

Answer on Question #47744-Physics-Electric Circuits

Two similar cells A and B are connected in series with a coil of resistance 9.8ohm. A voltmeter of very high resistance connected to the terminals of A reads 0.98 volt and when connected to the terminals of B it reads 1.0 volt. Find the internal resistance of each cell having emf 1.08

Solution

$$I = \frac{(V_A + V_B)}{R} = \frac{0.98 + 1}{9.8} = 0.2 \text{ A.}$$

The internal resistance of each cell:

$$r_A = \frac{\mathcal{E} - V_A}{I} = \frac{1.08 - 0.98}{0.2} = 0.5 \text{ ohms}$$

$$r_B = \frac{\mathcal{E} - V_B}{I} = \frac{1.08 - 1.00}{0.2} = 0.4 \text{ ohms.}$$