

- 9 (a) State what is meant by the *magnetic flux linkage* of a coil.

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[3]

- (b) A coil of wire has 160 turns and diameter 2.4 cm. The coil is situated in a uniform magnetic field of flux density 7.5 mT, as shown in Fig. 9.1.

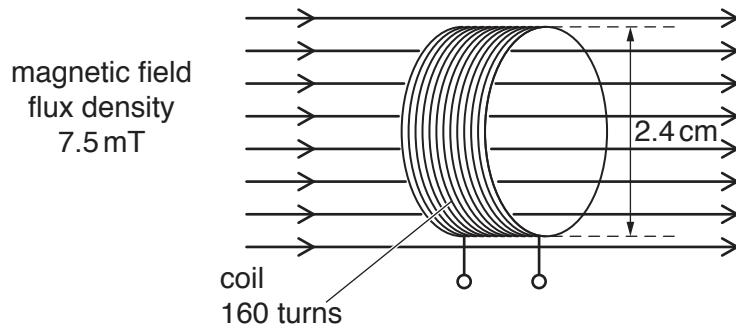


Fig. 9.1

The direction of the magnetic field is along the axis of the coil.

The magnetic flux density is reduced to zero in a time of 0.15 s.

Show that the average e.m.f. induced in the coil is 3.6 mV.

[2]

- (c) The magnetic flux density B in the coil in (b) is now varied with time t as shown in Fig. 9.2.

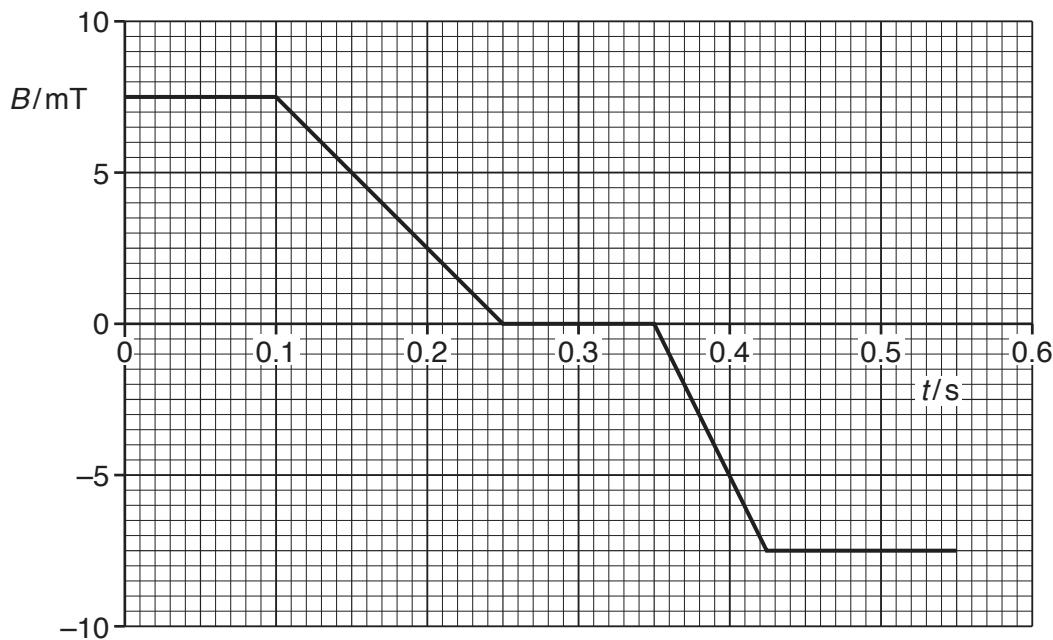


Fig. 9.2

Use data in (b) to show, on Fig. 9.3, the variation with time t of the e.m.f. E induced in the coil.

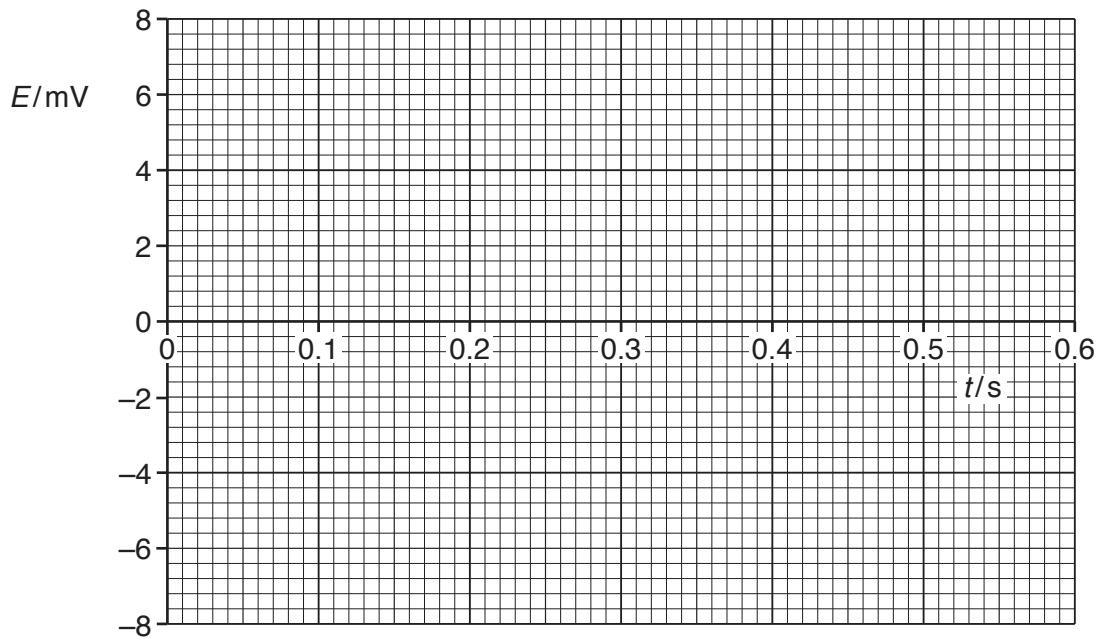


Fig. 9.3

[4]

[Total: 9]

