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) Name any two Object Oriented Programming (OOP) principles. [2]

(b) Give an example of a Relational operator and a Bitwise Operator. [2]

(c) State one similarity and one difference between while and do-while loop. [2]

(d) What is a compound statement? Give an example. [2]

(e) Find the value of c where x = 0, y = 10.25, z = -5

c =(x + y * z / 2.5) [2]

Question 2.

(a) Explain with the help of an example, the purpose of default in a switch-case construct. [2]

(b) Give an example each for:

(i) Runtime Error

(ii) Syntax Error

(iii) Logical Error [2]

(c) Differentiate between equals ( ) and compareTo ( ) functions. [2]

(d) Write a Java expression for $\sqrt{6x^2 + 25 / x - y}$ [2]

(e) Write Java statements to find if a character variable called 'var' contains an alphabet or not. [2]

Question 3.

(a) What is the purpose of:

(i) new operator [2]

(ii) this keyword [2]

(b) Write Java statements to check if the 5^{th} element of an array X [10] is divisible by 2. [2]

(c) What is a constructor and what is its use? [2]

(d) Give the output in the following function definitions and also write what mathematical operation it carries out if value of n = 7:

```
void test1(int n)
{
for(int x=1; x< = n; x++)
if(n%x = = 0)
        System.out.println (x);
}
```
[2]

Question 4.

(a) Fill in the blank numbers from 1 to 5 in the following program that attempts to find 5^n :

```
class Power
{
int getresult ( __1__)
        {
        int pro =  __2__ ;
        for(int i=1; i< = n; i++)
                pro = pro *  __3__ ;
        __4__ ;
        }
void callerFunct ( )
        {
        int p;
        __5__ ;                    //calling function getresult ( )
        System.out.print (p);
        }
}
```
[5]

(b) Determine the errors in the following statements of Java programs and correct them:

(i) String x = {“Java”,“for”,“School”,“Students”, “Rocks”};

(ii) String s = “Apple”.equals(“Banana”); [2]

(c) Name the package of Java:

(i) which is imported by default.

(ii) which contains Scanner class. [2]

(d) What is String Buffer? [1]

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*** *such that the logic of the program is clearly depicted.*

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

Question 5.

Define a class Telephone having the following description:

Instance Variables / Data Members:

int prv, pre - to store the previous and present meter reading
int call - to store the calls made (i.e. pre – prv)
String name - to store name of the customer
double amt - to store the amount
double total - to store the total amount to be paid

Member Methods:

void input ( ) - to input the previous reading, present reading and name of the customer
void cal ( ) - to calculate the amount and total amount to be paid
void display ( ) - to display the name of the customer, calls made, amount and total amount to be paid in the following format:

Name	Calls Made	Amount	Total Amount
……..	……..	……..	……

Write a program to compute the monthly bill to be paid according to the given conditions:

Calls made	**Rate**
Up to 100 calls	No charge
For the next 100 calls	90 paise per call
For the next 200 calls	80 paise per call
More than 400 calls	70 paise per call

However every customer has to pay Rs. 180 per month as monthly rent for availing the service. [15]

Question 6.

Write a program in Java to input a word. Arrange all the alphabets of the word in ascending order and display the new word.

Sample Input: BLUEJ

Sample Output: BEJLU [15]

Question 7.

Write a program in Java to accept two integer arrays from the user and join them into a third array. After joining the arrays, sort the final array in ascending order using Bubble sort technique.

Sample Input: Array A [ ] = {5,6,45,17,2,58,33};
Array B [ ] = {13,25,1,0,7,9};

Sample Output: The final Array after joining is : 5 6 45 17 2 58 33 13 25 1 0 7 9
The final Array after sorting is : 0 1 2 5 6 7 9 13 17 25 33 45 58 [15]

Question 8.

Write a menu driven program to perform the following: (Use switch-case statement)

(a) To input a word from the user and print it in the following pattern:
J
J A
J A V
J A V A

(b) To find the sum of the series given below:
$S = 1 + \frac{x}{1!} + \frac{x^2}{2!} + \frac{x^3}{3!} + \cdots$ up to n terms (Where x and n are to be inputted from the user)
[Note: ! denotes the factorial of a number which is equal to the product of the numbers starting from 1 till that number. Example: 5! = 1 x 2 x 3 x 4 x 5] [15]

Question 9.

Using Scanner class, write a program to input a string and display all those words of the string which begins with a capital letter and end with a small letter.

Sample Input: We all love Java for School Students because of its Uniqueness

Sample Output: We Java School Students Uniqueness [15]

Question 10.

Write a program to input two numbers and check whether they are **Co-Prime** number or not. Use the following two functions in your program:

int calc_hcf (int, int) – to find the HCF of the 2 numbers.
int prime (int) – to check whether a number is a prime number or not.

[**Note:** Co-Prime numbers are numbers which are both prime and their HCF is 1] [15]