

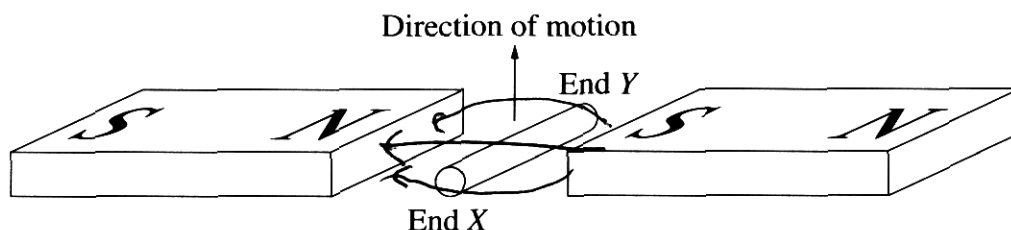
Question 23 (7 marks)

- (a) State Lenz's law.

1

~~any~~ magnetic field with a change in this field induces a current.

- (b) When the metal rod is moved upwards through the magnetic field as shown in the diagram, an emf is induced between the two ends.



- (i) Which end of the rod is negative?

1

End X

- (ii) Explain how the emf is produced in the rod.

3

There is a breaking of magnetic flux lines between the two magnets when the metal rod is moved between them. There is then an emf induced into the rod to repel it from the magnets.

- (c) Explain how the principle of induction can be used to heat a conductor.

2

This is used in induction stoves. The element uses the change in magnetic flux to create a current.

$$V = I^2 R \quad I = \frac{V}{R}$$

therefore there is resistance in the ~~conductor~~ the conductor and this heats up the conductor.