Course Name:	**Elements of Electrical and Electronics Engineering**	**Semester:**	**I**
Date of Performance:	**22 / 11 / 2022**	**Batch No:**	**C2-2**
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Faculty Sign & Date:		**Grade/Marks:**	**/ 25**

Experiment No: 5

Title: Maximum Power Transfer Theorem

Aim and Objective of the Experiment:

- To observe maximum power transfer in D.C. circuit.

COs to be achieved:

CO1: Analyze resistive networks excited by DC sources using various network theorems.
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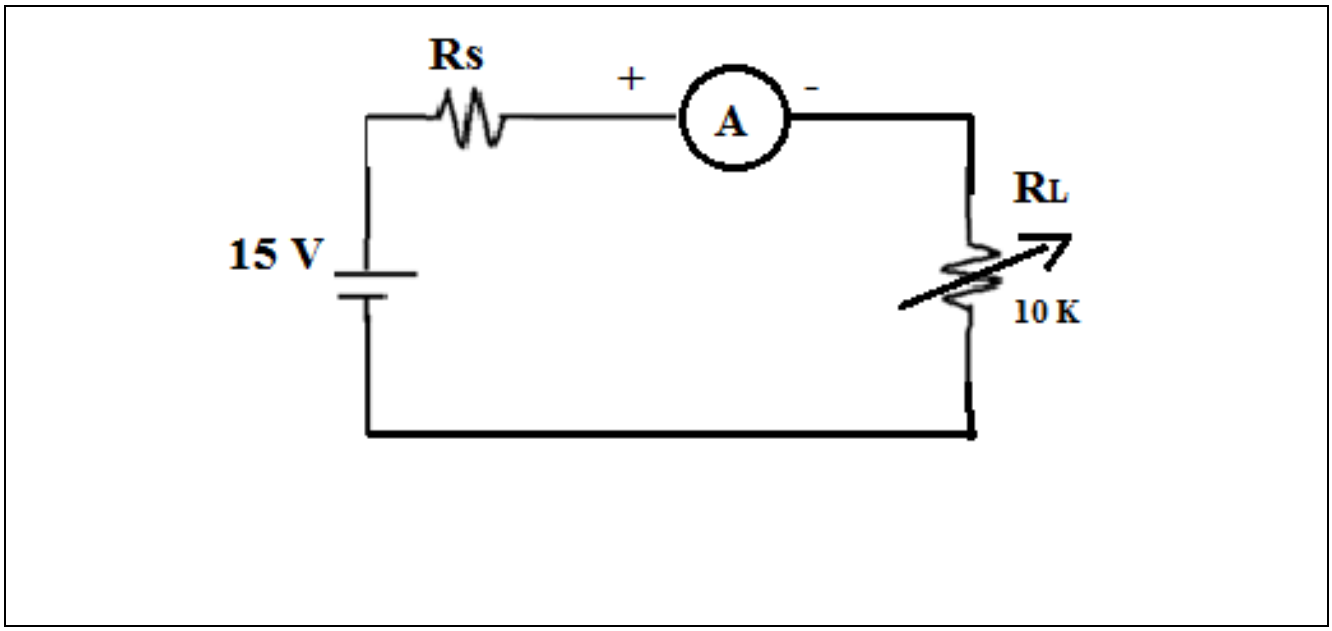
Circuit Diagram/ Block Diagram:

Circuit Diagram: V_s = 50 V and R_s = 500 Ω



Stepwise-Procedure:

