

Name of the Student: _____

Max. Marks : 17 Marks

Time : 17 Minutes

Q1.

Answer the question with a cross in the box you think is correct ☐. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☐.

A student uses a plotting compass to investigate the magnetic field around a wire.

Figure 10 shows the wire going straight through a card.

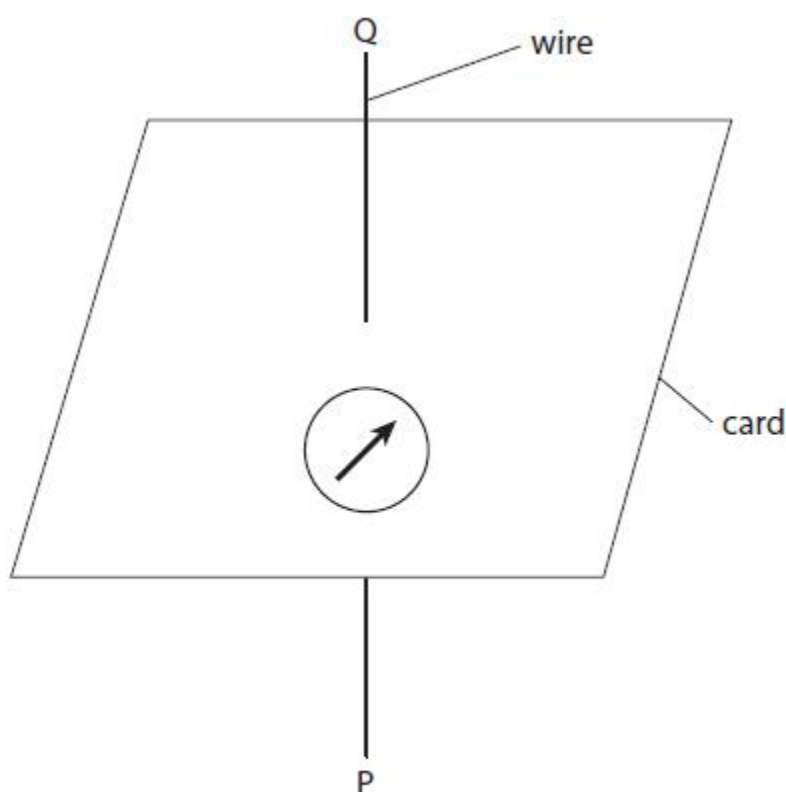


Figure 10

Figure 10 shows the compass needle when there is no current in the wire.

(i) Which of these shows a possible direction of the compass needle when there is a current in the wire going from P to Q?

(1)



☐ A



☐ B



☐ C



☐ D

(ii) Describe how the student could develop the investigation to find the shape of the magnetic field produced by the current.

(3)

.....

.....

.....

.....

.....

.....

(Total for question = 4 marks)

Q2.

A student investigates the relationship between the magnetic flux density and the electromagnetic force on a current-carrying wire.

The student has the equipment shown in Figure 19.

