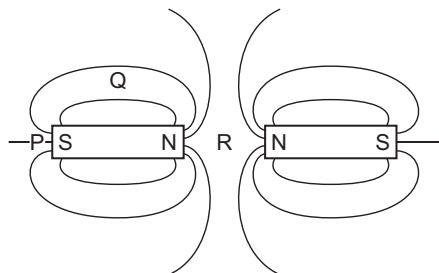


24 The diagram shows part of the magnetic field around two magnets.



Which list gives the order of magnetic field strengths at the positions P, Q and R, from weakest to strongest?

- A P → Q → R
- B P → R → Q
- C Q → P → R
- D R → Q → P

24 Which statements about magnets are correct?

- 1 Permanent magnets are made of steel.
- 2 Electromagnets are temporary magnets.
- 3 A magnet can be used to induce magnetism in an iron bar.

- A 1, 2 and 3 B 1 and 2 only C 1 and 3 only D 2 and 3 only

29 An electrical appliance has a symbol on it to indicate it is double-insulated.

Which statement is correct?

- A A two-core, flexible cable with **no** earth wire is used to connect it to the mains supply.
- B It needs an earth wire that is connected to a fuse.
- C **No** fuse or circuit breaker is needed.
- D The cable should be connected to the live and earth connectors of the plug but **not** the neutral.

8 (a) State what is meant by a magnetic field.

.....
 [1]

(b) Fig. 8.1 shows an ammeter connected to a coil wound on a thin plastic cylinder. A small trolley is placed on a curved track which passes through the cylinder.

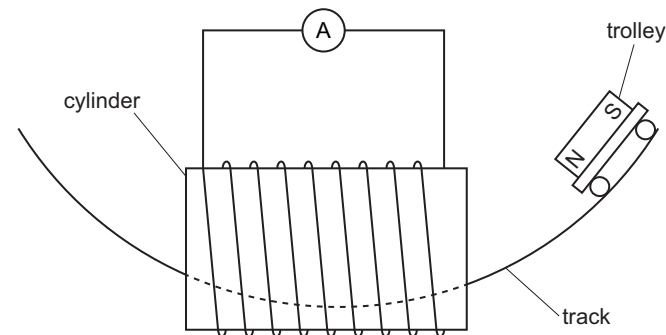


Fig. 8.1

The trolley is released from the position shown in Fig. 8.1. It travels through the coil from right to left. The trolley travels back from left to right. It has a lower maximum speed when it travels from left to right.

The plastic cylinder does not affect any magnetic field. A magnet is fixed to the trolley.

(i) State why there is a lower maximum speed when the trolley travels back from left to right.

.....
 [1]

As the trolley enters the coil moving from right to left, the ammeter needle deflects to the left and then returns to zero.

State and explain any changes to the deflection on the ammeter as the trolley enters the coil when moving back from left to right.

..... [3]

[Total: 5]

The diagram shows a directed graph with two nodes, J and K, connected by a thick gray loop. Node J has three outgoing arrows to a central node X, and node K has three outgoing arrows to a central node Y. Arrows also point from X to Y and from Y to X.

Which row identifies the magnetic pole at J, the magnetic pole at K and where the magnetic field is the strongest?

	magnetic pole at J	magnetic pole at K	where the magnetic field is the strongest
A	N	N	X
B	N	N	Y
C	S	S	X
D	S	S	Y

- 4 Fig. 4.1 shows a heater used to warm the air in a room.

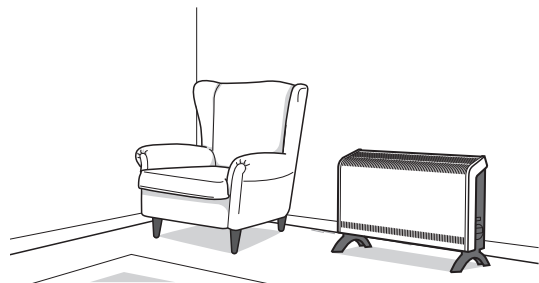


Fig. 4.1

- (a) (i) State the main method of thermal energy transfer throughout the air in the room.
 [1]
- (ii) Explain how the heater warms **all** the air in the room.

 [3]
- (b) The power of the heater is 2.0kW when it is connected to the mains supply with an e.m.f. of 230V.
- (i) Show that the current in the heater is approximately 8.7A.
 [2]
- (ii) The plug connecting the heater to the mains supply is fitted with a fuse.
 Fuse ratings of 3A, 5A, 10A and 13A are available.
 State which fuse is used. Explain your answer.
 fuse
 explanation
 [2]

- 6 Fig. 6.1 shows a person using a magnetic window cleaner. The part on the outside of the window is attracted to the inside part through the glass window.



Fig. 6.1

Each part of the window cleaner contains two magnets. Fig. 6.2 shows the magnetic field between the parts of the window cleaner.

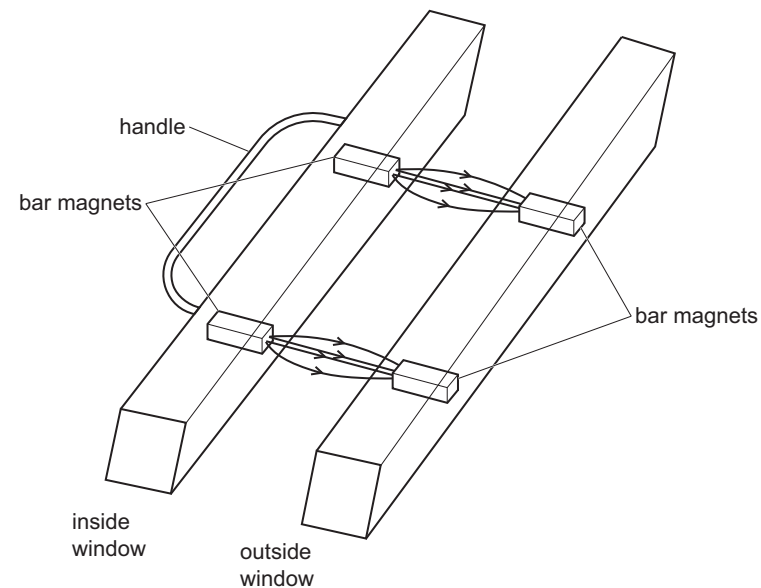


Fig. 6.2

(a) Glass is **not** a magnetic material.

State the difference between magnetic and non-magnetic materials.

.....

..... [1]

(b) Suggest a suitable material for the magnets in the window cleaner. Explain your answer.

.....

..... [1]

(c) Label the poles of the magnets in Fig. 6.2. [1]

(d) State how the field lines in Fig. 6.2 show different strengths of the magnetic field between the magnets.

.....

..... [1]

[Total: 4]

24 Which row describes suitable materials for use in a temporary magnet and in a permanent magnet?

	temporary magnet	permanent magnet
A	soft iron	soft iron
B	soft iron	steel
C	steel	soft iron
D	steel	steel