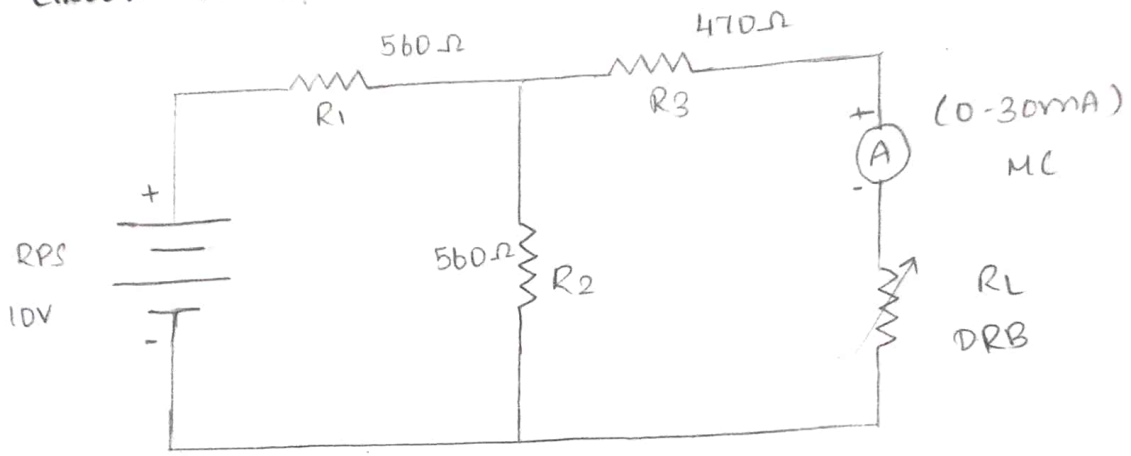
CIRCUIT DIAGRAM:



MODEL GRAPH:-

TABLE : FOR PRACTICAL CALCULATION :-

S.No	Load resistance (R_L)	Load current (I_L) in amps.	Load voltage (V_L) in volts.	Load power (P_L) in watts.
1	1KΩ	2.96mA	2.96V	8.76mW
2	150 KΩ	5.53mA	0.995V	6.60mW
3	100 KΩ	6.00mA	0.6V	3.6 mW
4	470 KΩ	4.13mA	1.94V	8.01 mW
5	5KΩ	0.85mA	4.335V	3.68 mW

VERIFICATION OF MAXIMUM POWER TRANSFER THEOREM.

AIM:

To measure the power absorbed in load and to verify that the power absorbed in a load is maximum only when load resistance is equal to the source resistance.

APPARATUS REQUIRED:

S.NO	NAME OF THE APPARATUS	SPECIFICATION	QUANTITY
1.	Voltmeter	(0-15 V) MC	1
2.	Ammeter	(0-500 mA) MC	1
3.	Resistors.	560Ω,	2
		470Ω	1
4.	RPS (DC supply)	15 V	1

PROCEDURE:

1. Make connection as per the circuit diagram.
2. Change the resistors R_L whose value close to R_{TH}, measure the corresponding V_L, I_L and calculate P_L and enter into the table (2).
3. Plot a graph between R_L and P_L and find the R_L corresponding to maximum power transfer.
4. Verify the measured values of R_L at maximum power transfer as same as calculated and found graphically.

CALCULATION :

$$V_{th} = \frac{V \times R_2}{R_1 + R_2} = \frac{10 \times 560}{560 + 560} = 5V$$

$$R_{th} = \frac{560 \times 560}{2(560)} + 470 = 280 + 470$$

$$= 750\ \Omega$$

$$R_L = R_{th}$$

$$P_L = \frac{(V_{th})^2}{4(R_{th})} = \frac{5^2}{4 \times 750} = \frac{25}{4 \times 750} = \frac{25}{3000}$$

$$= 8.33\ mW$$

$$I_L = \frac{V_{th}}{R_{th} + R_L} = \frac{5}{1500} = 0.0333\ A$$

$$I_L = 3.33\ mA$$

$$V_L = I_L \times R_L = 3.33 \times 10^{-3} \times 750$$

$$V_L = 2.5V$$

RESULT:

Thus maximum power transfer theorem is verified practically and theoretically.