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*

Question 1.

(a) Define abstraction. [2]

(b) Differentiate between searching and sorting. [2]

(c) Write a difference between the functions isUpperCase( ) and toUpperCase( ). [2]

(d) How are private members of a class different from public members? [2]

(e) Classify the following as primitive or non-primitive datatypes: [2]

(i) char

(ii) arrays

(iii) int

(iv) classes

Question 2.

(a) (i) int res = 'A'; [2]

What is the value of **res**?

(ii) Name the package that contains wrapper classes.

(b) State the difference between **while** and **do while** loop. [2]

(c) System.out.print("BEST "); [2]

System.out.println("OF LUCK");

Choose the correct option for the output of the above statements

(i) BEST OF LUCK

(ii) BEST

OF LUCK

(d) Write the prototype of a function **check** which takes an integer as an argument and returns a character. [2]

(e) Write the return data type of the following function. [2]

(i) endsWith()

(ii) log()

Question 3.

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

$$\frac{\sqrt{3x + x^2}}{a + b}$$

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

y+= ++y + y-- + -- y; when int y=8

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

(i) Math.floor (-4.7)

(ii) Math.ceil(3.4) + Math.pow(2, 3)

(d) Write two characteristics of a constructor. [2]

(e) Write the output for the following: [2]

```
System.out.println("Incredible"+"\n"+"world");
```

(f) Convert the following **if else if** construct into **switch case** [2]

```
if( var==1)
System.out.println("good");
else if(var==2)
    System.out.println("better");
else if(var==3)
    System.out.println("best");
else
    System.out.println("invalid");
```

(g) Give the output of the following string functions: [2]

(i) "ACHIEVEMENT".replace('E', 'A')

(ii) "DEDICATE".compareTo("DEVOTE")

(h) Consider the following String array and give the output [2]

```
String arr[]= {"DELHI", "CHENNAI", "MUMBAI", "LUCKNOW",
"JAIPUR"};
System.out.println(arr[0].length()> arr[3].length());
System.out.print(arr[4].substring(0,3));
```

(i) Rewrite the following using ternary operator: [2]

```
if (bill >10000 )
discount = bill * 10.0/100;
else
discount = bill * 5.0/100;
```

(j) Give the output of the following program segment and also mention how many times the loop is executed: [2]

```
int i;
for ( i = 5 ; i > 10; i ++ )
System.out.println( i  );
System.out.println( i * 4 );
```

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 **RailwayTicket** with following description: [15]

Instance variables/data members :

String name : To store the name of the customer

String coach : To store the type of coach customer wants to travel

long mobno : To store customer's mobile number

int amt : To store basic amount of ticket

int totalamt : To store the amount to be paid after updating the original amount

Member methods :

void accept () – To take input for name, coach, mobile number and amount.

void update() – To update the amount as per the coach selected

(extra amount to be added in the amount as follows)

Type of Coaches	**Amount**
First_AC	700
Second_AC	500
Third_AC	250
sleeper	None

void display() – To display all details of a customer such as name, coach, total amount and mobile number.

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

Question 5.

Write a program to input a number and check and print whether it is a **Pronic** number or not. (Pronic number is the number which is the product of two consecutive integers) [15]

Examples: $12 = 3 \times 4$

$20 = 4 \times 5$

$42 = 6 \times 7$

Question 6.

Write a program in Java to accept a string in lower case and change the first letter of every word to upper case. Display the new string. [15]

Sample input: we are in cyber world

Sample output: We Are In Cyber World

Question 7.

Design a class to overload a function volume() as follows: [15]

(i) double volume (double R) – with radius (R) as an argument, returns the volume of sphere using the formula.

$V = 4/3 \times 22/7 \times R^3$

(ii) double volume (double H, double R) – with height(H) and radius(R) as the arguments, returns the volume of a cylinder using the formula.

$V = 22/7 \times R^2 \times H$

(iii) double volume (double L, double B, double H) – with length(L), breadth(B) and Height(H) as the arguments, returns the volume of a cuboid using the formula.

$V = L \times B \times H$

Question 8.

Write a menu driven program to display the pattern as per user's choice.

[15]

Pattern 1	**Pattern 2**
ABCDE	B
ABCD	LL
ABC	UUU
AB	EEEE
A	

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

Question 9.

[15]

Write a program to accept name and total marks of **N** number of students in two single subscript array **name[ ]** and **totalmarks[ ]**.

Calculate and print:

(i) The average of the total marks obtained by **N** number of students.
[average = (sum of total marks of all the students)/N]

(ii) Deviation of each student's total marks with the average.
[deviation = total marks of a student – average]