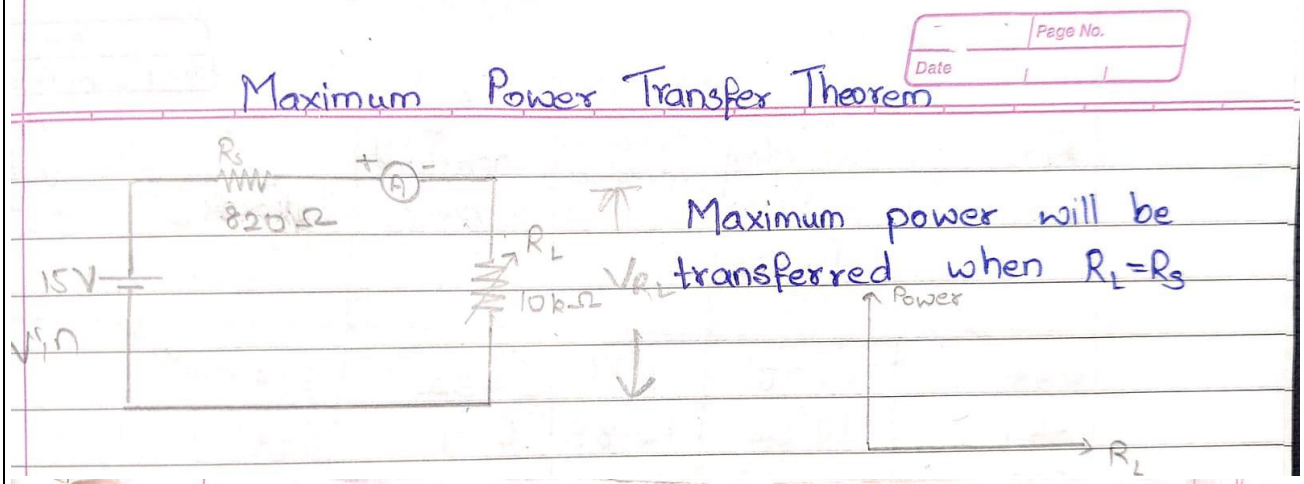
1. Set D.C. supply voltage V= 15 V.
2. Vary R_L in the range 50 Ω - 10 KΩ in steps of 100 Ω.
3. Note down I_L and V_L for each value of R_L. Where I_L and V_L are current through R_L and voltage across R_L respectively.
4. Prepare observation table showing readings of R_L Vs $power$ $P := I_L . V_L$
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: R_{th} = 815 Ω

Sr No	R_L Ω	Circuit Current (I_L) mA		Power absorbed by load (P_L) W $P_L = I^2.R_L$	
		Th	Pr	Th (*10^4)	Pr (*10^4)
1.	238	14.78	14.68	5.2	4.6
2.	365	12.66	12.85	5.8	6.2
3.	557	10.89	11.08	6.6	6.6
4.	700	9.87	9.80	6.81	6.8
5.	815	9.17	9.25	6.85	6.9
6.	1060	7.98	8.20	6.7	6.8
7.	2030	5.26	5.28	5.6	5.9
8.	3050	3.88	3.82	4.5	4.6
9.	4030	3.09	3.11	3.8	3.9
10.	5040	2.56	2.56	3.3	3.3

Output Snap:

