DELHI PUBLIC SCHOOL NEWTOWN

SESSION: 2024-25

HALF YEARLY EXAMINATION

CLASS: IX **FULL MARKS: 100**

SUBJECT: COMPUTER APPLICATIONS [SET A] **TIME: 2 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 consist of eleven printed pages. 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 from the choices given: [1x20=20]

(i) Which of the following is **NOT** a type of error in Java?

(a) System.out.println(This is my age);
(b) sum=(10+20)/0;
(c) a=n>0? “Even”: “Odd” ;
(d) double y=Math.pow(-2, 3);

(ii) Which of the following is a **valid** variable name in Java?

(a) 1stVariable (b) _variableName (c) class (d) variable-Name

(iii) **Assertion(A):** The **do-while** loop in Java always executes the block of code at least once, regardless of the loop condition.

Reason(R): The **do-while** loop tests the loop condition after executing the loop body.

(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, but **(R)** is false.
(d) **(A)** is false, but **(R)** is true.

(iv) Convert the following **if-else** construct into a **ternary** operator:

```
if (++count > 10)
 {  result = "Limit Exceeded";    }
    else {  result = "Within Limit";   }
```

(a) result = (++count > 10) ? "Limit Exceeded" : "Within Limit";

(b) result = (++count > 10) : "Limit Exceeded" : "Within Limit";

(c) result = (++count > 10) ? "Limit Exceeded" ? "Within Limit";

(d) result = (count > 10++) ? "Limit Exceeded" : "Within Limit";

(v) **Assertion(A):** In a switch statement, if no case matches the switch expression, the default case is executed.

Reason(R): As break statement is required after each case block to prevent fall-through to subsequent cases.

(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, but **(R)** is false.

(d) **(A)** is false, but **(R)** is true.

(vi) What is the output of the following expression: **Math.floor(Math.max(-23.75,-43.8))**

(a) -23.0 (b)-43.0 (c) -24.0 (d)-22.0

(vii) Which of the following statement stands **true** for **'*continue*'**:

(a) Exits current iteration and proceeds to next iteration

(b) Continues current iteration

(c) Exits from the program

(d) Both (b) and (c)

(viii) Which of the following statements is true regarding the use of the division operator:

```
int x = 9;   int y = 2;
double result = x / y;
```

(a) The code will compile and *result* will be *4.5.*

(b) The code will compile and *result* will be *4.0.*

(c) The code will compile and *result* will be *4*.

(d) The code will not compile because the result of *x / y* cannot be assigned to a *double*.

(ix) In which loop is the condition tested **before** executing the loop body?

(a) for loop, while loop (b) while loop, do while loop

(c) do-while loop, for loop (d) all types of loops

(x) What will be the output of the following code snippet:

```
int x = 0;
  for (int i = 0; i < 5; i++)
  {  x += i;  }
     System.out.println(x++);
```

(a) 10 (b) 15 (c) 5 (d) 20

(xi) Identify the **error** in the following code:

```
public class Test
{  public static void main( )
   {  short x = 5;  x=x+2;
      System.out.println(x);   } }
```

(a) x cannot be initialized by an integer (b) x cannot be updated by 2

(c) Incorrect print statement. (d) No error

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

```
public class Test
{  public static void main( )
   {  int a = 5, b = 10;
      System.out.println(++a * b- -  <  a++ *  - -b);    }  }
```

(a) True (b) False (c) true (d) false

(xiii) **Assertion(A):** In Java, the == operator can be used to compare primitive data types such as int, double and boolean.

Reason(R): The == operator checks whether two operands have the same value.

(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, but **(R)** is false.

(d) **(A)** is false, but **(R)** is true.

(xiv) What is the output of **Math.ceil(2.3)**?

(a) 2 (b) 3.0 (c) 2.3 (d) 2.0

(xv) Which package contains the **Math class** in Java?

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

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

```
int x = 5;
while (x > 0)
{   System.out.println(x);
   x--;  }
```

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

(xvii) Consider the following Java code snippet:

```
int a = 5;   int b = 10;
int result1 = ++a + b--;
int result2 = a-- + ++b;
```

What are the final values of **result1** and **result2** respectively?

(a) result1 = 16, result2 = 16 (b) result1 = 17, result2 = 15

(c) result1 = 16, result2 = 15 (d) result1 = 17, result2 = 16

(xviii) Predict the **output**:

```
public class PrintlnExample
{   public static void main( )
    {   System.out.println("First Line");
        System.out.print("Second Line ");
```

```
        System.out.print("Continues");
        System.out.println();
        System.out.print("Third Line");    } }
```

(a) First Line
Second Line Continues
Third Line

(b) First Line
Second Line Continues Third Line

(b) First Line
Second Line
Continues
Third Line

(d) First Line Second Line Continues
Third Line

(xix) Identify the **error** in the following code:

```
public class Test
{   public static void main( )
    {  Scanner sc= new Scanner(System.in);
       char ch=sc.next();   }   }
```

(a) ch is not declared

(b) Invalid input statement

(c) Runtime error

(d) Semantic error

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

```
public class Test
{    public static void main( )
     {    int a = 5;     int b = 10;     int c = 15;
          if ((a > b) && (b < c))
             {  System.out.println("Condition 1");   }
          else if ((a < b) || (b > c))
             {  System.out.println("Condition 2");   }
          else
             {  System.out.println("Condition 3");       }    }    }
```

(a) Condition 1

(b) Condition 2

(c) Condition 3

(d) Compile-time error

Question 2 [10x2=20]

(i) Write a Java expression for the following:

