

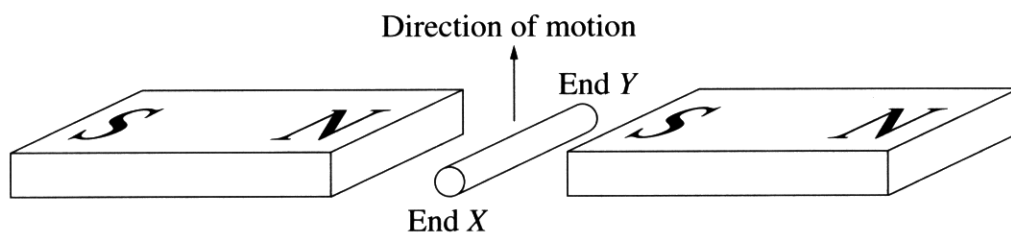
Question 23 (7 marks)

(a) State Lenz's law.

1

when a conductor is ^{moving} ~~placed~~ to intercept a magnetic field ~~within it~~, an emf will be produced within it.

(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

The rod dissects the magnetic field between the two permanent magnets and ^{then} sets up an magnetic force to oppose the existing force. This in turn creates a current within the rod, according to Faraday's ~~works~~ as a result.

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

2

Induction can be used to heat a conductor in the example of an electric cook top.

LENZ'S laws about Eddy currents are proven here when eddy currents are set up in the metal stove top as a result of a current running through it, heating the metal ~~and creating heat~~ and providing a surface to cook on.