Answers to this paper must be written on the paper provided separately.

This paper is divided into two sections.

You are to answer **all** questions in Section A, and any **four** questions in 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.

a) What is meant by precedence of operators?

b) What is the difference between a break statement and a continue statementin a loop?

c) Name the methods of Scanner class that :

i) is used to input an integer data from the standard input stream.

ii) is used to input a String data from the standard input stream.

d) Give one point of difference between unary and binary operators.

e) What are the two ways of invoking functions?

Question 2.

a) What are nested classes?

b) What are logical operators?

c) What is a compound statement? Give an example.

d) Give a difference between a constructor and a method.

e) Define the following :

i) Type Promotion

 ii) Type Conversion

Question 3.

a) What is the difference between print and println statements?

b) Give the functions of keywords used with main() method.

    i) public   ii) static   iii) void

c) What is a wrapper class? Give an example.

d) What is difference between *isUpperCase()* and *toUpperCase()*?

e) What is being computed in the following program code?

```
char ch;
if(ch>= 'A'&&ch<= 'Z')
ch+=32;
else if(ch>= 'a' &&ch<= 'z')
ch= ch-32;
```

Question 4.

a) What is the difference between length() and length function? Give one example of each.

b) What do you mean by a package? Give three examples, also write the way of using any one.

c) Write valid java statements to perform the following operations on strings.

i) Extract 8 characters from the 1st character to 5th character in string greenlawns.

ii) To print the position of the first occurrence of the letter 'r' in the above string.

d) Determine the total number of bytes occupied by array's.

i) int gr[15]   ii) double P[10]

e) Declare an array with 5 integers and initialize it with 5 prime numbers between 20 and 45

Section B
(*Answer any four questions from this section*)
(4X15 Marks)

Each program should be written in such a way that it clearly depicts the logic of the problem. This should be achieved by using mnemonic names and comments in the program.

Question 5.

Write a program to accept 10 different numbers in a Single dimensional Array. Display the sum of all the numbers which are divisible by either 3 or 5.

Question 6.

Write a program to accept 8 different city names in a single Dimensional Array. Arrange the names in ascending order by using the 'Bubble Sort' technique and display them.

Example : Delhi, Mumbai, Hyderabad, Bangalore, Agra

 After sorting : Agra, Bangalore, Delhi, Hyderabad, Mumbai

Question 7.

Using the switch statement, write a menu driven program for the following:

i) to display the given pattern:

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

ii) to display the given pattern

```
I
I   C
I   C   S
I   C   S   E
```

For an incorrect option, an appropriate error message should be displayed.

Question 8.

Write a program to perform binary search on a list of integers given below, to search of an element input by the user, if it is found display the element along with its position, otherwise display the message "Search element not found".

5,9,13,17,23,26,29,31,37,41

Question 9.
Define a class employee described as below:

Data Members	int pan	to store personal account number
	String name	to store name
	double tax income	to store annual taxable income
double tax		to store tax that is calculated

Member functions:

input()   store the pan number, name, taxable income
calc()   calculate tax for an employee
display() Output details of an employee

Write a program to compute the tax according to the given conditions and display the output as per given format.

Total Annual Taxable Income   Tax Rate
UptoRs. 1,00,000   No Tax
From 1,00,001 to 1,50,000   10% of the income exceeding Rs. 1,00,000
From 1,50,001 to 2,50,000   ₹ 5000 + 20% of the income exceeding ₹ 1,50,000
Above ₹ 2,50,000₹ 25,000+30% of the income exceeding ₹ 2,50,000

Question 10.

Design a class to overload a function series as follows:

i) void series(inta,int n) with two integer argument to find and display the sum of the series.

$$S = 1 + \frac{a^2}{1!} + \frac{a^3}{2!} + \frac{a^4}{3!} + \text{.........................} \text{ to n}$$

ii) void series() to find and display the sum of the following series:

S=1+(1x2)+(1x2x3)+………………………(1x2x3x4…..x20)