EXPERIMENT NO. 5

Objective: To verify the Maximum power transfer theorem Theorem.

Apparatus Required:

Sr. No.	Apparatus	Quantity	Range/ Remark
1	D.C. Supply	1	(……..) V, (…….)A
2	D.C Voltmeter	3	Power Supply Voltmeter-1,(……)V. (……..) V
3	DC Ammeter	1	(……)mA
4	Rheostate	3	Rs=……, R_L=…….
5	Multimeter	1	To Measure Resistance
6	Connecting wires	--	--

Circuit Diagram:

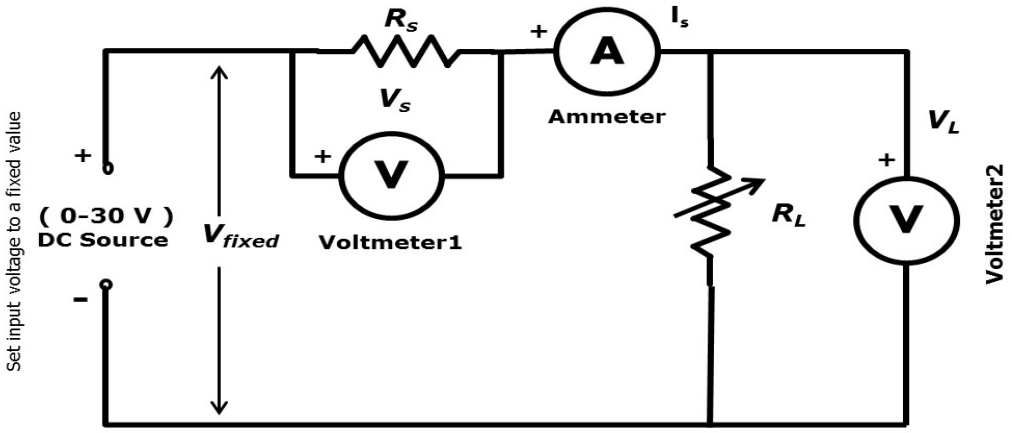


Fig 1- Circuit diagram for Maximum power transfer theorem

Observation Table:

S.N.	V (volts)	V_S (volt)	V_L(volt)	I (mA)	$R_S = \frac{V_S}{I}$	$R_L = \frac{V_L}{I}$	Pmax= V_L(volt) I (mA)
1							
2							
3							
4							
5							
6							
7							

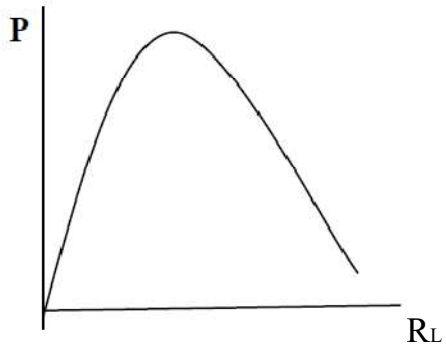
Theory:

According to maximum power transfer theorem "maximum power is transferred from source to load when load resistance is made equal to internal resistance of the source" The value of maximum power transfer is given by:

$$\text{Pmax} = \left(\frac{V_{TH}{}^2}{4 * R_L}\right) = V_L * I$$

Where V_L is load voltage, I = load current and R_L = load resistance.

Model Graph:



Procedure:

1. Connect the circuit as shown in the diagram.
2. Switch On the DC power supply
3. Keeping the V fixed and varying the value of R_L note down the value of V_S, V_L and I
4. Calculate Rs and $R_L$using formula and show the maximum power position

Result: When $R_S = R_L$ ……Ω maximum power is obtained and therefore maximum power transfer theorem has been verified successfully.

Precaution:

1. Make the connections properly.
2. Note the readings of voltmeters and ammeters properly avoid parallax
3. Connect the DC supply and ammeter with correct polarity.
4. Avoid loose connections and don't touch wire with wet hand.