3.1 Measurements and their Errors: 10-minute Pack

AQA 7408 · Calculator allowed · about 10 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 SI units, prefixes and estimation are the foundation of all physical measurements.

(a) State the SI base unit of: (i) mass, (ii) time, (iii) electric current. **(3)**

(b) A component in a circuit is 250 nm thick. Write this thickness in metres, using standard form. **(1)**

(c) A capacitor is labelled as having a capacitance of 4.7 nF. Express this value in picofarads (pF). **(2)**

(d) Estimate, to one significant figure, the diameter of a single human hair in metres. State the order of magnitude of your estimate. **(2)**

(Total for Question 1 is 8 marks)

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Mark scheme · 3.1 Measurements and their Errors: 10-minute Pack

Question 1

(a) kilogram, kg **B1**

(a) second, s **B1**

(a) ampere, A **B1**

(a) Answer: (i) kilogram (kg); (ii) second (s); (iii) ampere (A).

(b) 2.5×10^{-7} m (cao) **B1**

(b) Answer: 2.5×10^{-7} m

(c) recognises 1 nF = 10^3 pF (i.e. multiplies by 1000) **M1**

(c) 4700 pF, or equivalently 4.7×10^3 pF (cao) **A1**

(c) Answer: 4700 pF (4.7×10^3 pF)

(d) any sensible estimate in the range 5×10^{-5} m to 2×10^{-4} m **B1**

(d) correctly states the order of magnitude of their estimate (e.g. 10^{-4} m) oe **B1**

(d) Answer: Approximately 1×10^{-4} m; order of magnitude 10^{-4} m (any value from 5×10^{-5} to 2×10^{-4} m with a correctly stated matching order of magnitude is acceptable).

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