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 the term *Byte code*. [2]

(*b*) What do you mean by type conversion ? How is implicit conversion from explicit conversion ? [2]

(*c*) Name two jump statements and their use. [2]

(*d*) What is an *Exception* ? Name two *Exception* handling blocks. [2]

(*e*) Write two advantages of using functions in a program. [2]

Question 2.

(*a*) State the purpose and return data type of the following String functions :

(*i*) index Of ().

(*ii*) compare To (). [2]

(*b*) What is the result stored in x, after evaluating the following expression

int x = 5; x = x++ * 2 + 3 * --x; [2]

(*c*) Differentiate between static and non-static data members. [2]

(*d*) Write the difference between length and length() functions. [2]

(*e*) Differentiate between *private* and *protected* visibility modifiers. [2]

Question 3.

(*a*) What do you understand by term *data abstraction* ? Explain with an example. [2]

(*b*) What will be the output of the following code ?

(*i*)
```
int m=2;
int n=15;
for (int i = 1 ; i<5; i++);
m++ ; -- n;
```

System.out.println("m="+m);
system.out.println("n="+n); [2]

(*ii*) char x='A'; int m;
m=(x=='a') ? 'A' : 'a';
System.out.println ("m="+m); [2]

(*c*) Analyse the following program segment and determine how many times the loop will be executed and what will be the output of the program segment.

```
int k=1, i=2;
while (++i<6)
k*=i;
System.out.println(k);
```
[2]

(*d*) Give the prototype of a function *check* which receives a character *ch* and an integer *n* and returns true or false. [2]

(*e*) State two features of a constructor. [2]

(*f*) Write a statement each to perform the following task on a string :

(*i*) Extract the second last character of a word stored in the variable *wd*. [2]

(*ii*) Check if the second character of a string *str* is in uppercase. [2]

(*g*) What will the following functions return when executed ?

(*i*) Math.max(-17, -19)

(*ii*) Math.ceil(7.8) [2]

(*h*) (*i*) Why is an object called an instance of a class ?

(*ii*) What is the use of the kyeword *import* ? [2]

SECTION – B (60 MARKS)

(Attempt any FOUR Questions)

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*** *such that the logic of the program is clearly depicted.* ***Flow-Charts and Algorithms are not required.***

Question 4.

Write a program to perform *binary search* on a list of integers given below, to search for 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"

5,7,9,11,15,20,30,45,89,97 [15]

Question 5.

Define a class student described as below :
Data members/instance variables :
name, age, m1, m2, m3 (marks in 3 subjects), maximum, average
Member methods :

(*i*) A parameterized constructor to initialize the data members

(*ii*) To accept the details of a student

(*iii*) To compute the average and the maximum out of three marks

(*iv*) To display the name, age, marks in three subjects, maximum and average.

Write a main method to create an object of a class and call the above member methods. [15]

Question 6.

Shasha Travels Pvt. Ltd. gives the following discount to its customers :

Ticket amount	Discount
Above Rs. 70000	*18%*
Rs. 55001 to Rs. 70000	16%
Rs. 35001 to Rs. 55000	12%
Rs. 25001 to Rs. 35000	10%
less than Rs 25001	*2%*

Write a program to input the name and ticket amount for the customer and calculate the discount amount and net amount to be paid. Display the output in the following format for each customer :

Sl. No.	*Name*	*Ticket charges*	*Discount*	*Net amount*
1	-	-	-	-

(Assume that there are 15 customers, first customer is given the serial no (Sl.No.) 1, next customer 2 ..... and so on) [15]

Question 7.

Write a menu driven program to accept a number and check and display whether *it is a prime number* or not OR an automorphic number or not. (*Use switch-case* statement)

(*a*) Prime number : A number is said to be a prime number if it is divisible only by 1 and itself and not by any other number.

Example : 3, 5, 7, 11, 13 etc.

(*b*) Automorphic number : An automorphic number is the number which is contained in the last digit(s) of its square.

Example 25 is an automorphic number as its square is 625 and 25 is present as the last two digits. [15]

Question 8.

Write a program to store 6 elements in an array P, and 4 elements in an array Q and produce a third array R, containing all the elements of array P and Q.
Display the resultant array.

EXAMPLE :	INPUT	OUTPUT :
P[]	Q[]	R[]
4	19	4
6	23	6
1	7	1
2	8	2
3		3
10		10
		19
		23
		7
		8

[15]

Question 9.

Write a program to input a string in uppercase and print the frequency of each character.

Example :

INPUT : COMPUTER HARDWARE

OUTPUT :

CHARACTERS	FREQUENCY
A	2
C	1
D	1
E	2
H	1
M	1
O	1
P	1
R	3
T	1
U	1
W	1

[15]