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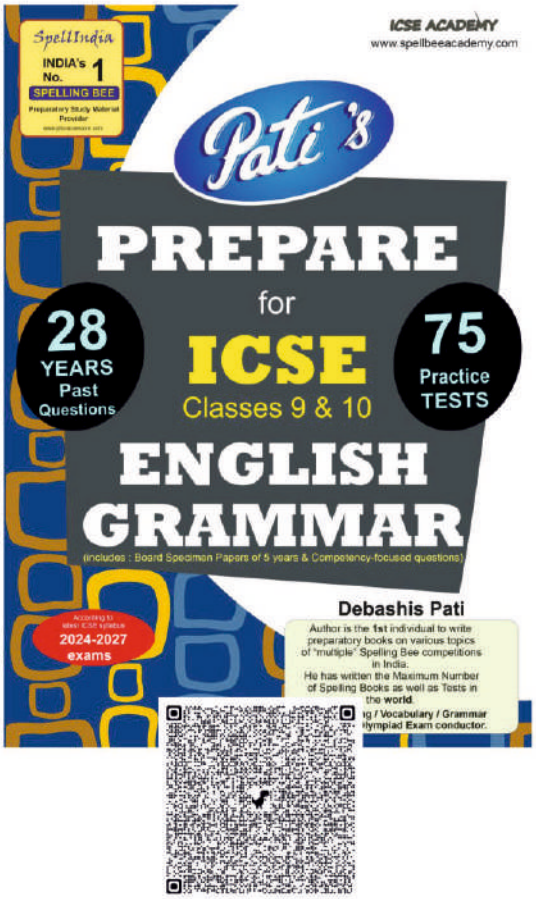

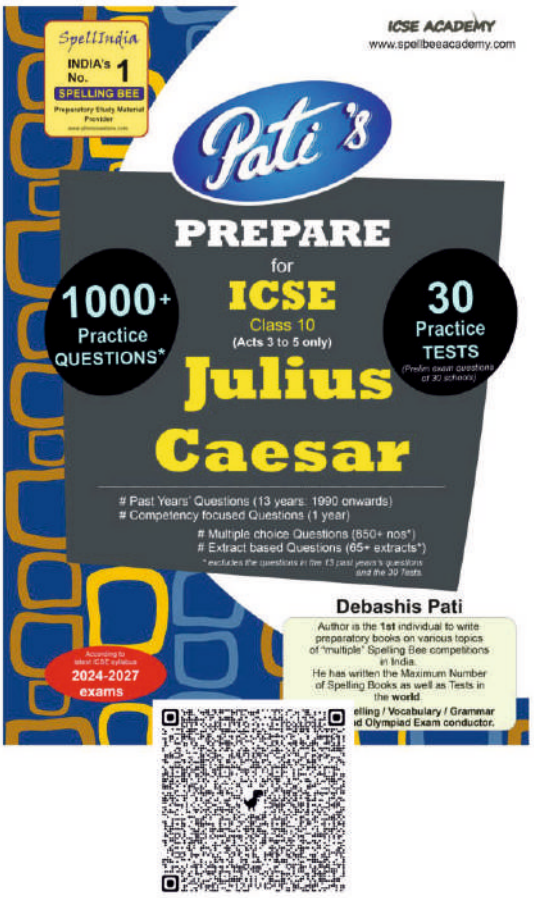

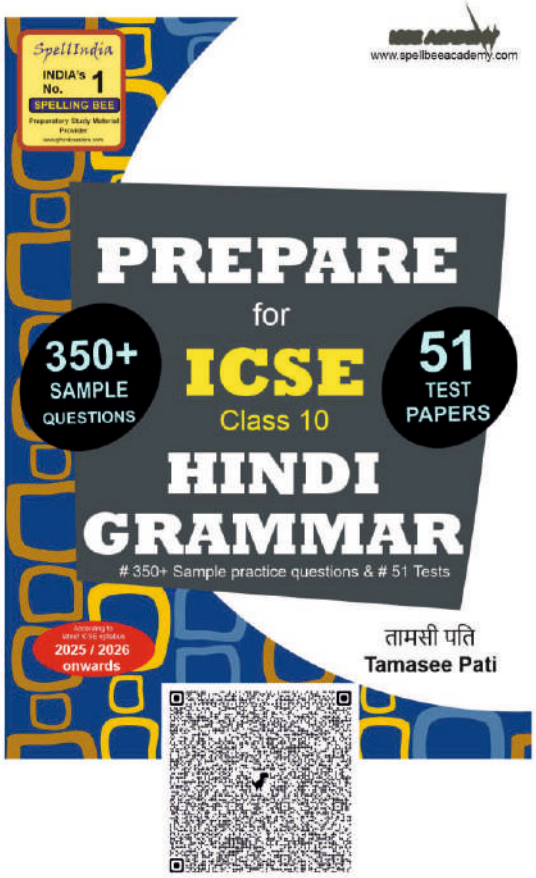

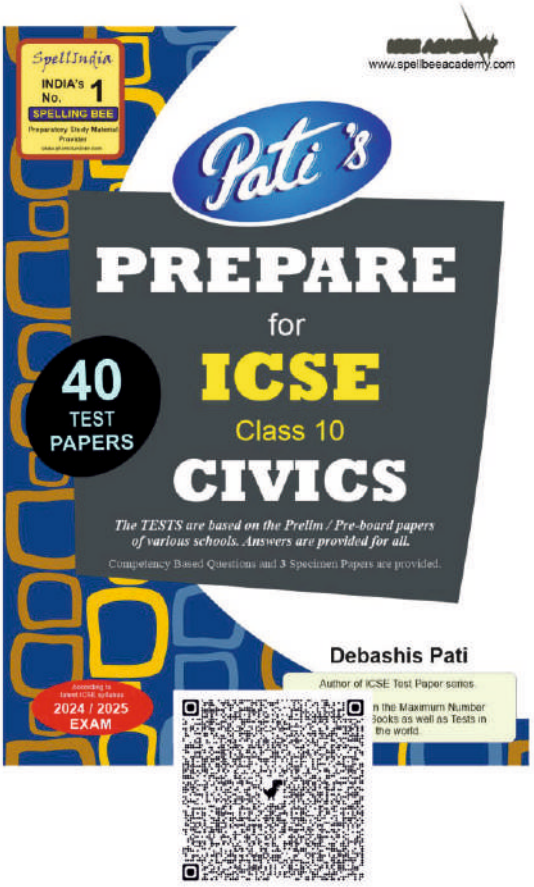

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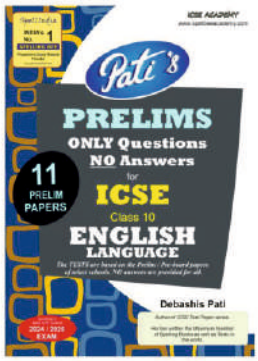

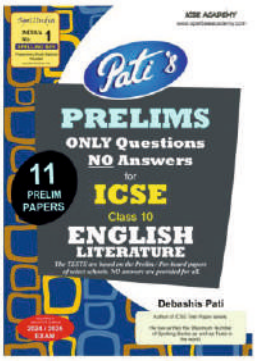

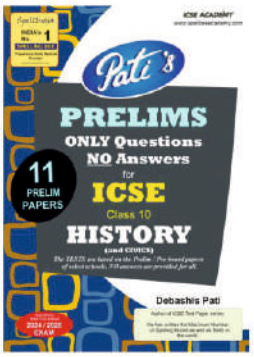

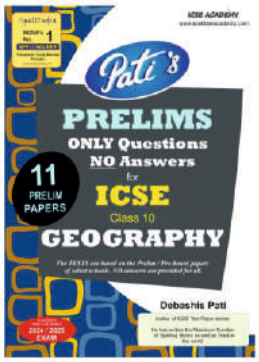

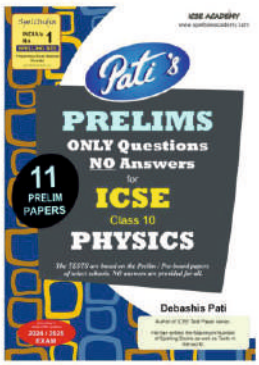

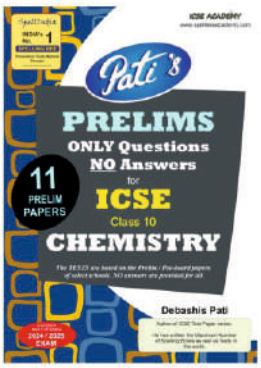

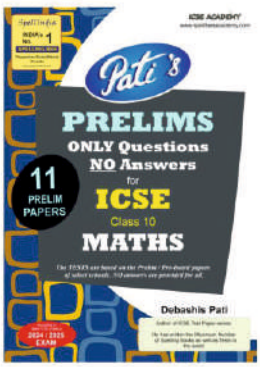

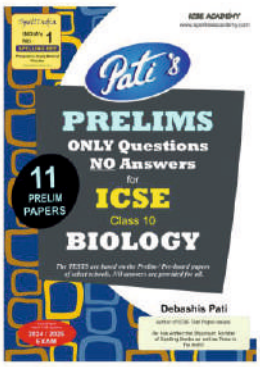

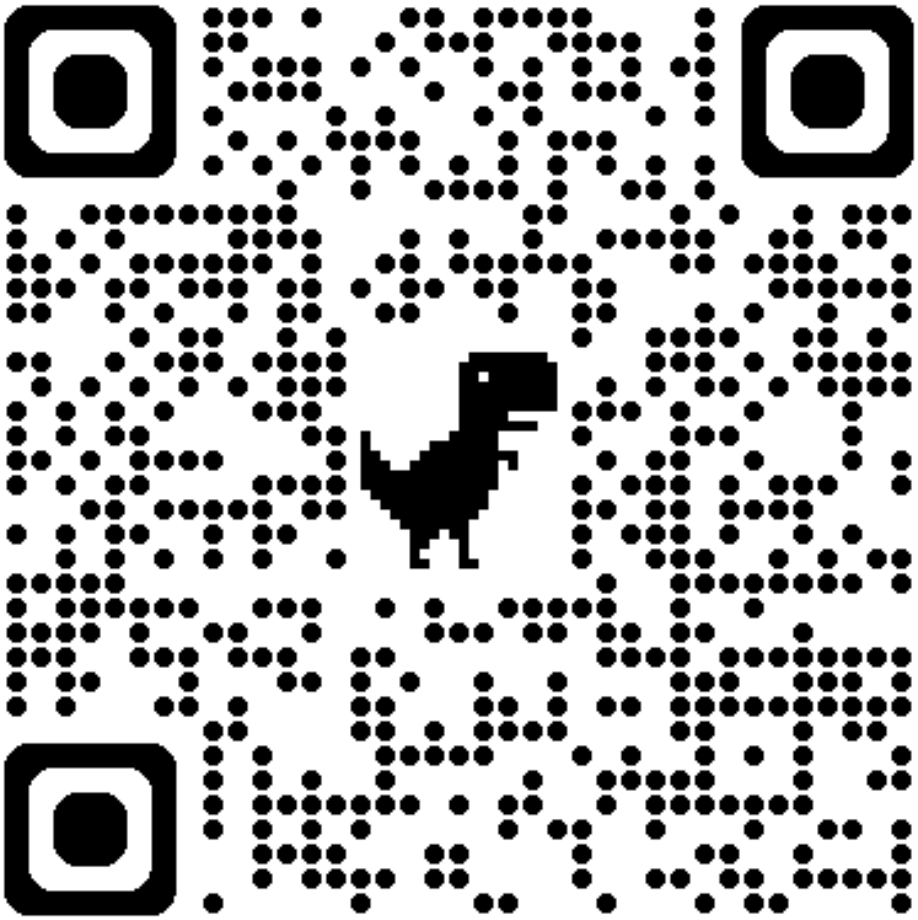

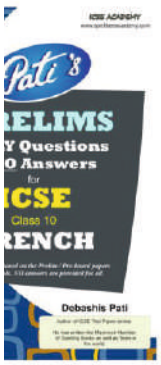

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2026

KARNATAKA ICSE SCHOOLS ASSOCIATION
ICSE STD .X PREPARATORY EXAMINATION 2026

Subject: Computer Applications

Maximum Marks 100 Time Allowed: 2 hours Date:19.01.2026

Maximum Marks: 100
Time allowed: 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
(Attempt **all** questions from this **Section**)

