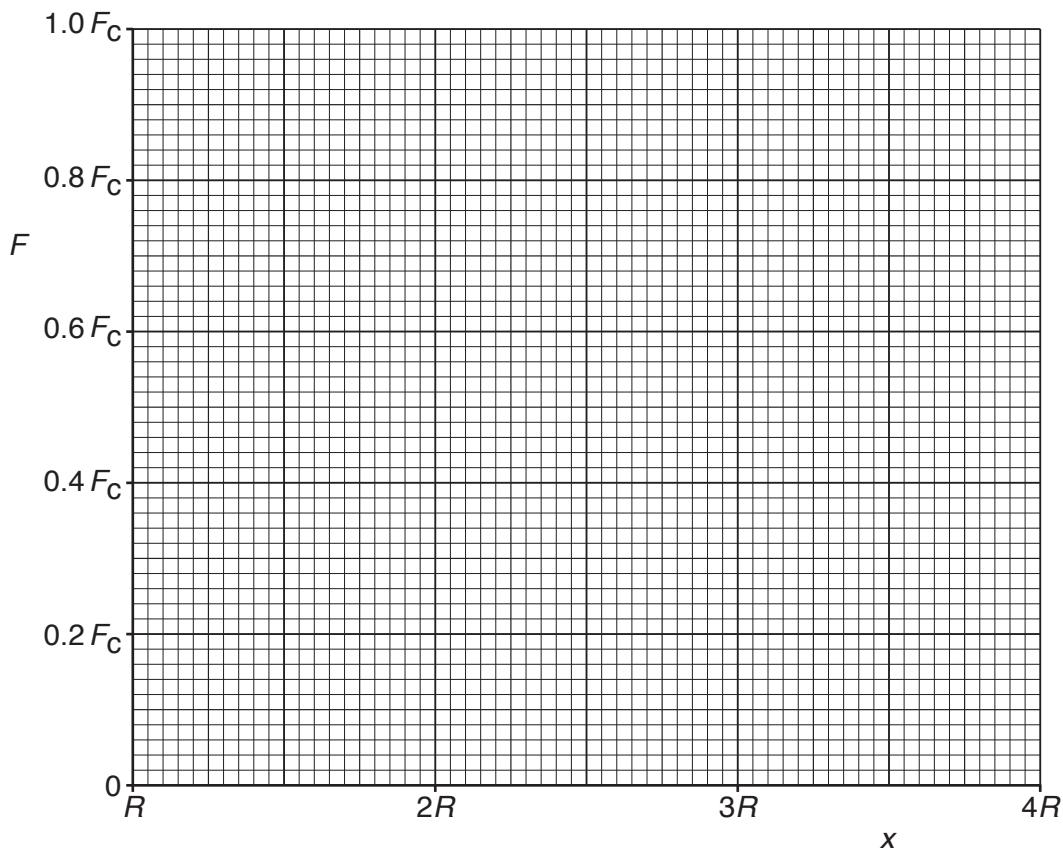


- 5 (a) (i) State Coulomb's law for the force between two point charges.

.....  
..... [1]

- (ii) Two point charges are situated in a vacuum and separated by a distance  $R$ . The force between the charges is  $F_C$ .

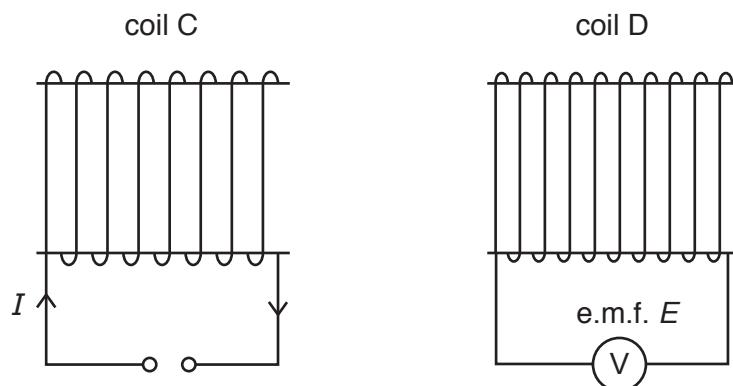
On Fig. 5.1, sketch a graph to show the variation of the force  $F$  between the charges with separation  $x$  for values of  $x$  from  $x = R$  to  $x = 4R$ .