SUM = $\sqrt{((a^2 + b^2 + c^2))/3}$

(ii) Convert the following **if-else if** construct into a ***switch*** **case**:

```
if (city == 'K')
System.out.println("Kolkata");
else if (city == 'D')
System.out.println("Delhi");
else if (city == 'C')
System.out.println( "Chennai");
else if (city == 'M' )
System.out.println( "Mumbai");
else      System.out.println("Invalid city");
```

(iii) Give the ***output*** of the following program segment and also mention the number of times the loop is executed:

```
int x, y;
for (x = 4, y = 6; x <= 24; x += 4)
{   if (x % y == 0)
     {   x += 2;    } }
        System.out.println(x);
```

(iv) Convert the following ***for*** loop into an equivalent ***while*** loop in Java:

```
public class Conversion
{   public static void main( )
    {   int n = 5;     int factorial = 1;
       for (int i = 1; i <= n; i++)
        {   factorial *= i;    }
          System.out.println("Factorial of the number is: " + factorial);    }   }
```

(v) The following Java program contains some **errors**. Identify and correct the errors.

```
public class OddEven
{   public static void main( )
  {    int limit = 20; int i = 0
          do
      {    if(i % 2 = 0
          {   System.out.println(i , " is even");     }
          else
          {   System.out.println(i , " is odd");     }
          i++;
          } while(i <= limit)     }  }
```

(vi) The following program is supposed to check if a given number is a **prime** number. Some parts of the program are replaced by _____. Fill in the blanks with the correct statements:

```
class CheckPrime
{    public static void main( int n)
    {    boolean isPrime = true;
        for (int i = 2; i <= ______1______; i++)
        {     if (______2______ % i == ______3______)
            {    isPrime = ______4______;
                break;          }    }
        if (isPrime && n > 1)
        System.out.println("The number " + n + " is prime.");
        else      System.out.println("The number " + n + " is not prime.");    } }
```

(vii) Predict the **final** value of **x** and **y** , when **x=0, y=-2**:

```
S = ++x * y / --y + x / x++ - y--;
```

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

```
int m = -4;   int n = -12;
for (int i = 0; i < 3; i++)
    m++;
    --n;
System.out.println("m=" + m);
System.out.println("n=" + n);
```

(ix) What will be the **output** of the following Java program:

```
class jump_stat
 {  public static void main( )
   {  int x=2, y=0;
      for(   ; y<10;++y)
      {   if(y%x==0)
          continue;
          else if(y==8)
          break;
          else      System.out.println(y+  “    ”);   } } }
```

(x) What is the **output** of the following?

```
char ch = 'D';
short num = 30;
int result = ch + num;
System.out.println(result);
```

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 [8+7]

(a) Write a program in Java to **reverse** the digits of a given number.

Example: Given number is **1234**, **Reversed** number is **4321**

(b) Write a Java program that calculates and prints the **sum of all even numbers** between 1 to 100 (inclusive) using a for loop. **Do not** use nested loops. The program should also print the total number of even numbers found in this range.

Question 4

Write a **menu** driven program for the following: [15]

(a) To find and display the **sum** of the series given below:

$S = x^1 - x^2 + x^3 - x^4 + x^5 - \ldots\ldots\ldots\ldots - x^{20}$; where x = 2

(b) To display the series**:** **1, 11, 111, 1111, 11111**

(c) To find and display the **sum** of the series given below:

$S = a^2 + a^2 / 2 + a^2 / 3 + \ldots\ldots + a^2 / 10$

For an incorrect option, an appropriate error message should be displayed.

Question 5 [8+7]

(a) **Tribonacci** numbers are a sequence of numbers similar to Fibonacci numbers, accept that a number is formed by adding the **three** previous numbers. Write a program to display first **20** Tribonacci numbers. **Example: 1,1,2,4,7,13…..**

(b) Write a program to display all sunny numbers within the range1 to n. A number is called a **Sunny Number** if the number next to the given number is a perfect square. A number N will be a sunny number if **N+1** is a perfect square.

Example: 3 is a Sunny number, as 4 (3+1=4) is a perfect square.

Example: 15 is a Sunny number, as 16 (15+1=16) is a perfect square.

Question 6 [15]

A computerized bus charges fare from each of its passengers based on the distance traveled as per the tariff given below:

Distance (in km)	**Charges(in ₹)**
First 5 km	80 paise
Next 10 km	₹ 10/km
More than 15 km	₹ 8/km

As the passenger enters the bus, the computer prompts 'Enter distance you intend to travel'. On entering the distance, it prints his ticket and the control goes back for the next passenger. At the end of journey, the computer prints the following:

The number of passenger travelled:

Total fare received:

Write a program to calculate and print the journey details of the bus for a particular day.

Question 7 [15]

Kumar electronics has announced seasonal discounts on purchase of certain items:

Purchase Amount	Discount on Laptop	Discount on Desktop PC
Up to ₹ 25000	0.0%	5.0%
₹ 25,001 to ₹ 50,000	5%	7.5%
₹ 50,001 to ₹ 1,00,000	7.5%	10.0%
More than ₹ 1,00,000	10.0%	15.0%

Write a program to input the name, amount of purchase and the type of purchase (`L' for Laptop and 'D' for Desktop) by a customer. Compute and print the net amount to be paid by a customer along with his name. (Net amount = Amount of purchase - discount)

Question 8 [15]

Write a program to accept a number. Add the sum of its digits to the product of its digits. If the value is equal to the number input, then display the message "***Special 4-digit number*",** otherwise, display the message "***Not a special four-digit number***"

Example: Consider the number **1234.**

Sum of digits = 1 + 2 + 3 + 4 = 10

Product of digits = 1 * 2 * 3 * 4 = 24

Sum of the sum of digits and product of digits **= 10 + 24 = 34** (which is not 1234)

Therefor, **1234 is not a special four digit number.**