

- 6 A rectangular coil PQRS of dimensions 14.0 cm by 12.0 cm, moves with a constant speed of 2.0 cm s^{-1} through a region of uniform magnetic field WXYZ of width 10.0 cm, as shown in Fig. 6.1. There is a magnetic flux density B of 1.5 T in WXYZ directed into the plane of the paper.

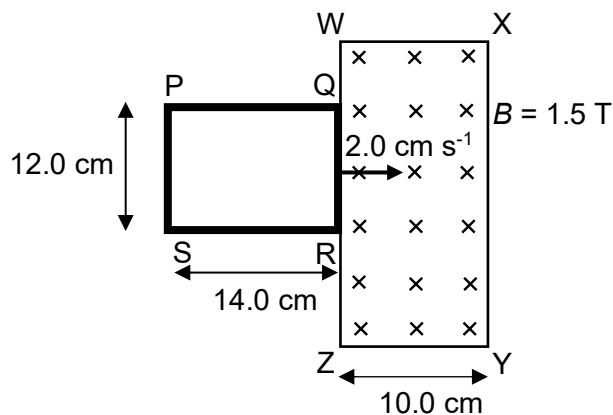


Fig. 6.1

- (a) State and explain the direction of induced current in coil PQRS when it enters the field.

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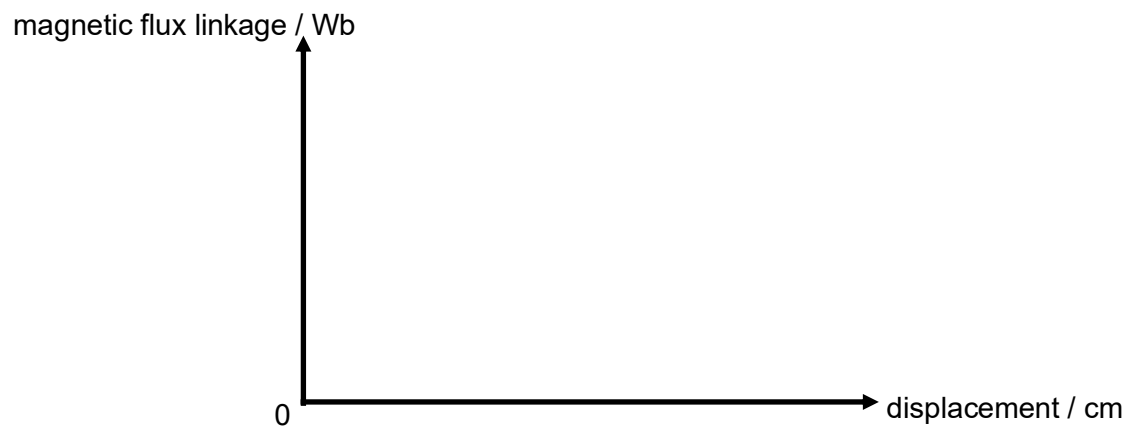
 [3]

- (b) Calculate the maximum possible magnetic flux linkage during the motion.

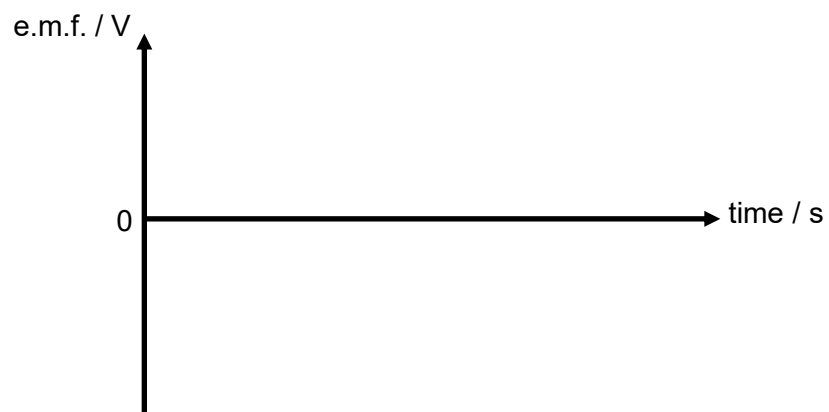
maximum flux linkage = Wb [1]

- (c) The coil PQRS is moved from the position shown in Fig. 6.1 until side PS is aligned with WZ. Sketch and label with appropriate values on the axes, the following graphs:

- (i) the variation with displacement of magnetic flux linkage through the coil,
[2]



- (ii) the variation with time of induced e.m.f. in the coil.
[2]



[Total: 8]

