DELHI PUBLIC SCHOOL NEWTOWN
SESSION: 2023-2024
FINAL 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 consists of five 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(40 Marks)

(Attempt all questions from this Section)

Question 1: Choose the correct answer and write the correct option: [1x20=20]

(i) Which of the following is a valid integer constant: I. 4 II. 4.0 III. 4.3f IV. "four"
(a) only I (b) I and III (c) II and IV (d) I and II

(ii) Predict the output, assuming that the method is called and 0.5 is passed as the value of x:
static double cal(double x)
{ return Math.round(x); }
(a) 1 (b) 1.0 (c) 0 (d) 0.0

(iii) Function signature refers to:
(a) function name, parameter list and its data type (b) parameter list and its data type
(c) function name (d) return type, function name, parameter list and its data type

(iv) The ternary statement uses the colon (:) to represent a/an _____
(a) if condition (b) else condition (c) if-else condition (d) both b and c

(v) The _____ are real life entities in a class.
(a) behaviour (b) objects (c) characteristics (d) modules

(vi) Real life example of class and object is:
(a) vehicles □ car, bike, bus (b) Audi Q3, Audi Q5, Audi Q7
(c) car □ SUV, Sedan (d) both a and c

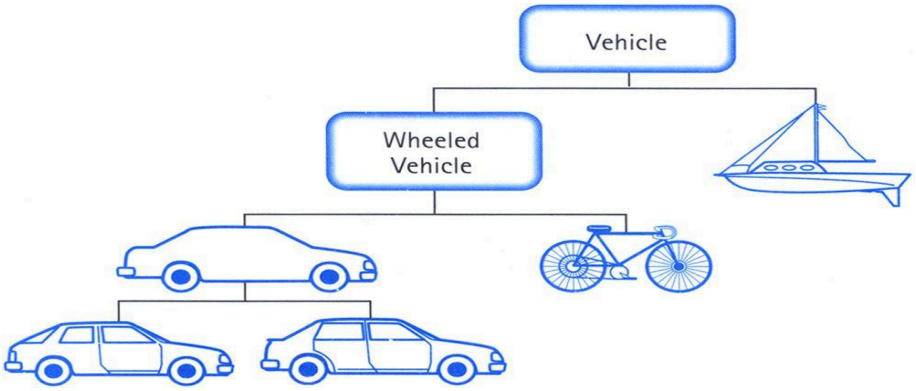
(vii) Identify the type of error in the statement: System.out.println(Math.max(0,-1)+(-5));
(a) runtime error (b) logical error (c) syntax error (d) no error

(viii) Choose the odd one: (a) double (b) int (c) char (d) String

(ix) Assertion(A): The for loop is a control flow statement iterating a part of program multiple times.
Reason(R): If the number of iterations is fixed, it is recommended not to use for loop.
(a) Both Assertion (A) and Reason (R) are true and (R) is a correct explanation of (A)
(b) Both Assertion (A) and Reason (R) are true and (R) is not a correct explanation of (A)
(c) Assertion (A) is true and Reason (R) is false

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

(x) Which concepts of java is shown in the given picture?



(a) encapsulation (b) polymorphism (c) abstraction (d) inheritance

(xi) Answer question (xi – xv) based on the program given below:

The following program segment calculates the norm of a number. The norm of a number is the square root of sum of squares of all the digits of the number. Sample Input: 68 Sample Output: The norm of 68 is 10. [Hint: 6x6 + 8x8 = 36 + 64 = 100. The square root of 100 is 10. Hence, norm of 68 is 10].There are some places in the program left blank marked with ?1?, ?2?, ?3? , ?4? and ?5? to be filled with variable/function/expression.

```
Scanner in = new Scanner(System.in);
int num;
int d, s = 0;
num = ......?1?.....
while (.....?2?.....)
{   d = num % 10;
    s = .....?3?.....
    num = ….?4?.....;}
System.out.println("The norm of " + num + " is " + .....?5?.....);
```

Which of the following will be filled in place of ?1?

(a) in.nextInteger; (b) in.NextInt( ); (c) in.nextInt( ); (d) in.nextint( );

(xii) What will you fill in place of ?2?

(a) num > 0 (b) num < 0 (c) num > 1 (d) num = 0

(xiii) What will you fill in place of ?3?

(a) s + d * d (b) s * d + d (c) s * s + d (d) s + d

(xiv) What will you fill in place of ?4?

(a) num/10 (b) num%10 (c) 10%num (d) 10/num

(xv) What will you fill in place of ?5?

(a) Math.sqrt(s) (b) Math.SQRT(s) (c) Math.sqrt(n) (d) Math.sqrt(num)

(xvi) How to call a class *orange* from a *fruit* package, which is inside a subclass *citrus*?

(a) import citrus.fruit.orange (b) import fruit.orange.citrus

(c) import orange.citrus.fruit (d) import fruit.citrus.orange

(xvii) Assertion(A): An expression is a combination of operands and operators.

Reason(R): The order of evaluation of operators is determined by the precedence of operators.

(a) Both Assertion (A) and Reason (R) are true and (R) is a correct explanation of (A)

(b) Both Assertion (A) and Reason (R) are true and (R) is not a correct explanation of (A)

(c) Assertion (A) is true and Reason (R) is false

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

(xviii) What would be the result of the following two expressions, if i=25 initially?

a. ++i<=25 b. i++<=25

(a) true, false (b) false, true (c) true, true (d) false, false

(xix) Which of the following packages contains math functions?

