COMPUTER APPLICATIONS

(Theory)

(Two 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 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.

(a) Define Unicode. [2]

(b) Identify the following conversions as Autoboxing or Unboxing: [2]

(i) Conversion of an Integer to an int.

(ii) Conversion of an int to an Integer.

(c) Name the following literals: [2]

(i) "ICSE"

(ii) '+'

(iii) 254

(iv) false

(d) Mention the two types of comments used in Java. [2]

(e) Rewrite the following using **for** loop:

```
int X = 10, Y = 5;
do
{
X++;
Y--;
} while(X<=15);
System.out.println (X + Y);
```

Question 2.

(a) Name the following: [2]

(i) Parameters present in the method call statement.

(ii) Smallest individual unit of a program.

(b) State the purpose of the following methods: [2]

(i) compareToIgnoreCase()

(ii) trim( )

(c) What is a constructor? [2]

(d) Write a prototype of the method **Show()** which receives a string and an integer as arguments and returns a character. [2]

(e) State the output of the following program segment: [2]

```
int n = 47389, d;
while (n > 10)
{
d = n % 10;
System.out.println(d);
n = n / 100;
}
System.out.println(n);
```

Question 3.

(a) Differentiate between the methods indexOf() and lastIndexOf(). [2]

(b) What is the value of **y** after evaluating the expression given below? [2]

y+= ++y +--y+y--; when int y =5

(c) Give the output of the following statements: [2]

```
System.out.println("Good".concat("Day"));
System.out.println("MERRYWORLD".substring(0,5));
System.out.println("My_dream".length());
System.out.println("Memory".startsWith("Me"));
```

(d) Write the output of the following statements: [2]

```
System.out.println("result 1=" +6+2);
System.out.println("result 2="+(6+2));
```

(e) Write the return data type of the following methods of Character class: [2]

(i) isLetter()

(ii) toUpperCase()

(f) Predict the output of the following: [2]

(i) Math.sqrt(196) + Math.pow(49,0.5);

(ii) Math.floor(17.9) + Math.ceil(-17.5);

(g) What will be the output when the following code segment is executed? [2]

```
int x=5; char ch ='C';
int y=ch+5;
System.out.println(y+ "  " + (char) y);
```

(h) What is the value of **x** and **y** in the following statements? [2]

int a = 63, b = 36;

(i) boolean x= (a<b)? true:false;

(ii) int y= (a<b)? a : b;

(i) What are library classes? Give an example. [2]

(j) Write a Java expression for the following: [2]

$$\frac{ax^2 + by}{2ab}$$

SECTION B (60 Marks)

Attempt ***any four*** questions from this Section.

The answers in this Section should consist of the ***Programs in either Blue J environment or any program environment with Java as the base.***

Each program should be written using ***Variable descriptions/Mnemonic Codes*** *so that the logic of the program is clearly depicted.*

Flow-Charts and Algorithms ***are not required.***

Question 4.

Design a class **Hotel** with the following description: [15]

Member variables:

String name	-	to store the name of the customer
long mno	-	to store the mobile number of the customer
double bill	-	to store the bill amount
double gst	-	to store the GST amount
double st	-	to store the service tax
double tamt	-	to store the total amount to be paid by the customer

Member methods:

void accept( ) - to accept customer's name, mobile number and bill amount.

void calculate() - to calculate GST, service tax and total amount to be paid by the customer.

gst = 18% on bill

st = 12.5% on bill

tamt = bill+ gst + st

void display () - to display the customer's name, mobile number, GST, service tax and total amount.

Write a main method to create an object and invoke the above member methods.

Question 5.

Write a program to input **n** number of integer elements in an array and sort them in **descending** order using **bubble sort** technique and print the sorted list. [15]

Question 6.

Write a menu driven program using **switch case** to accept a choice from the user and according to the choice entered perform the following operations: [15]

(a) To calculate and display the area of a **circle** using the formula

Area = ($\pi \times$radius^2) where π= 22/7

(b) To calculate and display the area of a **rectangle** using the formula

Area = (length × breadth)

(c) To calculate and display the area of a **triangle** using the formula

Area = 1/2 × base × height

(d) To calculate and display the area of a **square** using the formula

Area = side^2

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

Question 7.

Design a class to overload a method called **PattSeries()** as follows: [15]

(a) void PattSeries() - To generate and display the pattern given below:

5 4 3 2 1

4 3 2 1

3 2 1

2 1

1

(b) void PattSeries(int n) - To find and display the **sum** of the series given below:

$$\text{sum} = \frac{1}{3} + \frac{2}{4} + \frac{3}{5} \ldots\ldots\ldots\ldots\ldots \frac{n}{(n+2)}$$

Write a main method to create an object of the class and call the above member methods.

Question 8.

Write a program to input a number and check and print whether it is an **EvenPal** number or not. [15]

The number is said to be an EvenPal number when the number is a palindrome number and the sum of its digits is an even number.

Example:

Number 121 is a palindrome number and the sum of its digits is 1+2+1=4, which is an even number.

Therefore 121 is an EvenPal number.

Question 9.

A list contains marks in the subject Computer Applications for 'N' number of students. Write a program to create an array of size 'N' and store the marks. Check and print the number of students falling into the different ranges given below: [15]

100 – 80

79 – 60

59 – 40

39 – 20

19 – 0

```
a=0,b=0, c=0,d=0,e=0;

for(i=0      i<N;
{
  if(x[i]>=80)
    a++;
  elseif(x[i]>=60)
    b++;
```