

Course Name:	Elements of Electrical and Electronics Engineering	Semester:	I/II
Date of Performance:		Batch No:	16010421063
Faculty Name:		Roll No:	
Faculty Sign & Date:		Grade/Marks:	/ 25

Experiment No: 4

Title: Maximum Power Transfer Theorem

Aim and Objective of the Experiment:

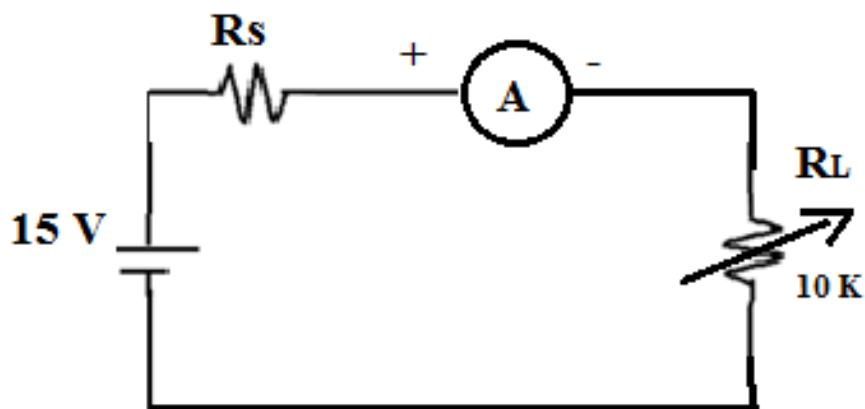
- To observe maximum power transfer in D.C. circuit.

COs to be achieved:

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

Circuit Diagram/ Block Diagram:

Circuit Diagram



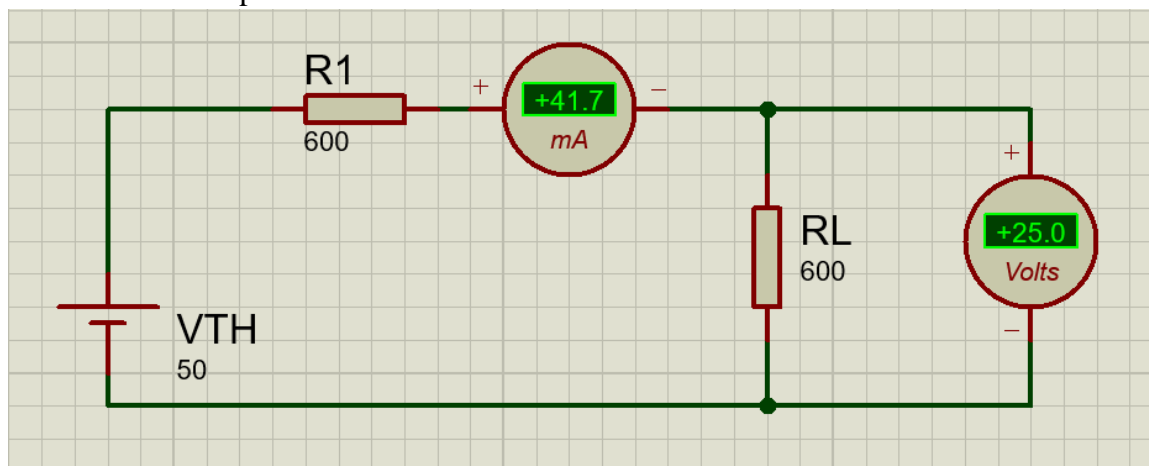
Stepwise-Procedure:

1. Set D.C. supply voltage $V = 15\text{ V}$.
2. Vary R_L in the range $50\ \Omega$ - $10\text{ K}\Omega$ in steps of $100\ \Omega$.
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

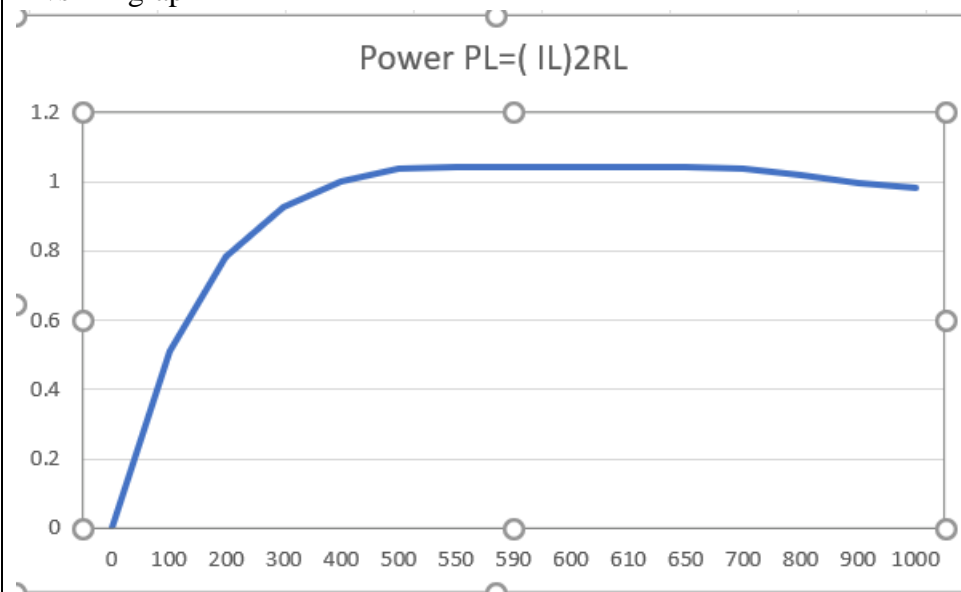
Observation Table:

Sr No.	Value of R_L (Ω)	Load current I_L (mA)	Power $P_L = (I_L)^2 R_L$	Power supplied	Power Efficiency (in %)
1	0	83.3	0	4.165	0
2	100	71.4	0.5098	3.57	14.28
3	200	62.5	0.78125	3.125	25
4	300	55.6	0.92741	2.78	33.36
5	400	50	1	2.5	40
6	500	45.5	1.03513	2.275	45.5
7	550	43.5	1.04074	2.175	47.849977
8	590	42	1.04076	2.1	49.56
9	600	41.7	1.04333	2.085	50.04
10	610	41.3	1.04047	2.065	50.385956
11	650	40	1.04	2	52
12	700	38.5	1.03758	1.925	53.9
13	800	35.7	1.01959	1.785	57.12
14	900	33.3	0.998	1.665	59.94
15	1000	31.3	0.97969	1.565	62.6

Screenshot of Output:



P vs R_L graph-



Conclusion:

- The maximum power that can be transferred from source to load is 50%, which occurs when source impedance is exactly matched to load impedance.
- Maximum power transmission theorem is true because maximum power is passed when Load resistance is same as source resistance.

Signature of faculty in-charge with Date: