them in ascending order using the selection sort technique. Display the sorted array.

P 7.2 [15 marks] *[T25 861]*

Define a class that stores the characters 'A','H','N','P','S','U','W','Y','Z','b','d' in an array. Accept a character from the user and search for it using the binary search technique. Print "Search Successful" if found, otherwise "Search is not Successful".

P 7.3 [15 marks] *[T26 861]*

Write a program to accept the designations of 100 employees in a single dimensional array. Accept a designation from the user and print the number of employees holding that designation.

P 7.4 [15 marks] *[ICSE 2025 Specimen]*

Define a class to accept values into a 4 × 4 integer array, and find and display the sum of each row.

P 7.5 [15 marks] *[T24 861]*

Define a class to accept values into a 4 × 4 integer array and check whether it is a DIAGONAL array, i.e. the sum of the left diagonal elements equals the sum of the right diagonal elements. Print an appropriate message.

P 7.6 [15 marks] *[T25 861]*

Define a class to accept values into a 4 × 4 integer array. Calculate and print the NORM of the array, which is the square root of the sum of squares of all its elements.

P 7.7 [15 marks] *[T26 861]*

Write a program to accept a two-dimensional integer array of order 4 × 5. Check whether it is a Sparse Matrix, i.e. the number of zero elements is greater than the number of non-zero elements. Print appropriate messages.

Topic 8: String handling: String class methods and their use in programs

P 8.1 [15 marks] *[T25 861]*

Define a class to accept a String and print whether it is a Super String. A String is Super if the number of uppercase letters equals the number of lowercase letters. Use Character and String methods only. (Example: "COmmITmeNt" has 5 uppercase and 5 lowercase letters.)

P 8.2 [15 marks] *[ICSE 2025 Specimen]*

Define a class to accept a String, convert it to uppercase, and create and display a new string by replacing each vowel with the immediately next character and each consonant with the previous character. Other characters remain the same. (Example: #IMAGINATION@2024 gives #JLBFJMBSJPM@2024.)

P 8.3 [15 marks] *[ICSE Specimen 2020+]*

Write a program to input a string, convert it to uppercase, and print the pairs of vowels occurring in it together with the number of such pairs. (Example: "BEAUTIFUL BEAUTIES" gives pairs EA, AU, EA, AU, IE and count 5.)

PART IV — Answer key for Section A, Question 1

Short answers (Question 2) and programs (Section B) are left for the student to attempt.

Topic 1: 1.1 – c 1.2 – b 1.3 – b 1.4 – a 1.5 – b

Topic 2: 2.1 – c 2.2 – c 2.3 – b

Topic 3: 3.1 – b 3.2 – d 3.3 – a 3.4 – a

Topic 4: 4.1 – a 4.2 – b 4.3 – d 4.4 – d

Topic 5: 5.1 – c 5.2 – c 5.3 – b 5.4 – c 5.5 – b

Topic 6: 6.1 – c 6.2 – d 6.3 – c

Topic 7: 7.1 – a 7.2 – d 7.3 – a 7.4 – a

Topic 8: 8.1 – d 8.2 – b 8.3 – c 8.4 – c 8.5 – c