**PSG COLLEGE OF TECHNOLOGY**

**DEPARTMENT OF COMPUTER APPLICATIONS**

**I MCA**

**23MX17 DATA STRUCTURES LABORATORY**

**Problem Sheet -1**

**Date: 16-08-2023                          Due date: 21-08-2023**

1. A Pen stand can hold only five pens. Ask the user how many pens he would like to put in the pen stand. Write a program to print the message “PEN STAND IS FULL” if it exceeds 5 pens.
2. Write a program to check whether the blood donor is eligible or not for donating blood. The conditions laid down are as under.

* Age should be greater than 18 years but not more than 55 years.
* Weight should be more than 45 kg.

1. Write a program to check whether the voter is eligible for voting or not. If his/her age is equal to or greater than 18.Display message “Eligible” otherwise “Non-Eligible”.
2. A Student studying in an institution is examined by course work and written examination. Both components of the assessment carry a maximum of 50 marks. The following rules are applied by the examiner in order to determine whether a student passes or fails:

i) A student must secure a total of 45% or more in order to pass.

ii) A total mark of 44% is moderate to 45% however.

iii) Each component must be passed with minimum of 20 out of 50.

iv) If a student scores 45% or more but does not achieve the minimum mark in one component he is failed with 44% which is moderated to 45%.

Write a program to input the marks for each component and output the final mark along with the result.

1. Write a program to calculate the telephone bill. Read the total number of phone calls made and calculate the total charges as per the following rates given below.

|  |  |
| --- | --- |
| Telephone Call | Rate per call |
| <=99  >=100 and <=199  >=200 and <=299  >=300 | Rs 50 (Fixed)  Rs1  Rs2  Rs3 |

1. Write a program to find the number in between 7 and 100 which is exactly divisible by 4 and if divided by 5 and 6 remainders obtained should be 4.
2. Write a program to enter few numbers and count the positive and negative numbers together with their sums. When 0 is entered program should be terminated.
3. Write a program to print the entered number in the reversed order. Also perform sum and multiplication with their digits.
4. Write a program to find the cubes of 1 to 10 numbers.
5. Write a C program to read in two numbers, x and n, and then compute the sum of this geometric progression: 1+x+x2+x3+………….+xn

For example: if n is 3 and x is 5, then the program computes 1+5+25+125. Print x, n, the sum.

**Challenging Problems:**

1. Write a program to print following pattern :

1

1 2

1 2 3

1 2 3 4

1 2 3 4 5

1. Print a pattern of numbers from 1 to n as shown below. Each of the numbers is separated by a single space. (HackerRank)

**Input Format:** The input will contain a single integer n.

**Constraints:** 1<=n<=1000

**Sample Input**

5

**Sample Output**

5 5 5 5 5 5 5 5 5

5 4 4 4 4 4 4 4 5

5 4 3 3 3 3 3 4 5

5 4 3 2 2 2 3 4 5

5 4 3 2 1 2 3 4 5

5 4 3 2 2 2 3 4 5

5 4 3 3 3 3 3 4 5

5 4 4 4 4 4 4 4 5

5 5 5 5 5 5 5 5 5