Magnetism – 2021 IGCSE 0625

1. June/2021/Paper_11&21/No.27,28

Diagram 1 shows a small compass needle with its poles marked. It is not near any magnetic materials.

Diagram 2 shows a bar magnet with its poles marked. The compass needle is placed at point P.

diagram 1

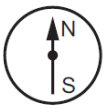


diagram 2

In which direction will the N pole of the compass needle point?

A to the left

B to the right

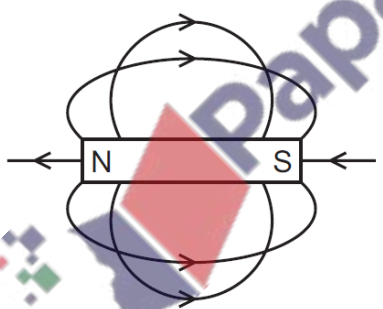
C down the page

D up the page

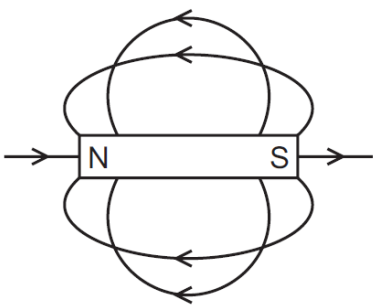
2. June/2021/Paper_11/No.28

Which diagram shows the pattern and direction of the magnetic field lines around a bar magnet?

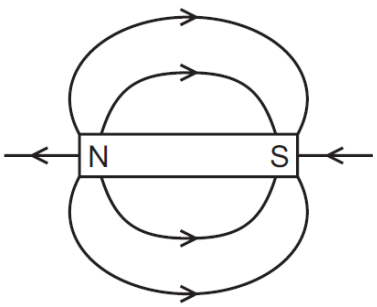
A



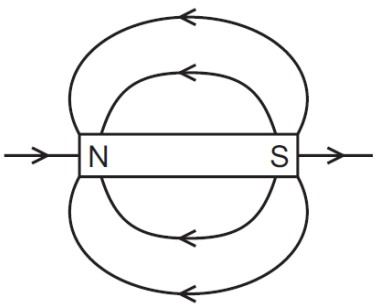
B



C



D



3. June/2021/Paper_12/No.27

Two metal rods each have a painted end. The painted ends are placed next to the N pole and S pole of a bar magnet in turn.

The rods are made from iron, aluminium or magnetised steel.

rod	placed next to	observation
1	N pole of bar magnet	attracts
1	S pole of bar magnet	attracts
2	N pole of bar magnet	nothing happens
2	S pole of bar magnet	nothing happens

What are rod 1 and rod 2 made from?

	rod 1	rod 2
A	magnetised steel	aluminium
B	iron	magnetised steel
C	aluminium	iron
D	iron	aluminium

4. June/2021/Paper_12&22/No.28

Three piles of small nails, P, Q and R, are placed on a bench below three electromagnets.

One set of nails is made of copper, one of soft iron and one of steel.

Diagram 1 shows the situation when the electromagnets are switched on.

Diagram 2 shows the situation when the electromagnets are then switched off.

