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## 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.*

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*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[ ].*

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### 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 ( ));
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**This Paper consists of 5 printed pages and 1 blank page.**

**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<sub>1</sub>** and **r<sub>2</sub>**: [2]

(i) double r<sub>1</sub> = Math.abs(Math.min(-2.83, -5.83));

(ii) double r<sub>2</sub> = 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:

<u>Number of units</u>	<u>Rate per unit</u>
------------------------	----------------------

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** [15]  
or not. (A number is spy if the sum of its digits equals the product of its digits.)

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

Product of the digits =  $1 \times 1 \times 2 \times 4 = 8$

**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:

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

(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:	Output :
s1 ="computer"	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]

