Solution at the end

ANNUAL EXAMINATION : 2023-24

Class - IX

Time : 2 hrs. **Subject - Computer Application** **M.M. : 100**

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 to write the answers.

This paper is divided into TWO sections.
Answer ALL the questions in Section A and any FOUR questions from Section B.
The intended marks for questions or parts are given in [ ].

SECTION - A [40 MARKS]

Attempt ALL questions from this section.

Q.1- Choose the correct answer and write the correct option. [20]

a. Name the feature of Java depicted in the picture.

i. Encapsulation

ii. Inheritance

iii. Abstraction

iv. Polymorphism

b. **Assertion (A) :** The upper case and lower case letters are distinguished by Java language.

Reason (R) : Java is Case sensitive.

i. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

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

iii. Assertion (A) is true but Reason (R) is false.

iv. Assertion (A) is false but Reason (R) is true.

Primitive data types are pre-defined or built-in data types because the system developers of Java have defined them. These are also known as Basic Data Types.

Eg. byte, int, long, float, double etc.

Based on the above text, choose the correct option.

c. Which of the following type is an exact representation of fractional values?

i. char ii. double iii. byte iv. string

d. The scanner class belongs to the ____ package.

i. java.util ii. java.io iii. java.lang iv. none of these

e. The basic elements in Java are known as ____ .

i. tokens ii. tickets iii. packets iv. coupons

f. The output of Math.abs(x), when x = -22. 4

i. -22.4 ii. 0.4 iii. 2.21 iv. none of these

g. switch statement cannot handle ____ point tests.
i. floating ii. integer iii. character iv. none of these

h. The storage size of char data type is :
i. 2 bytes ii. 3 bytes iii. 1 byte iv. none of these

i. The expression 11 % 3 returns :
i. 2 ii. 3 iii. 3.66 iv. none of these

j. What will be the result of ++m - - -n + m++, if m = 9 and n = 5?
i. 16 ii. 24 iii. 34 iv. 44

k. Which of the following will produce 9.0 if x = 9.9 ?
i. Math.ceil(x) ii. Math.floor(x)
iii. Math.abs(x) iv. Math.round(x)

l. Which of the following is not an entry controlled loop?
i. for ii. while iii. do-while iv. none of these

m. The person who breaks password, release viruses to corrupt the computer system are :
i. Cracker ii. Hacker
iii. Information warriors iv. None of these

n. Unwanted and illegal copying and use of software :
i. Commercial Software ii. Public domain software
iii. Software Piracy d. Site license

o. Software which converts the whole source program into object program at once is known as :
i. Interpreter ii. Compiler iii. Assembler iv. None of these

p. What is the fundamental unit of OOP?
i. Class ii. Object iii. Data iv. Function

q. The ASCII codes of uppercase characters range from :
i. 65 - 90 ii. 60 - 85 iii. 65 - 91 iv. 97 - 122

r. An escape sequence character begins with a ____ .
i. / ii. \ iii. // iv. \\

s. The loop which does not have the body of the loop is known as :
i. Infinite loop ii. Step loop
iii. Null loop iv. None of these

t. Copyright, patents and trademarks are the examples of :
i. Protocols ii. Cyber Law
iii. Ethics iv. Intellecutal property rights

Q.2- a. Write Java expression:- [2]

$a = 5x^3 + 2y^2 + xyz$

b. Give the output :- if a = 5 ; [2]

a = ++a - a++ + - -a

c. Rewrite the following using ternary operator:- [2]

```
if(bill > 10000)
    discount = bill * 10.0/100.0;
else
    discount = bill * 5.0/100.0;
```

d. Give the output of the following:- [2]

i. Math.pow(6, 2) + Math.cbrt(125)

ii. Math. ceil(4.2) + Math. floor(7.9)

e. Give the output of the following code and mention how many times the loop will execute? [2]

```
int v = 5;
while(- -v >= 0)
System.out.print(v) ;
```

f. Convert the following while loop to the corresponding for loop:- [2]

```
int m = 5, n = 10;
while ( n>=1)
{
    System.out.println(m * n) ;
    n- -;
}
```

g. Name the keyword for the following:- [2]

i. skips the rest of the loop body and transfers the control to the beginning of the loop body.

