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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) Define Java byte code. [2]
- (b) Write a difference between *class* and an *object*. [2]
- (c) Name the following: [2]
- (i) The keyword which converts variable into constant.
- (ii) The method which terminates the entire program from any stage.
- (d) Which of the following are primitive data types? [2]
- (i) double
- (ii) String
- (iii) char
- (iv) Integer
- (e) What is an operator? Name any two types of operators used in Java. [2]

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**This Paper consists of 6 printed pages.**

**Question 2.**

- (a) What is autoboxing in Java? Give an example. [2]
- (b) State the difference between length and length() in Java. [2]
- (c) What is constructor overloading? [2]
- (d) What is the use of *import* statement in Java? [2]
- (e) What is an infinite loop? Give an example. [2]

**Question 3.**

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

$$\sqrt{b^2 - 4ac}$$

- (b) Evaluate the following if the value of x=7, y=5 [2]

x+=x++ + x + ++y

- (c) Write the output for the following: [2]

```
String s1 = "Life is Beautiful";
```

```
System.out.println ("Earth" + s1.substring(4));
```

```
System.out.println( s1.endsWith("L") );
```

- (d) Write the output of the following statement: [2]

```
System.out.println("A picture is worth \t \"A thousand words.\");
```

- (e) Give the output of the following program segment and mention how many times the loop will execute: [2]

```
int k;
```

```
for ( k = 5 ; k <= 20 ; k += 7 )
```

```
if ( k% 6==0 )
```

```
continue;
```

```
System.out.println ( k );
```

- (f) What is the data type returned by the following library methods? [2]

(i) isWhitespace()

(ii) compareToIgnoreCase()

(g) Rewrite the following program segment using logical operators: [2]

```
if ( x > 5 )
```

```
if ( x > y )
```

```
System.out.println (x+y);
```

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

```
if (ch== 'c' || ch=='C')
```

```
System.out . print("COMPUTER");
```

```
else if (ch== 'h' || ch=='H')
```

```
System.out . print("HINDI");
```

```
else
```

```
System.out . print("PHYSICAL EDUCATION");
```

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

(i) `Math.pow (36,0.5) + Math.cbrt (125)`

(ii) `Math.ceil (4.2 ) + Math.floor (7.9)`

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

```
if(n1>n2)
```

```
r = true;
```

```
else
```

```
r = false;
```

## 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.

A private Cab service company provides service within the city at the following rates: [15]

	AC CAR	NON AC CAR
UPTO 5 KM	₹ 150 /-	₹ 120 /-
BEYOND 5 KM	₹ 10/-PER KM	₹ 08/- PER KM

Design a class **CabService** with the following description:

*Member variables /data members:*

- String car\_type - To store the type of car (AC or NON AC)
- double km - To store the kilometer travelled
- double bill - To calculate and store the bill amount

*Member methods :*

- CabService() - Default constructor to initialize data members.  
String data members to " " and double data members to 0.0.
- void accept () - To accept car\_type and km (using Scanner class only).
- void calculate () - To calculate the bill as per the rules given above.
- void display() - To display the bill as per the following format  
CAR TYPE:  
KILOMETER TRAVELLED:  
TOTAL BILL:

Create an object of the class in the main method and invoke the member methods.

**Question 5.**

Write a program to search for an integer value input by the user in the sorted list given [15]  
below using **binary** search technique. If found display "Search Successful" and print  
the element, otherwise display "Search Unsuccessful"

{31, 36, 45, 50, 60, 75, 86, 90}

**Question 6.**

Write a program to input a **sentence** and convert it into uppercase and display each [15]  
word in a separate line.

Example: Input : India is my country

Output : INDIA

IS

MY

COUNTRY

**Question 7.**

Design a class to overload a method Number( ) as follows: [15]

- (i) void Number (int num , int d) - To count and display the frequency of a  
digit in a number.

Example:

num = 2565685

d = 5

Frequency of digit 5 = 3

- (ii) void Number (int n1) - To find and display the sum of even digits of  
a number.

Example:

n1 = 29865

Sum of even digits = 16

Write a main method to create an object and invoke the above methods.

### Question 8.

Write a menu driven program to perform the following operations as per user's choice: [15]

- (i) To print the value of  $c=a^2+2ab$ , where **a** varies from **1.0** to **20.0** with increment of **2.0** and **b=3.0** is a constant.
- (ii) To display the following pattern using **for** loop:

```
A
AB
ABC
ABCD
ABCDE
```

Display proper message for an invalid choice.

### Question 9.

Write a program to input and store integer elements in a double dimensional array of size **3 x 3** and find the **sum** of elements in the left diagonal. [15]

Example:

```
1  3  5
4  6  8
9  2  4
```

Output: Sum of the left diagonal elements =  $(1 + 6 + 4) = 11$