INTERVIEW EXPERIENCE – SOLITON

Name : DINESH S
Register ID : 7376231EC140
Company : SOLITON

DAY 1

Paper & Pen Recruitment Test (Offline)

Programming Round 1

Technical & HR Round

DAY 2

Programming Round 2

Design Round

Essay Writing Round

DAY 1

ROUND 1: PAPER & PEN RECRUITMENT TEST (OFFLINE)

Duration : 1 hour 15 minutes
Total Questions : 15
Difficulty : Moderate to Hard

The written test focused on core fundamentals including Mathematics, Physics, Electronics, Computer Fundamentals, and C Programming.

MATHEMATICS

Questions were mainly from Conic Sections.

Topics included:

- Circle
- Parabola
- Ellipse
- Hyperbola

questions:

1. Problems based on equations of circle, parabola, and ellipse.
2. An ellipse and a hyperbola intersect at four points. Find the area of the polygon formed.

Ellipse: 2x^2 + 3y^2 − 4x − 3 = 0
Hyperbola: x^2 − y^2 − 2x = 0

3. Find the radius of a circle if a chord of length 12 cm is drawn at a distance of 5 cm from the center.

PHYSICS

Topics were from Work, Power, Energy, and Collisions.

questions:

1. A 2 kg block rests on a frictionless horizontal table. A time-varying force F(t) = 6 * t^2 acts on it, where t is in seconds. Find the speed of the block at t = 5 seconds.

2. A rigid body is acted upon by a force of 100 N. Its velocity changes from 15 m/s to 25 m/s in 50 seconds. Find the average power delivered.

ELECTRONICS & ELECTRICAL

1. Finding Equivalent Resistance of Resistor Networks

In this type of question, a complex resistor circuit is given.
The task is to simplify the network step by step using:

- Series resistance rule
- Parallel resistance rule

The final goal is to find the **equivalent resistance** between the given terminals.

2. Finding Resistor Values in Op-Amp Circuits

In these questions, an op-amp circuit is given with:

- Input voltage
- Output voltage
- Gain relationship

Using the standard op-amp gain formulas (inverting or non-inverting), we calculate the **unknown resistor values** based on the given input–output ratio.

3. Rectifier Circuit Analysis

A rectifier circuit output waveform is shown or described.

The task is to:

- Identify errors or distortion in the output
- Find which component is responsible for the issue

Typical causes discussed:

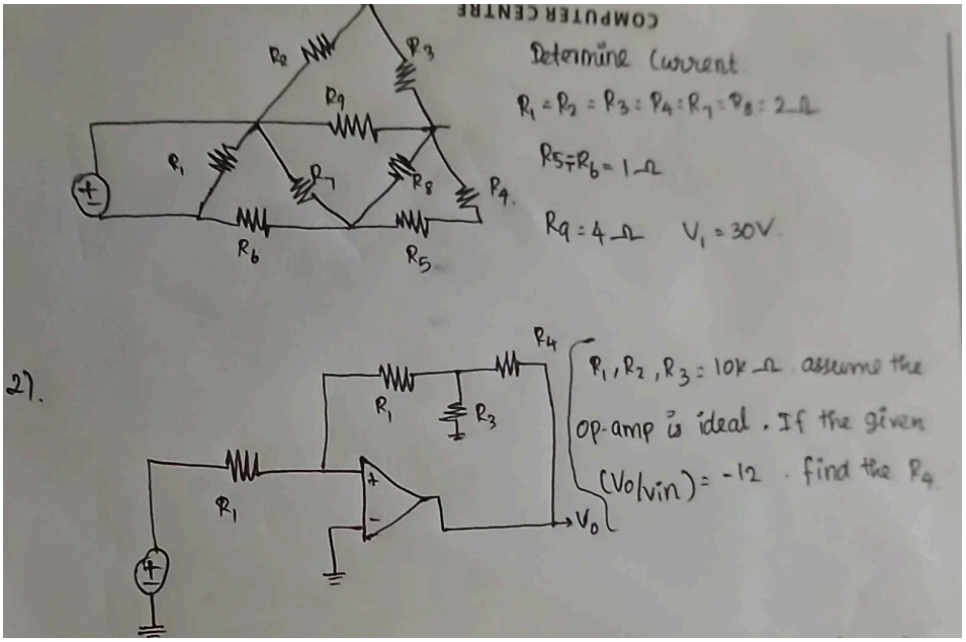
- Faulty diode
- Improper filter capacitor
- Incorrect load resistance

