

Name of the Student: _____

Max. Marks : 23 Marks

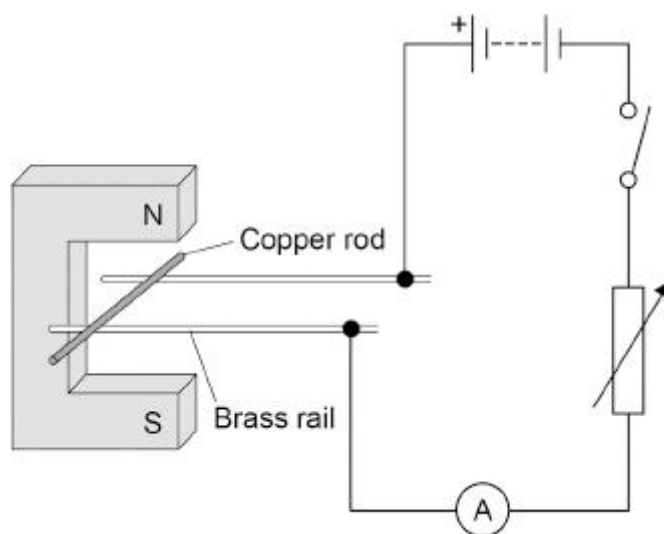
Time : 23 Minutes

Q1.

A teacher demonstrated the motor effect.

Figure 1 shows the equipment used. The equipment includes a permanent magnet.

Figure 1



- (a) The copper rod remains stationary while the switch is open.

Complete the sentence.

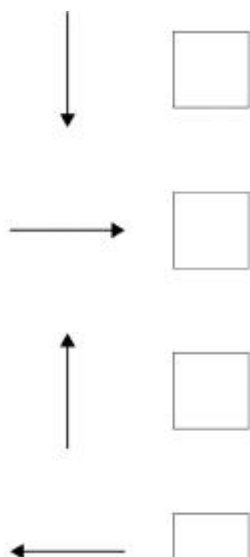
The tendency for an object to remain stationary is
called _____.

(1)

When the switch is closed the copper rod accelerates.

- (b) In which direction will the copper rod accelerate?

Tick (✓) **one** box.



(1)

- (c) Explain **one** way the teacher could increase the acceleration of the copper rod.

(2)

- (d) The magnet used in the demonstration was a permanent magnet.

Figure 2 shows an iron bar and a permanent magnet.

Figure 2



Describe how the permanent magnet could be used to test if the iron bar is also a permanent magnet.

(2)

- (e) **Figure 3** shows a magnetic compass used by walkers.

Figure 3



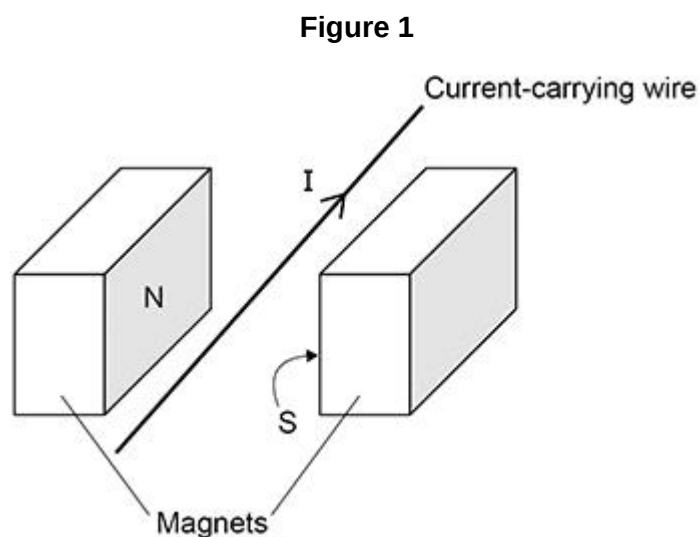
Explain how a magnetic compass provides evidence that the Earth has a magnetic field.

(2)
(Total 8 marks)

Q2.

A teacher demonstrated the motor effect.

Figure 1 shows the equipment used.



(a) Explain why there is a force on the wire when there is a current in the wire.

