K. J. Somaiya College of Engineering, Mumbai-77
(A Constituent College of Somaiya Vidyavihar University)
Department of Sciences and Humanities

SOMAIYA
VIDYAVIHAR UNIVERSITY
K J Somaiya College of Engineering

Somaiya
TRUST

Course Name:	Elements of Electrical and Electronics Engineering	Semester:	I/II
Date of Performance:	11 /9/ 2024	Batch No:	C5-2
Student Name:	Nidhesh Gomai	Roll No:	16014224025
Faculty Sign & Date:		Grade/Marks:	/ 20

Experiment No: 4

Title: Maximum Power Transfer Theorem
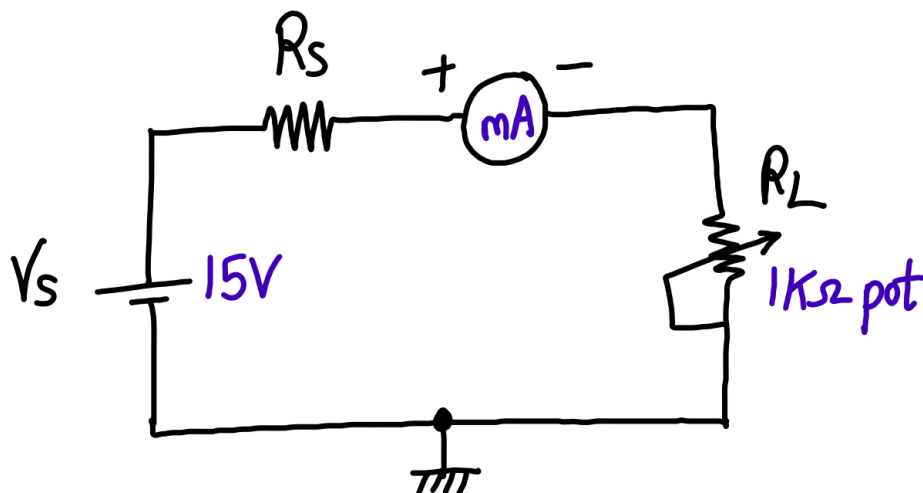
Aim and Objective of the Experiment:

- To observe maximum power transfer across load resistor in a D.C circuit.

COs to be achieved:

CO1: Analyze resistive networks excited by DC sources using various network theorems.