SECTION-A

Question 1

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

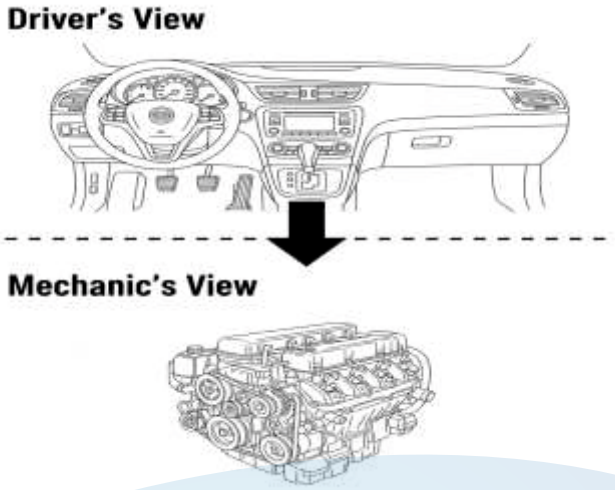
(i) What is stored in a wrapper object?
(a) Only strings
(b) Primitive value
(c) Class name
(d) No value

(ii) What is the output of the following code ?
"MARKER".substring(1, 4);
(a) ARK
(b) MAR
(c) RKE
(d) AR

(iii) **Assetion (A):** The default case in a Java switch statement is optional.
Reason (R): If no default case is provided, the program will give a compilation error.
(a) Both A and R are true, and R is the correct explanation of A
(b) Both A and R are true, but R is not the correct explanation of A
(c) A is true, R is false
(d) A is false, R is true

(iv) Which of the following statements about constructors is true?
(a) A constructor can have a return type
(b) A constructor is called automatically when an object is created
(c) A class can have only one constructor
(d) Constructors can be inherited

(v) Name the feature of java depicted in the below picture.



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

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

```
int cnt = 4;
while (cnt > 1)
{
   System.out.print(cnt);
   cnt++;
}
```

(a) 1 time
(b) 3 times
(c) 10 times
(d) Infinite times

(vii) What is the output of the following Java statement?

```
System.out.println("Server says: \"Error!\\tTry again.\"");
```

(a) Server says: "Error!\Try again."
(b) Server says: "Error! Try again."
(c) Server says: "Error!\tTry again."
(d) Server says: Error! Try again.

(viii) int a = 3, b = 4;
a += a++;
b += ++b;
System.out.println(a + " " + b);
(a) 7 9
(b) 6 9
(c) 6 8
(d) 7 8

(ix) double y = Math.floor(5.8) + Math.round(4.3);
What is the value of y?
(a) 9.0
(b) 10.0
(c) 8.0
(d) 11.0

(x) int marks[][] = { {12, 15, 18}, {10, 14, 16}, {20, 18, 12} };
What is the result of marks[0][1] + marks[2][2]?
(a) 30
(b) 33
(c) 27
(d) 32

(xi) What is the output of the following code?
String str = " OpenAI GPT ";
System.out.println(">" + str.trim() + "<");
(a) > OpenATGPT <
(b) >OpenAI GPT<
(c) > OpenAIGPT <
(d) > OpenAIGPT<

(xii) Which of the following is the wrapper class for the data type int?
(a) Integer
(b) Int
(c) Float
(d) Double

(xiii) int[] arr = {1, 2, 3};
System.out.println(arr[5]);
What will happen when this program code is executed?
(a) It will print 5
(b) It will print 3
(c) It will throw a runtime error
(d) It will compile-time error

(xiv) In a cinema hall, the staff checks each row and within each row, they check each seat to ensure it is clean.This situation represents which programming concept?
(a) Arrays
(b) Nested loop
(c) Switch-case
(d) Inheritance

(xv) How many memory cells are created?
long data[][] = new long[2][7];
(a) 9
(b) 14
(c) 7
(d) 2

(xvi) What is the output of the following code?
System.out.println((3 + 2 > 4) && (6 / 2 == 3));
(a) true
(b) false
(c) 5
(d) 6

(xvii) String A = "30", B = "40";
int x = Integer.parseInt(A);
int y = Integer.valueOf(B);
System.out.println("" + x + y);
(a) 3040
(b) 70
(c) "70"
(d) 30 40

(xviii) Which of the following is a primitive data type in Java?
i. int
ii. String
iii. char
iv. class
(a) i and iv
(b) i and ii
(c) only i
(d) i and iii

(xix) double d = 9.78;
int x = (int) d;
double y = x;
System.out.println(x + y);
What will be the output?
(a) 19.78
(b) 18.0
(c) 9.78
(d) 10.0

(xx) Which of the following will give a compilation error?

(a) int arr[] = new int[5];

(b) int arr[] = {1, 2, 3};

(c) int arr[] = new int[];

(d) int arr[];

Question 2

(i) String s1 = "butterfly"; **[2]**
String s2 = "caterpillar";
int idx = s2.indexOf('p');
System.out.println(s1.substring(3,7).concat(s2.substring(idx)));
System.out.println(s2.toUpperCase());

(ii) Convert the following code into an equivalent if–else statement: **[2]**
int num = 15;
int output = (num % 3 == 0) ? num * 3 : num - 2;

(iii) Find the maximum of the absolute values of A and B using the Math class. **[2]**

(iv) What is the value of t of the following code snippet ? **[2]**
int p = 4, q = 3, s = 2, t;
t = ++p * q-- - --s + p++;

(v) Write the output: **[2]**
int arr[] = {5, 10, 15, 20, 25};
int s = 0;
for(int i = 0; i < 3; i++)
s += arr[i];
System.out.println(s);

(vi) Analyze the following program segment and answer the questions that follow: **[2]**

```
String word = "RABBIT";
for(int i = 0; i < word.length(); i++)
{
   if(word.charAt(i) == 'B')
      continue;

   System.out.print(word.charAt(i));
}
```

i) Write the output of the above program segment.

(ii) How many times does the body of the loop get executed?

(vii) Write the equivalent Java expression for **[2]**

$$\frac{2\sqrt{m} - 3}{n^3}$$

(viii) **[2]**

```
class Employee
{
   int salary;
   Employee()
    {
      salary = 5000;
    }
   Employee(int s)
   {
      salary = s;
   }

    void increment(int amount)
   {
      salary += amount;
   }
    void display()
   {
      System.out.println(salary);
    }
   public static void main(String[] args)
   {
      Employee e1 = new Employee();
      e1.increment(1500);
      e1.display();

      Employee e2 = new Employee(7000);
      e2.increment(1000);
      e2.display();
   }
}
```

What is the output of the above program?

(ix) String state[] = {"KERALA", "ASSAM", "BIHAR", "ODISHA"}; **[2]**

```
System.out.println(state[1].length() < state[0].length());

String w = state[2];
w = w.replace("B", "");
w = w.replace("R", "");
System.out.print(w);
```

(x) **[2]**

```
int p;
for(p = 2; p < 10; p += 3)
   System.out.print(p);
System.out.println(p);
```

Convert the above code to while loop.

SECTION-B

(Answer ***any four*** questions from this section)

The answers in this section should consist of the programs either BlueJ environment or any program environment with java as the base.

Each program should be written using variable description/mnemonic codes so that the logic of program is clearly depicted.

Flowcharts and algorithms are not required.

Queston-3 **[15]**

Define a class *OnlineCourse* to compute the total fee for an online learning program.

The details of the class are given below:

Member Variables:

int studentID – to store the student's identification number
int hours – to store the total number of learning hours purchased
double fee – to store the total course fee

Member Methods:

void accept()
This method should input the values of studentID and hours using the Scanner class.
void calculate()
This method should compute the total fee based on the number of hours purchased using the following rate chart:

Hours Purchased	Rate per Hour (Rs)
First 10 hours	200
Next 20 hours	180
Above 30 hours	150

void display()
This method should display the studentID, the total hours purchased, and the calculated fee.

Write a ***main method*** to create an ***object*** of the class and ***invoke*** the methods of the class with respect to the object.

Question 4 **[15]**

Define a class to accept a string and check whether it is a *Twin Letter String* or not. A string is called a *Twin Letter String* if it contains at least one pair of identical consecutive letters (like *tt*, *ss*, *pp*, etc.).

The program should input a word, check for any such twin pair, and display whether the string is a Twin Letter String.

Sample Input:

Enter a word: Butter

Sample Output:

Word: Butter
Twin Letter Found: tt
Result: It is a Twin Letter String

Question 5 **[15]**

Write a Java program to accept elements of a 4 × 4 integer array.
a) Print the array in its original form.
b) Print the *mirror image* of the array, where each row is reversed.

Sample Input:

1 3 5 7
2 4 6 8
7 5 3 1
8 6 4 2

Sample Output:

Original Array:

1 3 5 7
2 4 6 8
7 5 3 1
8 6 4 2

Mirror Image:

7 5 3 1
8 6 4 2
1 3 5 7
2 4 6 8

Question 6 **[15]**

Define a ***class*** to overload the method ***perform()*** as follows:

i. void perform()

This method should display the following number pattern using nested loops:

1 2 3 4
2 3 4 5
3 4 5 6
4 5 6 7

ii. void perform(int n)

This method should generate and display the first *n* terms of the series:

7, 15, 31, 63, 127, …

Question 7 **[15]**

Write a Java program to check whether an entered number is a special number or not. A number is called special if the reverse of its square is divisible by the number itself. The program should accept a positive integer from the user, compute and print the square of the number, reverse the digits of the square and print the reversed number, and finally print "Special? Yes" if the reversed number is divisible by the original number, otherwise print "Special? No".

Sample Input:48

Sample Output:

Square: 2304

Reversed square: 4032
Special?Yes

Question 8 **[15]**

Define a class to accept 10 capital characters from the user into a single-dimensional array. Sort the array in ascending order using the Bubble Sort technique and print the array before sorting and after sorting.

Sample Input:

D A H B Z N P S W Y

Sample Output:

Array before sorting: D A H B Z N P S W Y
Array after sorting: A B D H N P S W Y Z

KARNATAKA ICSE SCHOOLS ASSOCIATION
ICSE STD .X PREPARATORY EXAMINATION 2026

Subject: Computer Applications

Maximum Marks 100 Time Allowed: 2 hours

ANSWER KEY

SECTION A
(Attempt **all** questions from this **Section**)

SECTION-A

Question 1

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

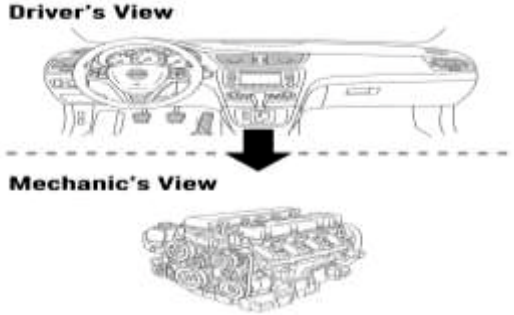
(i) What is stored in a wrapper object?
Only strings
(b) Primitive value
(c) Class name
(d) No value

(ii) What is the output of the following code?
"MARKER".substring(1, 4);
(a) ARK
(b) MAR
(c) RKE
(d) AR

(iii) **Assertion (A):** The default case in a Java switch statement is optional.
Reason (R): If no default case is provided, the program will give a compilation error.
(a) Both A and R are true, and R is the correct explanation of A
(b) Both A and R are true, but R is not the correct explanation of A
(c) A is true, R is false
(d) A is false, R is true

(iv) Which of the following statements about constructors is true?
(a) A constructor can have a return type
(b) A constructor is called automatically when an object is created
(c) A class can have only one constructor
(d) Constructors can be inherited

(v) Name the feature of java depicted in the below picture.



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

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

```
int cnt = 4;
while (cnt > 1)
{
   System.out.print(cnt);
   cnt++;
}
```

(a) 1 time
(b) 3 times
(c) 10 times
(d) Infinite times

(vii) What is the output of the following Java statement?

```
System.out.println("Server says: \"Error!\\tTry again.\"");
```

(a) Server says: "Error!\Try again."
(b) Server says: "Error! Try again."
(c) Server says: "Error!\tTry again."
(d) Server says: Error! Try again.

(viii)

```
int a = 3, b = 4;
a += a++;
b += ++b;
System.out.println(a + " " + b);
```

(a) 7 9
(b) 6 9
(c) 6 8
(d) 7 8

(ix) double y = Math.floor(5.8) + Math.round(4.3);
What is the value of y?
(a) 9.0
(b) 10.0
(c) 8.0
(d) 11.0

(x) int marks[][] = { {12, 15, 18}, {10, 14, 16}, {20, 18, 12} };
What is the result of marks[0][1] + marks[2][2]?
(a) 30
(b) 33
(c) 27
(d) 32

(xi) What is the output of the following code?
String str = " OpenAI GPT ";
System.out.println(">" + str.trim() + "<");
(a) > OpenATGPT <
(b) >OpenAIGPT<
(c) > OpenAIGPT <
(d) > OpenAIGPT<

(xii) Which of the following is the wrapper class for the data type int?
(a) Integer
(b) Int
(c) Float
(d) Double

(xiii) int[] arr = {1, 2, 3};
System.out.println(arr[5]);
What will happen when this program code is executed?
(a) It will print 5
(b) It will print 3
(c) It will throw a runtime error
(d) It will compile-time error

(xiv) In a cinema hall, the staff checks each row and within each row, they check each seat to ensure it is clean.This situation represents which programming concept?
(a) Arrays
(b) Nested loop
(c) Switch-case
(d) Inheritance

(xv) How many memory cells are created?
long data[][] = new long[2][7];
(a) 9
(b) 14
(c) 7
(d) 2

(xvi) What is the output of the following code?

System.out.println((3 + 2 > 4) && (6 / 2 == 3));

(a) true

(b) false

(c) 5

(d) 6

(xvii) String A = "30", B = "40";

int x = Integer.parseInt(A);

int y = Integer.valueOf(B);

System.out.println("" + x + y);

(a) 3040

(b) 70

(c) "70"

(d) 30 40

(xviii) Which of the following is a primitive data type in Java?

i. int

ii. String

iii. char

iv. class

(a) i and iv

(b) i and ii

(c) only i

(d) i and iii

(xix) double d = 9.78;

int x = (int) d;

double y = x;

System.out.println(x + y);

What will be the output?

a) 19.78

b) 18.0

c) 9.78

d) 10.0

(xx) Which of the following will give a compilation error?

(a) int arr[] = new int[5];

(b) int arr[] = {1, 2, 3};

(c) int arr[] = new int[];

(d) int arr[];

Question 2

(i) String s1 = "butterfly"; **[2]**
String s2 = "caterpillar";
int idx = s2.indexOf('p');
System.out.println(s1.substring(3,7).concat(s2.substring(idx)));
System.out.println(s2.toUpperCase());
Ans: terfpillar
CATERPILLAR

(ii). Convert the following code into an equivalent if–else statement: **[2]**
int num = 15;
int output = (num % 3 == 0) ? num * 3 : num - 2;
Ans:

```
int num= 15;int output;
if(num % 3 == 0)
{
   output = num *3;
}else
{
   output = num- 2;
}
```

(iii). Find the maximum of the absolute values of A and B using the Math class. **[2]**
Ans:
Math.max(Math.abs(A), Math.abs(B))

(iv). What is the value of t of the following code snippet ? **[2]**
int p = 4, q = 3, s = 2, t;
t = ++p * q-- - --s + p++;
Ans: t = 19

(v). Write the output: **[2]**
int arr[] = {5, 10, 15, 20, 25};
int s = 0;
for(int i = 0; i < 3; i++)
   s += arr[i];
System.out.println(s);
Ans: 30

(vi). Analyze the following program segment and answer the questions that follow: **[2]**

```
String word = "RABBIT";
for(int i = 0; i < word.length(); i++)
{
   if(word.charAt(i) == 'B')
      continue;
   System.out.print(word.charAt(i));
}
```

i) Write the output of the above program segment.

(ii) How many times does the body of the loop get executed?

Ans:

RAIT

6 times

(vii). Write the equivalent Java expression for **[2]**

$$\frac{2\sqrt{m} - 3}{n^3}$$

Ans:

(2 * Math.sqrt(m)- 3) / Math.pow(n, 3)

(viii). **[2]**

```
class Employee {
   int salary;

   // Default constructor
   Employee() {
      salary = 5000;
   }

   // Parameterized constructor
   Employee(int s) {
      salary = s;
   }

   // Method to increase salary
   void increment(int amount) {
      salary += amount;
   }
```

```
    // Method to display salary
    void display() {
        System.out.println(salary);
    }
    public static void main(String[] args) {
        Employee e1 = new Employee();
        e1.increment(1500);
        e1.display();

        Employee e2 = new Employee(7000);
        e2.increment(1000);
        e2.display();
    }
}
```

What is the output of the above program?

Ans:

6500

8000

(ix). String state[] = {"KERALA", "ASSAM", "BIHAR", "ODISHA"}; **[2]**

```
System.out.println(state[1].length() < state[0].length());

String w = state[2];
w = w.replace("B", "");
w = w.replace("R", "");
System.out.print(w);
```

Ans:

true

IHA

(x). int p; **[2]**

```
for(p = 2; p < 10; p += 3)
    System.out.print(p);
System.out.println(p);
```

Convert the above code to while loop.

Ans:int p = 2;

while(p < 10)

```
{
   System.out.print(p);
   p += 3;
}
System.out.println(p);
```

SECTION-B

(Answer ***any four*** questions from this section)

The answers in this section should consist of the programs in either BlueJ environment or any prc environment with java as the base.

Each program shdd be written using variable description/mnemonic codes so that the logic of th program is clearly depicted.

Flowcharts and algorithms are not required.

Question 3 **[15]**

Define a class *OnlineCourse* to compute the total fee for an online learning program.

The details of the class are given below:

Member Variables:

int studentID – to store the student's identification number
int hours – to store the total number of learning hours purchased
double fee – to store the total course fee

Member Methods:

void accept()
This method should input the values of studentID and hours using the Scanner class.
void calculate()
This method should compute the total fee based on the number of hours purchased using the following rate chart:

Hours Purchased	Rate per Hour (Rs)
First 10 hours	200
Next 20 hours	180
Above 30 hours	150

void display()
This method should display the studentID, the total hours purchased, and the calculated fee.

Write a ***main method*** to create an ***object*** of the class and ***invoke*** the methods of the class with respect to the object.

Ans:

```
import java.util.Scanner;
 public class OnlineCourse {
```

```
    // Instance Variables (Data Members)
     int studentID;
    int hours;
   double fee;
    /**
     * Accepts input values for studentID and hours from the user using the
Scanner class.
     */
    public void accept() {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter Student ID: ");
       studentID = scanner.nextInt();
        System.out.print("Enter Total Learning Hours Purchased: ");
        hours = scanner.nextInt();
        //
    }

    /**
     * Computes the total course fee based on the number of hours purcl
     */
    public void calculate() {
        if (hours <= 10) {
            fee = hours * 200;
        } else if (hours <= 30) {
            fee = (10 * 200) + ((hours - 10) * 180);
        } else {
            fee = (10 * 200) + (20 * 180) + ((hours - 30) * 150);
        }
    }

    /**
     * Displays the studentID, the total hours purchased, and the calculated fee.
     */
    public void display() {
        System.out.println("\n--- Course Fee Details ---");
        System.out.println("Student ID: " + studentID);
        System.out.println("Total Hours Purchased: " + hours);
        System.out.println("Total Fee: Rs " + fee);
    }

    //  A main method to demonstrate the class functionality.
    public static void main(String[] args) {
        OnlineCourse course = new OnlineCourse();
        course.accept();
```

```
        course.calculate();
        course.display();
    }
}
```

Class name – 1 mark
Data members – 1 mark
Input- 1 mark
Method names – 3 marks(1 mark each)
If conditions together – 2 marks(1 mark each)
Calculation of fee- 2 marks(I mark each)
Display fee and details- I mark
Creating an object -1 mark
Calling of functions- 1 mark
Variable Description- 2 Marks

Question 4 **[15]**

Define a class to accept a string and check whether it is a *Twin Letter String* or not.A string is called a *Twin Letter String* if it contains at least one pair of identical consecutive letters (like *tt*, *ss*, *pp*, etc.).
The program should input a word, check for any such twin pair, and display whether the string is a Twin Letter String.
Sample Input:
Enter a word: Butter
Sample Output:
Word: Butter
Twin Letter Found: tt
Result: It is a Twin Letter String

Ans:

```
import java.util.*;

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

        System.out.print("Enter a word: ");
        String word = sc.nextLine();
```

```
        boolean isTwin = false;

        // checking for twin letters
        for (int i = 0; i < word.length()-1; i++)
        {
           if (word.charAt(i) == word.charAt(i + 1))
           {
              isTwin = true;
              break;
           }
        }

        // output
        System.out.println("Word: " + word);
        if (isTwin)

           System.out.println("Result: It is a Twin Letter String");
        else
           System.out.println("Result: It is NOT a Twin Letter
String");
     }
}
```

Variable Description – 2 marks
Accepting a string -1 mark
Initializing a boolean variable – 1 mark
Length of a String-1 mark
For loop -1 mark
If condition to check-3 marks
Boolean variable true and break statement= 2 marks
Printing the word- 1 mark
If condition to check Twin Letter-1 mark
Printing twin Letter or not with else -3 marks

Question 5 **[15]**

Write a Java program to accept elements of a 4 × 4 integer array.

a) Print the array in its original form.

b) Print the *mirror image* of the array, where each row is reversed.