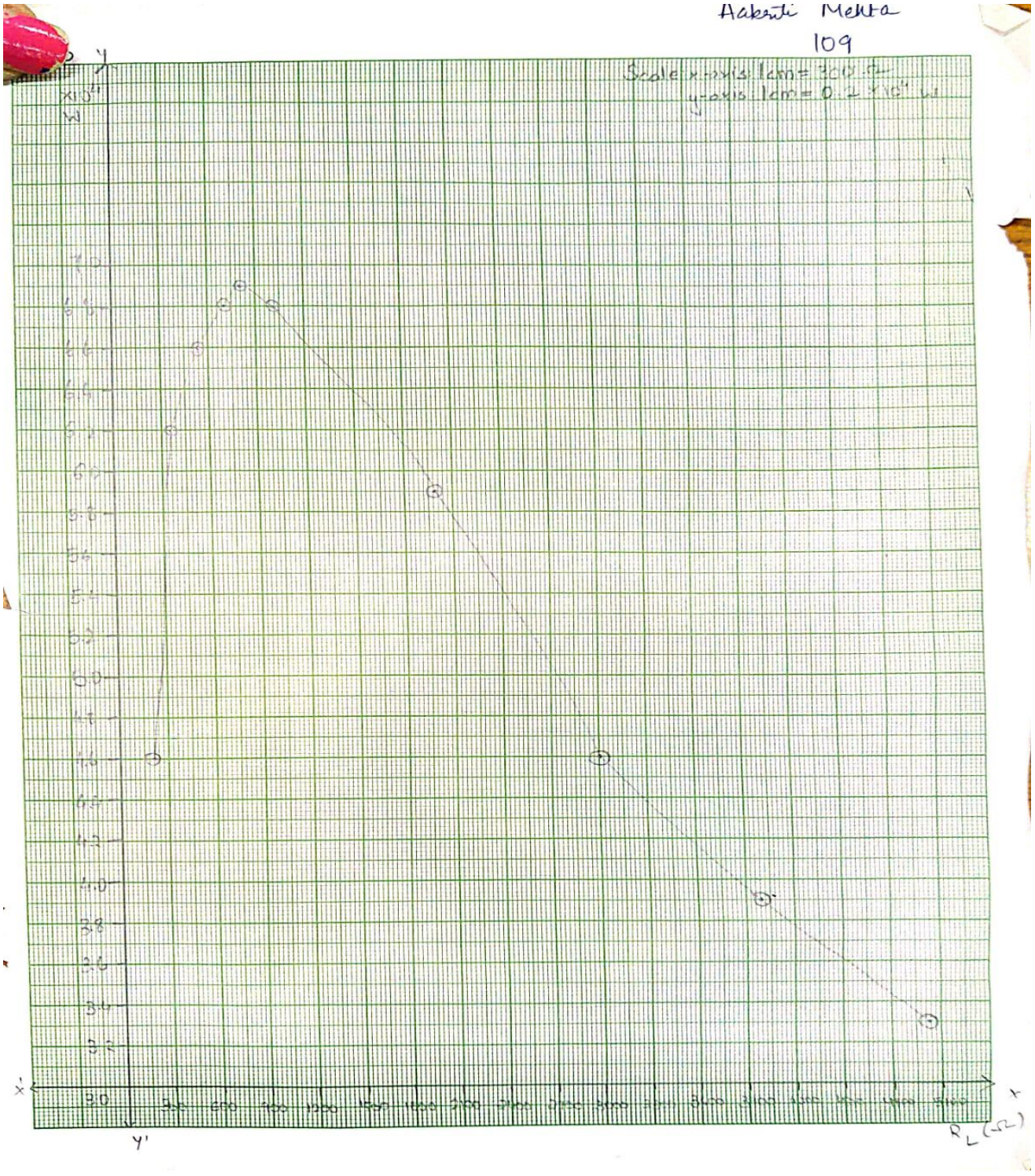
Maximum Power Transfer Theorem



Observation Table:

R_L (Ω)	Current (mA) Theoretical $I_{th} = \frac{V_{in}}{R_S + R_L}$	Current (mA) Practical	V_L across R_L	$P = V_L^2/R_L$ Theoretical $I_{th}^2 \times R_L$	$P = V_L^2/R_L$ Practical
238	14.78	14.68	3.32	5.2×10^4	4.6×10^4
365	12.66	12.85	4.77	5.8×10^4	6.2×10^4
557	10.89	11.08	6.10	6.6×10^4	6.6×10^4
700	9.87	9.80	6.92	6.81×10^4	6.8×10^4
815	9.17	9.25	7.50	6.85×10^4	6.9×10^4
1060	7.98	8.20	8.56	6.7×10^4	6.8×10^4
2030	5.26	5.28	11.02	5.6×10^4	5.9×10^4
3050	3.88	3.82	11.93	4.5×10^4	4.6×10^4
4030	3.09	3.11	12.59	3.8×10^4	3.9×10^4
5040	2.56	2.56	12.91	3.3×10^4	3.3×10^4

Graph:


Aakanksha Mehta
109
Scale x-axis 1cm = 200 Ω
y-axis 1cm = 0.2 x 10⁻⁴ W
Y
X
Y'
X'

Conclusion:

By this experiment we get to know about the maximum power transfer in D.C. circuit.

Signature of faculty in-charge with Date: