6 A plane circular coil of radius 0.17 m has 30 turns and is placed with its plane horizontal in a vertical magnetic field of flux density *B* as shown in Fig. 6.1.

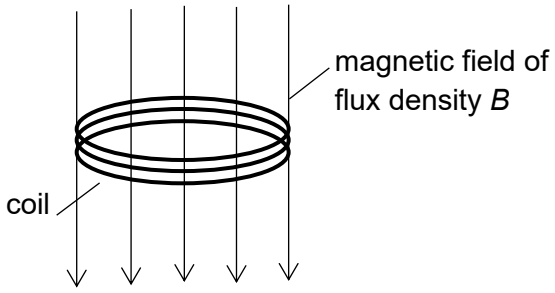

Fig. 6.1

Fig. 6.2 shows the variation with time *t* of the magnetic flux density *B*.

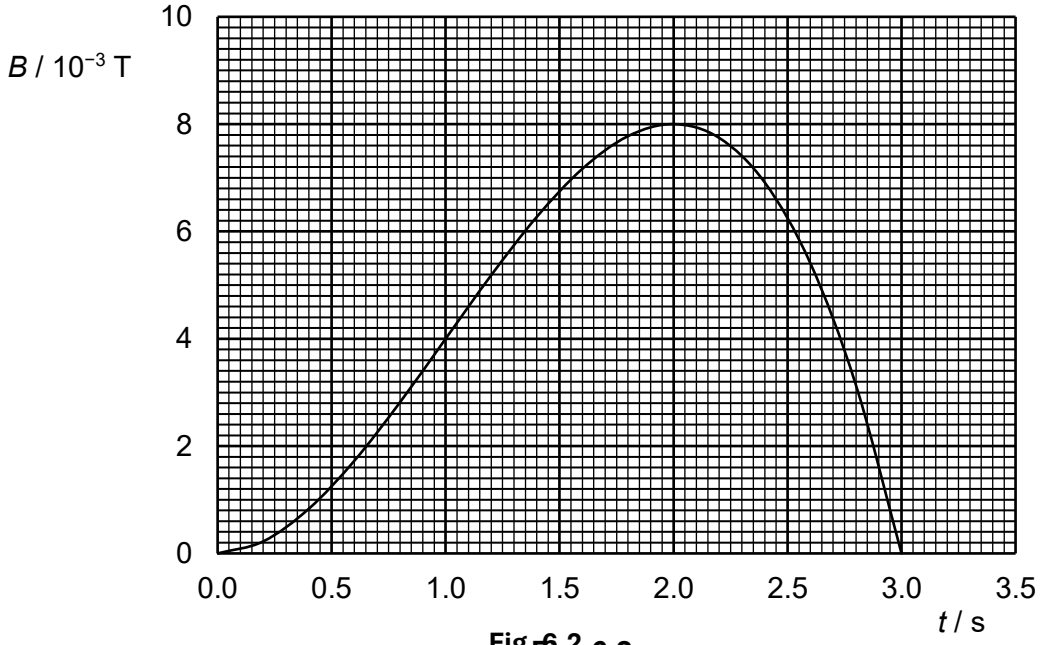

Fig. 6.2

(a) Calculate the maximum magnetic flux linkage of the coil.

maximum magnetic flux linkage = ... Wb [2]

(b) Determine the maximum induced e.m.f. in the coil during the time interval t = 0 to t = 2.0 s.

maximum induced e.m.f. = ... V [2]

(c) State and explain the direction of the induced current in the coil as viewed from the top for t = 0 to t = 2.0 s.

.....

.....

.....

..... [2]

(d) On the axes of Fig. 6.3, sketch the variation with time t of the induced e.m.f. in the coil from t = 0 to t = 3.0 s.

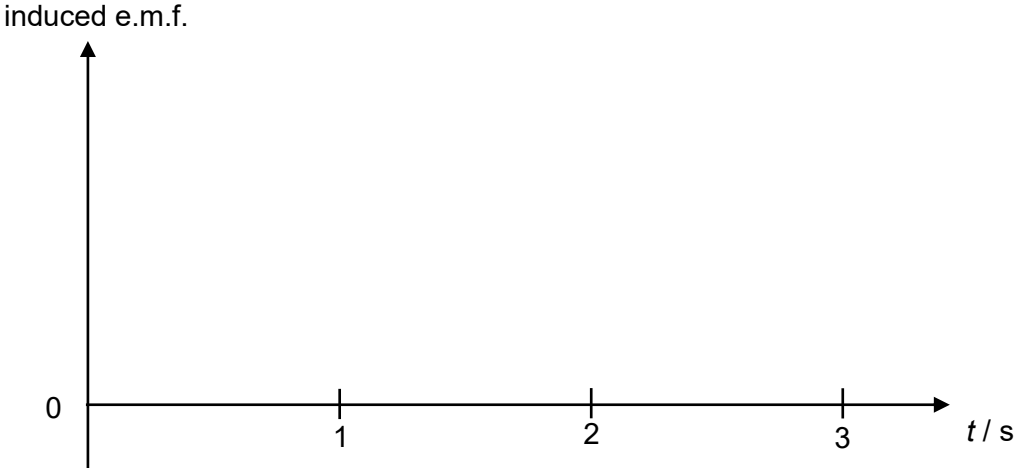

Fig. 6.3

[2]