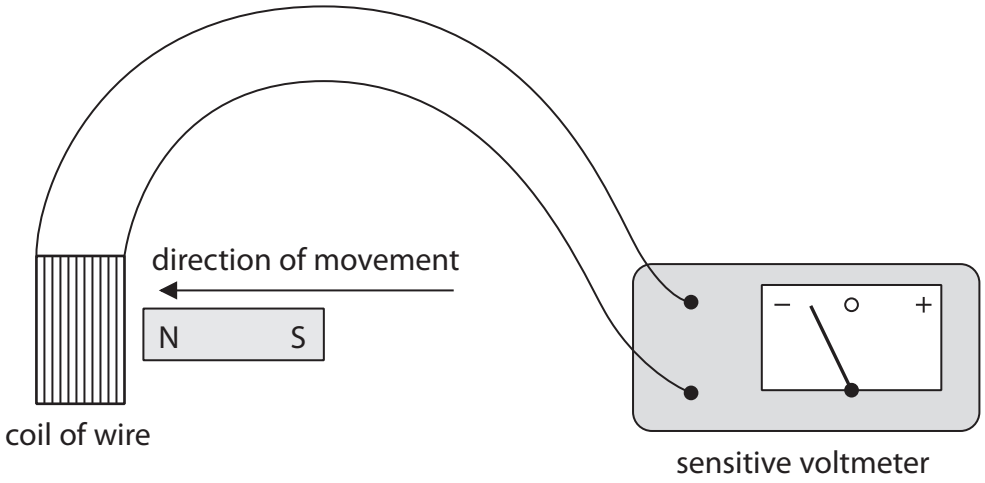
11 (a) This apparatus can be used to investigate electromagnetic induction.



When the magnet is moved into the coil of wire, the voltmeter shows a negative reading.

State two separate changes, each of which would make the voltmeter show a positive reading.

(2)

1 .....

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2 .....

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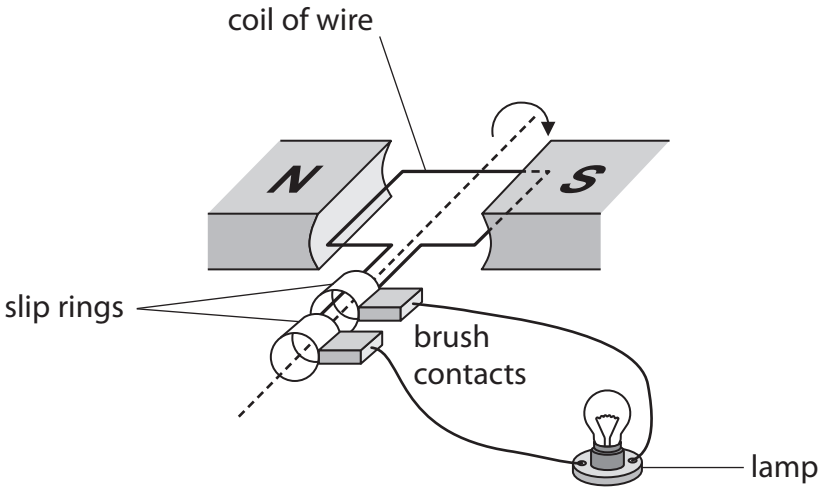
(b) The diagram shows a simple electrical generator connected to a lamp.

When the coil is turned, a voltage is induced.



(i) Explain why a voltage is induced when the coil is turned.

(2)

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(ii) State two ways that this induced voltage can be increased.

(2)

1 .....

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2 .....

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(iii) When the lamp is connected to the generator, the coil is hard to turn.

When the lamp is disconnected from the generator, the coil is easy to turn.

Suggest, in terms of energy, why it is harder to turn the coil when the lamp is connected.

(2)

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(Total for Question 11 = 8 marks)

TOTAL FOR PAPER = 120 MARKS

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