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

(xx) The statement ((1 > 0) || (1 < 0)) evaluates to _____.

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

Question 2: [2x10=20]

(i) Is it necessary to include default case in a switch statement? Justify.

(ii) Predict the output:-

```
class fg
{ static void main()
  {  if(Math.floor(-2.5) < Math.ceil(1.5))
     System.out.println(Math.cbrt(0.001+0.026));
     else    System.out.println(Math.sqrt(0.5+0.5));    }}
```

(iii) Write the java expression: $\sqrt{3a^2 + 2(x/y) - b^{2a}}$

(iv) Predict the output:

```
int m = -2;
int n = 10;
for(int i = 1 ; i < 5 ; i++)
m++;
--n;
System.out.println(" m = " + m);
System.out.println(" n = " + n);
```

(v) If m = 7, n = 6, s = 7, evaluate the following expressions:

(a) (m < =n) && (n != s) || ((s % n) > 10)

(b) ((s + n) != m) || (m + n == s) && (s >= m)

(vi) Write the equivalent code using ternary operator:

```
int x = 89, y=0;
if( x > = 100)
y -=y ;
else  y +=y ;
System.out.println(y);
```

(vii) Predict the value of *num* after the execution of the following code. Also find the number of times loop is executed.

```
int num=0;
for( int j=9;j>=6;j--)
{  if( j%3 == 0 )
   num = num+j;
   else     num=num-j;   }
```

(viii) Sam wants to print the following pattern. He designed the code but the code is not giving the

correct output. What are the changes required to correct the code in achieving the output?

```
1
2 1
3 2 1
4 3 2 1
5 4 3 2 1
public class Pattern
{   public static void main(String args[])
    {  for (int i = 1; i >= 5; i++)
       {  for (int i = i; j >= 1; j--)
          {   System.out.print(j - " ");  }
           System.out.print( );  } } }
```

(ix) Evaluate the expression, if int a = 0, b = -1:

```
double c= (--a * --b) / a++ + 1/2.0 * --b;
```

(x) Give one point of similarity and one difference between while and do while loop.

Section B (60 Marks)

(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]**

Write a java program to judge the performance of a cricketer based on the given criteria:

Class name: cricket

Data members: Player's name, total runs, number of wickets, number of innings played

Member functions:

void input( ): to take input of the data members

void calculate( ): to judge the performance of the cricketer as per the given norms:

Average run = Total runs / number of innings played

Average wickets = number of wickets / number of innings played

Average runs and wickets	Judgement
Average runs >= 40 and Average wickets >= 2	All Rounder
Average runs >= 50	Batsman
Average wickets >= 4	Bowler
Otherwise	Fielder

void display( ): to display output in the given format:

Sample Input:

Name: Hardik Pandya

Runs: 1457

Wickets: 72
Innings: 35
Sample output: Hardik Pandya ----- All Rounder

Question 4 **[15]**

A magic number is a number in which the entered sum of digits of the number is equal to 1.
Example 1: 172 = 1 + 7 + 2 = 10, 10 = 1 + 0 = 1, therefore, 172 is a magic number.
Example 2: 173 = 1 + 7 + 3 = 11, 11 = 1 + 1 = 2, therefore, not a magic number.
Design a class Magic to check if a given number is a magic number or not.

Question 5 **[15]**

Write a program to draw the following patterns using functions. Also write the main( ) method.

(i) void pat1( ):

```
A
B C
D E F
G H I J
K L M N O
```

(ii) void pat2( ):

```
a b c d e
B C D E
c d e
D E
e
```

Question 6 **[15]**

Design a class Armstrong_series with two methods:

- **boolean getArmstrong(int n) it checks and returns true if number *n* is armstrong otherwise returns false. A positive integer of n digits is called an Armstrong number of order n (order is number of digits) if, abcd... = pow(a,n) + pow(b,n) + pow(c,n) + pow(d,n) + ... Input : 153 Output : Yes, 153 is an Armstrong number. (1*1*1 + 5*5*5 + 3*3*3 = 153)**
- **void printSeries() to generate first ten armstrong numbers by calling getArmstrong(int n) method to determine if the number is armstrong or not. [Hint: 1,2,3,4,5,6,7,8,9,153]**

Question 7 **[15]**

Design a class with the following methods:

1. **void calculate1(int m, int n) with two integer arguments. The method calculates and displays all the prime numbers between 'm' and 'n' (where m<n, m>0, n>0).**
2. **double calculate2( ): The method inputs the values of 'x' and 'n' and prints the sum of the given series. S= 1 + (x+2)/2! + (2x+3)/3! + (3x+4)/4! + ….. to n terms.**
   Also write the main( ) method to implement the functions.

Question 8 **[15]**

A paper roll manufacturing company offers a discount to the dealer and retailer based on the length of the paper roll as per the following criteria:

Length of the Paper	Dealer	Retailer
Upto 10 meters	10%	8%
11 to 20 meters	15%	10%
20 to 40 meters	20%	12%
More than 40 meters	25%	15%

Write a menu driven program to input the length of the paper roll and the amount of purchase. Use

a menu driven approach, having choices (D) for the dealer and (R) for the retailer, to find and print the amount to be paid to the company after discount.