Sample Input:

1 3 5 7

2 4 6 8

7 5 3 1

8 6 4 2

Sample Output:

Original Array:

1 3 5 7

2 4 6 8

7 5 3 1

8 6 4 2

Mirror Image:

7 5 3 1

8 6 4 2

1 3 5 7

2 4 6 8

Ans:

```
import java.util.Scanner;

public class MirrorImage {

   // Single method to accept input, print original and mirror image
   void mirrorImage() {
      Scanner sc = new Scanner(System.in);
      int arr[][] = new int[4][4];

      // Accept input
      System.out.println("Enter 16 elements of 4x4 array:");
      for (int i = 0; i < 4; i++) {
         for (int j = 0; j < 4; j++) {
            arr[i][j] = sc.nextInt();
         }
      }
```

```
        // Print Original Array
        System.out.println("Original Array:");
        for (int i = 0; i < 4; i++) {
            for (int j = 0; j < 4; j++) {
                System.out.print(arr[i][j] + " ");
            }
            System.out.println();
        }
        // Print Mirror Image (reverse each row)
        System.out.println("Mirror Image:");
        for (int i = 0; i < 4; i++) {
            for (int j = 3; j >= 0; j--) {
                System.out.print(arr[i][j] + " ");
            }
            System.out.println();
        }
    }
}
```

Variable description – 2 marks
Initialising the array – 2marks
Accepting elements in an array – 2marks
Printing the original array – 2 mark
Outer for loop – 1 mark
Inner for loop – 2 marks
Printing the mirror image – 2 marks

Question 6 **[15]**

Define a ***class*** to overload the method ***perform()*** as follows:

i.void perform()

This method should display the following number pattern using nested loops:

1 2 3 4
2 3 4 5
3 4 5 6
4 5 6 7

ii.void perform(int n)

This method should generate and display the first *n* terms of the series:

7, 15, 31, 63, 127, …

Ans:

```
import java.util.Scanner;
public class PerformOverload {
// 1. Method to display the number pattern
 void perform() {

      for (int i = 1; i <= 4; i++) {
         for (int j = 0; j < 4; j++) {
            System.out.print((i + j) + " ");
         }
         System.out.println();
      }
   }

   // 2. Overloaded method to print the series
   void perform(int n) {
          int term = 7;
      System.out.print(term);

      for (int i = 2; i <= n; i++) {
         term = term * 2 + 1;
         System.out.print(", " + term);
      }
   }
}
```

Variable description – 2 marks
Declaring the methods 2 marks(Should include the parameters properly, if not no marks allotted)
First method For loops – 2 marks(2 marks each)
Print statements- 2 marks (1 mark for each statement)
Second method Accepting a and n from the user – 1 mark
Initializing term=7- 1 mark
Printing term-1 mark
For loop- 1 mark
Finding the term=term*2+1 -2 marks
Displaying the term – 1 mark

Question 7 **[15]**

Write a Java program to check whether an entered number is a special number or not. A number is called special if the reverse of its square is divisible by the number itself. The program should accept a positive integer from the user, compute and print the square of the number, reverse the digits of the square and print the reversed number, and finally print "Special? Yes" if the reversed number is divisible by the original number, otherwise print "Special? No".
Sample Input:48
Sample Output:
Square: 2304
Reversed square: 4032
Special?Yes

Ans:

```
import java.util.Scanner;

public class ReversibleSquare {

   // Single method to handle everything
   void reversibleSquareSpecial() {
      Scanner sc = new Scanner(System.in);
      System.out.print("Enter a positive integer: ");
      int num = sc.nextInt();

      //  Square the number
      int square = num * num;

      //  Reverse the square
      int reversed = 0, temp = square;
      while (temp > 0) {
         reversed = reversed * 10 + (temp % 10);
         temp /= 10;
      }

      //  Print results
      System.out.println("Square: " + square);
      System.out.println("Reversed square: " + reversed);

      // Step 4 Check if special using if-else
      if (reversed % num == 0) {
         System.out.println("Special? Yes");
```

```
        } else {
            System.out.println("Special? No");
        }
    }
}
```

Variable description 2 marks
Accepting a number – 1 mark
Square the number - 1 mark
Initialise the variables-2 marks
Loop condition for reverse of a number- 1mark
Reverse logic of the number – 2 marks
Updation -1 mark
Printing square and reverse – 2 marks
Condition to check Special- 1 mark
Printing Special?Yes and Special? No with else - 3 marks

Question 8 **[15]**

Define a class to accept 10 capital characters from the user into a single-dimensional array. Sort the array in ascending order using the Bubble Sort technique and print the array before sorting and after sorting.

Sample Input:
D A H B Z N P S W Y
Sample Output:
Array before sorting: D A H B Z N P S W Y
Array after sorting: A B D H N P S W Y Z

Ans:

```
import java.util.Scanner;
public class CharacterBubbleSort {
    void sortCharacters() {
        Scanner sc = new Scanner(System.in);
        // Accept characters into array
        char[] arr = new char[10];
        System.out.println("Enter 10 characters:");
        for (int i = 0; i < arr.length; i++) {
            arr[i] = sc.next().charAt(0);
        }
        // Print array before sorting
        System.out.print("Array before sorting: ");
        for (int i = 0; i < arr.length; i++) {  // simple for loop
            System.out.print(arr[i] + " ");
```

```
        }
        System.out.println();
        // Bubble Sort
        for (int i = 0; i < arr.length - 1; i++) {
            for (int j = 0; j < arr.length - i - 1; j++) {
                if (arr[j] > arr[j + 1]) {
                    char temp = arr[j];
                    arr[j] = arr[j + 1];
                    arr[j + 1] = temp;
                }
            }
        }
        // Print array after sorting
        System.out.print("Array after sorting: ");
        for (int i = 0; i < arr.length; i++) {  // simple for loop
            System.out.print(arr[i] + " ");
        }
        System.out.println();
    }
}
```

Variable description – 2 marks
Initializing the array – 1 mark
Accepting character elements in an array – 2 marks
Printing original Array-1 mark
For loop -3 marks(Outer loop -1 mark ,inner loop 2 marks)
If condition – 1 mark
Swapping the variables – 3 marks
Displaying the sorted array – 2 marks(I mark for the for loop and 1 mark for the print statement)

ICSE ACADEMY

2

This solved paper

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ICSE Schools Association

2025

KARNATAKA ICSE SCHOOLS ASSOCIATION

ICSE STD. X Preparatory Examination 2025

Subject– Computer Applications

Duration: 2 hours **Maximum Marks : 100** **Date: 16.01.2025**

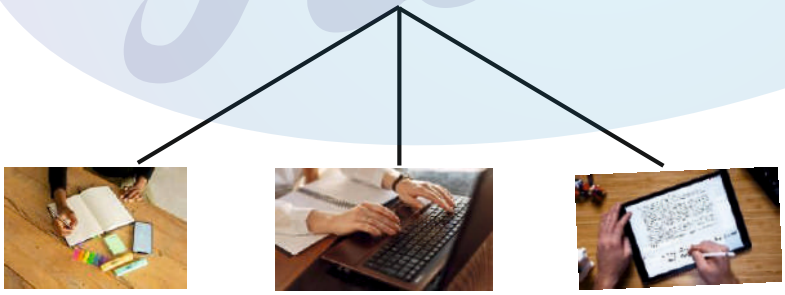
General Instructions

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[].
Instruction for the Supervising Examiner
Kindly read aloud the Instructions given above to all the candidates present in the Examination Hall.

Section A
(Attempt allquestions from this section)

Question 1
Choose the correct answers to the questions from the given options. [20]

i.



Name the feature of Java that is depicted in the given picture.
a) Data Abstraction
b) Inheritance
c) Encapsulation
d) Polymorphism

ii. What enables Java to be a "Write Once, Run Anywhere" language?
a) Compiler
b) Java Virtual Machine (JVM)
c) Interpreter
d) Operating System

iii. The protected access specifier allows access:
a) Only within the same class

b) Within the same package and by subclasses
c) From anywhere
d) Only by subclasses in the same package

iv. Which of the following has the highest precedence?
a) Post-increment (i++)
b) Pre-increment (++i)
c) Multiplication (*)
d) Addition (+)

v. Which of the following correctly lists the sizes of primitive data types in Java?
a) byte = 1 byte, short = 2 bytes, int = 4 bytes, long = 8 bytes
b) byte = 2 bytes, short = 4 bytes, int = 8 bytes, long = 16 bytes
c) byte = 1 byte, short = 1 byte, int = 2 bytes, long = 4 bytes
d) byte = 4 bytes, short = 4 bytes, int = 8 bytes, long = 8 bytes

vi. The output of the statement System.out.println(Math.pow(Math.max(Math.floor(5.7),4),2)); is
a) 16.0
b) 36.0
c) 16
d) 25.0

vii. What is the use of the trim() method in Java?
a) Removes all spaces in a string
b) Removes spaces at the beginning and end of a string
c) Replaces spaces with underscores
d) Removes a specified character

viii. What happens if two case values are identical in a switch statement?
a) Both cases will execute
b) Only the first case will execute
c) Compilation error occurs
d) Default case is executed

ix. Assertion(A): Constructors are used to initialize objects when they are created in Java.
Reasoning(R): A constructor initializes the instance variables of an object when it is created.
a) Both Assertion and Reasoning are true, and Reasoning is the correct explanation of Assertion.
b) Both Assertion and Reasoning are true, but Reasoning is not the correct explanation of Assertion.
c) Assertion is false, but Reasoning is true.
d) Assertion is true, but Reasoning is false.

x. Which of the following happens automatically in Java during autoboxing?
a) A primitive type is automatically converted to a corresponding wrapper class object.
b) A wrapper class object is automatically converted to a primitive type.
c) Both autoboxing and unboxing occur at the same time.
d) Primitive types are converted to arrays of objects.

xi. Which code snippet will correctly calculate the sum of all elements in a two-dimensional array arr?

a) int sum = 0;
for (int i = 0; i < arr.length; i++) {
sum += arr[i];
}

b) int sum = 0;
for (int i = 0; i < arr.length; i++) {
for (int j = 0; j < arr[i].length; j++) {
sum += arr[i][j];
}}

c) int sum = 0;
for (int i = 0; i < arr[0].length; i++) {
sum += arr[i];
}

d) int sum = 0;
for (int i = 0; i < arr.length; i++) {
for (int j = 0; j < arr[i]; j++) {
sum += arr[i][j];
}
}

xii. Assertion: In Java, int and Integer are the same.
Reasoning: int is a primitive data type, while Integer is a wrapper class that encapsulates the int type as an object.
a) Both Assertion and Reasoning are true, and Reasoning is the correct explanation of Assertion.
b) Both Assertion and Reasoning are true, but Reasoning is not the correct explanation of Assertion.
c) Assertion is false, but Reasoning is true.
d) Assertion is true, but Reasoning is false.

xiii. What will be the value of z after the given statements ae executed?
int x=7,y=3,z=10;
z+=++x%10 + y++*10 + ++z/10;
a) 12
b) 45
c) 49
d) 52

xiv. Consider the following program segment where the statements are jumbled, choose the correct order of statements to find the sum of the odd factors of a number.

void sum(int n)
{
sum+=i; → 1
for(int i=1;i<=n;i++) → 2
{
int sum=0; → 3

```
    }
    if(n%i==0 && i%2!=0) ——→ 4
}
System.out.println("The sum of the odd fators="+sum); ——→ 5
```

a) 4,1,3,2,5
b) 4,2,3,1,2
c) 3,2,1,3,5
d) 3,2,4,1,5

xv. The output of the given statements is

```
String str="Fantastic";
System.out.println(str.substring(str.length()%4,5));
```

a) Fant
b) anta
c) ant
d) Fan

xvi. Which keyword is used to define a constant value in Java?
a) final
b) const
c) static
d) constant

xvii. Which of the following is NOT allowed in Java?
a) Overloading a method.
b) Overloading a constructor.
c) Defining multiple constructors in a class.
d) Defining a constructor with a return type.

xviii. The keyword used to access members of another package.
a) import
b) static
c) class
d) switch

xix. A method in which the method parameter can get modified is called as _____
a) Pure method
b) Virtual method
c) Impure method
d)Actual parameters

xx. What is the output of the following code?

```
int n[]={5,4,3,2,1};
int b=3;
b=n[n[b]/2];
System.out.println(b);
```

a) 2
b) 4
c) 1
d) 5

Question 2

i. Evaluate the given expression.

```
r+=p++ + --q + --p/++r
```

where p=12,q=10 and r=3. [2]

ii. Write the java expression for $\sqrt[3]{\frac{(a+b)^4}{a^2}}$ [2]

iii. A student when executes the following code, gets the output as 0 1, whereas, he desires to get the output as 0 1 4 9.

Identify the statement which has an error, correct the same to get the desired output

```
void main()
  {
    int sum=0;
    for(int i=1;i<=5;i++)
    {
    if(i%2==0)
    break;
    System.out.print(sum+"\t");
    sum=sum+i;
    }
   System.out.print(sum);

  }
```

[2]

iv. Write the output of the following string methods.

a. String m="Administration", n="Department";
System.out.println(m.substring(2,6)+n.substring(3,6));

b. String p="Microsoft", q="Micro";
System.out.println (q. compareTo (p)); [2]

v. How many times will the loop be executed? Write the output of the code. [2]

```
int a=0,b=1;
for(a=0;a<=20;a+=5,b++)
System.out.println(a+b);
System.out.println(b);
```

vi. Rewrite the following code using ternary operator. [2]

```
if (age >= 18)
eligibility = "Adult";
else
eligibility = "Minor";
```

vii. A student is trying to convert the given string to a numerical value, but gets an error in the following code. Name the error (syntax/logical/runtime). Give the reason for the error.

```
String s="356.A8";
double p=Double.parseDouble(s);
char ch=s.charAt(4);
System.out.println(p+ch);
```

[2]

viii. Consider the following program segment and answer the following questions. [2]

```
int a[][]={{1,2,3},{4,5,6},{7,8,9}};
```

a. What is position of 5?

b. What is the result of the statement a[0][0]+a[1][2]+a[2][1]

ix. Predict the output of the following. [2]

```
char ch="Deer".charAt(2);
int a=Character.toUpperCase(ch)+20;
System.out.println(ch);
System.out.println(a);
```

x. Consider the following program segment and answer the questions given below.

```
class example
{
 int a,b;
 static int x,y;
 void perform()
 {  a=10;b=2;
    int z=a;
    a=b;
    b=z;
    display();
 }
 void display()
 {
    System.out.println("Value of a="+a);
    System.out.println("Value of b="+b);
 }
}
```

a. What will be the values of a and b?

b. Name the class variables. [2]

SECTION B

(Answer any four questions from this Section.)

The answers in this section should consist of the programs in either BlueJ environment or any program environment with java as the base.

Each program should be written using variable description/mnemonic codes so that the logic of the program is clearly depicted.

Flowcharts and algorithms are not required.

Buffered Reader / Data Input Stream should not be used in the programs.

Question 3

Fashion Courier Service charges for the parcels of its customers as per the following specifications.

Class name: FashionCourier

Member variables:

String name: to store the name of the customer

int wt: to store the weight of the parcel in kg

double charge: to store the charge of the parcel

Member methods:

FashionCourier() : default constructor to initialise the member variables with their respective default initial values.

void accept(): to accept the name of the customer and weight of the parcel.

void compute(): to calculate the charge as per the following criteria.

Weight	Charge
Less than 5 kgs	Rs. 50 per kg
Above 5 kgs and less than 10 kgs	Rs. 150 per kg
Above 10 kgs and less than 20 kgs	Rs. 200 per kg
Above 20 kgs	Rs. 350 per kg

A surcharge of 5% is charged on the bill as well.

void display(): to display the name of the customer, weight of the parcel and total bill inclusive of surcharge in a tabular format in the following format :

Name	Weight	Bill amount
*****	*****	********

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

Question 4

Write a program to accept 15 integers in a single dimensional array and perform selection sort on the integers and print them in ascending order. [15]

Question 5

Write a Java Program to input a string and check it is a palindrome string, a special word or neither.

A string is called palindrome when the string is read from left to right or from right to left it is the same string. A string is called special word if it starts and ends with the same character.

Sample Input: madam Sample Output: Palindrome string

Sample Input: comic Sample Output: Special word

Sample Input: cream Sample Output: It is neither a palindrome nor a special [15]

Question 6

Write a program to accept a number and calculate the norm of the number.
Norm of a number is the square root of the sum of the squares of all digits of the number.
Example: The norm of 68 is 10
6×6 + 8x8 = 36+64= 100
Square root of 100 is 10. [15]

Question 7

Write a program to accept the integer elements of a 2D array of order mxm. Print the elements in matrix format. Also print the sum of elements of each column.
Example:
Input: Order of the matrix m=3
a[][]={{1,2,3},{3,4,5},{6,7,8}}

Output:

1	2	3
3	4	5
6	7	8

Sum of 1st column=10
Sum of 2nd column=13
Sum of 3rd column=16 [15]

Question 8

Define a class to overload the method result() as follows:
a. result( )- Print the following series .
A,C,E,G……. n terms.
b. result(int a, int n)- To print the sum of the given series :
$\frac{a}{1}+\frac{a}{2}+\frac{a}{3}+\cdots \ldots \ldots n\ terms$
c. result(char ch,char ch)- To print the following pattern using the character $ and @

@			
@	$		
@	$	@	
@	$	@	$

KARNATAKA ICSE SCHOOLS ASSOCIATION

ICSE STD. X Preparatory Examination 2025

Subject– Computer Applications(Answer Key)

Duration: 2 hours **Maximum Marks : 100** **Date: 16.01.2025**

Question 1		
i.	d) Polymorphism	1
ii.	b) Java Virtual Machine (JVM)	
iii.	b)Within the same package and by subclasses	1
iv.	b) Pre-increment (++i)	1
v.	a) byte = 1 byte, short = 2 bytes, int = 4 bytes, long = 8 bytes	1
vi.	25.0	1
vii.	b) Removes spaces at the beginning and end of a string	1
viii.	c) Compilation error occurs	1
ix.	a) Both Assertion and Reasoning are true, and Reasoning is the correct explanation of Assertion.	1
x.	a) A primitive type is automatically converted to a corresponding wrapper class object.	1

xi	int sum = 0;
	for (int i = 0; i < arr.length; i++) {
	for (int j = 0; j < arr[i].length; j++) {
	sum += arr[i][j];
	}
	}
		1

xii.	c) Assertion is false, but Reasoning is true.	1
xiii.	c) 49	1
xiv.	d) 3,2,4,1,5	1
xv.		1
xvi.	a)final	1
xvii.	d) Defining a constructor with a return type.	1

xviii.	a) import	1
xix	method	
xx	b) 4	1
Question 2		
i.	27	2
ii.	Math.cbrt(Math.pow((a+b),4)/Math.pow(a,2))	2
iii.	Statement with error- if(i%2==0) break; Replace break with continue	2
iv.	a. miniart b.-4	2
v.	The loop will be executed 5 times. The output of the code is as follows. 1 7 13 19 25 6	2
vi.	String eligibility=(age>=18)?"Adult":"Minor";	2
vii.	Runtime error. These functions cannot be performed on alpha numeric strings	2
viii.	a. Position of 5 is a[1][1] b. 15	2
ix.	a. e b. 89	2
x.	a. Value of a=2 and b=10. b. Class variables x and y	2
Question 3		

	import java.util.Scanner;
	class FashionCourier
	{ String name; int wt; double charge;
	FashionCourier()
	{ name = "";
	wt = 0; charge = 0.0; }
	void accept()
	{ Scanner sc = new Scanner(System.in);
	System.out.print("Enter the customer's name: ");
	name = sc.nextLine();
	System.out.print("Enter the weight of the parcel (in kg): ");
	wt = sc.nextInt(); }
	void compute()
	{ double baseCharge = 0.0;
	if (wt < 5)
		[15]

	{ baseCharge = wt * 50; }
	else if (wt >= 5 && wt < 10)
	{ baseCharge = wt * 150; }
	else if (wt >= 10 && wt < 20)
	{ baseCharge = wt * 200; }
	else if (wt >= 20)
	{ baseCharge = wt * 350; }
	double surcharge = baseCharge * 0.05;
	surcharge charge = baseCharge + surcharge; }
	void display()
	{ System.out.println();
	System.out.println("Name\t\tWeight\t\tBill Amount");
	System.out.println("*****\t\t*****\t\t**********");
	System.out.printf("%s\t\t%d\t\tRs. %.2f\n", name, wt, charge); }
	public static void main()
	{
	FashionCourier obj = new FashionCourier();
	obj.accept()
	obj.compute();
	obj.display();} }	

Question 4	import java.util.Scanner;
	public class SelectionSort
	{
	public static void main()
	{
	int[] arr = new int[15];
	Scanner sc = new Scanner(System.in);
	System.out.println("Enter 15 integers:");
	for (int i = 0; i < 15; i++)
	{
	System.out.print("Enter integer " + (i + 1) + ": ");
	arr[i] = sc.nextInt();
	}
	for (int i = 0; i < 14; i++)
	{
	int minIndex = i;
	for (int j = i + 1; j < 15; j++)
	{ if (arr[j] < arr[minIndex])
	{ minIndex = j; } }
	if (minIndex != i)
	{
	int temp = arr[i]; arr[i] = arr[minIndex]; arr[minIndex] = temp; } }
	System.out.println("\nThe integers in ascending order are:"); for (int i = 0; i < 15; i++) { System.out.print(arr[i] + " "); } } }	

Question 5	import java.util.Scanner; class String2	15

```
{
   void main()
   {
      Scanner sc=new Scanner(System.in);
      System.out.println("Enter the string");
      String str=sc.nextLine();
      int x=str.length();String s=" ";char ch;
      for(int i=x-1;i>=0;i--)
      {    ch=str.charAt(i);
         s=s+ch;
      }
      if(str.equals(s))
      System.out.println("The given string is a palindrome");
      else
      if(str.charAt(0)==str.charAt(x-1))
       System.out.println("The given string is a special word") ;
       else
        System.out.println("The given string is neither a palindrome nor a
special word");
   }
}
```

Question 6

15

```
import java.util.Scanner;

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

      // Input the number
      System.out.print("Enter a number: ");
      int number = sc.nextInt();

      int sumOfSquares = 0;

      // Loop to extract each digit and calculate the sum of squares of the
digits
      while (number > 0) {
         int digit = number % 10; // Extract the last digit
         sumOfSquares += digit * digit; // Add the square of the digit to
sum
         number /= 10; // Remove the last digit
      }

      // Calculate the square root of the sum of squares
      double norm = Math.sqrt(sumOfSquares);

      // Output the result
```

```
        System.out.println("The norm of the number is: " + (int) norm);

    }
}
```

