Measurement and time-scale applications

6 questions | 15 marks

Equivalent correct methods earn the corresponding marks.

1. Write 3.5 km in metres using scientific notation. [2 marks]

1 km $= 10^3$ m, so multiply 3.5 by 10^3.

Answer: 3.5×10^3 m

2. Write 0.0042 m in millimetres. [2 marks]

1 m $= 1000$ mm.

$0.0042 \times 1000 = 4.2$.

Answer: 4.2 mm

3. A particle is 2.5×10^{-6} m wide. Express its width in micrometres. [2 marks]

1 micrometre $= 10^{-6}$ m.

Divide 2.5×10^{-6} m by 10^{-6} m per micrometre.

Answer: 2.5 micrometres

4. A beam travels 1.8×10^6 m in 6×10^{-3} s. Find its constant speed. [3 marks]

$v = d \div t = \frac{1.8}{6} \times 10^{6-(-3)} = 0.3 \times 10^9$.

Normalise to 3×10^8 m/s.

Answer: 3×10^8 m/s

5. A model is 15 cm long and represents a real object 30 m long. Find the scale factor from real object to model. [3 marks]

Convert 30 m to 3000 cm.

$15 \div 3000 = \frac{1}{200}$.

Answer: $\frac{1}{200}$

6. A sensor records 2×10^4 readings each second. How many readings does it record in 5 minutes? [3 marks]

5 minutes $= 300 = 3 \times 10^2$ seconds.

$(2 \times 10^4)(3 \times 10^2) = 6 \times 10^6$.

Answer: 6×10^6 readings