



7.9.7 Magnetic Fields



14 minutes



17 marks

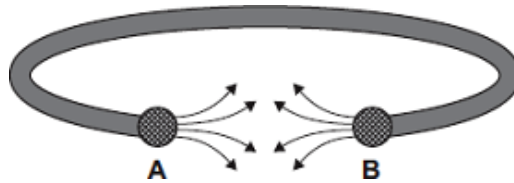
- Q1.** (a) Some people wear magnetic bracelets to relieve pain.

Figure 1 shows a magnetic bracelet.

There are magnetic poles at both **A** and **B**.

Part of the magnetic field pattern between **A** and **B** is shown.

Figure 1



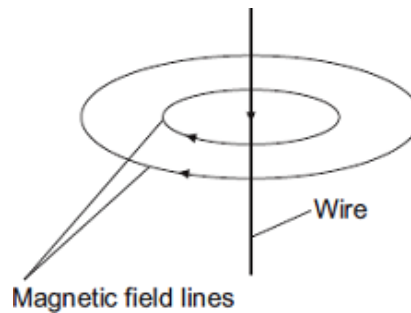
What is the pole at **A**?

What is the pole at **B**?

(1)

- (b) **Figure 2** shows two of the lines of the magnetic field pattern of a current-carrying wire.

Figure 2



The direction of the current is reversed.

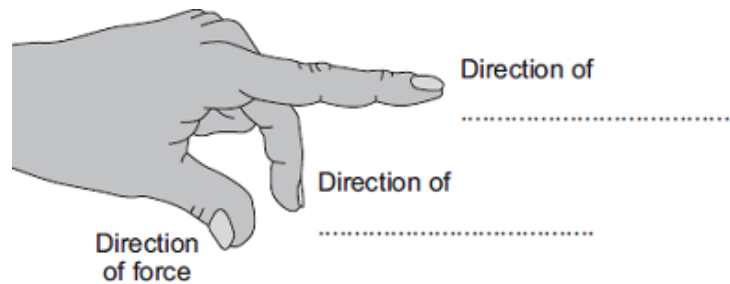
What happens to the direction of the lines in the magnetic field pattern?

.....

(1)

- (c) Fleming's left-hand rule can be used to identify the direction of a force acting on a current-carrying wire in a magnetic field.
- (i) Complete the labels in **Figure 3**.

Figure 3

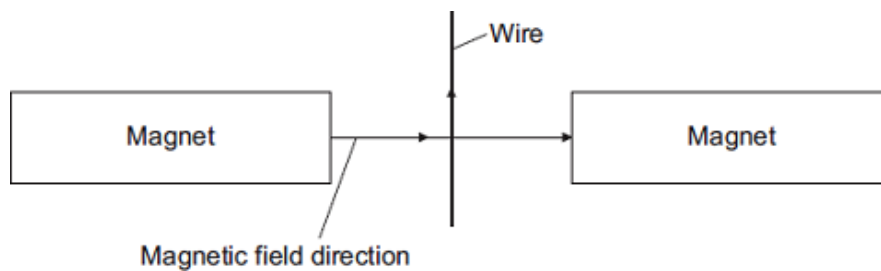


(2)

- (ii) **Figure 4** shows:

- the direction of the magnetic field between a pair of magnets
- the direction of the current in a wire in the magnetic field.

Figure 4



In which direction does the force on the wire act?

.....

(1)

- (iii) Suggest **three** changes that would **decrease** the force acting on the wire.