Question 7

```
import java.util.Scanner;

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

        // Accept the size of the matrix (m x m)
        System.out.print("Enter the size of the matrix (m): ");
        int m = sc.nextInt();

        int[][] matrix = new int[m][m]; // 2D array of order m x m

        // Accept elements of the matrix
        System.out.println("Enter the elements of the matrix:");
        for (int i = 0; i < m; i++) {
            for (int j = 0; j < m; j++) {
                System.out.print("Element at (" + i + "," + j + "): ");
                matrix[i][j] = sc.nextInt();
            }
        }

        // Print the matrix in matrix format
        System.out.println("\nThe matrix is:");
        for (int i = 0; i < m; i++) {
            for (int j = 0; j < m; j++) {
                System.out.print(matrix[i][j] + "\t");
            }
            System.out.println();
        }

        // Calculate and print the sum of elements of each column
        System.out.println("\nSum of elements of each column:");
        for (int j = 0; j < m; j++) {
            int columnSum = 0;
            for (int i = 0; i < m; i++) {
                columnSum += matrix[i][j];
            }
            System.out.println("Column " + (j + 1) + ": " + columnSum);
        }
    }
}
```

Question 8

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

```
public class OverloadResult {
    // Method 1: Print the series A, C, E, G... n terms
    void result() {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter the number of terms for the series A, C, E,
G...: ");
        int n = sc.nextInt();

        char ch = 'A'; // Starting character
        System.out.println("The series is:");
        for (int i = 0; i < n; i++) {
            System.out.print(ch + " ");
            ch += 2; // Increment by 2 to skip letters
        }
        System.out.println();
    }

    // Method 2: Print the sum of the given series a/1 + a/2 + ... n terms
    void result(int a, int n) {
        double sum = 0.0;
        for (int i = 1; i <= n; i++) {
            sum += (double) a / i; // Add each term of the series
        }
        System.out.printf("The sum of the series is: %.2f\n", sum);
    }

    // Method 3: Print the pattern using $ and @
    void result(char ch1, char ch2) {
        System.out.println("The pattern is:");
        for (int i = 1; i <= 4; i++) { // Rows of the pattern
            for (int j = 1; j <= i; j++) { // Columns of the pattern
                if (j % 2 != 0) // Odd position
                    System.out.print(ch1 + "\t");
                else // Even position
                    System.out.print(ch2 + "\t");
            }
            System.out.println();
        }
    }

    // Main method
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        OverloadResult obj = new OverloadResult();
```

```
        // Call the first result() method
        obj.result();

        // Call the second result() method
        System.out.print("\nEnter the value of 'a' and number of terms 'n' for
the series a/1 + a/2 + ...: ");
        int a = sc.nextInt();
        int n = sc.nextInt();
        obj.result(a, n);

        // Call the third result() method
        System.out.println("\nPattern using '@' and '$':");
        obj.result('@', '$');
    }
}
```

ICSE ACADEMY

3

This solved paper

is of KISA - Karnataka

ICSE Schools Association

2024

KARNATAKA ICSE SCHOOLS ASSOCIATION

ICSE STD. X Preparatory Examination 2024

Subject: Computer Applications

Maximum Marks: 100 **Time Allowed: 2 hours** **Date: 24.01.2024**

Maximum Marks: 100
Time allowed: 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

*(Attempt **all** questions from this **Section**.)*

Question 1 **[10]**

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

i. When a class serves as base class for many derived classes, the situation is called

a. Polymorphism b. Encapsulation
c. Inheritance d. Abstraction

ii. The expression which uses the && operator is known as
a. Relational b. Logical c. Arithmetic d. Assignment

iii. iii. Precedence of shorthand operator is _____ than Unary operator
a. Higher b. Lower c. Equal d. Not related

iv. When the object of a wrapper class is assigned to primitive type variable, the object is automatically converted to the primitive type is called as

a. Unboxing b. Boxing c. Implicit Conversion d. Inheritance

v. How many bytes are allocated for the array a[] if int a [] = new int [4];
a. 40 bytes b. 16 bytes c. 20 bytes d. 32 bytes

vi. The wrapper class of char type is
a. character b. Chracter c. Character d. Char

vii. The output of System.out.print(Math.ceil(Math.min(-4.3,-7.8))); is
a. -7.0 b. -8.0 c. 7 d.6

viii. Which of the following is not a token?
a. Byte code b. identifiers c. literals d. operators

ix. Name the type of error in the following statement
System.out.println(10/0);

a. Syntax error b. Logical error
c. Runtime error d. No error

x. The size of the array a[ ]={ 3,8,2,1,12,11,13} is
a. 6 b. 7 c. 9 d. 8

xi. The output of the given statements is
String a = "Success", b = "Happiness";
boolean h = a.substring(4).equals(b.substring(6));
a. ess b. ness c. true d false

xii. _____ compiles the Java source code into byte code
a. Virtual machine b. java interpreter
c. JVM compiler d. object code

xiii. The java statement to access the 5th character in the string str is:
a. str.indexOf(i) b. str.charAt(4)
c.str.substring(5) d. str.length()

xiv. A method prototype which has function name display() which takes two characters as input and an integer number as a return type is
a. void display(int a ,int b) b. int display(int a ,int b)
c. int display(char a ,char b) d. char display(int a ,int b)

xv. The method compareTo() returns _____ when two strings are equal and in lowercase :
a. true b. 0 c. 1 d. false

xiv. Which of the following is a valid String constant?
a. true b. 'false' c. false d."true"

xvii. The output of the following snippet is
System.out.print("Output is ");
for(int m=5;m<=50;m+=5)
{
if(m%6==0)
continue;

```
else
if(m%3==0)
System.out.println(m);
}
```

a. Output is 15 45 b. 16 35 c. Output is 15 d. 45 15

xviii. Assertion (A): A loop that in which there is no statement associated in its body is called as an infinite loop.
Reason(R) : In the infinite loop the test condition will always be true.
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

xix. Read the following text and choose the correct answer

A constructor is a special member function used to initialise the data members whenever an object is created for the class. The different types of constructors are

- Default constructor
- Parameterised constructor

How do we invoke a constructor in the program?

a. We should create a separate method with the return type as void
b. When an object is created the constructor is invoked
c. The method call should be initialsed to a data type.
d. A pure function needs to be created to call the constructor

xx. Assertion (A): When you pass an object as an argument to a function, it is called as pass by reference.
Reason(R) : The reference of an object is passed as parameter and not the value of the argument.
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d. Assertion (A) is false and Reason (R) is true

Question 2

i. Write the java expression for $\sqrt[3]{(a+b)^2}$ **[2]**

ii. Evaluate the expression when the value of p=5 **[2]**

p*=++p + --p/++p +p;

iii. The following code segment should add the fifth and eight elements of the array and displays the answer as 56. However, the code has errors. Fix the code so that it compiles and runs correctly. **[2]**

```
int s[]={2,22,3,32,4,42,5,52};
 if(s[3]%2==0)
 int sum=s[5]+s[7];
 System.out.println(sum);
```

iv. John executes the following line of the program and the answer displayed will be a floating-point value, but he expects to get the answer as 0. Name the error and how can the given statement be modified.

System.out.println(Math.sqrt(2)/10); **[2]**

v. How many times will the loop be executed? What will be the output? **[2]**

```
int a=12010;int d;
 while(a>0)
 {
    d=a%100;
    if(++d/3==0)
    break;
    else
    a=a/1000;
    System.out.println(d);
 }
```

vi. What will be the output of the following string methods? **[2]**

a. System.out.println("All the Best".length()/2);

b. System.out.println("Acquatic".equalsIgnoreCase("ACQUATIC"));

vii. Differentiate between actual and formal parameters. **[2]**

viii. Predict the output of the following: **[2]**

```
String s="123.45";
    int x=Integer.parseInt(s.substring(0,3));
    float y=Float.parseFloat(s.substring(3));
    System.out.println(x+y);
```

ix. Name the following: **[2]**

a. The return type of compareTo function

b. A principle of OOP, which allows a method to be used for multiple purposes.

x. Give the output of the following code-snippet: **[2]**

```
double z[]={0.3,4.5,23.0,4.5};
    System.out.println(Math.pow((z[1]+z[3]),2));
    System.out.println(z.length);
```

SECTION B

(Answer any four questions from this Section.)

The answers in this section should consist of the programs in either BlueJ environment or any program environment with java as the base.

Each program should be written using variable description / mnemonic codes so that the logic of the program is clearly depicted.

Flowcharts and algorithms are not required

Question 3 **[15]**

Design a class named Bill, which will contain the following members:

Data Members:

units,amt of int data type.

Member Functions:

Parameterised constructor to initialise units.

void show( ) to display the contents of units and amt.

void compute(int u) :calculate the electricity bill with the help of the below mentioned charges:

- 1 to 100 units – Rs.10/unit
- 100 to 200 units – Rs.15/unit
- 200 to 300 units – Rs.20/unit
- above 300 units – Rs.25/unit

In the main( ) create an object and initialise u with any value and calculate amt by invoking the compute( ) function and display the contents of U an amt using show( ) function.

Question 4 **[15]**

Write a program to input height of 10 Students in feet (like 5.8, 6.1, ...) in a single dimensional array. Sort the heights in ascending order, using bubble sort technique and display the sorted array.

Question 5 **[15]**

Write a program to accept a string and convert it into uppercase. Replace all the vowels in the string with the character '#' and display the new string.

Question 6 **[15]**

Write a program to overload the function display() for the following tasks:

i) To display the following pattern using the function void pattern (char ch,int n) where n is the number of lines and ch is the character to be printed.

*****

****

***

**

*

ii) To display the sum of the following series

S=$a^2 + a^4 + a^6 + \cdots \ldots + n\ terms$

Question 7 **[15]**

Write a program to accept a number and check if it's a Peterson number or not.

A number is said to be **Peterson** if the sum of factorials of each digit is equal to the sum of the number itself.

For example:

Input: Enter a number=145

Output=1!+4!+5!=145

Question 8 **[15]**

Define a class to accept values into a 3×3 array and find the sum of all the odd numbers in the array.

Example:

Input: A[][]={{ 4 ,5, 6}, { 5 ,3, 2}, { 4, 2, 5}};

Output: Sum of odd numbers=5+5+3+5=18

KARNATAKA ICSE SCHOOLS ASSOCIATION

ICSE STD. X Preparatory Examination 2024

Subject: Computer Applications

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ANSWER KEY

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SECTION A

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Question 1

Choose the correct answers to the questions from the given options.
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i. When a class serves as base class for many derived classes , the situation is called

a. Polymorphism b. Encapsulation
c. **Inheritance** d. Abstraction

ii. The expression which uses the && operator is known as

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iii. Precedence of shorthand operator is _____ than Unary operator

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iv. When the object of a wrapper class is assigned to primitive type variable, the object is automatically converted to the primitive type is called as

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System.out.println(10/0);

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String a = "Success", b = "Happiness";
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xiv. A method prototype which has function name display() which takes two characters as input and an integer number as a return type is

a. void display(int a ,int b) b. int display(int a ,int b)

c. **int display(char a ,char b)** d. char display(int a ,int b)

xv. The method compareTo() returns _____ when two strings are equal and in lowercase :
a. true b. **0** c. 1 d. false

xiv. Which of the following is a valid String constant?

a. true b. 'false' c. false d**."true"**

xvii. The output of the following snippet is

```
System.out.print("Output is ");
for(int m=5;m<=50;m+=5)
{
if(m%6==0)
continue;
else
if(m%3==0)
System.out.println(m);
}
```

a. **Output is 15 45**

b. 16 35

c. Output is 15

d. 45 15

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b**. When an object is created the constructor is invoked**

c. The method call should be initialsed to a data type.

