GARDEN HIGH SCHOOL

CLASS IX

Annual Examination 2017

Computer Applications (Theory)

Time: 2 hours Full Marks: 100

This Question Paper has five printed pages.

Answers must be written in the script/s provided. You will not be allowed to write for the first 15 minutes. This time must be spent in reading the Question Paper.

The time given at the head of this Paper is the time allowed for writing answers.

This Paper is divided into two sections.

Answer all the questions of Section A, and any four of Section B.

Maximum marks for a question or part of a question are given in brackets [ ].

SECTION A (40 marks)

Answer all the questions.

Question No 1

(a) Class is an object factory – explain the statement. [2]

(b) State any two features of Java. [2]

(c) What is *JVM*? [2]

(d) Differentiate between *call by value* and *call by reference*. [2]

(e) What is a function signature? [2]

Question No 2

(a) What is the significance of the keyword 'final'? Give an example. [2]

(b) Write the Java expression for: $\frac{1}{2}$ ab – $\frac{1}{2}$ cd. [2]

(c) State the size in bytes of the following data types: [2]

(i) char (ii) boolean

(d) What is the role of the keyword 'void' in declaring functions? [2]

(e) Explain the significance of the keyword 'static'. [2]

Question No 3

(a) (i) If x = –9.99, calculate: Math.ceil (x)

(ii) If x = 9.0, calculate: Math.floor (x)

(iii) System.out.println (Math.max (–18, –19)); [3]

(b) Find the output of the following: [2]

(i)
```
int m = 11, n = 10, p;
p = (n – –)% 4 + (m – –)% 2;
System.out.println  (“p = ” + p);
```

(ii) [2]
```
int a = 5;
a++;
System.out.println (a);
a – = (a – –) – (– –a);
System.out.println (a);
```

(c) Determine how many times the following loop will be executed and give the output. [3]
```
int m = 1, i = 3;
while (++ i < 7)
m*= i;
System.out.println (m);
```

Question No 4

(a) Convert the following into a ‘for’ loop: [2]
```
int i = 0;
while (i < = 20)
{
   System.out.println (1 + “ ”);
       i ++;
}
```

(b) Rewrite the following using the ternary operator: [2]
```
if (a > b)
  {
    if (a > c)
       x = 0;
    else
       x = 1;
  }
else
       x = 2;
```

(c) Analyze the given program segment and answer the following questions:

```
for (x = 5; x < = 20; x + = 5)
        {
          if  (x% 3 = = 0)
             break;
          else if (x% 5 = = 0)
            System.out.println (x);
             continue;
        }
```

(i) Write the output. [2]

(ii) How many times does the body of the loop get executed? [1]

(d) Name the following: [3]

(i) An OOP principle which implements function overloading.

(ii) A function which converts a String value to int.

(iii) The default initial value of boolean variable data type.

SECTION B (60 marks)

Answer any <u>four</u> questions.

Answers should consist of programs in either Blue J environment or any program environment with Java as the base. Variable Descriptions/Mnemonic Codes should be used to write each program so that the logic of the program is clearly demonstrated.

Flow charts and algorithms are not required.

Question No 5

Write a menu-driven program to calculate the sum of the following series: [15]

(a) $S = \frac{1}{3!} + \frac{1}{5!} + \frac{1}{7!} + ... + \frac{1}{15!}$

(b) $S = \frac{x^2}{2} - \frac{x^3}{3} + \frac{x^4}{4} - \frac{x^5}{5} + ... + \frac{x^{12}}{12}$

Question No 6

Write a menu-driven program to perform the following as per the user's choice: [15]

(a) Calculate and print the sum of the squares and the sum of the cubes of the first n natural numbers.

(b) Input a number and find the smallest digit of the number:

eg sample input: 6428

sample output: 2

Question No 7

Write a program to overload the function area ( ), in the following manner: [15]

(a) Display the area of an equilateral triangle.

area of an equilateral triangle = $\sqrt{\frac{3}{4}}s^2$ where s = side

(b) Display the area of an isosceles triangle.

area of an isosceles triangle = $\frac{1}{4}b\sqrt{4a^2 - b^2}$

where a = equal sides of the triangle and b = base

Write a main ( ) method to call the overloaded methods.

Question No 8

Write a program to input a number and check whether it is an Automorphic number.

(An Automorphic number is a number which is contained in the last digit(s) of its square. *eg* 25 as its square is 625 and 25 is present as the last two digits) [15]

Question No 9

Write a program to display all the 4-digit palindromic prime numbers.

(A palindromic number is one whose reverse is the same as the number itself. *eg* 1331) [15]

P.T.O

Question No 10

A company announces an increment of their employees' basic salary on seniority basis:

[15]

Age	Increment
56 years and above	20% of basic
above 45 years and below 56	15% of basic
upto 45 years	10% of basic

Write a program to calculate the new basic salary by using the following class specification:

Data Members	Description
String name	name of the employee
double basic	basic pay of the employee
int age	age of the employee

Member methods:

(i) void get data ( ) – to accept name, basic, age

(ii) void calculate ( ) – to calculate increment and update basic and display name and updated basic.

(iii) main ( ) function to create an object of the class and call the above methods.