1

2

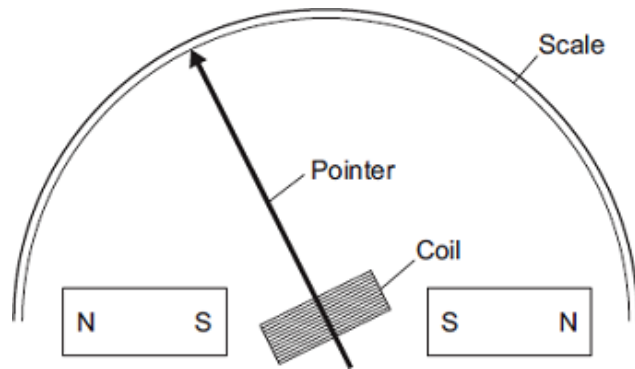
3

(3)

- (d) **Figure 5** shows part of a moving-coil ammeter as drawn by a student.

The ammeter consists of a coil placed in a uniform magnetic field. When there is a current in the coil, the force acting on the coil causes the coil to rotate and the pointer moves across the scale.

Figure 5



- (i) The equipment has **not** been set up correctly.

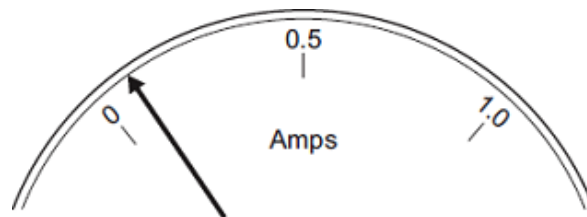
What change would make it work?

.....
.....

(1)

- (ii) **Figure 6** shows the pointer in an ammeter when there is no current.

Figure 6



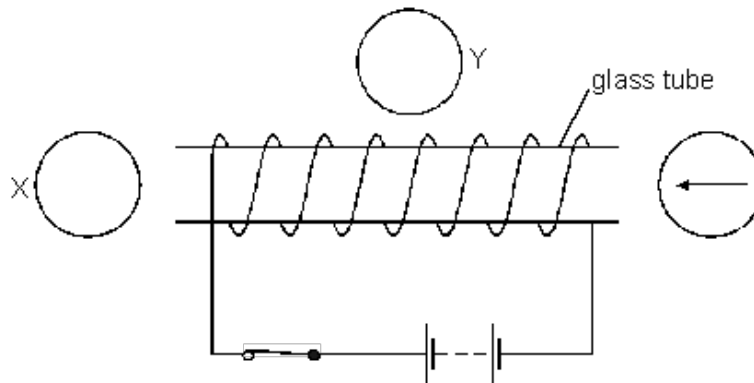
What type of error does the ammeter have?

.....

(1)

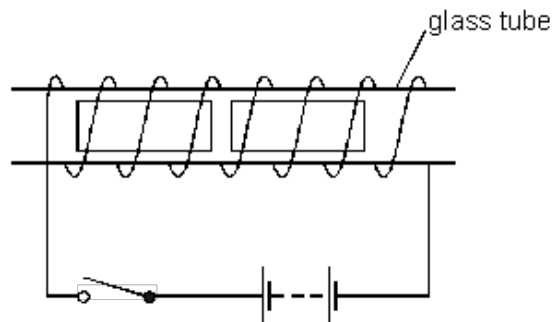
(Total 10 marks)

- Q2.** A pupil wound a coil of copper wire around a glass tube and connected the wire to a battery. She placed a compass at each end of the tube and one compass beside the tube as shown.



- (a) (i) Complete the diagram by drawing arrows in compasses X and Y to show the direction of the magnetic field. 2 marks
- (ii) Draw an arrow in the middle of the glass tube to show the direction of the magnetic field in the glass tube. 1 mark
- (iii) When the switch is opened, in which direction will the three compass needles point?
 1 mark
- (b) Give **one** way to reverse the magnetic field around the glass tube

 1 mark
- (c) Two pieces of iron are placed inside the glass tube.
- (i) When the switch is closed, the magnetic field is the same as in the diagram opposite. The pieces of iron become magnetised. Label the **four** poles on the pieces of iron.



1 mark'

- (ii) When the switch was closed, the pieces of iron moved.
Explain why they moved.

.....

.....

1 mark
Maximum 7 marks

