2019 Ph H1 Q22

Section: Electricity

Topic: Current, PD, Power, Resistance

Question Summary
A resistor’s voltage and current are measured with uncertainties: V = (10.0 ± 0.1) V, I = (0.50 ± 0.01) A. Find the approximate absolute uncertainty in the calculated resistance.

Worked Solution
$R = V/I = 10.0/0.50 = 20.0\ \Omega$.

$\%\Delta V = (0.1/10.0) \times 100\% = 1.0\%$
$\%\Delta I = (0.01/0.50) \times 100\% = 2.0\%$
Total $\%\Delta R = 3.0\% \Rightarrow \Delta R = 0.03 \times 20.0 = 0.60\ \Omega$.

Final Answer: B

Revision Tips

- For quotients, add percentage uncertainties.
- Convert back to absolute uncertainty at the end.
- Give the uncertainty to 1–2 s.f.