

NAME

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SUBJECT

SUBMITTED TO

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14231

EMI

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Q1: A wattmeter has 2 current coils in parallel, each having a resistance of 0.7Ω . The wattmeter is connected in a circuit - - - - - is 3A. Calculate

- Power loss in the wattmeter
- True load power
- Percentage error due to wattmeter connections

GIVEN DATA:-

$$R_1 = 0.7\Omega$$

$$R_2 = 0.7\Omega$$

$$P = 100W$$

$$I = 3A$$

Solution:

Effect Resistance of current coils

$$R_c = \frac{R_1 R_2}{R_1 + R_2} = \frac{0.7 \times 0.3}{0.7 + 0.3} = 0.35$$

① Power loss in wattmeter = $I^2 R_c$

$$= (3)^2 (0.35)$$

$$= 3.15 \text{ W}$$

② True load power = $100 - 3.15$
 $= 96.85 \text{ W}$

③ % age error = $\frac{100 - 96.85}{96.85} \times 100$

$$= 3.25\%$$

(3)

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

GIVEN DATA:-

$$V = 0-500V$$

$$R_1 = 30k\Omega$$

$$R_2 = 20k\Omega$$

$$V_s = 700V$$

Required:-

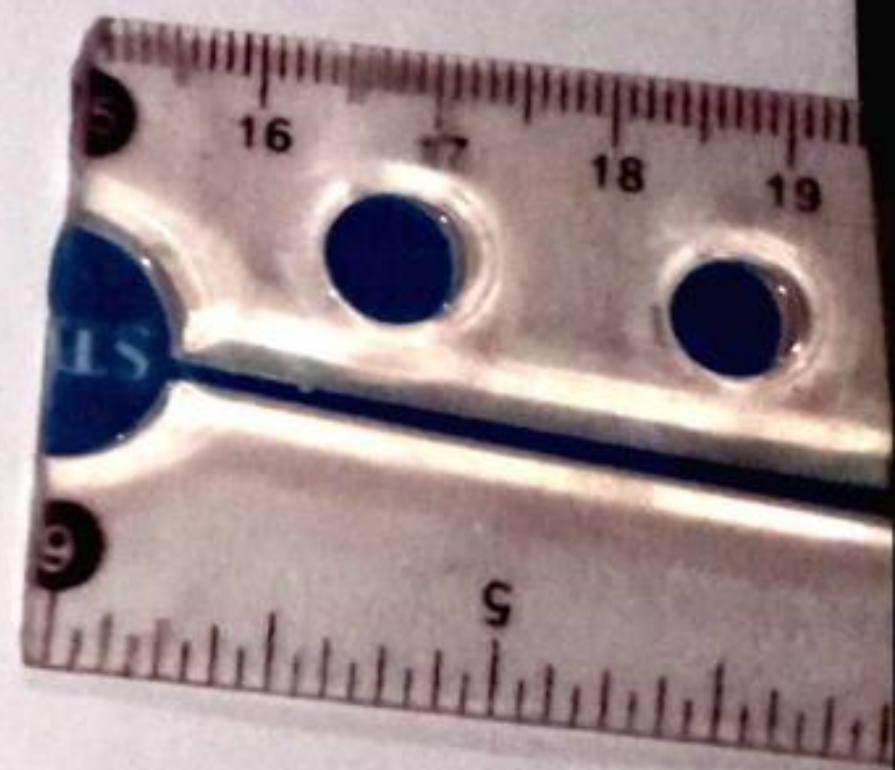
Voltage reading in 1st voltmeter?

voltage reading in 2nd voltmeter?

Solution:-

$$V_1 = \frac{30k}{30k + 20k} \times 700$$

$$V_1 = 420V$$



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



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