

Department of Electrical Engineering
Sessional Assignment
Course Details

Course Title: Instrumentation and Measurement **Module:** 6th (BE)

Student Details

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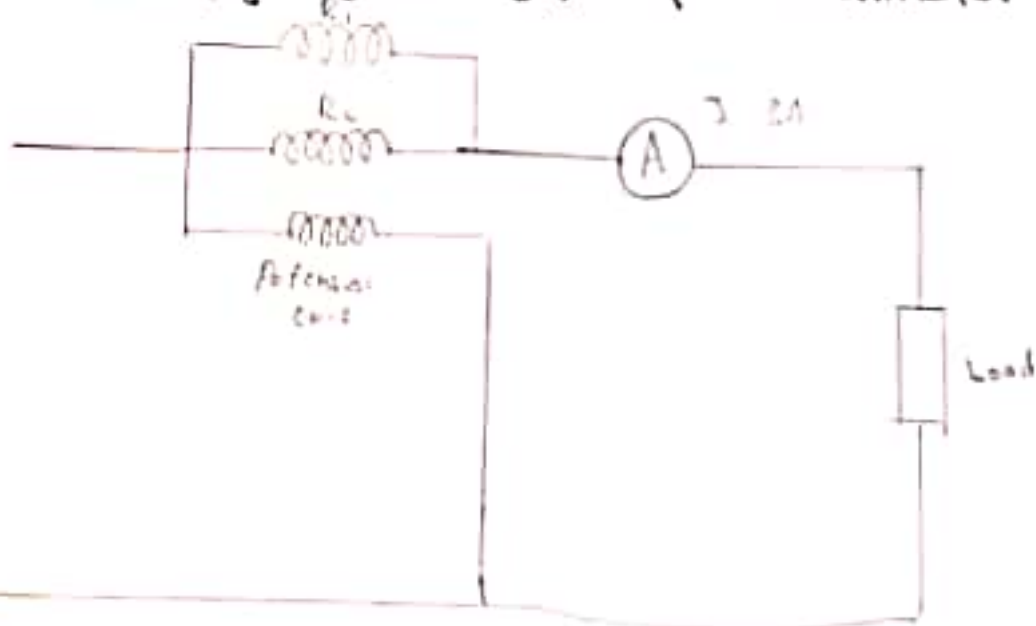
Q1: A wattmeter has 2 current coils connected in parallel, each having a resistance of 0.7Ω . The wattmeter is connected in a circuit to measure power with its potential coil on the supply side. The reading on the wattmeter is 100W and the reading on the ammeter connected in series with the current coil is 3A. Calculate:

- a) Power loss in the wattmeter
 - b) True load power
 - c) Percentage error due to wattmeter connection
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Q2: Two voltmeters have the same range 0-500V. The internal resistances are $30K\Omega$ and $20K\Omega$ respectively. If they are connected in series and 700V be applied across them, what will be their readings?

Q 1: A Wattmeter has 2 Current Coil Connected in Parallel, each having a resistance of 0.7Ω . The Wattmeter is connected in a circuit to measure Power with its Potential Coil on the Supply side. The reading on the Wattmeter is $100W$ and the reading on the ammeter is connected in Series with the Current Coil is $3A$.

- Power loss in the wattmeter
- True Load Power
- Percentage error due to wattmeter connection



Sol:

Given data:

$$I = 3A$$

$$R \text{ Current Coil} = 0.7\Omega$$

$$\text{Wattmeter Reading} = 100W$$

(2)

Required:

- Power Loss in wattmeter
- True Load Power
- % error due to wattmeter connection

Solution-

a) Power Loss in wattmeter = $I_c R_c$

$$R_c = \frac{R_i \times R_i}{R_i + R_i} = \frac{0.7 \times 0.7}{0.7 + 0.7} = 0.35 \Omega$$

$$= I_c R_c$$

$$\text{Power Loss in wattmeter} = I_c R_c = (3)^2 (0.35) = 3.15 \text{ W}$$

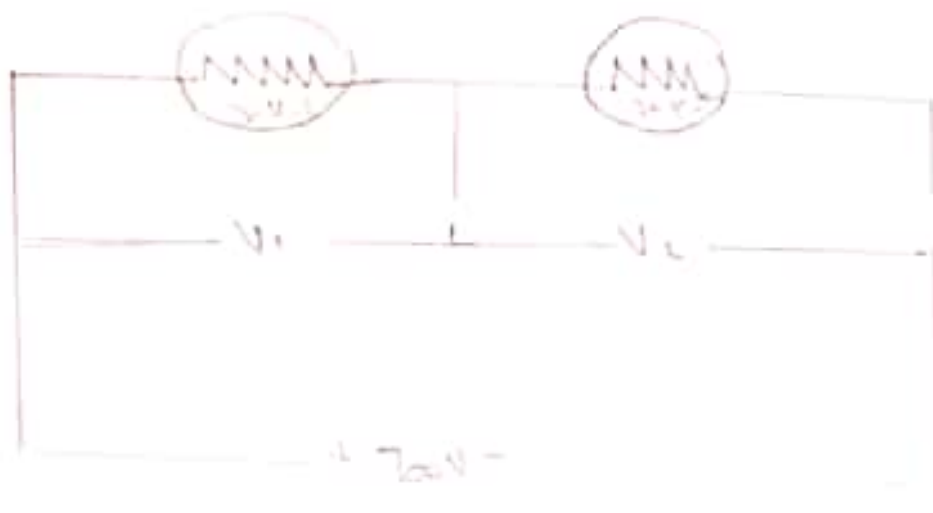
$$\text{b) True Load Power} = 100 - 3.15 = 96.85 \text{ W}$$

$$\text{c) \% age error} = \frac{100 - 96.85}{96.85} \times 100$$

$$= 3.252\%$$

(3)

Q 2: Two Voltmeters have same range 0-500V
The internal resistance are 30k and 20k
respectively. If they are connected in series
and 700V be applied across them what
will be their Reading



Given data

$$R_1 = 30k$$

$$R_2 = 20k$$

$$V = 700V$$

Required: Find Reading

$$\text{Solution: } V_1 = \frac{30k}{30k + 20k} \times 700 = 420V$$

$$V_2 = \frac{20k}{20k + 30k} \times 700 = 280V$$