

Giri's Tech Hub, Pune.

Core Java Machine Test

Batch: July-25

Date : 18/12/2025

Time : 09 to 12 Pm.

Instructions:

1. Solve any 9 questions.
2. Input should be from user.
3. Indentation and comments mandatory.
4. Each program 1 marks & all comments 1 marks.

Section – A (Solve Any 3 & Passing For 2 Questions)

Q1. Write a java program to print this pattern.

```
1
3   3   3
5   5   5   5
3   3   3
1
```

Q2. Write a java program to print this pattern.

```
1   A   2   B   3
C   4   D   5
6   E   7
F   8   G   9
H   10  I   11  J
```

Q3. Write a java program to check if a number is a happy number or not.

Input: n = 19

Output: 19 is Happy Number,

Q4. Write a Java program to display the following series using function recursion.

7 10 15 22 31 42 55 70

Section – B (Solve Any 3 & Passing For 2 Questions)

Q1. Write a java program to give an array, find the second largest element without sort array.

Input : Array = {12, 35, 1, 10, 34, 1}

Output : Second largest = 34

Explanation:

First largest is 35, second largest is the next maximum (34). We maintain two variables (largest, secondLargest).

Q2. Rearrange the array so that even and odd numbers alternate. Assume the number of even and odd elements is equal.

Input :- arr = [1, 2, 3, 4, 5, 6]

Output :- [2, 1, 4, 3, 6, 5]

Q3. Given an integer array, find the next greater element for each element using a stack.

If no greater element exists, print -1 for that position.

Example:

Input: {4, 5, 2, 25}

Output: {5, 25, 25, -1}

Q4. Perform binary search to find the index of a given key in a sorted array.

If the key is not found, print -1.

Example:

Input:

arr = {2, 4, 6, 8, 10, 12}

key = 10

Output: Index = 4

Section – C (Solve Any 3 & Passing For 2 Questions)

Q1. Write a java program to create pojo class name as Product with a following properties like as pid, pname, quantity and rate.

create the another class name as Bill and this class is depend on product but we want to pass more than one product details to Bill class so here we use the var-args concept.

1. Add 5 Records Of Product.
2. Display All Product Details.
3. Product Bill.
 - Calculate bill without Gst.
 - Calculate bill with 18% Gst.

Q2. Your Task: you have to create class name as MergeSort with constructor and methods.

MergeSort(int a[],int b[]): this function is used for accept two array as parameter.

int[] getMergedArray(): this function is used for return merged array.

Input -First Array :- 1 2 3 4 5

Second Array :- 6 7 8 9 10

Output - 1 10 2 9 3 8 4 7 5 6

Q3. Write a Java program to calculate overtime for 5 employees with both daily and weekly rules.

Rules:

- Daily shift = 8 hours
- If any day working > 8 hours → daily overtime
- Weekly limit = 40 hours
- Overtime rate:
 - Daily OT → Rs.40/hour
 - Weekly OT → Rs.60/hour

- If both daily and weekly OT occur, calculate both separately

Requirements:

1. Employee class:
id, name, int dailyHours[7], basicSalary, dailyOT, weeklyOT
2. OverTime class:
 - setEmployee(Employee emp[])
 - calculateDailyOvertime()
 - calculateWeeklyOvertime()
3. Display complete salary breakup

Q4. 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

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