

- 3 In making reasonable estimates of physical quantities, which statement is **not** correct?
- A The frequency of sound can be of the order of GHz.
  - B The wavelength of light can be of the order of 600 nm.
  - C The Young modulus can be of the order of  $10^{11}$  Pa.
  - D Beta radiation is associated with one unit of negative charge.
- 4 The uncertainty in the value of the momentum of a trolley passing between two points X and Y varies with the choice of measuring devices.

Measurements for the same trolley made by different instruments were recorded.

- 1 distance between X and Y using a metre rule with cm divisions = 0.55 m
- 2 distance between X and Y using a metre rule with mm divisions = 0.547 m
- 3 timings using a wristwatch measuring to the nearest 0.5 s at X = 0.0 s and at Y = 4.5 s
- 4 timings using light gates measuring to the nearest 0.1 s at X = 0.0 s and at Y = 4.3 s
- 5 mass of trolley using a balance measuring to the nearest g =  $6.4 \times 10^{-2}$  kg
- 6 mass of trolley using a balance measuring to the nearest 10 g =  $6 \times 10^{-2}$  kg

Which measurements, one for each quantity measured, lead to the least uncertainty in the value of the momentum of the trolley?

- A 1, 3 and 6      B 1, 4 and 6      C 2, 3 and 6      D 2, 4 and 5

**Space for working**