diagram 1
the switches are **closed**

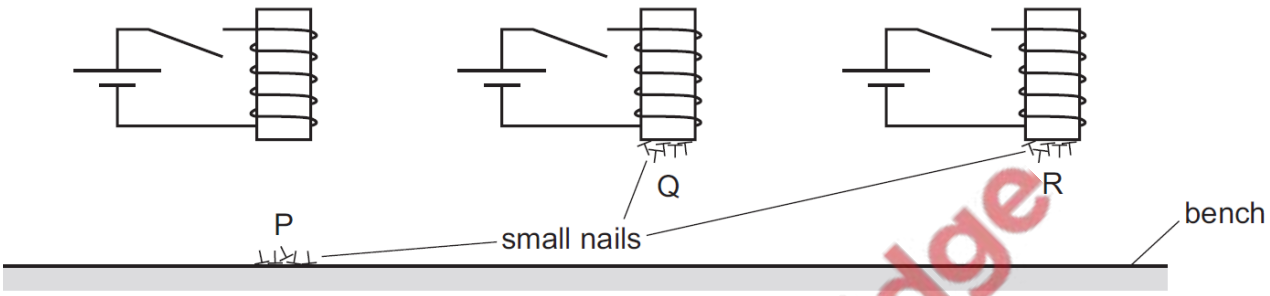
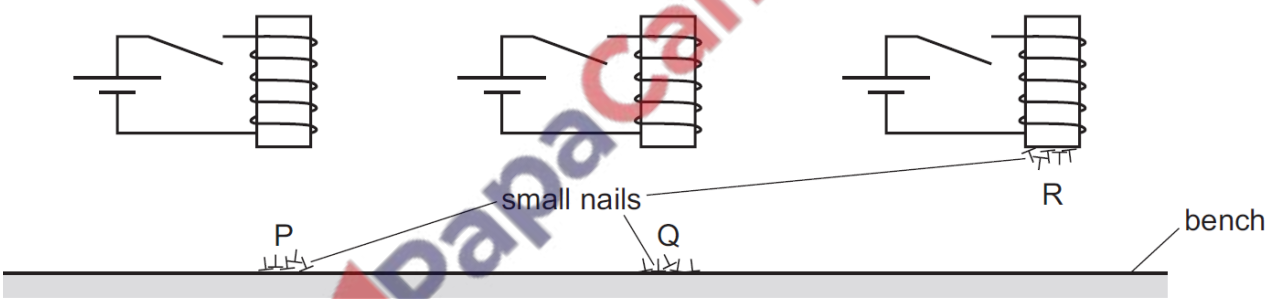


diagram 2
the switches are **open**



Which row correctly identifies the materials from which the nails are made?

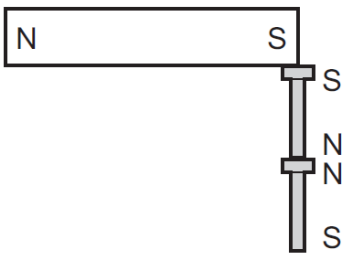
	copper	soft iron	steel
A	P	Q	R
B	P	R	Q
C	Q	P	R
D	Q	R	P

5. June/2021/Paper_13&23/No.28

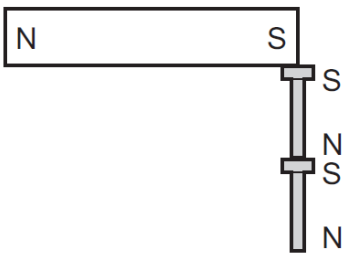
A bar magnet picks up two steel bolts.

Which diagram shows the magnetic poles induced in the bolts?

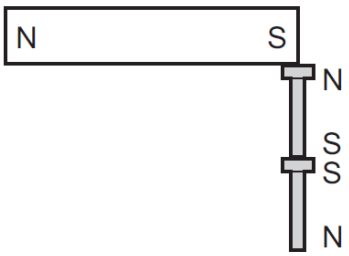
A



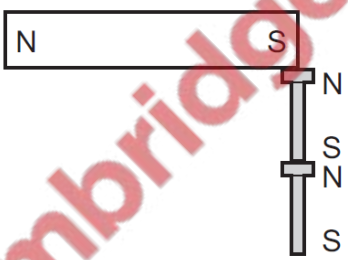
B



C



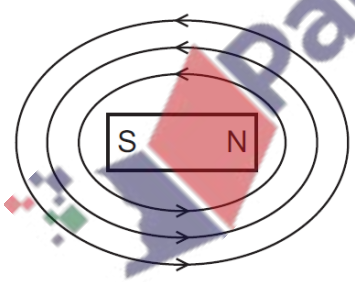
D



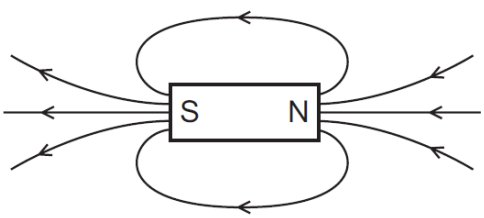
6. June/2021/Paper_13/No.29

Which diagram shows the magnetic field around a bar magnet?