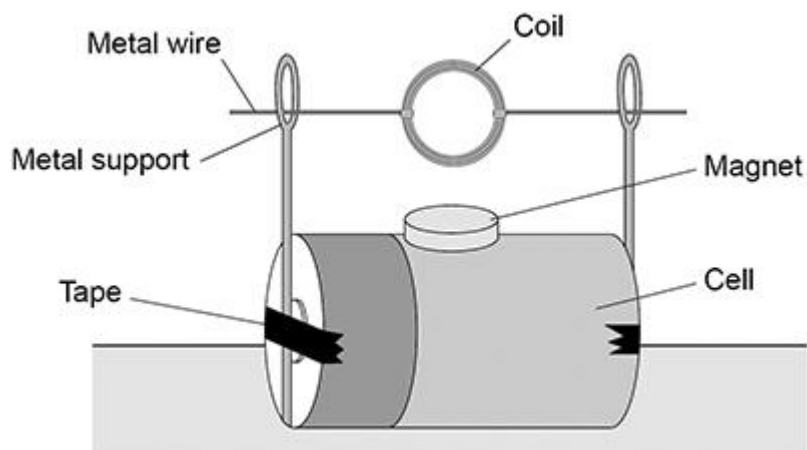
(2)

(b) Explain how the direction of the force on the wire can be predicted.

(3)

(c) **Figure 2** shows a simple electric motor.

Figure 2



Explain **one** way that the motor could be changed to increase the rate at which the coil rotates.

(2)

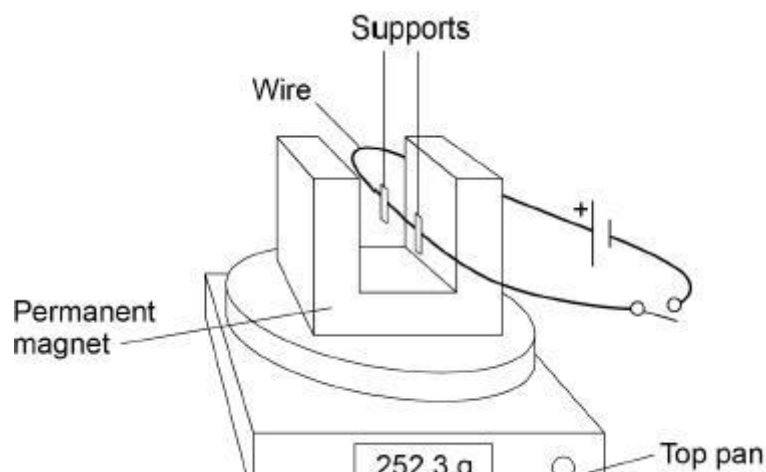
(Total 7 marks)

Q3.

A student clamped a wire between the poles of a permanent magnet.

The student investigated how the force on the wire varied with the current in the wire.

The diagram below shows the equipment used.



The top pan balance was used to determine the force on the wire.

- (a) When the switch was closed the reading on the top pan balance increased.

Explain why the increased reading showed that there was an upward force on the wire.

(2)

- (b) The table below shows the readings on the top pan balance with the switch open and with the switch closed.

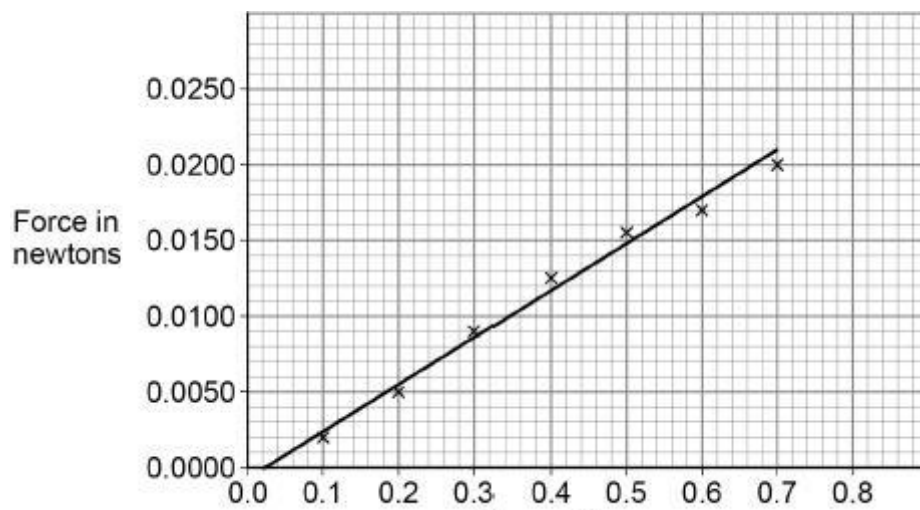
Switch	Mass in grams
Open	252.3
Closed	254.8

Explain how the values in the table above can be used to determine the size of the force on the wire.

(2)

- (c) The student varied the current in the wire and calculated the force acting on the wire.

The graph below shows the results.



The length of the wire in the magnetic field was 0.125 m

Determine the magnetic flux density.

Magnetic flux density = _____ T

(4)

(Total 8 marks)