H2126947

COMPUTER APPLICATIONS

Maximum Marks: 100

Time allowed: Two hours

1. *Answers to this Paper must be written on the paper provided separately.*
2. *You will **not** be allowed to write during the first **15** minutes.*
3. *This time is to be spent in reading the question paper.*
4. ***The time given at the head of this Paper is the time allowed for writing the answers.***

5. *This Paper is divided into **two** Sections.*
6. *Attempt **all** questions from **Section A** and **any four** questions from **Section B.***
7. *The intended marks for questions or parts of questions are given in brackets[ ].*

Instruction for the Supervising Examiner

Kindly read aloud the Instructions given above to all the candidates present in the Examination Hall.

This paper consists of 12 printed pages.

SECTION A (40 Marks)

*(Attempt **all** questions from this **Section**.)*

Question 1

Choose the correct answers to the questions from the given options. [20]

(Do not copy the questions, write only the correct answers.)

(i) Character class methods are found in the ***package*** called:

(a) java.util

(b) java.lang

(c) java.awt

(d) java.io

(ii) System.out.println(**'Z'+32**); will display:

(a) z

(b) Z

(c) 122

(d) 154

(iii) ***double x [ ]={2.5,4.5,5.5,6.4};*** occupies _____ bytes.

(a) 16

(b) 4

(c) 8

(d) 32

(iv) The output of ***42/6%2*** is:

(a) 1

(b) 10

(c) 2

(d) 0

(v)

 Mouse	 Keyboard	 Printer
 Scanner	 Barcode Scanner	 Microphone

Consider the ***Two dimensional array P[2][3]***, of peripherals (input / output devices) given above, state the index of the device ***Barcode Scanner***.

(a) P[1][1]

(b) P[0][1]

(c) P[1][2]

(d) P[0][0]

(vi) Which of the following is ***user defined data type***?

1. array	3. class
2. double	4. boolean

(a) only 1

(b) 1 and 3

(c) only 2

(d) only 4

(vii) Select the ***infinite*** loop:

(a) for(int i=1;i<=10;i++)

(b) for(int i=2; i!=0 ;i-=3)

(c) for(int i=5 ;i<=5;i++)

(d) for(int i =1;i>=1; i - -)

(viii) The output of ***Math.max(-7, Math.min(-5 ,-4))*** is:

(a) –5

(b) –4

(c) –7

(d) error

(ix) Which of the following ***is true*** for the given object creation statement?

Game cricket = new Game( );

(a) Game is an object of cricket class

(b) New keyword creates object Game

(c) Game is a class and cricket is an object

(d) Game and cricket are objects

(x) ***Post office*** is an example for _____ access specifier.

(a) public

(b) local

(c) protected

(d) private

(xi) **Assertion (A):** In switch case ***break*** statement avoids fall through.

Reason (R): ***break*** statement helps to execute only one case at a time.

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

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

(c) (A) is true and (R) is false.

(d) (A) is false and (R) is true.

(xii) A physical education teacher asks the students to do the ***side stretch*** as shown below, 10 times. Which ***programming construct*** the teacher uses?

(a) if

(b) switch

(c) for

(d) if else if

(xiii) The ***index (subscript)*** of the last element of an array ***ar[ ]*** is:

(a) ar.length( )

(b) ar[ ].length

(c) ar.length()-1

(d) ar.length-1

(xiv) **Assertion (A):** A clock is a real-life example of ***nested loops***.

Reason (R): The hour hand moves through 12 positions, while the minute hand moves through 60 positions within each hour.

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

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

(c) (A) is true and (R) is false.

(d) (A) is false and (R) is true.

(xv) Which of the following ***pairs of methods*** will cause a ***compile-time error*** due to incorrect method ***overloading***?

(a) void test(int a, int b) and void test(double a, double b)

(b) void test(int a, double b) and void test(double a, int b)

(c) void test(int a, double b) and void test(int a)

(d) void test(int a) and int test(int a)

(xvi) Which of the following converts *"25"* to *25.0*?

(a) Double.Parsedouble("25")

(b) Double.parse("25")

(c) Double.parseDouble("25")

(d) Double.parseDouble(25)

(xvii) Consider the program segment:

```
int p=0;
for(p=4 ; p>0 ; p- =2);
System.out.print(p);
System.out.println(p);
```

The above statements will display:

(a) 42

(b) 4200

(c) 0
0

(d) 00

(xviii) ***System.out.println("I said,\"It\'s wise to obey elders.\"");***

The *output* of the above statement is:

(a) I said,'It is wise to obey elders.'

(b) I said, "It's wise to obey elders."

(c) I said,It's wise to elders.

(d) "'It's wise to obey elders.'"

(xix) What is the ***output*** of the statement given below?

