



4 (a) (I) Define *magnetic flux density*.

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[3]

(II) State what is meant by *magnetic flux linkage*.

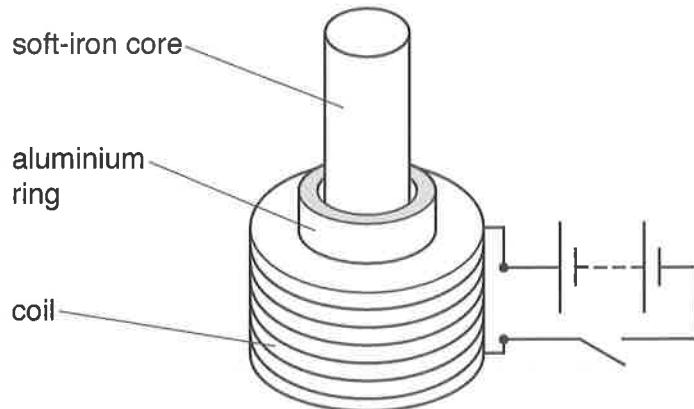
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[2]





- (b) A coil of wire is wound around one end of a soft-iron core, as shown in Fig. 4.1.



**Fig. 4.1**

The axis of the coil is vertical.

An aluminium ring is placed over the other end of the soft-iron core. The ring can move freely on the core.

The switch is closed and there is a direct current in the coil.

Explain why the aluminium ring moves vertically when the switch is closed.

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[4]

- (c) The switch is opened. The aluminium ring is now replaced with a ring made from an electrical insulator. This ring can also move freely on the core.

State and explain whether this ring would move vertically when the switch is closed.

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[2]

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