

- 8 (a) Define *magnetic flux density*.

.....

[3]

- (b) A stiff copper wire is balanced horizontally on a pivot, as shown in Fig. 8.1.

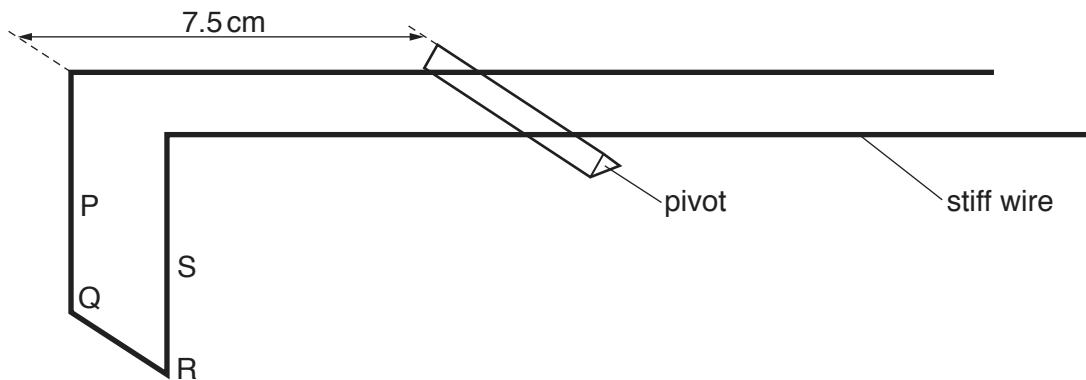


Fig. 8.1

Sections PQ, QR and RS of the wire are situated in a uniform magnetic field of flux density B produced between the poles of a permanent magnet.

The perpendicular distance of PQRS from the pivot is 7.5 cm.

When a current of 2.7 A is passed through the wire, a small mass of 45 mg is placed a distance 8.8 cm from the pivot in order to restore the balance of the wire, as shown in Fig. 8.2.

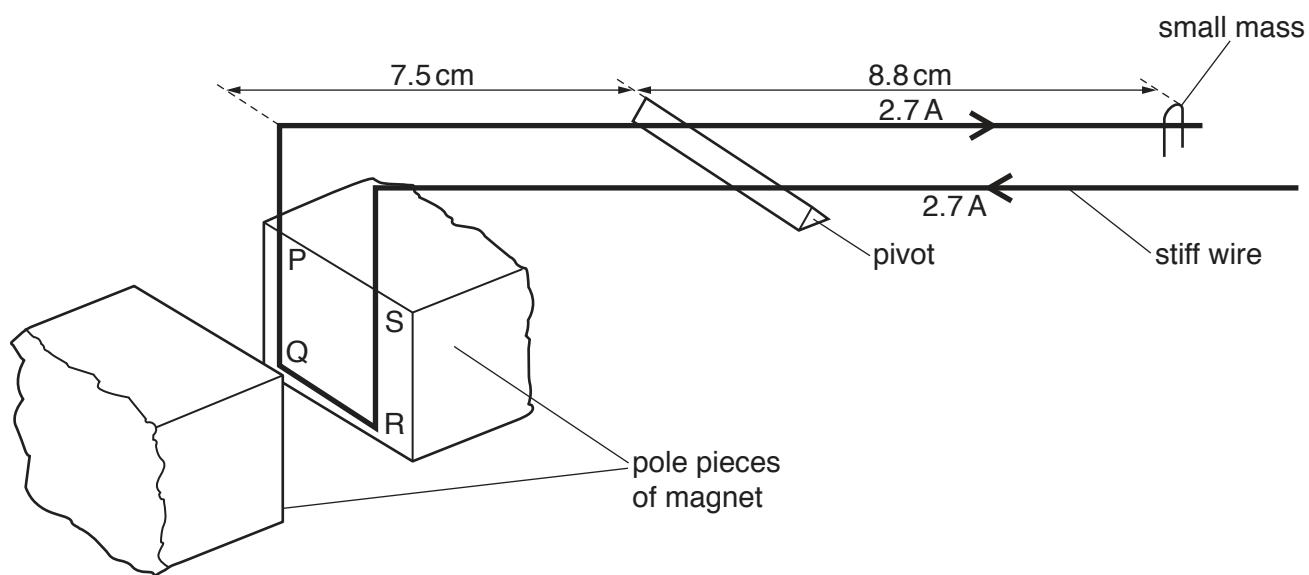


Fig. 8.2

- (i) Explain why, when the current is switched on, the current in the sections PQ and RS of the wire does not affect the balance of the wire.

.....
.....
.....

[2]

- (ii) The length of section QR of the wire is 1.2cm.
Calculate the magnetic flux density B .

$$B = \dots \text{ T} [3]$$

[Total: 8]