COMPOSITE SINUSOIDAL SIGNAL – PERIODICITY

Question:

Three sinusoidal signals with frequencies **35 Hz, 50 Hz, and 20 Hz** are added together.

Find the **fundamental frequency** of the signal, given that a sum of sinusoids is periodic only when all frequencies are integer multiples of a common fundamental frequency.



COMPUTER FUNDAMENTALS & NETWORKING

- Calculate the time taken to transmit data given the number of routers and communication links.
- Memory management question:
  Given the starting address of a file and the size of the file, find the ending address.

PSEUDO CODE

Initialize the address register.
Initialize count = 500.

Loop:
Load a byte from a device.
Store it into memory.
Increment the address register.
Decrement the count.
If count ≠ 0, go to LOOP.

Conditions:

- Each statement is a machine instruction.
- Load and Store instructions take 8 clock cycles.
- Other instructions take 1 clock cycle.

Question:
If 500 bytes are to be loaded, find the total number of clock cycles.

C PROGRAMMING – OUTPUT DEBUGGING

QUESTION 1

```
void func(int *a, int *b)
{
*a = *a + *b;
*b = *a - *b;
*a = *a - *b;

printf("%d %d", *a, *b);

}

void main()
{
int x = 5;
func(&x, &x);
printf("%d", x);
}
```

Output:
0 0 0

QUESTION 2

```
#include <stdio.h>

void modify(int *arr)
{
int b = 0;
```

```
for (; b < 10; b = *arr++, *(arr) += b){  }

}

int main()
{
int arr[] = {1, 2, 3, 4, 5, 6, 7};

modify(arr);

for (int i = 1; i < 6; i++)

{

    printf("%d ", arr[i]);

}

return 0;

}
```

ROUND 2: PROGRAMMING ROUND 1

Duration : 1 hour
Total Questions : 3
Difficulty : Easy to Moderate

QUESTION 1: TEMPERATURE RANGE ANALYSIS

Problem Statement:

Given:

- Size of the array
- Lower temperature limit
- Higher temperature limit
- Array elements

Task:
Count the elements that are **outside** the given temperature range and print the status based on the conditions.

Conditions:

1. If no elements are outside the range → print SAFE
2. If count of out-of-range elements is less than half of array size → print MODERATE and indexes

3. If count of out-of-range elements is greater than half of array size → print SEVERE and indexes

EXAMPLE 1

Input:
5 10 40
15 20 30 25 35

Output:
SAFE

EXAMPLE 2

Input:
6 10 40
12 45 30 8 25 50

Output:
MODERATE
Indexes: 1 3 5

EXAMPLE 3

Input:
5 20 30

5 10 15 35 40

Output:
SEVERE
Indexes: 0 1 2 3 4

DAY 2

QUESTION 2: ATM TRANSACTION PROBLEM

Problem Statement:

Inputs:

1. Number of 2000 rupee notes
2. Number of 500 rupee notes
3. Number of 200 rupee notes
4. Amount to withdraw

Task:
Determine whether the amount can be withdrawn using the available notes.

If possible, print the notes used.
Otherwise, print -1.

