


A Level • OCR • Physics

 9 mins 9 questions

Multiple Choice Questions

Handling Data

Presenting & Interpreting Results / Analysing Quantitative Data / Plotting & Interpreting Graphs / Evaluating Results & Drawing Conclusions / Observations & Measurements / Presenting in a Scientific Way / Use of Software & Tools / Research & Citation Skills / Precision, Accuracy & Experimental Limitations / Significant Figures / Methods to Increase Accuracy

Medium (5 questions)	/5
Hard (4 questions)	/4
Total Marks	/9

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Medium Questions

- 1 A solid cylindrical glass rod has length 20.0 ± 0.1 cm and diameter 5.00 ± 0.01 mm.

What is the percentage uncertainty in the calculated volume of this rod?

- A. 0.1 %
- B. 0.2 %
- C. 0.7 %
- D. 0.9 %

(1 mark)

- 2 Which is the **best** value for the elementary charge e in terms of both accuracy and uncertainty?

- A. $(1.5 \pm 0.5) \times 10^{-19}\text{C}$
- B. $(1.5 \pm 0.4) \times 10^{-19}\text{C}$
- C. $(1.7 \pm 0.2) \times 10^{-19}\text{C}$
- D. $(1.8 \pm 0.2) \times 10^{-19}\text{C}$

(1 mark)

- 3 The student measures the height of a tube. The student's values are:

83.5cm 82.9cm 83.3cm 83.1cm

What is the average height h and the absolute uncertainty in h ?

- A. 83.2 ± 0.3 cm
- B. 83.2 ± 0.1 cm
- C. 83.2 ± 0.5 cm
- D. 83.1 ± 0.3 cm

(1 mark)

- 4 A student of mass 85.2 kg uses a set of weighing scales to measure his mass three times. The following readings are obtained.

	Mass / kg
Reading 1	87.2
Reading 2	87.1
Reading 3	87.2

Which statement describes the precision and accuracy of the data?

- A. not precise to ± 0.1 kg and accurate to ± 0.1 kg
- B. not precise to ± 0.1 kg and not accurate to ± 0.1 kg
- C. precise to ± 0.1 kg and accurate to ± 0.1 kg
- D. precise to ± 0.1 kg and not accurate to ± 0.1 kg

(1 mark)

- 5 A hard disk is labeled as having a storage capacity of 420 GB. The letter B stands for byte, which is a unit. What is the equivalent storage capacity in bytes?

- A. 4.20×10^8
- B. 4.20×10^{11}
- C. 4.20×10^9
- D. 4.20×10^{17}

(1 mark)

Hard Questions

- 1 Which is the best estimate of the area of a rectangular field of length 98 ± 3 m and width 47 ± 2 m?

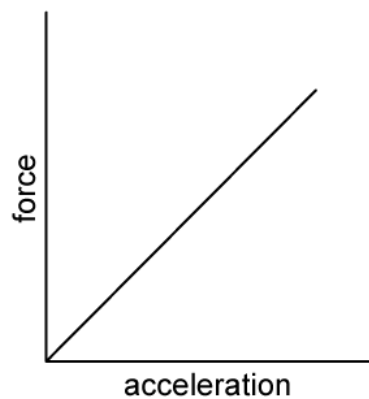
- A. $4600 \pm 5 \text{ m}^2$
- B. $4600 \pm 6 \text{ m}^2$
- C. $4600 \pm 300 \text{ m}^2$
- D. $4606 \pm 337 \text{ m}^2$

(1 mark)

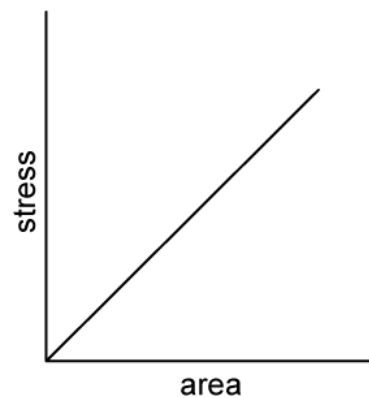
- 2 The units for the gradient of a graph are $\text{kg m}^{-1} \text{ s}^{-2}$.

Which one of the following options is a possible graph with this gradient?

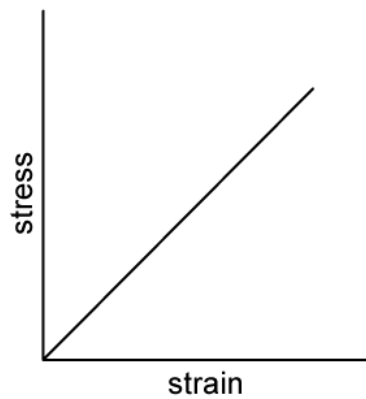
A.



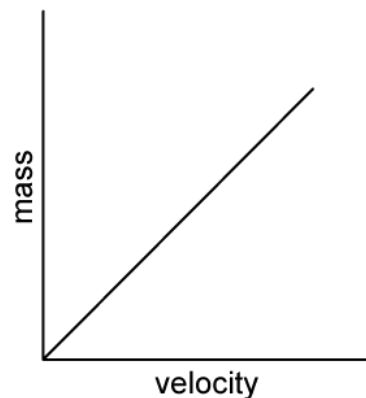
B.



C.



D.



(1 mark)

- 3 A voltmeter and ammeter are used to determine the resistance in a resistor. The value of the resistance is found to be $8.50\ \Omega$ with an absolute uncertainty of 15 %. The current through the resistor is measured to be 2.35 A with an absolute uncertainty of 6%.

What is the uncertainty of the voltmeter?

- A. $\pm 1.80\text{ V}$
- B. $\pm 0.09\text{ V}$
- C. $\pm 2.19\text{ V}$
- D. $\pm 1.28\text{ V}$

(1 mark)

- 4 A trolley is released from rest and it travels down a ramp. Its velocity is measured at 0.5 s intervals. The table of results are shown below, and a graph is plotted.

$v / \text{m s}^{-1}$	t / s
0.620	0.5
1.99	1.0
3.00	1.5
3.98	2.0
4.99	2.5

Which statement is **true**?

- A.** There are no anomalies in the results
- B.** The area under the graph is 6.2 m (2 s.f)
- C.** The gradient of the graph is 1.7 m s^{-2} (2 s.f)
- D.** The graph will show an inversely proportional relationship between v and t

(1 mark)