

5 Fig. 5.1 shows a circular coil of 500 turns and radius 0.12 m.

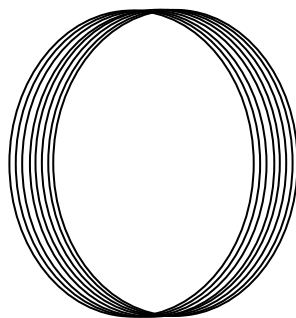


Fig. 5.1

A uniform magnetic field of flux density B is applied at right angles to the plane of the coil.

The magnetic flux density B changes with time t as shown in Fig. 5.2.

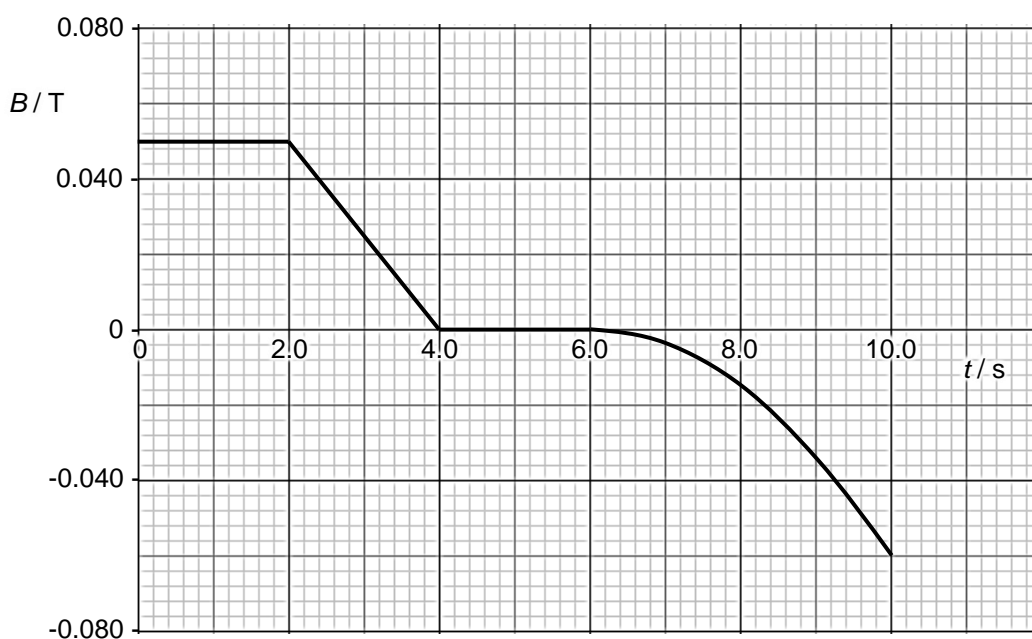


Fig. 5.2

From $t = 6.0$ s to $t = 10.0$ s, the gradient of the graph of B against t changes at a constant rate.

(a) Calculate the magnetic flux linkage of the coil at $t = 10.0$ s.

magnetic flux linkage = Wb [2]

[Turn over

- (b) Show that the magnitude of the induced e.m.f. in the coil between $t = 2.0$ s and $t = 4.0$ s is 0.57 V.

[2]

- (c) On Fig. 5.3, sketch a graph to show the variation with time t of the induced e.m.f. E in the coil for time $t = 0$ to $t = 10.0$ s.

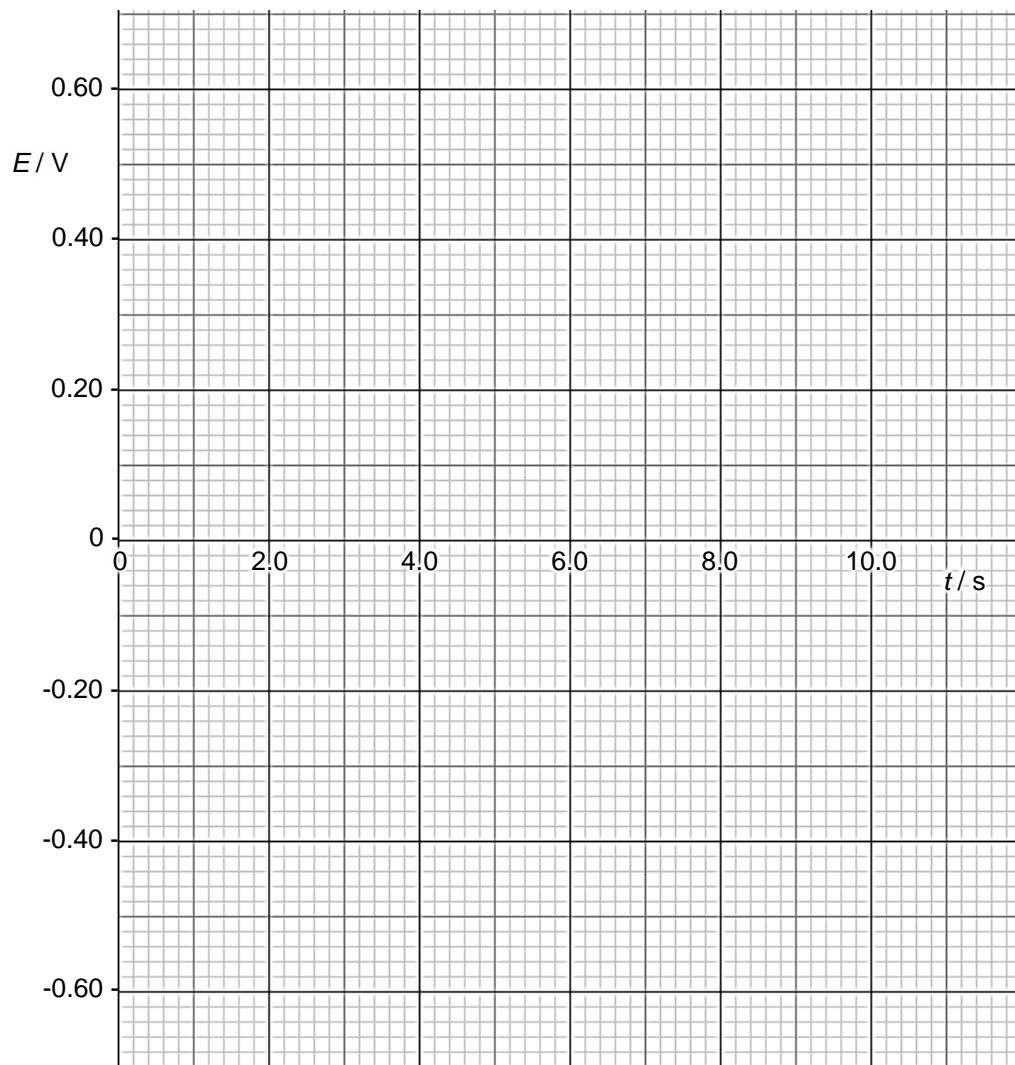


Fig. 5.3

[3]