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

Question 2

i. Write the java expression for $\sqrt[3]{(a+b)^2}$ [2]
Ans: Math.cbrt(Math.pow(a+b),2)

ii. Evaluate the expression when the value of p=5 [2]
p*=++p + --p/++p +p;
Ans: 60

iii. The following code segment should add the fifth and eight elements of the array and display the answer as 56. However the code has errors. Fix the code so that it compiles and runs correctly. [2]

```
int s[]={2,22,3,32,4,42,5,52};
 if(s[3]%2==0)
 int sum=s[5]+s[7];
 System.out.println(sum);
```

Ans: sum should be initialized before the if condition and the value s[5] should be changed to s[4]

iv. John executes the following line of the program and the answer displayed will be a floating-point value, but he expects to get the answer as 0. Name the error and how can the given statement be modified.
System.out.println(Math.sqrt(2)/10); [2]

Should explicitly convert the print statement to int
System.out.println((int)Math.sqrt(2)/10); The error is logical error

v. How many times will the loop be executed? What will be the output? [2]

```
int a=12010;int d;
    while(a>0)
    {
```

```
        d=a%100;
        if(++d/3==0)
        break;
        else
        a=a/1000;
        System.out.println(d);
    }
```

Ans: 11
13
The loop will be executed twice

vi. What will be the output of the following string methods? [2]
a. System.out.println("All the Best".length()/2);
Ans: 6
b. System.out.println("Acquatic".equalsIgnoreCase("ACQUATIC"));
Ans: true

vii. Differentiate between actual and formal parameters. [2]
Ans: Actual parameters : Defined in method call.
Formal parameters: Parameters in method definition and preceded by data type.

viii. Predict the output of the following: [2]

```
String s="123.45";
    int x=Integer.parseInt(s.substring(0,3));
    float y=Float.parseFloat(s.substring(3));
    System.out.println(x+y);
```

Ans: 123.45
ix. Name the following: [2]
a. The return type of compareTo function
Ans: int

b. A principle of OOP, which allows a method to be used for multiple purposes.
Ans: Polymorphism

x. Give the output of the following code-snippet: [2]

```
double z[]={0.3,4.5,23.0,4.5};
    System.out.println(Math.pow((z[1]+z[3]),2));
    System.out.println(z.length);
```

Ans: 81.0
4

SECTION B

Question 3 **[15]**

Design a class named Bill, which will contain the following members:
Data Members:
units,amt of int data type.
Member Functions:
Parameterised constructor to initialise units.
void show( ) to display the contents of units and amt.
void compute(int u) :calculate the electricity bill with the help of the below mentioned charges:

- 1 to 100 units – Rs.10/unit
- 100 to 200 units – Rs.15/unit
- 200 to 300 units – Rs.20/unit
- above 300 units – Rs.25/unit

In the main( ) create an object and initialise u with any value and calculate amt by invoking the compute( ) function and display the contents of U an amt using show( ) function.

Class name – 1 mark
Data members – 1 mark
Method names – 1 mark
If conditions together – 4 marks(1 mark each)
Calculation of bill- 4 marks(I mark each)
Main method- I mark
Creating an object -1 mark
Calling of functions- 2 marks(I mark each)

Question 4 **[15]**

Write a program to input height of 10 Students in feet (like 5.8, 6.1, ...) in a single dimensional array. Sort the heights in ascending order, using bubble sort technique and display the sorted array.

Variable description – 2 marks
Initialising the array – 1 mark
Accepting elements in an array – 2marks
Bubble sort technique

For loop -4 marks(2 marks each for loop)
Initializing the vaiables – 1 mark
Swapping the variables – 3 marks
Displaying the sorted array – 2 marks(I mark for the for loop and 1 mark for the print statement)

Question 5 **[15]**

Write a program to accept a string and convert it into uppercase. Replace all the vowels in the string with the character '#' and display the new string.

Variable Description – 2 marks
Accepting a string -1 mark
Initializing a new string – 1 mark
Upper case conversion 1 mark
For loop -2 marks
Character extraction 2 marks
If condition -3 marks
Creating a new string 1 mark
Displaying the new string -2 marks

Question 6 **[15]**

Write a program to overload the function display() for the following tasks:

i) To display the following pattern using the function void pattern (char ch,int n) where n is the number of lines and ch is the character to be printed.

*****
****
***
**
*

ii) To display the sum of the following series

S=$a^2 + a^4 + a^6 + \cdots \ldots + n\ terms$

Declaring the methods 2 marks(Should include the parameters properly, if not no marks allotted)

First method

For loops – 4 marks(2 marks each)

Print statements- 2 marks (1 mark for each statement)

Second method

Accepting a and n from the user – 1 mark

Initializing sum = 1 mark

Finding the sum which includes the Math pow function -3
Displaying the sum – 1 mark

Question 7 **[15]**

Write a program to accept a number and check if it's a Peterson number or not.
A number is said to be **Peterson** if the sum of factorials of each digit is equal to the sum of the number itself.
For example:
Input: Enter a number=145
Output=1!+4!+5!=145

Variable description 2 marks
Accepting a number – 1 mark
Loop for extraction of numbers – 2 marks
Number extraction logic – 2 marks
Loop for finding the factorial – 2 marks
Initializing the factorial variable – 1 mark
Finding the factorial logic – 2 marks
If condition – 2 marks
Final print statement – 1 mark

Question 8 **[15]**

Define a class to accept values into a 3×3 array and find the sum of all the odd numbers in the array.
Example:
Input: A[][]={{ 4 ,5, 6}, { 5 ,3, 2}, { 4, 2, 5}};

Output: Sum of odd numbers=5+5+3+5=18

Variable description – 2 marks
Initialising the array – 2mark
Accepting elements in an array – 2marks
Initializing the sum – 1 mark
For loop for the calculation – 2 mark
If condition – 2 marks
Sum calculation – 2 marks
Printing the sum – 2 marks

ICSE ACADEMY

4

This solved paper

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ICSE Schools Association

2023

ICSE ACADEMY

KARNATAKA ICSE SCHOOLS ASSOCIATION

ICSE STD-X
Preparatory Examination 2023
Subject:Computer Applications

Date: 09-02-2023 **Duration: 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
(Attempt all questions from this Section)

Question 1

Choose the correct answer and write the correct option.

i) When Wrapper class object converted to its corresponding primitive data type, it is called as_____.
- (a) Boxing
- (b) Unboxing
- (c) Implicit type conversion
- (d) Explicit type conversion

ii) Which of the following is called as array declaration?
- (a) int a[ ];
- (b) float [ ]b;
- (c) int x[10];
- (d) Both (a) & (b)

iii) The translators used in java are _____ and _____.
- (a) Assembler and Interpreter
- (b) Compiler and Assembler
- (c) Compiler and Interpreter
- (d) None of the above

iv) The result of (5672%100)/10 is _____.
- (a) 6
- (b) 2
- (c) 5
- (d) 7

v) int a=5, b=7; the result of !(a<=b) is _____.
- (a) true
- (b) false
- (c) True
- (d) False

vi)
```
char a='A';
int b=4;
char c=a+b;
System.out.println(c);
```

(a) Syntax error
(b) E
(c) e
(d) 69

vii) Which of the following represents a multi line comment?
(a) *.....*/
(b) //*.....*//
(c) /*.....*/
(d) */.....*/

viii) The Scanner class method(function) that reads a floating point token upto 32-bitscapacity is _____.
(a) next Float( )
(b) nextFloat( )
(c) NextFloat( )
(d) nextfloat( )

ix) if(x%2==0)
{
if(x<=20)
{
System.out.println(x);
}
}
Which of the following is correct, when the above code has to be written using single ifstatement?
(a) if(x%2==0 || x<=20) System.out.println(x);
(b) if(x%2==0 && x<=20) System.out.println(x);
(c) if(x%2==0 & & x<20) System.out.println(x);
(d) All of the above

x) Decision Control Statement in java can be implemented using _____.
(a) if
(b) if else
(c) Conditional (Ternary) Operator
(d) All of the above

xi) String x="12", y="10"; int a=Integer.parseInt(x);
System.out.println(a+y);
(a) 22
(b) 1210
(c) 1012
(d) Syntax Error

xii) int x[ ] = new int[10];
System.out.println (x[3]);
(a) Syntax Error
(b) Runtime Error
(c) 0
(d) -1

xiii) int x[ ]={2, 4, 6, 8, 10, 12};
System.out.println (x[2]++ + ++x[4] + x[2]);
(a) 24
(b) 23
(c) 25
(d) 22

xiv) Which of the following statement displays the 2nd element of an array x?
(a) System.out.println(x[2]);
(b) System.out.println(x[1]);
(c) System.out.println(x[3]);
(d) None of the above

xv) Name the type of error in the statement:
int x[ ]={1, 2, 3};
System.out.println(x[x.length]);
(a) Syntax error
(b) Run time error
(c) Logical error
(d) No error

xvi) The array float a[ ]=new float[5] occupies:
(a) 10 bytes
(b) 40 bytes
(c) 20 bytes
(d) 80 bytes

xvii) String s1="BASIC", s2="BASE";
System.out.println (s1.length ()+ s2.length());
(a) 10
(b) 9
(c) 8
(d) 11

xviii) The output of the method "Technology".substring(4,10) is:
(a) Syntax error
(b) nology
(c) logy
(d) Runtime error

xix) A method with the same name as of the class and with arguments and no return datatype is termed as:
(a) parameterized constructor
(b) default constructor
(c) Non-parameterized constructor
(d) Wrapper class method

xx) String a="35", b="8"; int x=Integer.parseInt(a);
double y=Double.parseDouble(b);
System.out.println(x+y);
(a) 43
(b) 358
(c) 43.0
(d) 835

Question 2

i) Evaluate the expression:
int x=10,y=5;
float z=y/x + ++x + ++y;
System.out.println(z);

ii) Write java expression for:
$\sqrt{a^4+b^2}$

iii) Rewrite the following using ternary operators:

```
if(sale>15000)
comm=sale*5.0/100;
else
comm=0;
```

iv) Rewrite the following while loop using for loop:

```
int x=0;
while(x<10)
{
    System.out.println(x);
    x++;
}
```

v) How many times the following loop will gets executed? What is the output of the same?

```
for (inti=20; i>=2;i-=2)
{
        if(i%4==0)
        continue;
        System.out.println(i);
}
```

vi)

```
int a=410,b=510;
System.out.println(String.valueOf(a) + String.valueOf(b));
```

vii)

```
String a="Floppy",b="Disk";
System.out.println(a.charAt(0) +" "+ b.charAt(0));
```

viii) Define Abstraction.

ix) Consider the following program and answer the questions given below:

```
class record
{
   static int m,n;
   int z;
   public static void show( )
   {
       m=25;
       n=36;
   }
   public void display()
   {    int h=27;
       record sum=new record( );
    }
}
```

(a) Name the class(static) and instance variables.

(b) Can the variable h be used in other functions? Give reason.

x) Consider the following array and answer the questions given below:

```
int x[ ]={2,4,6,8,10,12,14,16,18,20};
```

(a) What is the size of the array?

(b) What is the index position of 14

SECTION B

(Answer **any four** questions from this **Section**).

The answers in this section should consist of the program in either BlueJ environment or any program environment with java as the base.

Each program should be written using variable description/mnemonic codes so that the logic of the program is clearly depicted.

Flowcharts and algorithms are not required.

Question 3:

Design a class Hotel with the following description:
Member variables:
String name – to store the name of the customer
long mno – to store the mobile number of the customer
double bill – to store the bill amount
double gst – to store the GST amount
double st – to store the service tax
double tamt – to store the total amount to be paid by the customer
Member methods:
void accept() – to accept customer's name, mobile number, GST, service tax and amount.
void calculate() – to calculate GST, service tax and total amount to be paid by the customer.
gst = 18% on bill
st = 12.5% on bill
tamt = bill +gst +st
void display() – to display the customer's name, mobile number and bill amount.
Write a main method to create an object and invoke the above member methods.

