**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.

1. Name any two basic principles of Object-oriented Programming. [2]
2. Write a difference between **unary** and **binary** operator. [2]
3. Name the keyword which:
   1. indicates that a method has no return type.
   2. makes the variable as a class variable.

[2]

1. Write the memory capacity (storage size) of **short** and **float** data type in bytes. [2]
2. Identify and name the following tokens:
   1. public
   2. 'a'

(iii) ==

(iv) { }

[2]

# This Paper consists of 6 printed pages.

**T19 861 Turn Over**

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**Question 2.**

1. Differentiate between **if else if** and **switch-case** statements. [2]
2. Give the output of the following code: String P = "20", Q ="19";

int a = Integer.parseInt(P); int b = Integer.valueOf(Q); System.out.println(a+""+b);

[2]

1. What are the various types of errors in Java? [2]
2. State the data type and value of **res** after the following is executed: char ch = '9';

res= Character.isDigit(ch);

[2]

1. What is the difference between the **linear** search and the **binary** search technique?

[2]

# Question 3.

1. Write a Java expression for the following:

| x2+2xy |

[2]

1. Write the return data type of the following functions:
   1. startsWith( )
   2. random( )

[2]

1. If the value of **basic**=1500, what will be the value of **tax** after the following statement is executed?

tax = basic>1200 ? 200 :100;

1. Give the output of following code and mention how many times the loop will execute?

int i;

for( i=5 ; i>=1 ;i--)

{

[2]

[2]

if(i%2 ==1) continue; System.out.print( i+ '' '');

}

1. State a difference between call by value and call by reference. [2]
2. Give the output of the following: Math.sqrt(Math.max(9,16))

[2]

1. Write the output for the following:

String s1 = ''phoenix''; String s2 =''island'' ;

System.out.println (s1.substring(0).concat (s2.substring(2) ) ); System.out.println(s2.toUpperCase());

[2]

1. Evaluate the following expression if the value of x=2, y=3 and z=1. v=x+ --z+ y++ +y

[2]

1. String x[] = {"Artificial intelligence", "IOT", "Machine learning", "Big data"}; Give the output of the following statements:
   1. System.out.println(x[3]);
   2. System.out.println(x.length);

[2]

1. What is meant by a package? Give an example. [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.

Design a class name **ShowRoom** with the following description:

Instance variables / Data members:

String name - To store the name of the customer

long mobno - To store the mobile number of the customer double cost - To store the cost of the items purchased double dis - To store the discount amount

[15]

double amount - To store the amount to be paid after discount Member methods:

ShowRoom( ) - default constructor to initialize data members void input( ) - To input customer name, mobile number, cost

void calculate( ) - To calculate **discount** on the **cost** of purchased items, based on following criteria

|  |  |
| --- | --- |
| Cost | Discount (in percentage) |
| Less than or equal to ` 10000 | 5% |
| More than ` 10000 and less than or equal to ` 20000 | 10% |
| More than ` 20000 and less than or equal to ` 35000 | 15% |
| More than ` 35000 | 20% |

void display( ) - To display customer name , mobile number , amount to be paid after discount.

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

# Question 5.

Using the **switch-case** statement, write a menu driven program to do the following:

1. To **generate** and print Letters from A to Z and their Unicode Letters Unicode

A 65

B 66

. .

. .

. .

Z 90

[15]

1. Display the following pattern using **iteration** (looping) statement:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1 |  |  |  | |
| 1 | 2 |  |
| 1 | 2 | 3 |
| 1 | 2 | 3 | 4 |  |
| 1 | 2 | 3 | 4 | 5 |

# Question 6.

Write a program to input **15** integer elements in an array and sort them in **ascending**

order using the **bubble** sort technique.

[15]

# Question 7.

Design a class to overload a function **series( )** as follows:

1. void series (int x, int n) – To display the sum of the series given below: x1 + x2 + x3 + ……………… xn terms
2. void series (int p) – To display the following series: 0, 7, 26, 63 ……………. p terms
3. void series ( ) – To display the sum of the series given below:

[15]

+ + . . . . . . . . . . . . . . . .

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 1 |  | 1 |  | 1 |  | 1 |
| 2 |  | 3 |  | 4 |  | 10 |

# Question 8.

Write a program to input a **sentence** and convert it into uppercase and count and display the total number of words starting with a letter **'A'**.

Example:

Sample Input: ADVANCEMENT AND APPLICATION OF INFORMATION TECHNOLOGY ARE EVER CHANGING.

Sample Output: Total number of words starting with letter 'A' = 4.

[15]

# Question 9.

A ***tech number*** has even number of digits. If the number is split in two equal halves, then the square of sum of these halves is equal to the number itself. Write a program to generate and print all *four digits tech numbers.*

[15]

Example:

Consider the number 3025

Square of sum of the halves of 3025 = (30+25)2

= (55)2

= 3025 is a tech number.