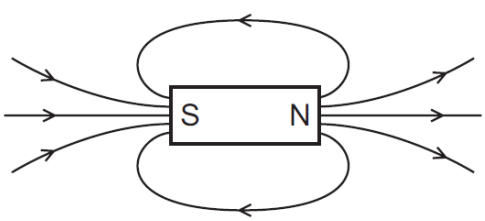
A



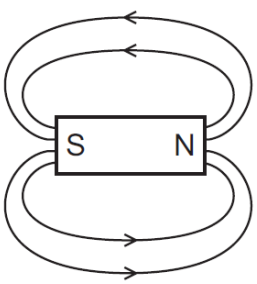
B



C



D



7. June/2021/Paper_22/No.27

Which method does **not** demagnetise a bar magnet?

A Heat the bar magnet and place it in the east-west direction to cool.

B Place the bar magnet in the east-west direction and hammer it.

C Place the bar magnet in a coil connected to an a.c. supply and slowly withdraw it.

D Place the bar magnet in a coil connected to a d.c. supply and slowly withdraw it.

8. June/2021/Paper_22/No.29

A magnet is suspended by a cotton thread.

The magnet is displaced then allowed to swing freely until it comes to rest.

Why does the magnet always come to rest pointing in the same direction?

A because of the interaction between the electric field of the magnet and the electric field of the Earth

B because of the interaction between the electric field of the magnet and the magnetic field of the Earth

C because of the interaction between the magnetic field of the magnet and the gravitational field of the Earth

D because of the interaction between the magnetic field of the magnet and the magnetic field of the Earth

9. March/2021/Paper_12/No.28

A soft-iron bar is not magnetised. It is held close to the N pole of a magnet and then to the S pole of the same magnet.

What will be the result?

	N pole	S pole
A	attracts	attracts
B	attracts	repels
C	repels	attracts
D	repels	repels

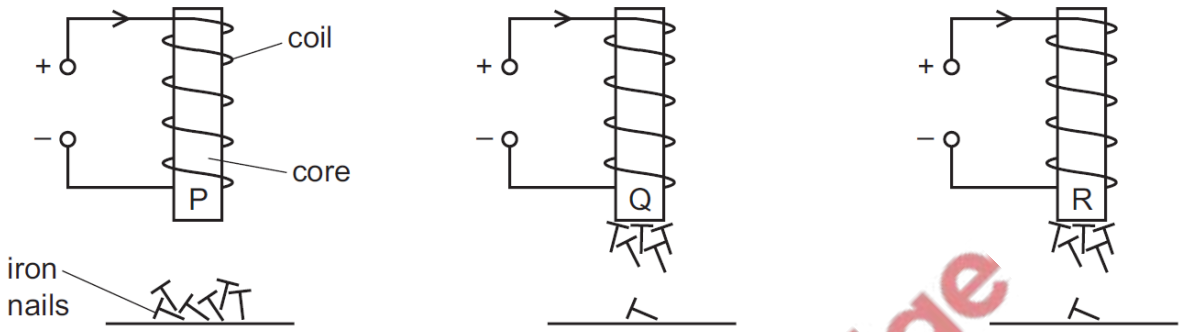
10. March/2021/Paper_12&22/No.30,29

Three cores of different metals P, Q and R are placed inside identical coils of wire.