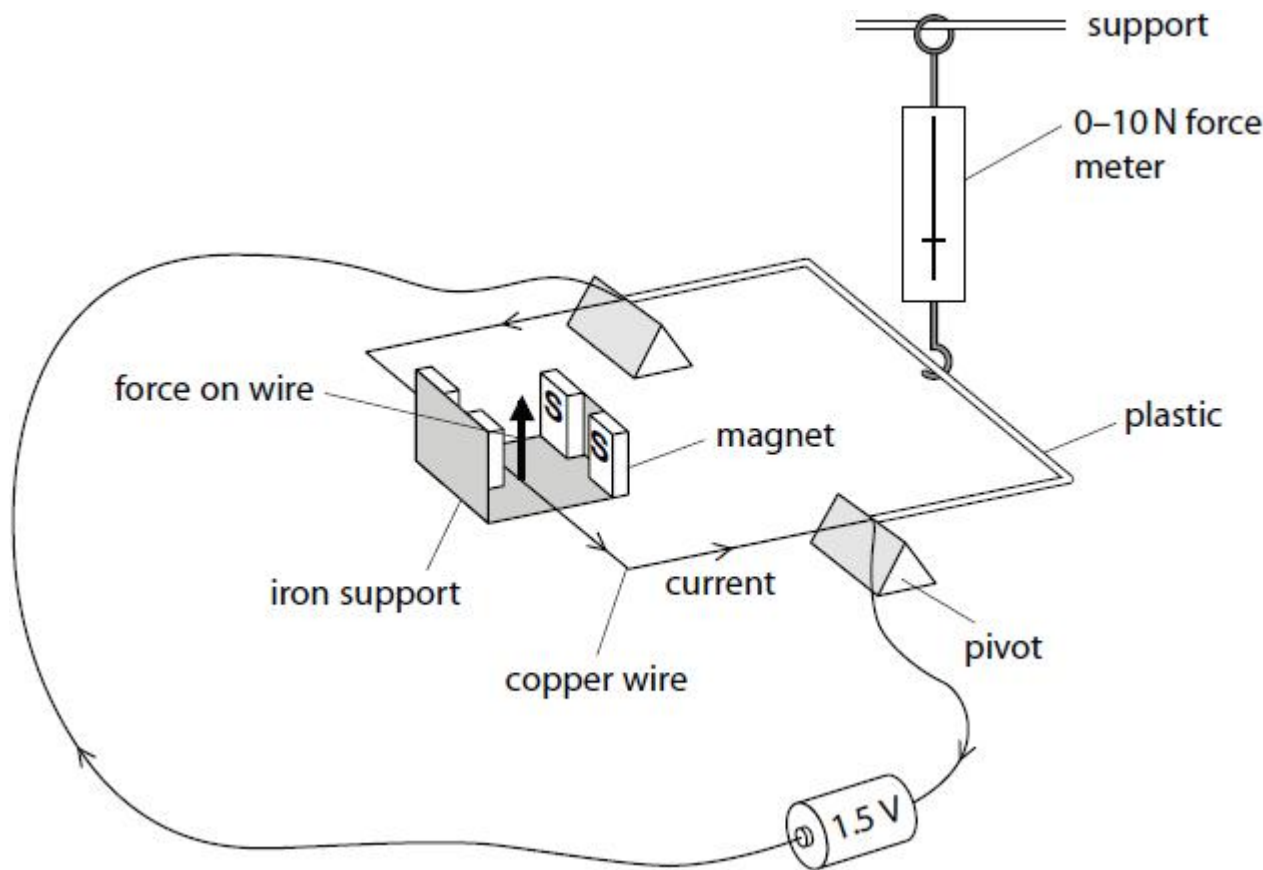


Figure 19

The student varies the number of magnets and measures the force on the wire using the force meter. The results are shown in Figure 20.

number of pairs of magnets	reading on force meter (N)
1	0.0
2	0.0
3	0.1

Figure 20

The student decides that his equipment is not sufficiently sensitive.

Give **three** ways the student should develop his investigation to improve the quality of his results.

(3)

- 1
- 2

.....
3
.....

(Total for question = 3 marks)

Q3.

A student uses plotting compasses to investigate the magnetic field between the poles of two bar magnets. Figure 12 shows **one** of the plotting compasses and **one** of the bar magnets.



Figure 12

The student places the two magnets on a piece of paper with a pole of one magnet a few centimetres away from a pole of the other magnet.

The student places 20 plotting compasses on the paper near the magnets.

Figure 13 shows the direction in which each of the plotting compasses points.