[3]

**Fig. 5.1**

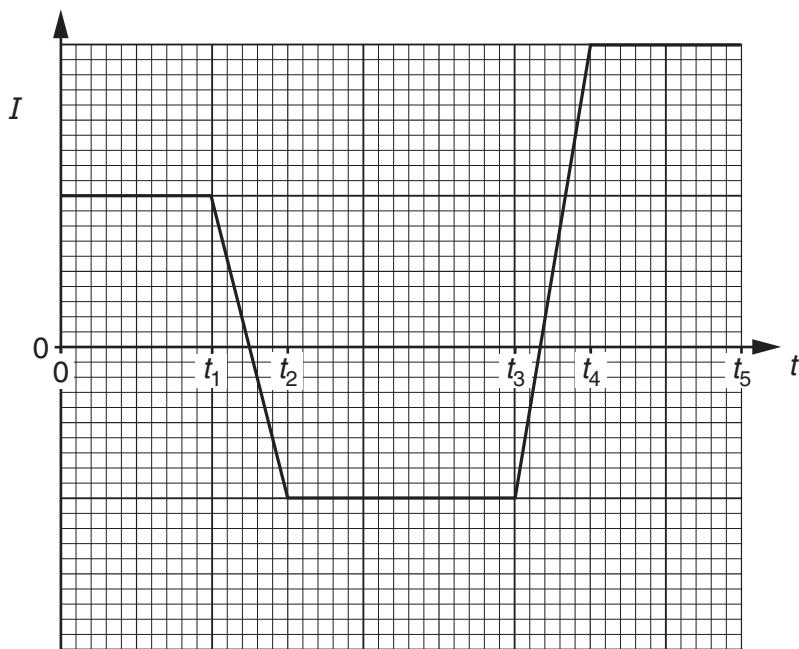
- (b) Two coils C and D are placed close to one another, as shown in Fig. 5.2.



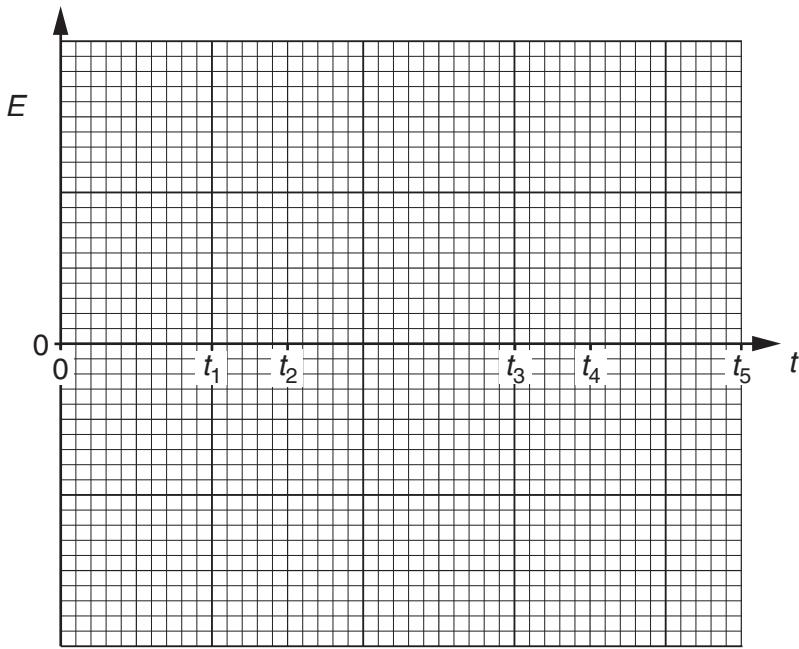
**Fig. 5.2**

The variation with time  $t$  of the current  $I$  in coil C is shown in Fig. 5.3.

On Fig. 5.4, show the variation with time  $t$  of the e.m.f.  $E$  induced in coil D for time  $t = 0$  to time  $t = t_5$ .



**Fig. 5.3**



**Fig. 5.4**

[4]

[Total: 8]