Giri's Tech Hub Pvt.Ltd, Pune.

Programming (Machine) Test

Batch: June-24 to Oct-24 & July-25

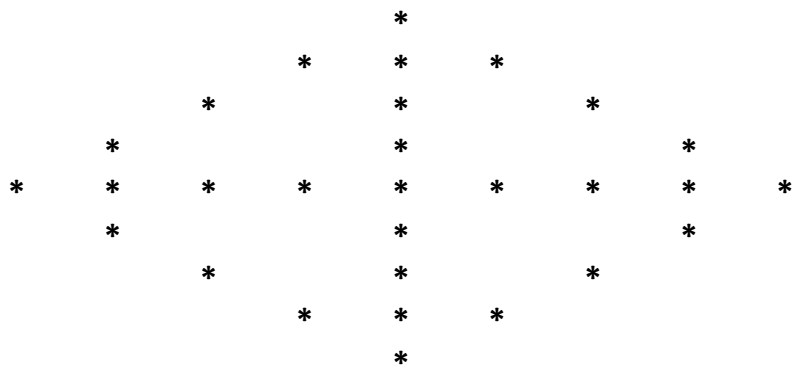
Date: 28/01/2026
Time: 08:00 to 11:00 Am

Instructions: **Total:- 10 Marks**

1. Solve any 9 questions.
2. Input should be from user.
3. Indentation and comments mandatory.
4. Each program 1 Marks and all comments 1 Marks.
5. Do not use any inbuilt functions.

Q1. Write a java program to print 1 to nth Strong number.

Q2. Write a java program to print this pattern.



Q3. Write a java program to Check If a Number Is a Neon Number or Not Neon number using function recursion.

Q4. Problem:
Given an array of positive integers and a target sum S, find the length of the smallest contiguous subarray whose sum is greater than or equal to S. If no such subarray exists, return 0.

Example:
Input: arr = [2,3,1,2,4,3], S = 7
Output: 2 (subarray [4,3]).

Explanation:
Expand window until the sum ≥ S. Then shrink from the left while maintaining the condition to minimize length.

Q5. Write a java program to find the " Leaders " in an array.

- **A leader in an array is an element which is larger than all the elements to its right side, which is what you can see in the above output.**

Input :- arr – { 15 , 18 , 5 , 7 , 9 , 2 }
Output :- 2 , 9 , 18

Q6. Create class name as ArrayOperation with method name as setArray() and create its Two child classes name as CeilFloor , Matrix. We need to inherit the ArrayOperation class in CeilFloor, Matrix and create method. and write the logic.

1. **CeilFloor Class : -**

Expected Output :

The given array is : 1 3 5 7 8 9
Number: 0 ceiling is: 1 floor is: -1
Number: 1 ceiling is: 1 floor is: 1
Number: 2 ceiling is: 3 floor is: 1
Number: 3 ceiling is: 3 floor is: 3
Number: 4 ceiling is: 5 floor is: 3
Number: 5 ceiling is: 5 floor is: 5
Number: 6 ceiling is: 7 floor is: 5
Number: 7 ceiling is: 7 floor is: 7
Number: 8 ceiling is: 8 floor is: 8
Number: 9 ceiling is: 9 floor is: 9
Number: 10 ceiling is: -1 floor is: 9

2. **Matrix class :-**

Enter 9 elements for the 3x3 matrix:
10 25 40
50 15 20
30 35 45

Expected Output :
Second max in column 1: 30
Second max in column 2: 25
Second max in column 3: 40

Q7. Problem Statement: Create an abstract class Student with attributes roll number, name, and an array of marks (5 subjects).
Create an interface ResultOperations with methods calculateTotal(), calculatePercentage(), and assignGrade().

- **Implement UGStudent and PGStudent classes with grading rules:**

UG: Pass if percentage ≥ 40%
PG: Pass if percentage ≥ 50%

Additional Requirements:

1. Store details for N students in an array.
2. Display:

- List of passed and failed students separately.
- Top 3 students by percentage.
- Average marks in each subject.

Explanation: Covers abstraction for common structure, interface for calculations, array processing for N students, sorting for top students, and subject-wise aggregation.

Q8. Write a program that maintains a Vector of city names. Perform the following:

1. **Insert 5 cities.**
2. **Remove the city at index 3.**
3. **Insert a new city at index 1.**
4. **Display final list.**

Q9. Write a program using ArrayList to store exam marks of students. Take a number from the user and count how many times it appears in the list.

Explanation:

- **Store marks in an ArrayList.**
- **Traverse the list using a loop.**
- **Compare each element with the user input and maintain a count.**
- **Demonstrates searching and frequency counting using ArrayList.**

Q10. Write a Java program that reads a sentence from the user and counts the frequency of each word using a HashMap.

The program should:

- **Accept a sentence as input.**
- **Split the sentence into words.**
- **Use a HashMap to count how many times each word appears.**
- **Display each word and its frequency.**

Input : Java is easy and Java is powerful

Output : Word Frequencies: Java: 2 is: 2 easy: 1 and: 1 powerful: 1

-----ALL THE BEST-----