ii. used to exit from the switch block.

h. Find the errors in the given program and rewrite the statements correctly to give the output:- [2]

```
class Square
{
    public static void main (String args[ ])
    {
        int n = 625, r;
        r = sqrt(n) ;
        if (n == r)
            System.out.ptintln("Perfect Square") ;
        else
            System.out.println("Not a Perfect Square ") ;
    }
}
```

i. Name the following:- [2]

i. default delimiter used in Scanner class.

ii. package used for Math class.

j. Correct the errors (if any) and give the values of x and y. [2]

```
int a = 63, b = 36;
boolean x = (a > b) ? a : b;
int y = (a < b) ? a : b;
```

SECTION - B [60 MARKS]

Attempt any FOUR questions from this Section.

The answers in this section should consist of the programs either Blue J environment or any program environment with JAVA as the base.

Each program should be written using **variable description/mnemonic codes** such that the logic of the program clearly depicted. Flow charts and algorithms **are not required.**

Q.3- Bihar State Electricity Board calculates electricity bill for their consumer according to the units consumed per month as per the given tariff.

Units Consumed	Charges
Upto 100 units	₹ 1.80/unit
More than 100 units and upto 300 units	₹ 2.30/unit
More than 300 units and upto 500 units	₹ 2.80/unit
More than 500 units	₹ 3.50/unit

Write a program to input name of the consumer and units consumed. Calculate and display the electricity bill with all the details. [15]

Q.4- Write a menu driven program to perform the following according to user's choice. [15]

a. To find and print the factorial of a number. Eg (5! = 1 * 2 * 3 * 4 * 5)

b. To find and print the sum of digits of a number.

Q.5- Write the programs in Java to display the first ten terms of the following series:-

a. 2, 5, 10, 17, ... [7]

b. 24, 99, 224, 399, ... [8]

Q.6- Write the programs in Java to display the following patterns:-

a. [7]

```
1
2 1
3 2 1
4 3 2 1
5 4 3 2 1
```

b. [8]

```
1
1 0
1 0 1
1 0 1 0
1 0 1 0 1
```

Q.7- Without using if-else statement and ternary operator, input three unequal numbers and print the second smallest number. [15]

[Hint : Use Math.max( ) and Math.min( ) functions]

Sample Input : 52, 93, 74

Sample Output : 74

Q.8- Write a program to display all composite numbers from 1 to 100. A number is said to be composite, if it has two or more factors excluding 1 and the number itself. [15]

Sample Input : 6

Sample Output : Factors of 6 are 2 and 3
Hence, 6 is a composite number

Few eg. are 4, 6, 8, 9, 10, 12, 14, 15, 16, 18, 20, 21, ...

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MARKING SCHEME

Time: 2 hrs. **M.M. :100**

SECTION A
[40 marks]

Question 1 **[20 x 1 marks]**

a)	iii	k)	ii
b)	i	l)	iii
c)	ii	m)	ii
d)	i	n)	iii
e)	i	o)	ii
f)	iv	p)	ii
g)	i	q)	i
h)	i	r)	ii
i)	i	s)	iii
j)	i	t)	iv

Question 2

a. 5*x*x*x+2*y*y-x*y*z **[2 marks]**

b. 6 **[2 marks]**

c. d i s c o u n t = (bill>10000)? bill*10.0/100.0: bill*5.0/100.0; **[2 marks]**

d. i)41.0 ii) 12.0 **[2 marks]**

e. 4 3 2 1 0
5 times loop will execute **[2 marks]**

f)
```
int m=5;
for(n=10;n>=1;n--)
  {
    System.out,println(m*n);
    }
```
[2 marks]

g) i.continue
ii.break **[2 marks]**

h)
```
class Square
{
public static void main(String args[])
{
int n=289,r; r=(int)Math.sqrt(n);
if(n==r)
System.out.println("Perfect Square"); else
System.out.println("Not a Perfect Square");
}
}
```
[2 marks]

i) i. whitespace
ii.java.lang **[1+1 marks]**

j)
```
int a=63 b=36:
boolean x=(a>b)?true:false;
int y=(a<b)?a:b;        x=true
y=36
```
[1+1 marks]