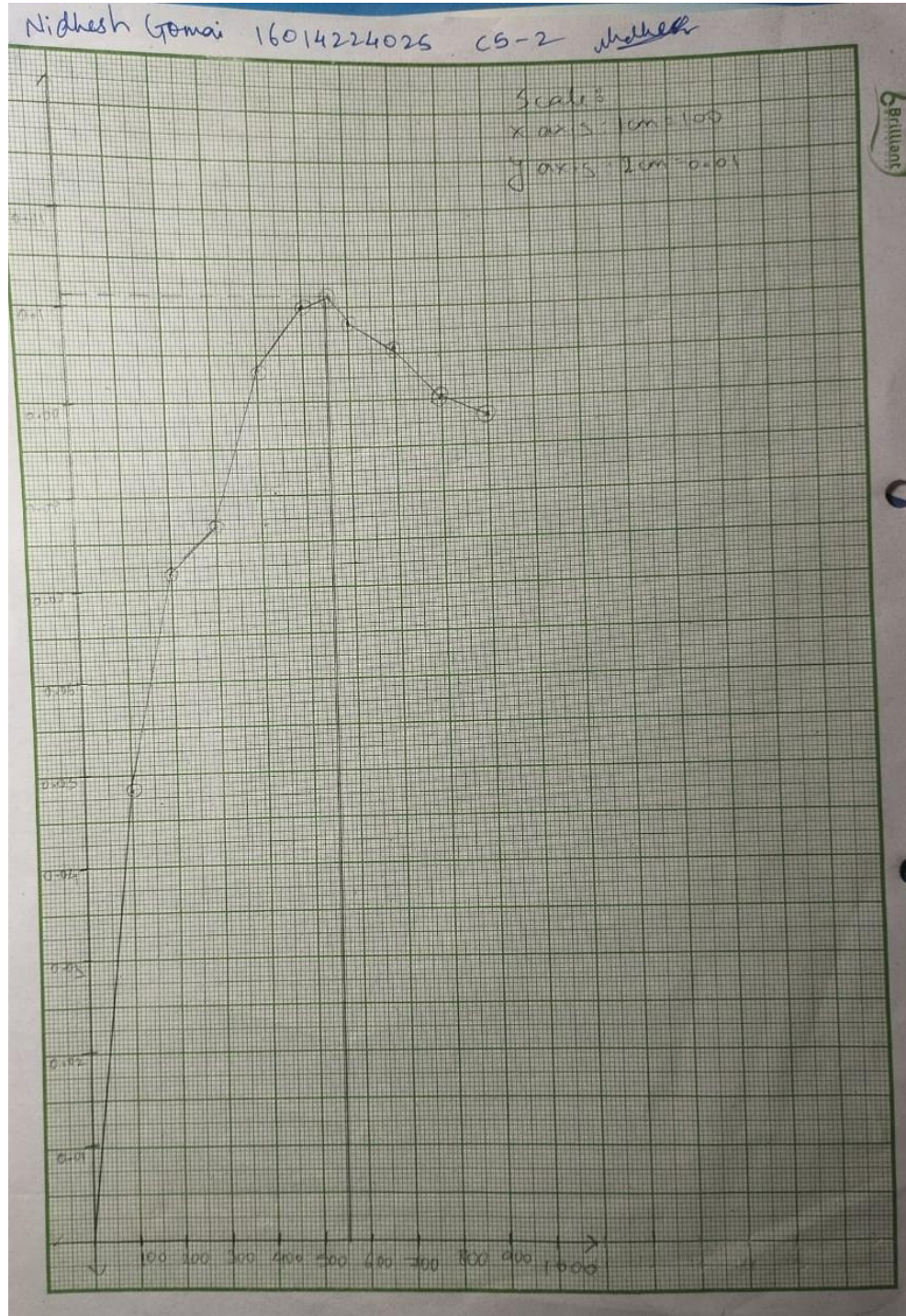**Circuit Diagram:**

$V_S = 15$ V and $R_S = $ __560__ Ω

Stepwise-Procedure:

1. Set D.C. supply voltage V_S = 15 V
2. Vary R_L in the range 100 Ω - 1 KΩ in steps of 100 Ω
3. Note down I_L and V_L for each value of R_L. Where I_L and V_L are current through R_L and voltage across R_L respectively.
4. Prepare observation table showing readings of R_L Vs power $P = I_L \cdot V_L$
5. Plot graph of P Vs R_L
6. Locate the point of maximum value of power P and note down corresponding value of R_L. Verify the results theoretically

Observation Table:

Sr. No.	R_L Ω	Circuit Current (I_L) in mA		Voltage (V_L) in Volts	Power absorbed by load (P_L) in $P_L = I_L^2 \cdot R_L$	
		Theoretical	Practical		Theoretical	Practical
1.	100	22.7	22	2.1	0.0515	0.0441
2.	200	19.7	18	4	0.07761	0.08
3.	300	17.7	16	5.16	0.0908	0.088
4.	400	15.6	14	6.32	0.0973	0.099
5.	500	14.5 13.3	14 12	7.09 7.52	0.1001 0.1004	0.1005 0.1009
6.	600	12.93	12	7.78	0.0849	0.1008
7.	700	11.90	10	8.26	0.0991	0.097
8.	800	11.02	10	8.78	0.9715	0.096
9.	900	10.27	10	9.20	0.0953	0.094
10.	1 K	9.61	9	9.65	0.0924	0.093

Graph: **Draw a graph showing effect of variation in** R_L on P_L using observation table. Take R_L on X –axis and P_L on Y- axis. (Use a graph paper)

Conclusion-

1. **Explore one practical application where Maximum Power Transfer Theorem is used.**
2. **Draw a block diagram or circuit diagram of this application.**
3. **Explain in brief.**

<div align="center">**OR**</div>

Answer the following:

4. **Do you apply Thevenin's Theorem to calculate Maximum Power across load resistor in a D.C. circuit?**
5. **Take a sample problem. Draw a block diagram or circuit diagram of this sample problem.**
6. **Explain the solution in brief.**

Signature of faculty in-charge with Date: