2019 H1 Q20

Section: Electricity

Topic: Monitoring and Measuring A.C.

- Count the peak-to-peak amplitude from the oscilloscope trace (e.g., 6 divisions peak-to-peak).
- Use the Y-gain (1.0 V per division) to convert divisions to peak-to-peak voltage and then divide by 2 to find the peak voltage (3 V).
- Calculate the r.m.s. voltage using $V_{rms} = V_{peak} / \sqrt{2}$.
- Substituting gives $V_{rms} = 3 \div \sqrt{2} \approx 2.1$ V.

Final Answer: A — 2.1 V

Revision Tips:

- For AC voltages, the r.m.s. value equals the peak value divided by √2; this gives the effective DC equivalent.
- On an oscilloscope, measure the peak-to-peak amplitude and halve it to get the peak amplitude before calculating r.m.s.
- The Y-gain converts divisions to volts; always use the correct vertical scale when reading amplitudes.