

# 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 Encapsulation. [2]
- (b) What are keywords? Give an example. [2]
- (c) Name any two library packages. [2]
- (d) Name the type of error ( syntax, runtime or logical error ) in each case given below: [2]
- (i) `Math.sqrt (36 – 45)`
- (ii) `int a;b;c;`
- (e) If `int x [ ] = { 4, 3 , 7, 8, 9, 10}`; what are the values of **p** and **q**? [2]
- (i) `p = x.length`
- (ii) `q= x[2] + x[5] * x[1]`

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

### Question 2.

- (a) State the difference between `== operator` and `equals ()` method. [2]
- (b) What are the types of casting shown by the following examples: [2]
- (i) `char c = (char)120;`
  - (ii) `int x = 't';`
- (c) Differentiate between *formal* parameter and *actual* parameter. [2]
- (d) Write a function prototype of the following : [2]
- A function **PosChar** which takes a string argument and a character argument and returns an integer value.
- (e) Name any two types of access specifiers. [2]

### Question 3.

- (a) Give the output of the following string functions : [2]
- (i) `"MISSISSIPPI".indexOf('S') + "MISSISSIPPI".lastIndexOf('I')`
  - (ii) `"CABLE".compareTo("CADET")`
- (b) Give the output of the following Math functions : [2]
- (i) `Math.ceil(4.2)`
  - (ii) `Math.abs(-4)`
- (c) What is a parameterized constructor? [2]
- (d) Write down java expression for : [2]
- $$T = \sqrt{A^2 + B^2 + C^2}$$
- (e) Rewrite the following using ternary operator: [2]
- if `(x%2 == 0)`
- ```
System.out.print("EVEN");  
else  
System.out.print("ODD");
```
- (f) Convert the following while loop to the corresponding for loop: [2]
- ```
int m = 5, n = 10;  
while (n >= 1)  
{  
    System.out.println(m*n);  
    n-- ;  
}
```

- (g) Write one difference between primitive data types and composite data types [2]
- (h) Analyze the given program segment and answer the following questions: [2]
- (i) Write the output of the program segment
- (ii) How many times does the body of the loop gets executed?
- ```
for (int m=5; m<=20; m+=5)
{
    if (m%3==0)
        break;
    else
        if (m%5==0)
            System.out.println(m);
            continue;
}
```

- (i) Give the output of the following expression : [2]
- $a += a++ + ++a + --a + a--$ ; when  $a = 7$
- (j) Write the return type of the following library functions : [2]
- (i) `isLetterOrDigit(char)`
- (ii) `replace(char, char)`

### 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 named **BookFair** with the following description : [15]

Instance variables /Data members :

String Bname - stores the name of the book

double price - stores the price of the book

Member methods :

- (i) BookFair() - Default constructor to initialize data members
- (ii) void Input() - To input and store the name and the price of the book.
- (iii) void calculate() - To calculate the price after discount. Discount is calculated based on the following criteria

| Price                                             | Discount     |
|---------------------------------------------------|--------------|
| Less than or equal to ₹1000                       | 2% of price  |
| More than ₹ 1000 and less than or equal to ₹ 3000 | 10% of price |
| More than ₹ 3000                                  | 15% of price |

- (iv) void display() - To display the name and price of the book after discount.

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

### Question 5.

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

- (i) To print the Floyd's triangle [Given below]

```
1
2 3
4 5 6
7 8 9 10
11 12 13 14 15
```

- (ii) To display the following pattern

```
I
IC
ICS
ICSE
```

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

**Question 6.**

Special words are those words which starts and ends with the same letter.

[15]

Examples :

EXISTENCE

COMIC

WINDOW

Palindrome words are those words which read the same from left to right and vice-versa

Examples :

MAJAYALAM

MADAM

LEVEL

ROTATOR

CIVIC

All *palindromes* are *special words*, but all *special words* are not *palindromes*.

Write a program to accept a word check and print whether the word is a *palindrome* or only *special word*.

**Question 7.**

Design a class to overload a function SumSeries() as follows :

[15]

(i) void SumSeries(int n, double x) – with one integer argument and one double argument to find and display the sum of the series given below :

$$s = \frac{x}{1} - \frac{x}{2} + \frac{x}{3} - \frac{x}{4} + \frac{x}{5} \dots \dots \dots \text{ to } n \text{ terms}$$

(ii) void SumSeries() – To find and display the sum of the following series :

$$s = 1 + (1 \times 2) + (1 \times 2 \times 3) + \dots \dots \dots + (1 \times 2 \times 3 \times 4 \dots \dots \dots \times 20)$$

Write a program to accept a number and check and display whether it is a **Niven** [15] number or not.

(Niven number is that number which is divisible by its sum of digits).

Example :

Consider the number 126.

Sum of its digits is  $1+2+6 = 9$  and 126 is divisible by 9.

### Question 9.

Write a program to initialize the seven Wonders of the World along with their [15] locations in two different arrays. Search for a name of the country input by the user. If found, display the name of the country along with its Wonder, otherwise display "Sorry Not Found!".

Seven wonders - CHICHEN ITZA, CHRIST THE REDEEMER, TAJMAHAL,  
GREAT WALL OF CHINA, MACHU PICCHU, PETRA,  
COLOSSEUM

Locations - MEXICO, BRAZIL, INDIA, CHINA, PERU, JORDAN, ITALY

Example - Country Name : INDIA      Output : INDIA - TAJMAHAL  
Country Name : USA      Output : Sorry Not Found!