"ANGER".compareTo("ANGEL")

(a) 3

(b) –6

(c) 6

(d) 0

(xx) Consider the following program segment in which the statements are ***jumbled***. Choose the ***correct order*** of statements to calculate and return the ***factorial of 4***.

for (k=1; k<=4; k++) ⟶ 1

return fa; ⟶ 2

long fa = 1, k; ⟶ 3

fa*=k; ⟶ 4

(a) 1, 2, 3, 4

(b) 3, 1, 4, 2

(c) 3, 1, 2, 4

(d) 1, 3, 2, 4

Question 2

(i) Write the ***java expression*** to find the product of square root of **P** and the square root of **Q** using the methods of ***Math class***. [2]

(ii) Write the ***output*** of the following String method: [2]

```
String x= "talent" ;  String y="matrix";
System.out.print(x.substring(3).concat(y.substring(3)) ;
```

(iii) Write the Java statement for creating an object named ***'sifra'*** of the class ***'Robot'***, which takes ***three double parameters***. [2]

(iv) Convert the given loop into **exit controlled loop.** [2]

```
int a,b;
for ( a=10 ,b=1; a>=1 ;a-=2)
{
b+=a;
b++;
}
System.out.print(b);
```

(v) Consider and give the ***output*** of the following program: [2]

```
class report
{  int a,b;
   report()
   {  a=10;
      b=15;
   }
   report(int x, int y)
   {  a=x;
      b=y;
   }
   void print()
   {  System.out.println(a*b);
   }
   static void main()
   {  report r = new report();
      r.print();
      report p = new report(4, 5);
      p.print();
   }
}
```

(vi) (a) Name one ***String method*** which results in ***positive integer only***

(b) Name one ***String method*** which results in a ***character*** [2]

(vii) John was asked to write a Java code to calculate the ***surface area of a cone***, the following code was written by him: [2]

Surface area of cone is $A=\pi rl$ $\quad l = \sqrt{r^2 + h^2}$

```
class area
{    double area (double r, double h)
   {  double l, a:
      a=22.0/7*r*l;
      l=Math.sqrt(r*r+h*h);
      return a;
   }
}
```

Specify the ***type of the error*** in the above program, correct and write the program to be error free.

(viii) Consider the following array and answer the questions given below: [2]

int a[ ] = {12,10,8,4,6,2,3,5,7}

(a) What is the ***output*** of System.out.print***(a[0]+a[5])***;?

(b) What is the ***index (subscript)*** of the ***largest*** element of the array ***a[ ]***?

(ix) (a) Write the Java statement to initialise the ***first 6 odd numbers*** in a 3×2 array. [2]

(b) What is the result of ***x[0][1] + x[2][1]*** of the above array?

(x) Give the ***output*** of the following program segment and specify ***how many times*** the loop is executed. [2]

```
String s = "JAVA";
for(i=0;i<s.length();i+=2)
System.out.println(s.substring(i);
```

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]

Define a ***class*** named ***CloudStorage*** with the following specifications:

- ***Member Variables:***
  - int acno - stores the user's account number.
  - int space - stores the amount of storage space in GB purchased by the user.
  - double bill - stores the total price to be paid by the user.
- ***Member Methods:***
  - void accept() - prompts the user to input their account number and storage space using Scanner class methods only.
  - void calculate() - calculates the bill total price based on the storage space purchased using the pricing table provided:

Storage range	Price per GB (Rs)
First 15 GB	15
Next 15 GB	13
Above 30 GB	11

  - void display() - displays the account number, storage space and bill to be paid.

Write a ***main method*** to create an ***object*** of the class and ***invoke*** the methods of the class with respect to the object.

Question 4 [15]

Define a ***class*** to accept values into a 4 x 4 integer array. Calculate and print the ***NORM*** of the array.

NORM is the square root of sum of squares of all elements.

1	2	1	3
5	2	1	6
3	6	1	2
3	4	6	3

Sum of squares of elements = 1+4+1+9+25+4+1+36+9+36+1+4+9+16+36+9 = 201

NORM = Squareroot of 201 = 14.177446878757825

Question 5 [15]

Define a ***class*** to accept a String and Print if it is a ***Super string*** or not. A ***String is Super*** if the ***number of uppercase letters*** are equal to the ***number of lower case letters***.

[Use Character & String methods only]

Example : "COmmITmeNt"

Number of Uppercase letters – 5

Number of Lowercase letters – 5

String is a Super String

Question 6 [15]

Define a ***class*** to initialise the following data in an array.

Search for a given character input by the user, using the ***Binary Search technique***.

Print ***"Search Successful"*** if the character is found otherwise print ***"Search is not Successful"***.

'A', 'H', 'N', 'P', 'S', 'U', 'W', 'Y', 'Z', 'b', 'd'

Question 7 [15]

Define a ***class*** to overload the method ***print( )*** as follows:

void print ( ) – To print the given format using nested loops.

@#@#@

@#@#@

@#@#@

@#@#@

double print(double *a*, double *b*) – To display the sum of numbers between ***a*** and ***b*** with difference of 0.5.

e.g. if $a = 1.0$, $b = 4.0$

output is: 1.0 + 1.5 + 2.0 + 2.5 + ... + 4.0

int print(char ch1, char ch2) – compare the two characters and return the ASCII code of the largest character.

Question 8 [15]

Define a ***class*** to accept a number. Check if the sum of the ***largest digit*** and the ***smallest digit*** is an even number or an odd number. ***Print appropriate messages.***

Sample Input:	6425	3748
Largest digit:	6	8
Smallest digit:	2	3
Sample Output:	Sum is even	Sum is odd