Question 4:

Define a class to accept 20 students marks in a subject out of 100 in a single dimensional array and display the number of students who have secured marks:

i) 90 and above ii) 40 and less than 40

Question 5:

Define a class to accept two string and convert both the strings to lowercase and display only the common characters at the corresponding index position of both the strings only if both the string has same length.

Sample Input: s1="heroic"
s2="health"
Sample Output: h,e

Sample Input:
s1="Device"
s2="Demands"
Sample Output:
Strings length do not match

Question 6:

Define a class to input 10 words and arrange the words in descending order using bubble sort technique. Display the sorted array.

Question7:

Design a class to overload the method display() as follows:

a) void display() – Print the given Pattern using nested loop.

```
2
4  4
6  6  6
8  8  8  8
10 10 10 10 10
```

b) void display(int n) – Print the first 'n' terms of the series 1,-3,5,-7……n terms

c) void display(int x,int y) – Display the last digit of x and y; if x and y are greater than or equal to 10

Example: If x is 45 and y is 12

Output : Last digit : 5 and 2

Question8:

Define a class to accept the years of graduation from a school as integer values from the user. Using Binary Search technique on the sorted array of integers given below, output the message "Record exists" if the value input is located in the array. If not, output the message "Record does not exist".

[1982,1987,1993,1996,1999,2003,2006,2007,2009,2010]

KARNATAKA ICSE SCHOOLS ASSOCIATION

ICSE STD-X
Preparatory Examination 2023
Subject:Computer Applications

Date: -02-2023 **Duration: Two Hours**

Key Answers

SECTION A

(Attempt all questions from this Section)

Question 1

Choose the correct answer and write the correct option.

i) When Wrapper class object is automatically converted to its corresponding primitive data type, it is called as _____.
(a) Boxing
(b) Unboxing
(c) Implicit type conversion
(d) Explicit type conversion

ii) Which of the following is called as array declaration?
(a) int a[ ];
(b) float [ ]b;
(c) int x[10];
(d) Both (a) & (b)

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(a) Assembler and Interpreter
(b) Compiler and Assembler
(c) Compiler and Interpreter
(d) None of the above

iv) The result of (5672%100)/10 is _____.
(a) 6
(b) 2
(c) 5
(d) 7

v) int a=5, b=7; the result of !(a<=b) is _____.
(a) true
(b) false
(c) True
(d) False

vi)
```
char a='A';
int b=4;
char c=a+b;
System.out.println(c);
```
(a) Syntax error
(b) E
(c) e
(d) 69

vii) Which of the following represents a multi line comment?
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```
String x="12", y="10"; int a=Integer.parseInt(x);
System.out.println(a+y);
```
(a) 22
(b) 1210
(c) 1012
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```
int x[ ] = new int[10];
System.out.println (x[3]);
```
(a) Syntax Error
(b) Runtime Error
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xiii)
```
int x[ ]={2, 4, 6, 8, 10, 12};
System.out.println (x[2]++ + ++x[4] + x[2]);
```
(a) 24
(b) 23
(c) 25
(d) 22

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(a) System.out.println(x[2]);
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xv) Name the type of error in the statement:
```
int x[  ]={1, 2, 3};
System.out.println(x[x.length]);
```
(a) Syntax error
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(c) Logical error
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(b) 358
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(d) 835

Question 2

i) Evaluate the expression:
int x=10,y=5;
float z=y/x + ++x + ++y;
System.out.println(z);

17.0

ii) Write java expression for:
$\sqrt{a^4+b^2}$

Math.sqrt(Math.pow(a,4)+ Math.pow(b,2))

iii) Rewrite the following using ternary operators:
if(sale>15000)
comm=sale*5.0/100;
else
comm=0;

comm=(sale>15000)? sales*5.0/100?0;

iv) Rewrite the following while loop using for loop:
int x=0;

```
        while(x<10)
        {
System.out.println(x);
            x++;
        }
```

for(int x=0;x<10;x++)
{ System.out.println(x); }

v) How many times the following loop will gets executed? What is the output of the same?

```
 for(inti=20; i>=2;i-=2)
        {
                if(i%4==0)
                continue;
                System.out.println(i);
        }
```

O/P:-
Prints 18, 14, 10, 6 and 2 in different lines
The loop is repeated 10 times

vi)
```
int a=410,b=510;
System.out.println(String.valueOf(a) + String.valueOf(b));
```

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vii)
```
String s="Floppy",b="Disk";
System.out.println(a.charAt(0) +" "+ b.charAt(0));
```

F D

viii) Define Abstraction.
Abstraction is the concept of representing essential details and hiding away implementation deta

ix) Consider the following program and answer the questions given below:

```
class record
{
   static int m,n;
   int z;
   public static void show( )
   {
       m=25;
       n=36;
}
   public void display()
   {    int h=27;
       record sum=new record( );
    }
  }
```

(a) Name the class(static) and instance variables.
Ans: - **Static variable = m and n**
Instance variable = z

(b) Can the variable h be used in other functions? Give reason.
No, h cannot be used in other functions as h is a local variable.

x) Consider the following array and answer the questions given below:
int x[ ]={2,4,6,8,10,12,14,16,18,20};
(a) What is the size of the array?
Ans: **- 10**
(b) What is the position of 14?
Ans:- 6

SECTION B

(Answer **any four** questions from this **Section**).

The answers in this section should consist of the program in either BlueJ environment or any program environment with java as the base.

Each program should be written using variable description/mnemonic codes so that the logic of the program is clearly depicted.

Flowcharts and algorithms are not required.

Question 3:

Design a class Hotel with the following description:
Member variables:
String name – to store the name of the customer
long mno – to store the mobile number of the customer
double bill – to store the bill amount
double gst – to store GST amount
double st – to store the service tax
double tamt – to store the total amount to be paid by the customer
Member methods:
void accept() – to accept customer's name, mobile number, GST, service tax and amount.
void calculate() – to calculate GST, service tax and total amount to be paid by the customer.
gst = 18% on bill
st = 12.5% on bill
tamt = bill +gst +st
void display() – to display the customer's name, mobile number and bill amount.
Write a main method to create an object and invoke the above member methods.

```
import java.util.*;
class Hotel
{
   String name;
   long mno;
   double bill,gst,st,tamt;
   void accept()
   {
      Scanner sc=new Scanner(System.in);
System.out.println("Enter the name=");
      name=sc.next();
System.out.println("Enter the mobile number=");
mno=sc.nextLong();
System.out.println("Enter the bill amount=");
      bill=sc.nextDouble();
   }
   void calculate()
   {
gst=18.0/100*bill;
st=12.5/100*bill;
tamt=bill+gst+st;
   }
```

```
    void display()
    {
System.out.println("Name="+name);
System.out.println("Mobile number="+mno);
System.out.println("GST="+gst);
System.out.println("Service tax="+st);
System.out.println("Total amount="+tamt);
    }
    publicstatic void main()
    {
       Hotel ob=new Hotel();
ob.accept();
ob.calculate();
ob.display();
    }
}
```

Question 4:

Define a class to accept 20 students marks in a subject out of 100 in a single dimensional array and display the number of students who have secured marks:

i) 90 and above ii) 40 and less than 40

```
import java.util.*;
class student
{
   public static void main()
   {
      Scanner sc=new Scanner(System.in);
      int a[]=new int[20];
      int c1=0,c2=0;
System.out.println("Enter 20 integers=");
      for(int i=0;i<20;i++)
      {
         a[i]=sc.nextInt();
         if(a[i]>=90)
         c1++;
         elseif(a[i]<=40)
         c2++;
      }
System.out.println("Count of 90 and above="+c1);
System.out.println("Count of 40 and less="+c2);
   }
}
```

Question 5:

Define a class to accept two string and convert both the strings to lowercase and display only the common characters at the corresponding index position of both the strings only if both the string has same length.

Sample Input: s1=”heroic”
s2=”health”

Sample Output: h,e

Sample Input:
s1=”Device”
s2=”Demands”

Sample Output:
Strings length do not match

```
import java.util.*;
class match
{
   publicstatic void main()
   {
      Scanner sc=new Scanner(System.in);
System.out.println("Enter two strings");
      String a=sc.nextLine();
      String b=sc.nextLine();
      a=a.toLowerCase();
      b=b.toLowerCase();
      if(a.length()==b.length())
      {
         for(int i=0;i<a.length();i++)
         {
            char c1=a.charAt(i);
            char c2=b.charAt(i);
            if(c1==c2)
System.out.print(c1+",");
         }
      }
      else
System.out.println("Strings length do not match");
   }
}
```

Question 6:

Define a class to input 10 words and arrange the words in descending order using bubble sort technique. Display the sorted array.

```
import java.util.*;
class bubble
{
   public static void main()
   {
      Scanner sc=new Scanner(System.in);
      String a[]=new String[10];
System.out.println("Enter 10 words=");
      for(int i=0;i<a.length;i++)
      {
         a[i]=sc.next();
      }
      for(int i=0;i<a.length;i++)
      {
         for(int j=0;j<a.length-1-i;j++)
         {
            if(a[j].compareTo(a[j+1])<0)
            {
               String t=a[j];
               a[j]=a[j+1];
               a[j+1]=t;
            }
         }
      }
```

```
System.out.println("Words in descending order");
      for(int i=0;i<a.length;i++)
System.out.println(a[i]);
   }
}
```

Question7:

Design a class to overload the method display() as follows:

a) void display() – Print the given Pattern using nested loop.

```
2
4  4
6  6  6
8  8  8  8
10 10 10 10 10
```

b) void display(int n) – Print the first 'n' terms of the series 1,-3,5,-7……n terms

c) void display(int x,int y) – Display the last digit of x and y; if x and y are greater than or equal to 10

Example: If x is 45 and y is 12

Output : Last digit : 5 and 2

```
import java.util.*;
class overload
{
   void display()
   {
      int a=2;
      for(int i=1;i<=5;i++)
      {
         for(int j=1;j<=i;j++)
         {
System.out.print(a);
         }
         a+=2;
System.out.println();
      }
   }
   void display(int n)
   {
      int a=1;
      for(int i=1;i<=n;i++)
      {
         if(i%2==1)
System.out.print(a+",");
         else
System.out.print(a+",");
         a+=2;
      }
   }
   void display(int x,int y)
   {
      if(x>10 & y>=10)
      {
System.out.println(x%10);
System.out.println(y%10);
      }
   }
   }
```

Question 8:

Define a class to accept the years of graduation from a school as integer values from the user. Using Binary Search technique on the sorted array of integers given below, output the message "Record exists" if the value input is located in the array. If not, output the message "Record does not exist".

[1982,1987,1993,1996,1999,2003,2006,2007,2009,2010]

```
import java.util.*;
 class binary
 {
    public static void main()
    {
       Scanner sc=new Scanner(System.in);
       int y[]={1982,1987,1993,1996,1999,2003,2006,2007,2009,2010};
System.out.println("Enter the year to search");
       int search=sc.nextInt();
boolean found=false;
       int lb=0,ub=y.length-1,m;
       while(lb<=ub)
       {
          m=(lb+ub)/2;
          if(search>y[m])
          lb=m+1;
          else if(search<y[m])
ub=m-1;
          else if(search==y[m])
          {
             found=true;
System.out.println("Record exists");
             break;
          }
       }
       if(found==false)
System.out.println("Record does not exist");
   }
 }
```

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EVS

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