EXAMPLE 1

Input:
1 2 3 2600

Output:
2000 x 1
500 x 1
100 x 1

EXAMPLE 2

Input:
1 2 1 1250

Output:
-1

EXAMPLE 3

Input:
2 1 3 4500

Output:
2000 x 2
500 x 1

QUESTION 3: LARGEST NUMBER SMALLER THAN N WITH SAME DIGITS

Problem Statement:

Given a number N in string format, find the **largest number smaller than N** that can be formed using the **same set of digits**.
If not possible, print:
Not Possible

EXAMPLE 1

Input:
N = "218765"

Output:
218756

EXAMPLE 2

Input:
N = "1234"

Output:
Not Possible

EXAMPLE 3

Input:
N = "262345"

Output:
256432

ROUND 3:TECHNICAL HR INTERVIEW

The Technical HR round focused mainly on my **interest, project involvement, and technical understanding**.

We discussed:

- Why I chose IT as my field
- My area of interest
- Technologies I like working with

A detailed discussion was done on my projects, including:

- Block diagram
- System flow
- Database design and SQL tables

They asked about:

- My role in the team project
- Primary key and foreign key concepts
- Advantages and disadvantages
- SQL queries related to my project

The interviewers mainly focused on **how deeply I was involved in my project** and how well I understood it.

ROUND 4:PERSONAL HR INTERVIEW

This round focused on my **background, attitude, and communication skills**.

Questions included:

- Self introduction
- Where I am from
- Father’s occupation
- How I came to know about Soliton
- Dream company
- Favorite achievement
- Team player or team leader
- Handling wrong decisions by a team lead

ROUND 5 :PROGRAMMING ROUND 2

Duration : 4 Hours

Question :3

In this round, the interviewers first discussed the **logic and approach** for each problem.
Only after they were satisfied with the explanation, I was allowed to start coding.
To proceed to the next question, **all test cases had to be passed successfully**.

QUESTION 1: FIND THE MISSING NUMBER

https://www.geeksforgeeks.org/dsa/find-missing-number-string-numbers-no-separator/

Problem Statement:

Given a string consisting of positive integers with **no separators**, where the numbers are in increasing order and increase by 1 except for one missing number.

Task:

- Find the missing number in the sequence.
- Print -1 if the sequence is not valid.

EXAMPLE

Input:
"101112131416"

Output:
15

Input:
"123567"

Output:
4

Input:
"101102103"

Output:
-1

QUESTION 2: SHORTEST SUBARRAY TO BE REMOVED TO MAKE ARRAY SORTED

https://leetcode.com/problems/shortest-subarray-to-be-removed-to-make-array-sorted/description/

Problem Statement:

Given an integer array, remove a **contiguous subarray** such that the remaining elements are in **non-decreasing order**.

Task:

- Return the **length of the shortest subarray** to remove.
- Also print the **indexes of the removed subarray**.
- If multiple subarrays have the same minimum length, remove the **left-most** one.

EXAMPLE 1

Input:
arr = [1, 2, 3, 10, 4, 5, 6]

Output:
1
3

EXAMPLE 2

Input:
arr = [1, 2, 3]

Output:
-1

EXAMPLE 3

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

Output:
4
0 1 2 3

ROUND 6: DESIGN ROUND

This round was conducted to evaluate our **communication skills, teamwork, and real-time problem-solving approach**.

We were divided into groups and given a real-world problem statement. The interviewers mainly observed:

- How we understand the problem
- How we explain our ideas
- How we interact with teammates
- How we respond to questions and suggestions

Problem Statement :
Design an automatic system in a submarine that can accurately detect and destroy a foreign object.

Each team member presented their ideas on the board. Group discussion was encouraged, and finally we summarized the best possible solution using diagrams or flowcharts..

ROUND 7: ESSAY WRITING

This round tested written communication.

Topics:

1. Self introduction and ambition.
2. Why Soliton and how I can contribute.
3. My 5-year personal and professional plan.

Final Tip:

Focus on clearing the **first round**, as it is the toughest.
After that, the remaining rounds are **easy to moderate** and mainly test your **thinking ability, communication skills, and teamwork**.
Try to **impress the HR** and make sure to **learn about Soliton**—it will be very helpful.