

Name of the Student: _____

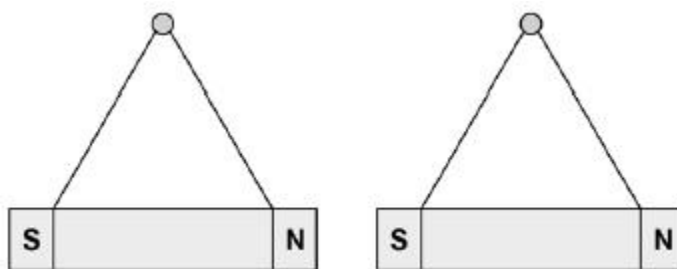
Max. Marks : 22 Marks

Time : 22 Minutes

Q1.

Figure 1 shows two bar magnets suspended close to each other.

Figure 1



- (a) Explain what is meant by the following statement.

‘A non-contact force acts on each magnet’.

(2)

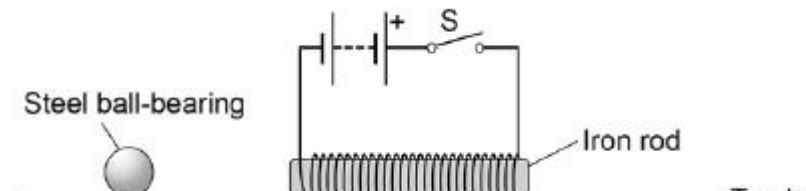
- (b) Describe how to plot the magnetic field pattern of a bar magnet.

(3)

A student has set up the apparatus shown in **Figure 2**.

The iron rod is fixed to the track and cannot move.

Figure 2



- (c) The student gives the steel ball bearing a gentle push in the direction of the iron rod. At the same time the student closes the switch **S**.

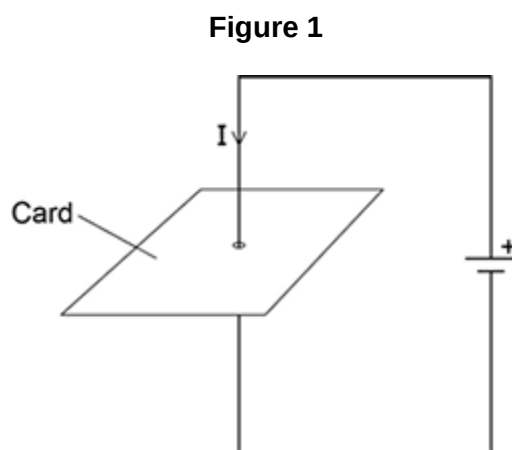
Explain the effect on the motion of the ball bearing when the switch **S** is closed.

(4)
(Total 9 marks)

Q2.

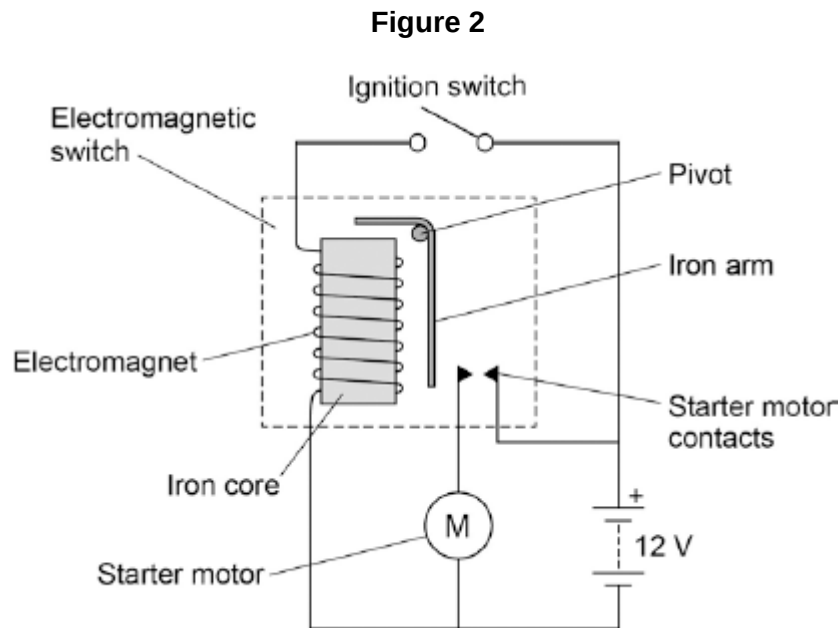
Figure 1 shows a straight wire passing through a piece of card.

A current (I) is passing down through the wire.



- (a) Describe how you could show that a magnetic field has been produced around the wire.

- (b) **Figure 2** shows the ignition circuit used to switch the starter motor in a car on. The circuit includes an electromagnetic switch.



Explain how the ignition circuit works.

(4)

(Total 6 marks)

Q3.

- (a) Electromagnets are often used at recycling centres to separate some types of metals from other materials.

Give **one** reason why an electromagnet would be used rather than a permanent magnet.

(1)

- (b) In this question you will gain marks for using good English, organising information

clearly and using scientific words correctly.

Some students want to build an electromagnet.

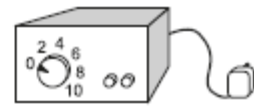
The students have the equipment shown below.



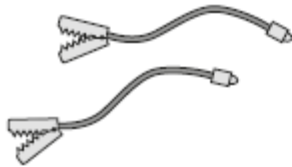
Insulated wire



Iron nail



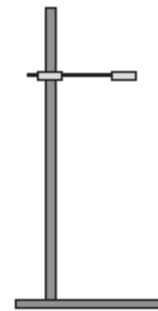
Power supply



Connecting leads



Steel paperclips



Wooden clamp
and stand

Describe how the students could build an electromagnet. Include in your answer how the students should vary and test the strength of their electromagnet.

(6)

(Total 7 marks)