

1 - (0625-S 2012-Paper 1 (Core)/1-Q27) - MAGNETS AND CURRENTS

Which statement describes a property of a magnet?

- A It attracts ferrous materials.
- B It could have only one pole (north or south).
- C It points in a random direction when suspended.
- D It repels non-ferrous materials.

2 - (0625-S 2012-Paper 1 (Core)/2-Q27) - MAGNETS AND CURRENTS

The diagram shows a magnet being brought near to an unmagnetised iron bar. This causes the iron bar to become magnetised.



Which magnetic pole is induced at X and how is the iron bar affected?

| | pole induced | effect on iron bar |
|---|--------------|--------------------|
| A | north | attracted |
| B | north | repelled |
| C | south | attracted |
| D | south | repelled |

3 - (0625-S 2012-Paper 1 (Core)/1-Q28) - MAGNETS AND CURRENTS

Which procedure may be used to demagnetise a steel bar?

- A cooling it in a freezer
- B earthing it with a copper wire
- C placing it in a solenoid carrying a large direct current (d.c.)
- D striking it repeatedly with a hammer

4 - (0625-S 2012-Paper 1 (Core)/2-Q28) - MAGNETS AND CURRENTS

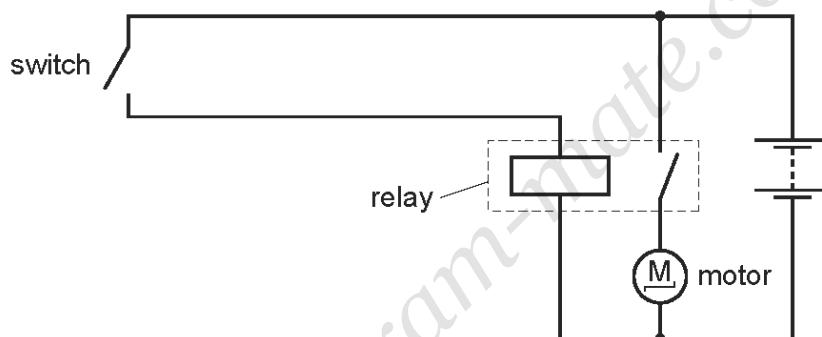
A student wishes to make a permanent magnet. She has an iron rod and a steel rod.

Which rod should she use to make the permanent magnet, and is this rod a hard magnetic material or a soft magnetic material?

| | rod | type of magnetic material |
|---|-------|---------------------------|
| A | iron | hard |
| B | iron | soft |
| C | steel | hard |
| D | steel | soft |

5 - (0625-S 2012-Paper 1 (Core)/2-Q31) - MAGNETS AND CURRENTS

A relay is used to operate a large electric motor using a switch some distance from the motor.



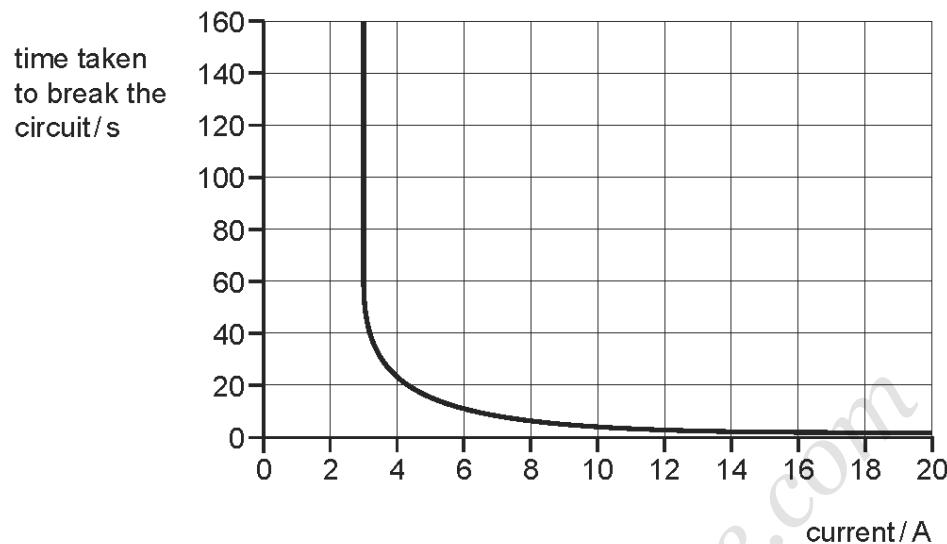
What is the purpose of the relay?

- A to allow a large current in the relay coil to control a smaller current in the motor
- B to allow a small current in the relay coil to control a larger current in the motor
- C to allow the current in the relay coil to pass to the motor
- D to disconnect the battery from the motor automatically if too much current flows

6 - (0625-S 2012-Paper 1 (Core)/3-Q31) - MAGNETS AND CURRENTS

A circuit-breaker is designed to protect a circuit which usually carries a current of 2 A.

The time taken to break the circuit depends on the current, as shown in the graph.

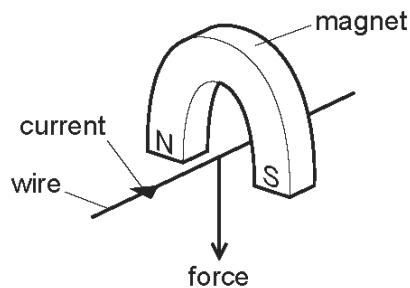


What happens when the current in the circuit is 2 A and what happens when the current 18 A?

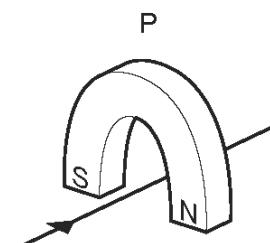
| | when the current is 2 A | when the current is 18 A |
|---|---|---|
| A | the circuit breaks in less than 5 seconds | the circuit breaks in less than 5 seconds |
| B | the circuit breaks in less than 5 seconds | the circuit does not break |
| C | the circuit does not break | the circuit breaks in less than 5 seconds |
| D | the circuit does not break | the circuit does not break |

7 - (0625-S 2012-Paper 1 (Core)/3-Q33) - MAGNETS AND CURRENTS

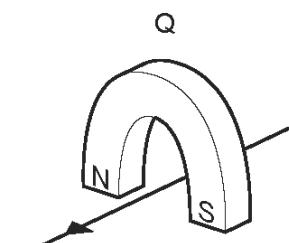
A wire passes between the poles of a horseshoe magnet. There is a current in the wire in the direction shown, and this causes a force to act on the wire.



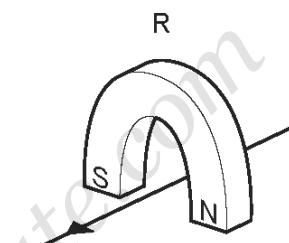
Three other arrangements, P, Q and R, of the wire and magnet are set up as shown.



magnet turned around



current direction reversed



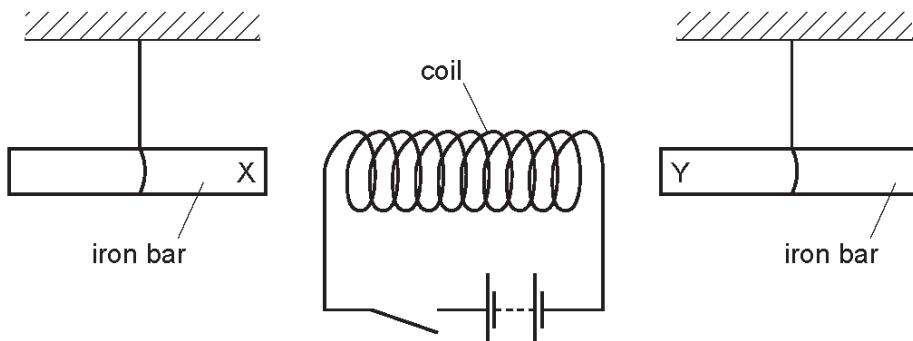
current direction reversed
and magnet turned around

Which arrangement or arrangements will cause a force in the same direction as the original arrangement?

- A** P, Q and R **B** P and Q only **C** P only **D** R only

8 - (0625-S 2012-Paper 1 (Core)/1-Q35) - MAGNETS AND CURRENTS

The diagram shows a coil connected to a battery and a switch. Two unmagnetised iron bars hang freely near opposite ends of the coil.

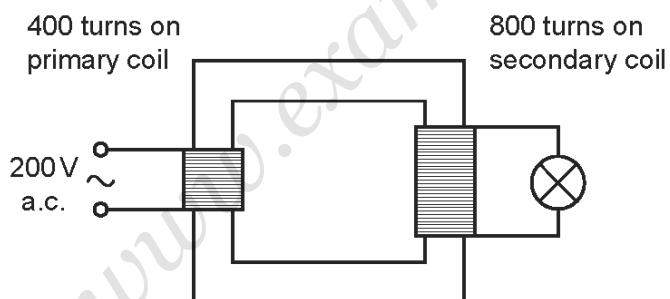


What happens to the iron bars when the switch is closed?

- A Both X and Y move away from the coil.
- B Both X and Y move towards the coil.
- C X moves towards the coil, Y moves away from the coil.
- D Y moves towards the coil, X moves away from the coil.

9 - (0625-S 2012-Paper 1 (Core)/2-Q35) - MAGNETS AND CURRENTS

The diagram shows a transformer. The input voltage and the number of turns on each coil are shown.



What is the output voltage?

- A 100V
- B 200V
- C 400V
- D 800V

10 - (0625-S 2012-Paper 1 (Core)/2-Q36) - MAGNETS AND CURRENTS

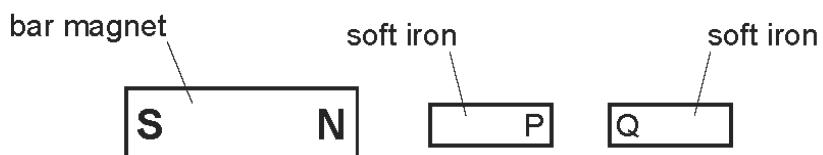
Which device uses slip rings?

- A a cathode-ray tube
- B a d.c. motor
- C an a.c. generator
- D a solenoid

*exam
mate*

11 - (0625-W 2012-Paper 1 (Core)/1-Q27) - MAGNETS AND CURRENTS

Two bars of soft iron are placed near a bar magnet.



Which row states and explains the behaviour of poles P and Q of the soft iron bars?

| | P and Q | reason |
|---|---------|--------------------------|
| A | attract | P and Q are like poles |
| B | attract | P and Q are unlike poles |
| C | repel | P and Q are like poles |
| D | repel | P and Q are unlike poles |

12 - (0625-W 2012-Paper 1 (Core)/3-Q27) - MAGNETS AND CURRENTS

Which row shows whether iron and steel are ferrous or non-ferrous?

| | iron | steel |
|---|-------------|-------------|
| A | ferrous | ferrous |
| B | ferrous | non-ferrous |
| C | non-ferrous | ferrous |
| D | non-ferrous | non-ferrous |

13 - (0625-W 2012-Paper 1 (Core)/1-Q28) - MAGNETS AND CURRENTS

Some electrical devices require a magnet which may be switched on and off many times in a second.

Which type of magnet may be used?

- A an electromagnet only
- B a permanent magnet only
- C either a permanent magnet or an electromagnet
- D neither a permanent magnet nor an electromagnet

14 - (0625-W 2012-Paper 1 (Core)/3-Q28) - MAGNETS AND CURRENTS

The N pole of a magnet repels one end of bar X.

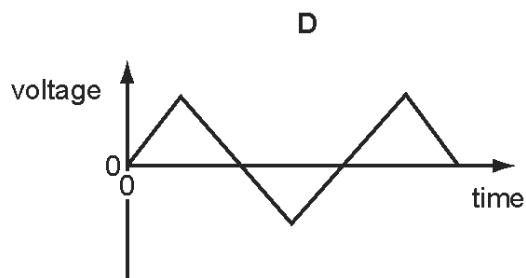
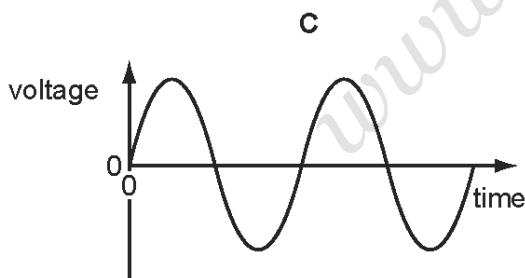
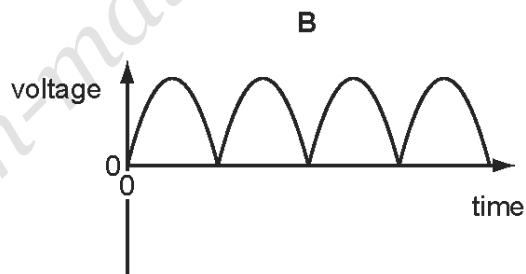
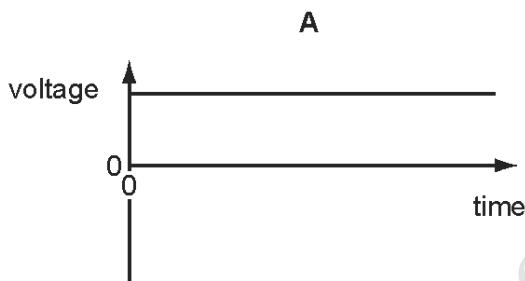


What happens when the **other** end of bar X is placed near to the poles of the magnet?

| | other end near N pole | other end near S pole |
|---|-----------------------|-----------------------|
| A | attracts | attracts |
| B | attracts | repels |
| C | repels | attracts |
| D | repels | repels |

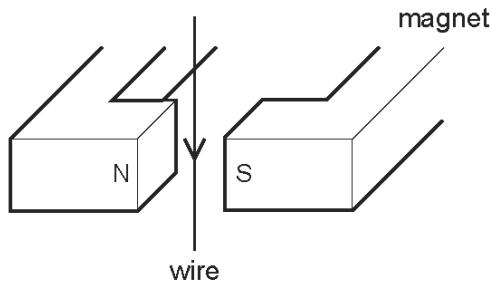
15 - (0625-W 2012-Paper 1 (Core)/2-Q32) - MAGNETS AND CURRENTS

Which graph shows how the voltage of a simple a.c. generator varies with time?

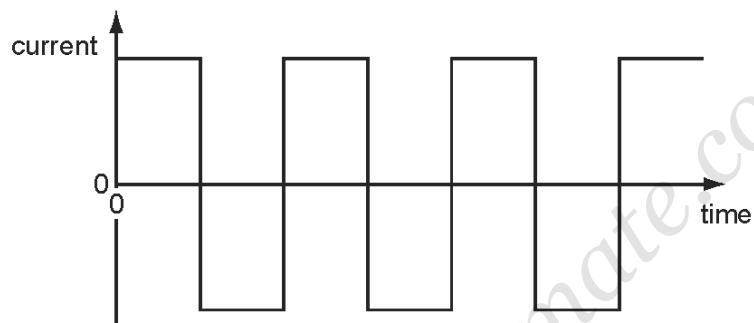


16 - (0625-W 2012-Paper 1 (Core)/2-Q35) - MAGNETS AND CURRENTS

The diagram shows a wire in the magnetic field between two poles of a magnet.



The current in the wire repeatedly changes between a constant value in one direction and a constant value in the opposite direction. This is shown on the graph.



What is the effect on the wire?

- A** The force on the wire alternates between one direction and the opposite direction.
- B** The force on the wire is constant in size and direction.
- C** There is no force acting on the wire at any time.
- D** There is only a force on the wire when the current reverses.

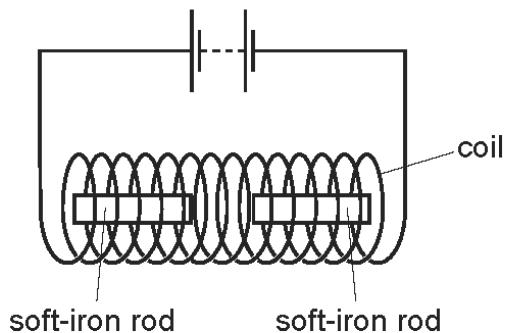
17 - (0625-W 2012-Paper 1 (Core)/3-Q36) - MAGNETS AND CURRENTS

In the construction of a transformer, which items must be included?

- A** an iron core and a permanent magnet
- B** an iron core and two coils of wire
- C** a steel core and a permanent magnet
- D** a steel core and two coils of wire

18 - (0625-S 2013-Paper 1 (Core)/3-Q25) - MAGNETS AND CURRENTS

Two soft-iron rods are placed end to end inside a coil which is connected to a battery.



The connections from the battery to the coil are now reversed.

What happens to the soft-iron rods in each case?

| | battery connections as shown | battery connections reversed |
|---|------------------------------|------------------------------|
| A | rods attract | rods attract |
| B | rods attract | rods repel |
| C | rods repel | rods attract |
| D | rods repel | rods repel |

19 - (0625-S 2013-Paper 1 (Core)/1-Q26) - MAGNETS AND CURRENTS

Which statement about magnetism is correct?

- A Aluminium is a ferrous metal.
- B A steel magnet can be demagnetised by heating it.
- C The core of an electromagnet is usually made of steel.
- D The magnetic field lines around a bar magnet are evenly spaced.

20 - (0625-S 2013-Paper 1 (Core)/2-Q26) - MAGNETS AND CURRENTS

An electromagnet is used to separate magnetic metals from non-magnetic metals.

Why is steel **not** suitable as the core of the electromagnet?

- A It forms a permanent magnet.
- B It has a high density.
- C It has a high thermal capacity.
- D It is a good conductor of electricity.

exam
mate
A+

21 - (0625-S 2013-Paper 1 (Core)/2-Q27) - MAGNETS AND CURRENTS

An old and expensive steel watch becomes magnetised.

The owner wants to use the watch again. He must demagnetise the watch.

What is the **best** method to do this?

- A Heat it until it glows red hot.
- B Pass direct current through it.
- C Place it in a plastic bag and put the bag in hot water for several hours.
- D Place it in a solenoid that carries alternating current and then slowly remove it.

22 - (0625-S 2013-Paper 1 (Core)/1-Q35) - MAGNETS AND CURRENTS

An electric current can produce a heating effect and a magnetic effect.

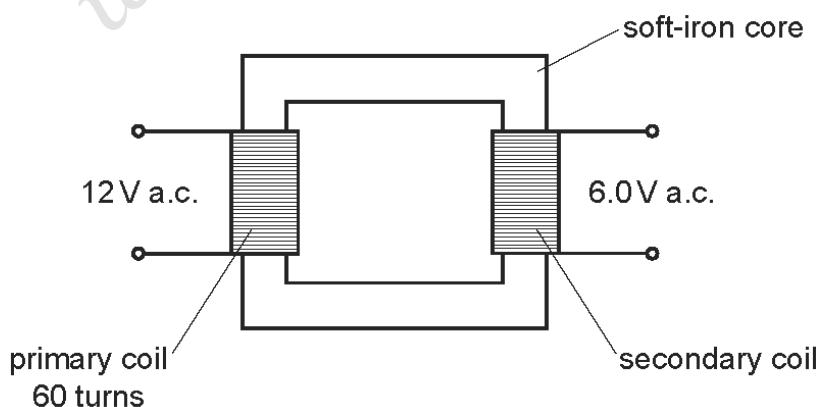
Which row shows the effect that a relay uses, together with one application of a relay?

| | effect used by a relay | one application of a relay |
|---|------------------------|---|
| A | heating effect | allowing a small current to switch on a large current |
| B | heating effect | changing the voltage of an alternating current |
| C | magnetic effect | allowing a small current to switch on a large current |
| D | magnetic effect | changing the voltage of an alternating current |

23 - (0625-S 2013-Paper 1 (Core)/2-Q35) - MAGNETS AND CURRENTS

A student wants to make a transformer to step 12V down to 6.0V.

She winds 60 turns of wire around an iron core as shown in the diagram.



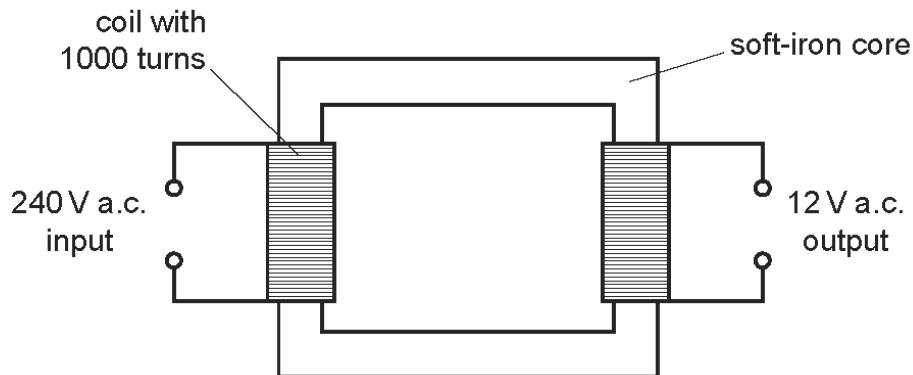
How many turns of wire should she wind on the secondary coil of her transformer?

- A 5
- B 30
- C 60
- D 120

exam
mate
(A+)

24 - (0625-S 2013-Paper 1 (Core)/3-Q35) - MAGNETS AND CURRENTS

The diagram shows a mains transformer that has an output voltage of 12 V.



How many turns of wire are in the secondary coil?

- A** 12 **B** 20 **C** 50 **D** 20 000

25 - (0625-S 2013-Paper 1 (Core)/2-Q36) - MAGNETS AND CURRENTS

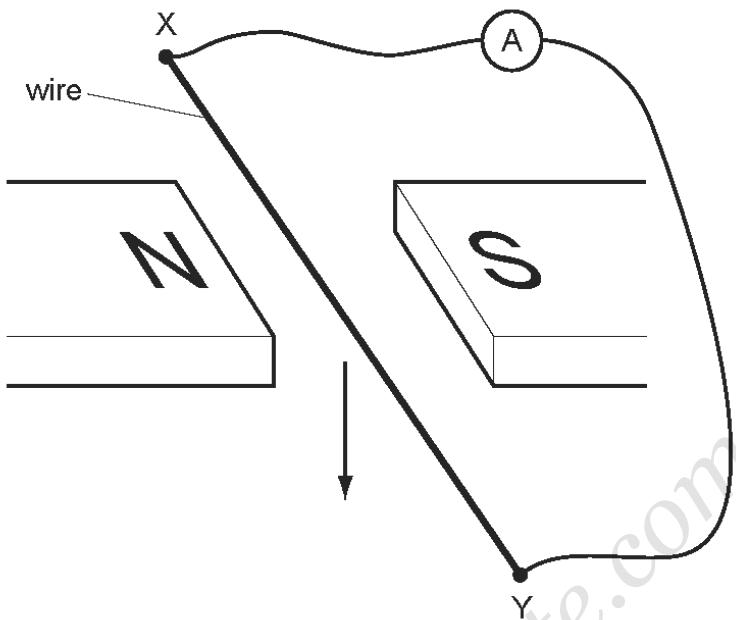
A toy railway engine is driven around a track by a d.c. electric motor.

How can the speed of the motor be increased?

- A** Use a motor made with fewer turns of wire.
B Use a smaller d.c. voltage.
C Use a stronger magnet in the motor.
D Use the supply with its connections reversed.

26 - (0625-S 2013-Paper 1 (Core)/1-Q37) - MAGNETS AND CURRENTS

The diagram shows an experiment to demonstrate electromagnetic induction.



X and Y are joined, in turn, by four wires, each made of a different material.

Each wire is then moved quickly downwards between the magnets.

Which material will **not** give rise to an induced current in the wire?

- A aluminium
- B copper
- C iron
- D nylon

27 - (0625-W 2013-Paper 1 (Core)/1-Q26) - MAGNETS AND CURRENTS

A hard magnetic material can be used to make a permanent magnet.

A soft magnetic material can be used to make a temporary magnet.

Which row shows whether iron and steel are hard or soft magnetic materials?

| | iron | steel |
|---|------|-------|
| A | hard | hard |
| B | hard | soft |
| C | soft | hard |
| D | soft | soft |

28 - (0625-W 2013-Paper 1 (Core)/2-Q26) - MAGNETS AND CURRENTS

How can a permanent magnet be demagnetised?

- A cool the magnet for a long time
- B hit the magnet repeatedly with a hammer
- C leave the magnet in a coil which is connected to a battery
- D shine bright light onto the magnet

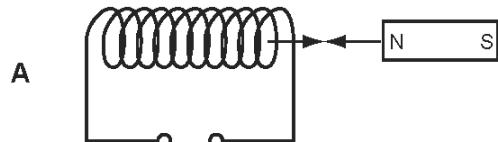
29 - (0625-W 2013-Paper 1 (Core)/3-Q26) - MAGNETS AND CURRENTS

In which pair are both metals ferrous?

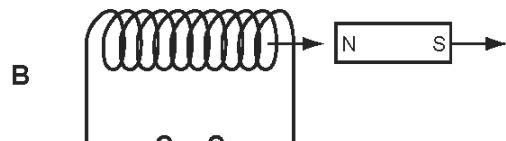
- A aluminium and copper
- B aluminium and steel
- C copper and iron
- D iron and steel

30 - (0625-W 2013-Paper 1 (Core)/2-Q34) - MAGNETS AND CURRENTS

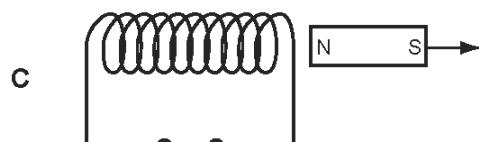
Which diagram shows a movement that will **not** produce the changing magnetic field needed to induce an e.m.f. in the coil?



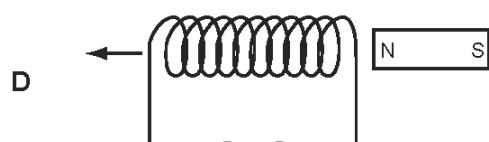
moving a magnet and a coil towards each other at the same speed



moving a magnet and a coil in the same direction at the same speed



moving a magnet away from a fixed coil



moving a coil away from a fixed magnet

exam
mate
A+