

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

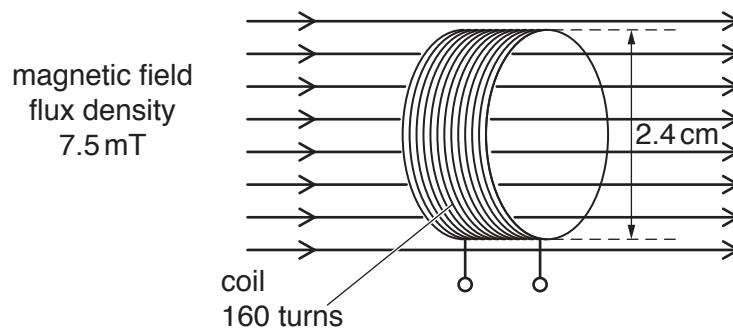
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- (b) A coil of wire has 160 turns and diameter 2.4 cm. The coil is situated in a uniform magnetic field of flux density 7.5 mT, as shown in Fig. 9.1.



**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.

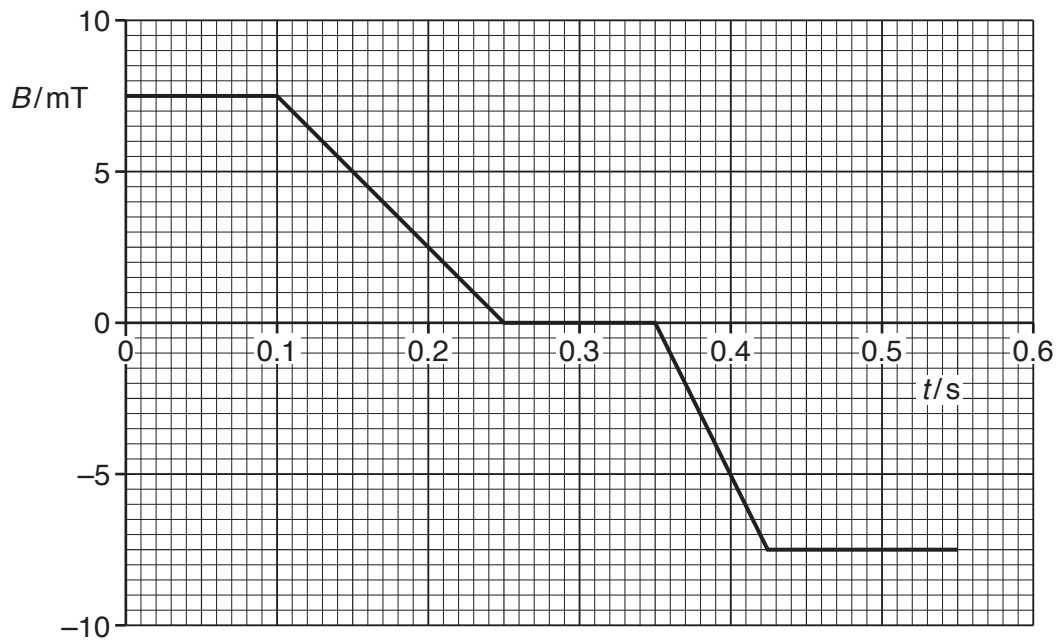


Fig. 9.2

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.

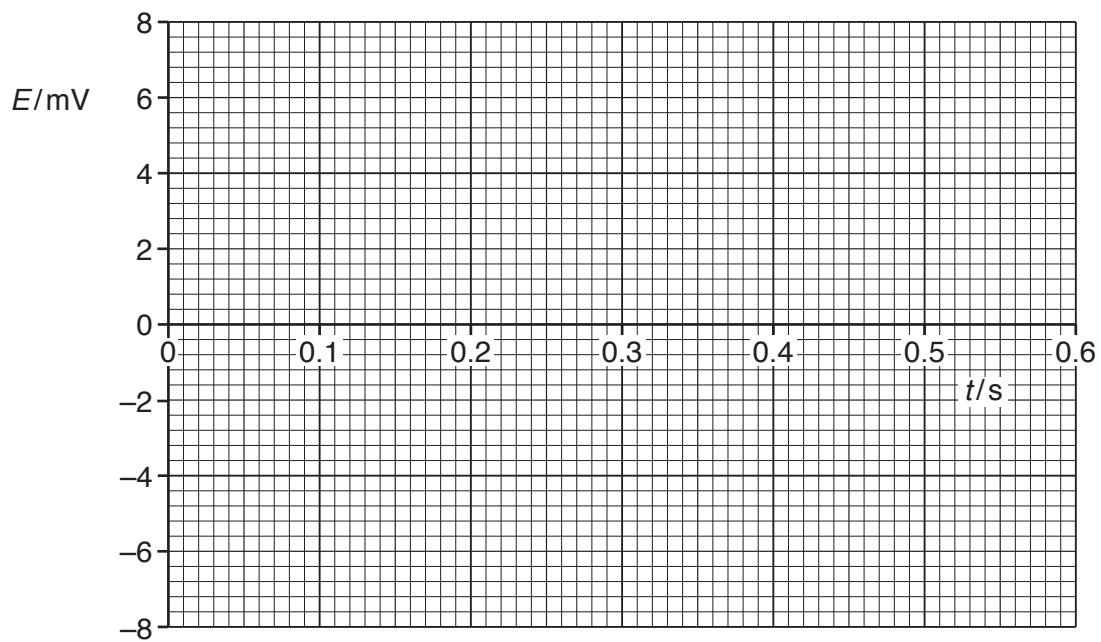


Fig. 9.3

[4]

[Total: 9]

