

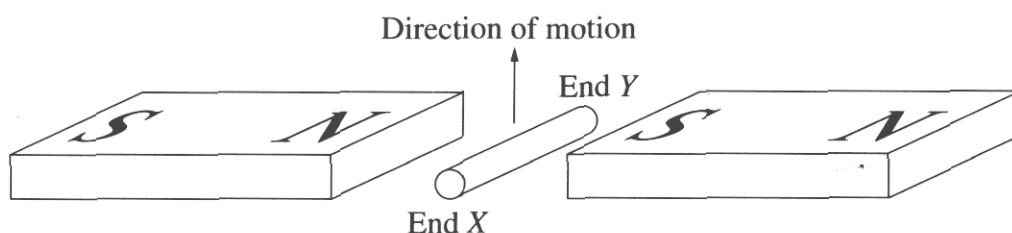
Question 23 (7 marks)

- (a) State Lenz's law.

1

An induced current will flow in such a direction that will oppose the motion that created 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

As the rod moves as shown in the diagram it passes through an area of changing magnetic flux. This changing magnetic flux induces an emf to oppose this motion (by Law of Conservation of Energy). If the rod were to stop moving, the magnetic flux would be no longer changing and the emf no longer produced.

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

2

Through the induction, eddy currents can be formed in the conductor. These eddy currents produce heat. Such technology is used in induction cookers.