AQA AS Physics exam practice answers

1 Measurements and their errors

**1**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Base unit | Base unit | Derived unit | Derived unit | Derived unit | Derived unit |
| Metre | Second | Velocity |  |  |  |
| Ampere | Second | Charge (A s) |  |  |  |
| Second |  | Velocity (m s−1) | Acceleration |  |  |
| Kilogram |  | Acceleration (m s−2) | Force |  |  |
|  | Metre | Force (kg m s−2) | Work (kg m2 s−2) |  |  |
|  |  | Work | Charge (A s) | Potential difference (volt) (kg m2 A−1 s−3) |  |
|  |  |  | Potential difference | Current (A) | Resistance () (kg m2 A−2 s−3) |

**2** D

**3** resistivity = *RA*/*L* = 0.5 × × (0.15 × 10−3)2/0.6

= 1.88 × 2.25 × 10−8/0.6 = 5.89 × 10−8 m

% accuracy in resistivity = Δ*R* + (2 × Δ*d*) + Δ*L*

= 5% + (2 × 2%) + 8% = ±17% = ±1.0 × 10−8 m

So:

resistivity = 5.89 × 10−8 m ±1.0 × 10−8 m

**4** B

**5 (a)** 5.5 cm

 **(b)** percentage uncertainty in the length at *F* = 3.0 N = ±(2/35.2) × 100 = 5.7%

**(c)** gradient of the line = (4.35 − 1.76)/(0.5 − 0.2) = 8.6 N m−1

**(d)** maximum gradient = (4.55 − 1.8)/(0.5 − 0.2) = 9.2 N m−1

minimum gradient = (4.2 − 1.75)/(0.5 − 0.2) = 8.2 N m−1

percentage accuracy = (9.2 − 8.2/8.6) × 100 = 11.6%