

**LAB NO: 12****TO ANALYZE A DC CIRCUIT USING MAXIMUM POWER TRANSFER THEOREM****OBJECTIVE:**


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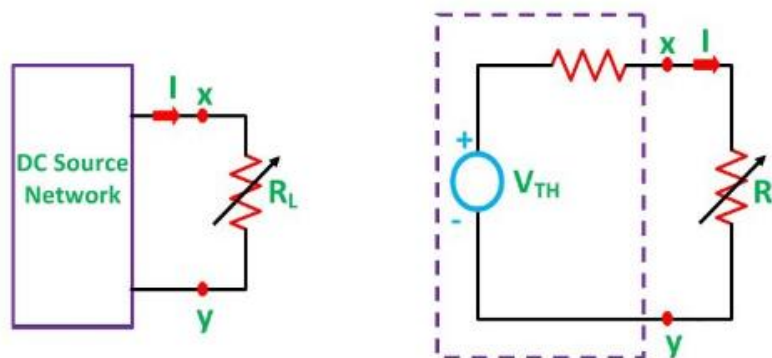
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**THEORY:****MAXIMUM POWER TRANSFER THEOREM:**

Maximum Power Transfer Theorem states that a resistive load, being connected to a DC network, receives maximum power when the load resistance is equal to the internal resistance known as (Thevenin's equivalent resistance) of the source network as seen from the load terminals. The Maximum Power Transfer theorem is used to find the load resistance for which there would be the maximum amount of power transfer from the source to the load.

A variable resistance  $R_L$  is connected to a DC source network as shown in the circuit diagram in figure A below and the figure B represents the Thevenin's voltage  $V_{TH}$  and Thevenin's resistance  $R_{TH}$  of the source network.

The aim of the Maximum Power Transfer theorem is to determine the value of load resistance  $R_L$ , such that it receives maximum power from the DC source.



**Figure 12.1: Equivalent Circuit**

The value of current and power can be calculated by the equation shown below:

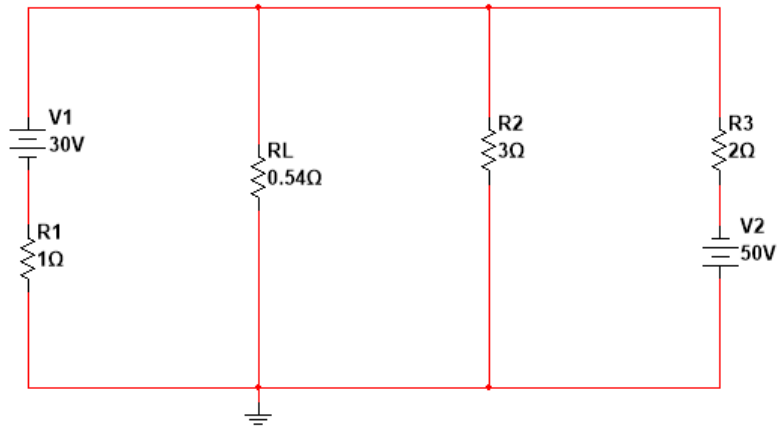
$$I = \frac{V_{TH}}{R_{TH} + R_L} \dots \dots \dots (1)$$

$$P_{max} = \frac{V_{TH}^2}{4R_{TH}}$$

**APPARATUS:**

- Digital multi-meter
- DC power supply
- Resistors
- Connecting Wires

**SCHEMATIC DIAGRAM:**



**Figure 12.2: Circuit Diagram**

**PROCEDURE:**

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**CALCULATIONS:**

<b>Parameters</b>	<b>Theoretical</b>	<b>Practical</b>
$V_{TH}$		
$R_{TH}$		
Current through $R_L$		
$P_{MAX}$		

**Table 12.1**

**CONCLUSION:**

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**POST LAB QUESTIONS:**

1. In Maximum power transfer theorem, how  $R_{TH}$  is calculated?

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2. In Maximum power transfer theorem, what is meant by  $P_{MAX}$ ?

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3. What is the main difference between Thevenin's Theorem and Maximum power transfer Theorem?

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**Teacher Remarks:**

**Obtained Marks:** \_\_\_\_\_ / 10