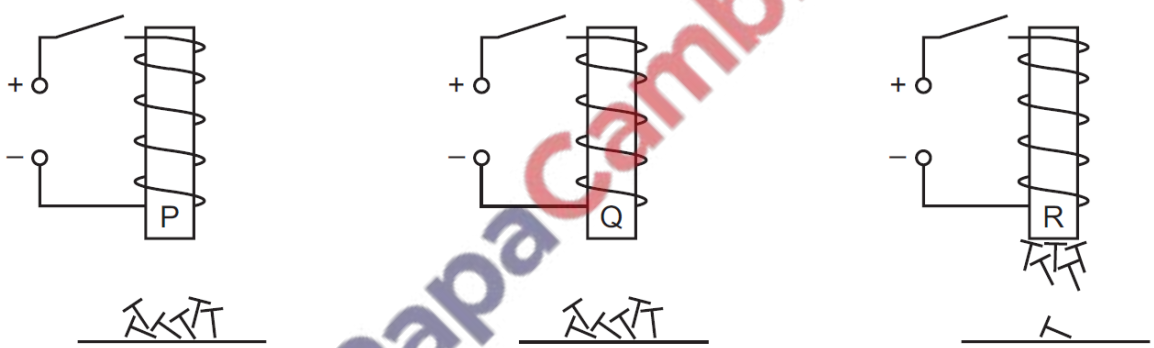
At least one of the metals is non-magnetic.

The cores are held above some iron nails.

The three diagrams show what happens when there is a current in the coils.



The three diagrams below show what happens when the current is then switched off.



Which core metals are magnetic?

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

11. March/2021/Paper_22/No.28

Three methods to demagnetise a magnet are suggested. The magnet is in an east-west direction.

1 hitting the magnet repeatedly with a hammer

2 heating the magnet until red hot

3 withdrawing the magnet from a coil which has a direct current (d.c.) in it

Which methods demagnetise the magnet?

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

12. June/2021/Paper_31/No.9

(a) The box lists four materials.

aluminium	iron	plastic	wood

Use words from the box to answer parts **(i)** and **(ii)**.
Each word may be used once, more than once or not at all.

(i) State **all** materials that are electrical insulators.

..... [1]

(ii) State **one** example of a magnetic material.

..... [1]

(b) Fig. 9.1 shows two magnets, P and Q, which are repelling each other.

Fig. 9.1

On magnet P, the N pole is labelled N.

On Fig. 9.1, label the other pole on magnet P and **both** poles on magnet Q. [1]

(c) One advantage that electromagnets have, compared with permanent magnets, is that their strength can easily be altered.

State **one** other advantage of an electromagnet compared with a permanent magnet.

..... [1]

(d) A student wants to make the strongest electromagnet possible.

Indicate which properties produce the **strongest** electromagnet.

Tick (✓) **one** box in each list.

number of turns in the coil		**material in the core**		**size of current in the coil**	
200 turns	☐	air	☐	20 mA	☐
100 turns	☐	iron	☐	0.5 A	☐
50 turns	☐	plastic	☐	3.0 A	☐

[3]

[Total: 7]

13. June/2021/Paper_42/No.7

(a) Fig. 7.1 shows two magnets and the gap between the N pole of one magnet and the S pole of the other magnet.

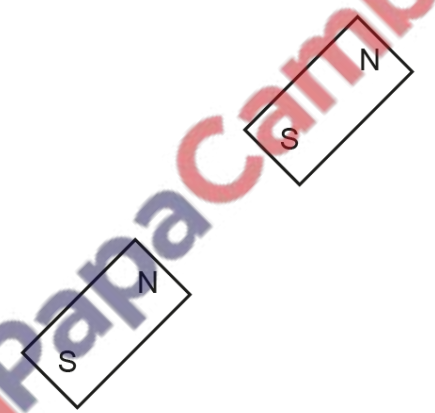


Fig. 7.1

On Fig. 7.1, draw **three** lines to show the pattern and direction of the magnetic field in the gap. [2]

(b) **(i)** Fig. 7.2 is a repeat of Fig. 7.1 showing the two magnets.

On Fig. 7.2, draw the position of a plotting compass needle when it comes to rest in the gap between the N pole and the S pole.

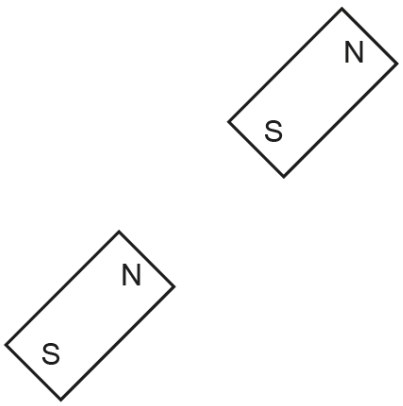


Fig. 7.2 [1]

(ii) Explain why the needle comes to rest in this position.

.....

.....

..... [2]

(c) Describe a method of demagnetising a bar magnet.

.....

.....

..... [2]

[Total: 7]

14. March/2021/Paper_32/No.8

(a) Fig. 8.1 shows the magnetic field pattern around a bar magnet.

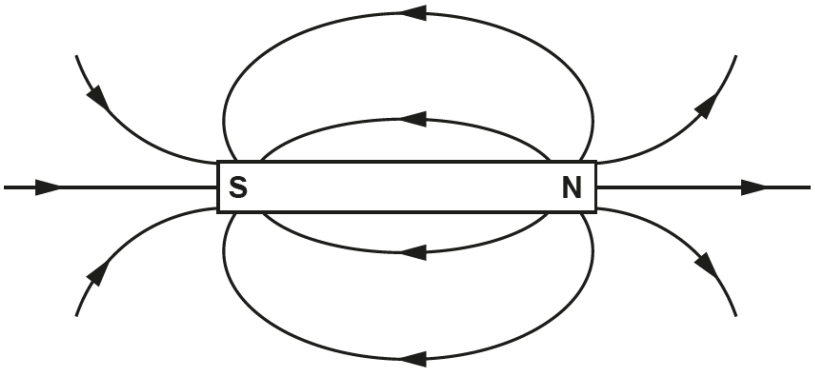


Fig. 8.1

(i) Describe an experiment to identify the pattern and direction of magnetic field lines around a bar magnet as shown in Fig. 8.1.

You may add to Fig. 8.1 as part of your answer.

.....

.....

.....

.....

..... [3]

(ii) State a material that can be used to make a permanent bar magnet.

..... [1]

(b) A student uses two bar magnets to create a uniform magnetic field. He places a current-carrying wire at right angles to the magnetic field, as shown in Fig. 8.2.

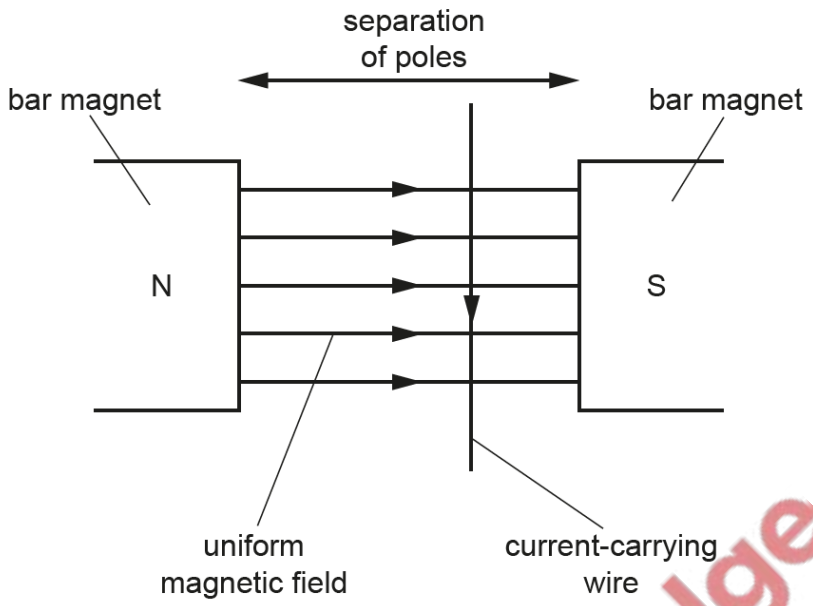


Fig. 8.2

There is a force on the current-carrying wire.

(i) The student wants to reverse the direction of the force on the wire.

State **one** change that reverses the direction of the force on the wire.

..... [1]

(ii) The student increases the separation of the poles of the permanent magnets.

State and explain how increasing the separation affects the force on the current-carrying wire.

.....

..... [2]

[Total: 7]