DELHI PUBLIC SCHOOL NEWTOWN
SESSION 2023-24
HALF-YEARLY EXAMINATION

CLASS: IX **FULL MARKS:100**
SUBJECT: COMPUTER APPLICATIONS [SET A] **TIME: 2 hours**

Answer 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 consists of six 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[].

Sectiom A(40 Marks)
(Attempt all questions from this section)

Question 1

Choose the correct answer from the choices given: **[1×20=20]**

i) Which of the following keywords is used to create an instance of a class?

(a) new (b) public (c) class (d) main

ii) Find the output of the following code.

```
int ++a = 2;      System.out.println (++a);
```

(a) 4 (b) Compile error (c) 3 (d) 2

iii) Which of the following statements is valid for the objects?

(a) They possess same characteristics and behaviour.

(b) They possess same characteristics but different behaviour.

(c) They possess different characteristics and different behaviour.

(d) They possess different characteristics but common behaviour.

iv) Java Virtual Machine (JVM) is an:

(a) Interpreter (b) compiler (c) machine code (d) byte code

v) How many times will "flower" be printed?

```
int count = 0;
do {  System.out.println ("Interview");      count++;
   } while (count < -2);
```

(a) 0 (b) 1 (c) error (d) 2

vi) Given: String st = (a>= 90)? "Excellent": "Best"; Predict the output, when a = 90.

(a) Best (b) Excellent: Best (c) Best: Excellent (d) Excellent

vii) Which of the following is the correct precedence of logical operators?

(a) !, &&, || (b) &&, !, || (c) ||, !, && (d) &&, ||, !

viii) When is the object created with new keyword?

(a) At run time (b) At compile time (c)Depends on the code (d)Independents on the code

ix) What is the value stored in c:

```
double c;    int x, y, z;    x = 5; y = 10; z = 11;        c = x*y+z/2;
```

(a) 55.0 (b) 55.5 (c) 55 (d) none

x) Boolean Data is used to test a particular condition i.e. true or false. Which of the following is a correct representation?

(a) boolean m=true (b) boolean m='true' (c) boolean m="true" (d) none

xi) Predict the output: System.out.println(Math.ceil(-0.95));

(a) 0 (b) 0.0 (c) -0.0 (d) error

xii) If a, b and c are the sides of a triangle then which of the following statement is true:

```
if(a!=b && a!=c && b!=c)
```

(a) Equilateral triangle (b) isosceles triangle (c) scalene triangle (d) none

xiii) To find the sum of whole numbers upto 10, a loop runs:

(a) once (b) ten times (c) eleven times (d) nine times

xiv) To execute a loop 10 times, which of the following statement satisfies:

(a) for(i=6;i<=26;i=i+2) (b) for(i=3;i<=30;i=i+3)

(c) for(i=0;i<10;i=i++) (d) all of the above

xv) When outer loop completes its iterations, the inner loop starts.

(a) false (b) true

xvi) Given the initial value of a = -2, k = 0 in the following expression, k = k + a++ + ++a/2;

Find the final value of k.

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

xvii) An operator is basically a symbol which performs arithmetical and logical operations to yield meaningful results. There are three types of operators used to perform any operation in Java programming. They are arithmetical, relational and logical operators. The arithmetical operators are used to perform arithmetical calculations. They are unary, binary and ternary operators. The syntax of using ternary operator is: variable = (condition) ? exp 1 : exp 2;

Based on the above discussion, answer the following questions:

(a) A/An ..... operator works on a single operand.

1. binary 2. relational 3. unary 4. ternary

(b) Which of the following is not a logical operator?

1. ++ 2. && 3. || 4. !

(c) Which of the following constructs is equivalent to the ternary operator in Java language?

1. if 2. if-else 3. nested if 4. switch-case

(d) Which of the following is a relational operator?

1. & 2. $ 3. != 4. !

Question 2 **[2x10=20]**

a) Write an equivalent Java expressions for the following mathematical operations:-

$$(\sqrt{mn} + \sqrt[3]{m+n}) / \sqrt[2]{m\text{^}2}$$

b) Correct the errors in the given program:

```
class Square
{  public static void main( )
{  int n=289,r;
   r=sqrt(n);
   if(n==r)      System.out.println("Perfect Square");
   else          System.out.println("Not a Perfect Square");  } }
```

c) Convert the given program into do while:

```
class test
{   void main()
   {   intx,c;
      for(x=10,c=20;c>=10;c=c-2)
      {   x++; System.out.println(x); }}}
```

d) State one difference and one similarity between while loop and do-while loop.

e) Predict the output of the given snippet:

```
int a,b;
for (a=1; a<=2; a++)
{   for (b= (64+a); b<=70; b++)
    System.out.print((char) b);
    System.out.println( );  }
```

f) How is for(;;) and for(inti=1;i<10;i++); different from each other?

g) Give the output of the following code: When (i) o = 'b' (ii) o = 'x'

```
switch (o)  {
case 'a':
System.out.println("Platform Independent");
break;
case 'b':
System.out.println("Object Oriented");
case 'c':
System.out.println("Robust and Secure");
break;
default:   System.out.println("Wrong Input");   }
```

h) How many times the loop will execute in the given snippet. Give reason to support your answer and explain the mechanism behind.

```
for(i=5; ; i++)
{ i=i*2; }
```

i) Give the output of the following expression if a = -3, b= 2, c= 0

S = - -c + a++ * ((c-- % ++b) / 3):

j) Show the change in output of the given program when the *continue* statement is replaced with a *break* statement.

```
int a=3;
while(a<=10)
{ a++;
if(a==5)
continue;
System.out.println(a);}
```

Section B(60 marks)

[Attempt any four questions from this section.)

The answer 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]**

Write a menu driven program in Java to perform the following:

i) To print the series: 0, 3, 8, 15, 24, …. to n terms. (value of 'n' is to be an input by the user)

i) To find the sum of the series: S = (1/2) + (3/4) + (5/6) + (7/8) + ... + (19/20)

Question 4 **[8+7]**

i) Write a program in java to accept a number from the user and check whether it is a Palindrome number or not. Palindrome number: A number is a Palindrome which when read in reverse order is same as in the right order. Example: 11, 101, 151 etc.

ii)Write a program in java to accept a number from the user and check whether it is a Perfect number or not. Perfect number: A number is called perfect if it is equal to the sum of its factors other than the number itself. Example: 6 = 1 + 2 + 3

Question 5 **[15]**

Employees at Arkenstone Consulting earn the basic hourly wage of Rs.500. In addition to this, they also receive a commission on the sales they generate while tending the counter. The commission given to them is calculated according to the following table:

Total Sales	Commmision Rate
₹ 100 to less than ₹ 1000	1%
₹ 1000 to less than ₹ 10000	2%
₹ 10000 to less than ₹ 25000	3%
₹ 25000 and above	3.5%

Write a program in Java that inputs the name of the employee, number of hours worked and the total sale of the employee. Compute the wage of the employee and display all the required details.

Question 6 **[15]**

A Pre-Paid taxi charges from the passenger as per the tariff given below:

Distance	Rate
Up to 5 km	₹ 100
For the next 10 km	₹ 10/km
For the next 10 km	₹ 8/km
More than 25 km	₹ 5/km

Write a program to input the passenger's name, taxi no. distance covered and calculate the amount paid by him. The program displays the printed bill with the details given below:

Passenger name :

Taxi No. :

Distance covered :

Amount :

Question 7 **[15]**

1. Write a program in Java to generate the following patterns:-

i)	**ii)**
1	**# @ # @#**
2 1	**@#@#**
3 2 1	**#@#**
4 3 2 1	**@#**
5 4 3 2 1	**#**

Question 8 **[15]**

Write a program to calculate and display the factorials of all the numbers between 'm' and 'n' (where m<n, m>0, n>0). [Hint: factorial of 5 means: 5!=5*4*3*2*1]