A Level · OCR · Physics

6 mins 1 question

Structured Questions

Magnetic Fields

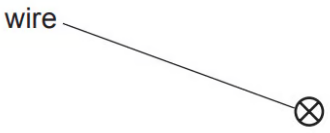
Magnetic Fields / Magnetic Fields Lines / Fleming's Left-Hand Rule / Force on a Current-Carrying Conductor / Magnetic Flux Density / Force on a Moving Charge / Motion of Charged Particles in a B Field / Velocity Selector

Scan here to return to the course
or visit savemyexams.com

Total Marks /6

© 2024 Save My Exams, Ltd.

1 (a) The diagram below shows the top-view of a long current-carrying wire. wire



The direction of the current in the wire is into the plane of the paper.

Draw at least **three** field lines to indicate the magnetic field pattern around this wire.

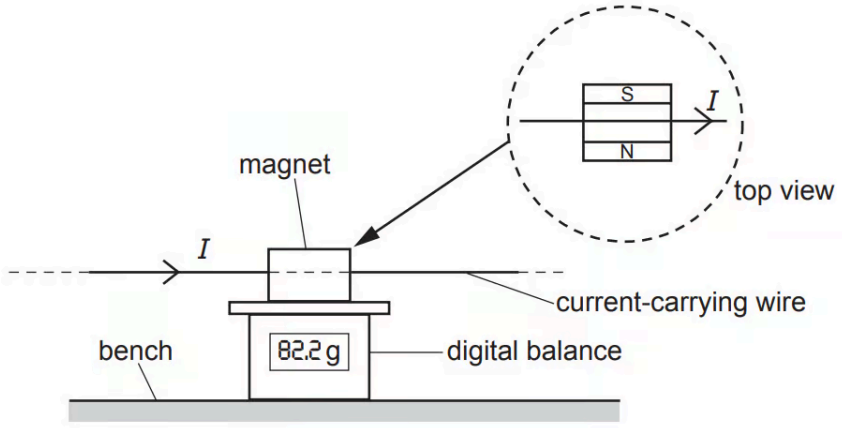
[2]

.....

.....

(2 marks)

(b) The arrangement shown in the diagram below is used to determine the magnetic flux density between the poles of a permanent magnet.



The magnet is placed on the digital balance. The current-carrying wire is horizontal and at right angles to the magnetic field between the poles of the magnet. The wire is fixed.

The following results are collected.

- length of the wire in the uniform field of the magnet = 6.0 ± 0.2 cm
- balance reading with no current in wire = 80.0 g

© 2024 Save My Exams, Ltd.

- balance reading with current in wire = 82.2 g
- current in wire = 5.0 ± 0.1 A

Calculate the magnetic flux density *B*, including the absolute uncertainty. Ignore the absolute uncertainty in the balance readings. Write your value for *B* to **2** significant figures and the absolute uncertainty to **1** significant figure.

B = ... ± ..... T **[4]**

(4 marks)

© 2024 Save My Exams, Ltd.