

State Examination Commission – Physics Higher Level, 2007

Question 12c

State Faraday's law of electromagnetic induction. (6)

Describe an experiment to demonstrate Faraday's law. (12)

A resistor is connected in series with an ammeter and an ac power supply. A current flows in the circuit. The resistor is then replaced with a coil. The resistance of the circuit does not change.

What is the effect on the current flowing in the circuit? Justify your answer. (10)

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Basic statement

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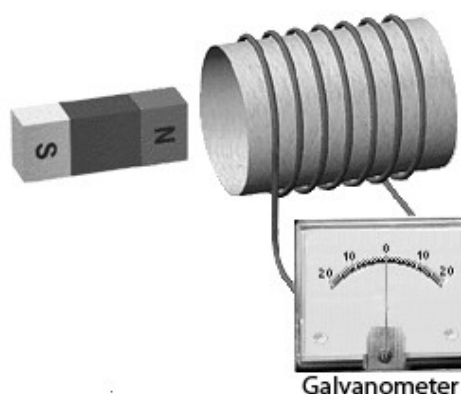
Set up simple apparatus as shown in the diagram

Shove magnet slowly into coil and observe what happens.

Repeat this action at a faster pace and observe again.

It will be seen that the pointer of the galvanometer deflects more with increased speed of magnet.

We can conclude that the greater the rate at which the magnetic flux is cutting the coil, the greater is the emf induced within it.



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What is the effect on the current flowing in the circuit? Justify your answer. (10)

The current flowing decreases as a back emf is produced in the coil by the ac which opposes the source emf, giving us a smaller net emf across the circuit.