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) What is inheritance? [2]

(b) Name the operators listed below: [2]

(i) <

(ii) ++

(iii) **&&**

(iv) **? :**

(c) State the number of bytes occupied by **char** and **int** data types. [2]

(d) Write one difference between / and **%** operator. [2]

(e) String x[] = {"SAMSUNG", "NOKIA", "SONY", "MICROMAX", "BLACKBERRY"}; [2]

Give the output of the following statements:

(i) System.out.println(x[1]);

(ii) System.out.println(x[3].length ( ));

Question 2.

(a) Name the following: [2]

(i) A keyword used to call a package in the program.

(ii) Any one reference data type.

(b) What are the two ways of invoking functions? [2]

(c) State the data type and value of **res** after the following is executed: [2]

```
char ch='t';
res= Character.toUpperCase(ch);
```

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

```
int a,b;
for (a = 6, b = 4; a <= 24; a = a + 6)
{
    if (a%b ==0)
    break;
}
System.out.println(a);
```

(e) Write the output: [2]

```
char ch = 'F';
int m = ch;
m=m+5;
System.out.println(m + " " + ch);
```

Question 3.

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

$ax^5 + bx^3 + c$

(b) What is the value of ***x1*** if $x=5$? [2]

$x1 = ++x - x++ + --x$

(c) Why is an object called an instance of a class ? [2]

(d) Convert following *do-while* loop into *for* loop. [2]

```
int i = 1;
int d=5;
do {
    d=d*2;
    System.out.println(d);
    i++ ;    } while ( i<=5);
```

(e) Differentiate between constructor and function. [2]

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

```
String s="Today is Test" ;
System.out.println(s.indexOf('T'));
System.out.println(s.substring(0,7) + " " +"Holiday");
```

(g) What are the values stored in variables r_1 and r_2: [2]

(i) double r_1 = Math.abs(Math.min(-2.83, -5.83));

(ii) double r_2 = Math.sqrt(Math.floor(16.3));

(h) Give the output of the following code: [2]

```
String  A ="26", B="100";
String  D=A+B+"200";
int  x=  Integer.parseInt(A);
int  y = Integer.parseInt(B);
int  d = x+y;
System.out.println("Result 1 = "+D);
System.out.println("Result 2 = " +d);
```

(i) Analyze the given program segment and answer the following questions: [2]

```
for(int i=3;i<=4;i++ )          {
for(int j=2;j<i;j++ )       {
System.out.print("" );      }
System.out.println("WIN" );   }
```

(i) How many times does the inner loop execute?

(ii) Write the output of the program segment.

(j) What is the difference between the Scanner class functions *next()* and *nextLine()*? [2]

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.

Define a class **ElectricBill** with the following specifications: [15]

class : ElectricBill

Instance variables / data member:

String n – to store the name of the customer

int units – to store the number of units consumed

double bill – to store the amount to be paid

Member methods:

void accept( ) – to accept the name of the customer and number of units consumed

void calculate( ) – to calculate the bill as per the following tariff:

Number of units	Rate per unit
First 100 units	Rs.2.00
Next 200 units	Rs.3.00
Above 300 units	Rs.5.00

A surcharge of 2.5% charged if the number of units consumed is above 300 units.

void print ( ) - To print the details as follows:

Name of the customer: .....

Number of units consumed: .....

Bill amount: .....

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

Question 5.

Write a program to accept a number and check and display whether it is a **spy number** or not. (A number is spy if the sum of its digits equals the product of its digits.) [15]

Example: consider the number 1124, Sum of the digits = 1 + 1 + 2 + 4 = 8

Product of the digits = 1 × 1 × 2 × 4 = 8

Question 6.

Using *switch* statement, write a menu driven program for the following: [15]

(i) To find and display the sum of the series given below:

$S = x^1 - x^2 + x^3 - x^4 + x^5 \ldots\ldots\ldots\ldots - x^{20}$

(where $x = 2$)

(ii) To display the following series:

1 11 111 1111 11111

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

Question 7.

Write a program to input integer elements into an array of size **20** and perform the following operations: [15]

(i) Display largest number from the array.

(ii) Display smallest number from the array.

(iii) Display sum of all the elements of the array.

Question 8.

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

(i) void check (String str , char ch) - to find and print the frequency of a character in a string.

Example :

Input: Output:

str = "success" number of **s** present is =3

ch = 's'

(ii) void check(String s1) - to display only vowels from string s1, after converting it to lower case.

Example :

Input:

s1 ="computer" Output : o u e

Question 9.

Write a program to input **forty** words in an array. Arrange these words in descending order of alphabets, using **selection** sort technique. Print the sorted array. [15]