SECTION B

Question 3

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

```
    public static void main(String args[])
  {
       Scanner in = new Scanner(System.in);
       System.out.print("Enter Consumer Name: ");
       String name = in.nextLine();
       System.out.print("Enter Unit's Consumed: ");
       int units = in.nextInt();
  double amt = 0.0;
  if (units <= 200)
  amt = units * 3.8;
   else if (units <= 300)
          amt = (200 * 3.8) + ((units - 200) * 4.4);        else if
  (units <= 400)
          amt = (200 * 3.8) + (100 * 4.4) + ((units - 300) * 5.1);        else
          amt = (200 * 3.8) + (100 * 4.4) + (100 * 5.1) + ((units - 400) * 5.8);
        System.out.println("Consumer Name: " + name);
       System.out.println("Units Consumed: " + units);
       System.out.println("Bill Amount: " + amt);
    }
  }
```

[13 for logic+2 for VD table]

Question 4

```
import java.util.*;
  public class Menudriven
  {
     public static void main(String args[])
   {
       Scanner in = new Scanner(System. in);
       System.out.println("1. Factorial of number ");
       System.out.println("2. Sums of the digits of a number");
       System.out.print("Enter your choice: ");
  int choice = in.nextInt();
        System.out.print("Enter number: ");
          Int num = in.nextInt();
  switch (choice)
       {          case 1:
                   int f = 1;
          for (int i = 1; i <= num; i++)
          {
             f *= i;
          System.out.println("Factorial = " + f);
  break;
  case 2:
          int sum = 0;
          while (num != 0)
         {
          sum += num % 10;
           num /= 10;
         }
          System.out.println("Sum of Digits " + " = " + sum);
  break;
  default:
          System.out.println("Incorrect Choice");
  break;
       }
    }
  }
```

[13 for logic+2 for VD table]

Question 5:

a)

```
public class Series1
{
   public static void main(String args[])
  {
      for (int i = 1; i <= 10; i++)
     {
        System.out.print((i * i + 1) + " ");
      }
   }
}
```

[5 for logic+2 for VD table]

b)-

```
public class Series2
   {
      public static void main(String args[])
       {
         for (int i = 5; i <= 50; i = i + 5)
          {
           int term = (int)(Math.pow(i, 2) - 1);
           System.out.print(term + " ");
         }
       }
   }
```

[6 for logic+2 for VD table]

Question 6

a)

```
public class Pattern1
{
    public static void main(String args[])
     {
       for (int i = 1; i <= 5; i++)
        {          for (int j = i; j >= 1; j--)
         {
            System.out.print(j + " ");
          }
          System.out.println();
       }
    }
}
```

[5 for logic+2 for VD table]

b)

```
public class Pattern2
  {
    public static void main(String[] args)
      {
       for (int i = 1; i <= 5; i++)
         {
         for (int j = 1; j <= i; j++)
           {             if ( j % 2 == 0)
            {
              System.out.print("0"+ " " );
                    }
        else
            {
              System.out.print("1"+ "  " );
           }
         }
         System.out.println();
       }
    }
}
```

[6 for logic+2 for VD table]

Question 7

```
import java.util.*;
public class Number
{
        public static void main(String args[])
        {
          Scanner in = new Scanner(System.in);
          System.out.println("Enter 3 unequal numbers");
      System.out.print("Enter first number: ");
      int a = in.nextInt();
          System.out.print("Enter second number: ");
      int b = in.nextInt();
           System.out.print("Enter third number: ");       int c =
      in.nextInt();
      int sum = a + b + c;
      int big = Math.max(a, b);
      big = Math.max(big, c);
      int small = Math.min(a, b);
      small = Math.min(small, c);
      int result = sum - big - small;
      System.out.println("Second Smallest Number = " + result);
          }
  }
```

[13 for logic+2 for VD table]

Question 8

```
  class ComposieNumber
  {
    public static void main(String[]Args)
   {
      for (int i = 0; i <= 100; i++)
     {
        for (int j = 2; j <= i/2; j++)
       {
         if (i % j == 0)
          {
            System.out.println(i);
              break;
    }
   }
  }
 }
}
```

[13 for logic+2 for VD table]