Intro to Electromagnetic Induction Motional EMF

1. A conducting rod is pulled through a perpendicular magnetic field at 2.0m/s to the right. The potential difference between points A and B (VB – VA) is 0.60V. What is the magnitude and direction of the magnetic field?

A

2.0m/s

42cm

B

2. If the rod in Q1 were pulled to the left instead, VB – VA= ?

3. If the rod in Q1 were pulled upward instead, VB – VA= ?

4. If the entire length of the rod in Q1 is 63cm, then what is the motional emf between its ends?

5.

4.0m/s 36cm 2.0Ω

The region above contains a 0.60T magnetic field directed into the page everywhere. The rod is moving to the right at 4.0m/s. a. Find the magnitude and direction of the current in the circuit.

b. What in the magnitude and direction of the applied force necessary to keep the rod moving right at 4.0m/s?

c. Find the power needed to keep the rod moving at 4.0m/s.

d. Find the power dissipated in the resistor.

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