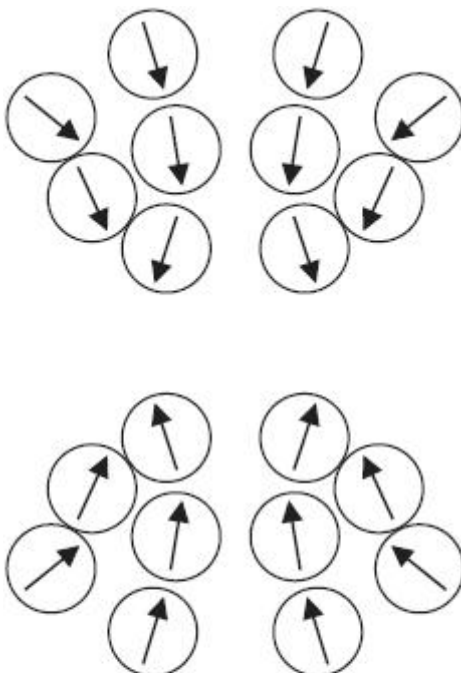


Figure 13

(i) Draw two rectangles on Figure 13 to show the positions of the two bar magnets.

Label the N-pole and the S-pole of each magnet.

(2)

(ii) The student wants to determine the shape of the magnetic field for a larger area around the magnets.

Describe how the student should continue the investigation using just one plotting compass.

(3)

.....

.....

.....

.....

.....

.....

(Total for question = 5 marks)

Q4.

A student uses plotting compasses to investigate the magnetic field between the poles of two bar magnets. Figure 5 shows **one** of the plotting compasses and **one** of the bar magnets.



Figure 5

The student places the two magnets on a piece of paper with a pole of one magnet a few centimetres away from a pole of the other magnet.

The student places 20 plotting compasses on the paper near the magnets.

Figure 6 shows the direction in which each of the plotting compasses points.

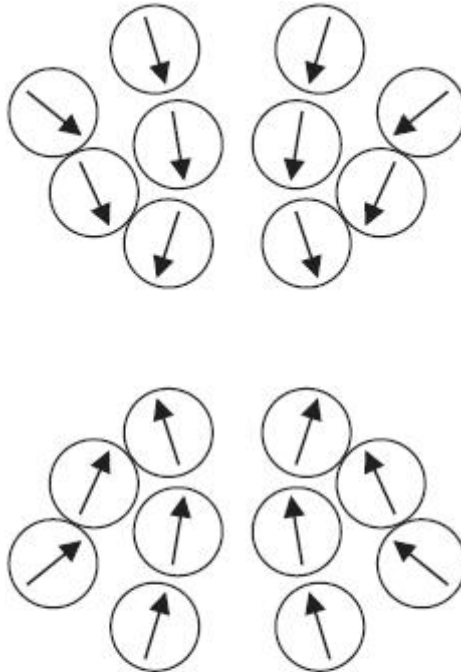


Figure 6

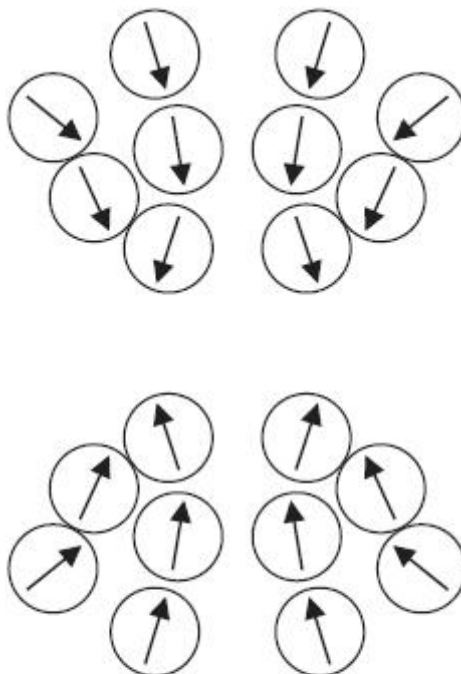


Figure 6

- (i) Draw two rectangles on Figure 6 to show the positions of the two bar magnets.
Label the N-pole and the S-pole of each magnet.

(2)

- (ii) The student wants to determine the shape of the magnetic field for a larger area around the magnets.
Describe how the student should continue the investigation using just one plotting compass.

(3)

.....

.....

.....

.....

.....

.....

(Total for question = 5 marks)