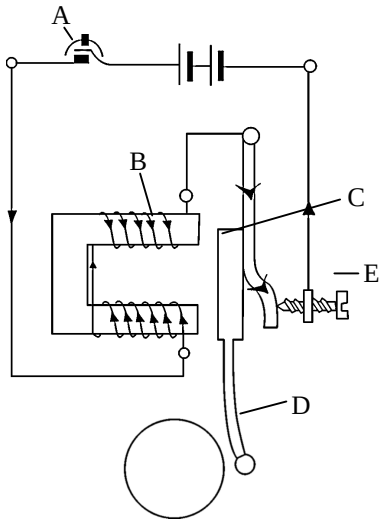
Here is a diagram of an electric bell.



Explain how the bell works by referring to the parts labelled A – E.

.....

.....

.....

.....

.....

.....

.....

.....

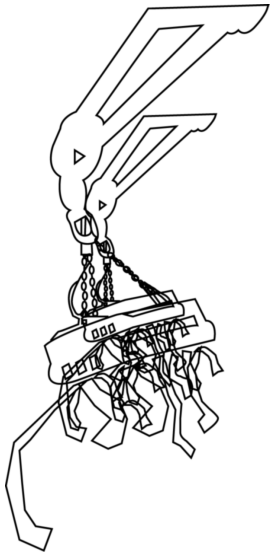
.....

.....[7]

TOTAL / 7

High Demand Questions QUESTIONSHEET 2

(a) A large electromagnet is used in a scrap yard to move old cars.



(i) Name a suitable material for the electromagnet.

.....[1]

(ii) Explain your choice.

.....

.....[2]

(b) A car of mass 1600 kg can be just be lifted.
What is the least force that the electromagnet must use to lift the car?
(1 g = 10 N/kg)

.....

.....

.....[2]

TOTAL / 5

High Demand Questions QUESTIONSHEET 3

Describe a simple electric motor.
Include a simple diagram in your answer.

.....

.....

.....

.....

.....

.....

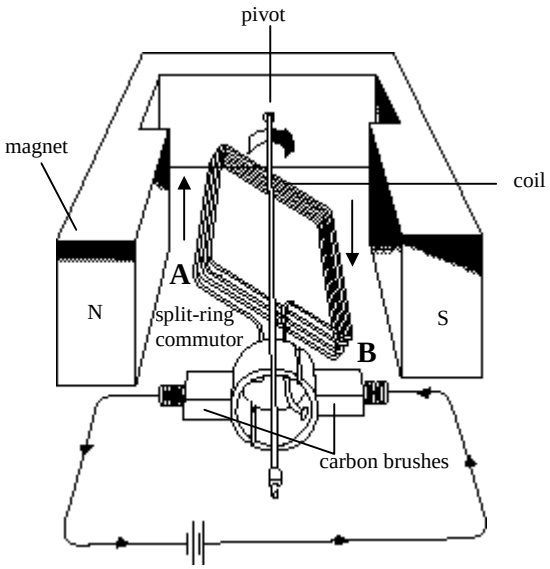
.....

.....

[7]

TOTAL / 7

(a) An electric motor is connected to the external circuit via a split ring commutator.



Explain the purpose of this.

.....

.....[3]

(b) (i) How could the motor be used as a generator ?

.....[1]

(ii) The current produced would be a varying direct current (dc).
What changes would be needed for the generator to produce an alternating current (ac) instead ?

.....

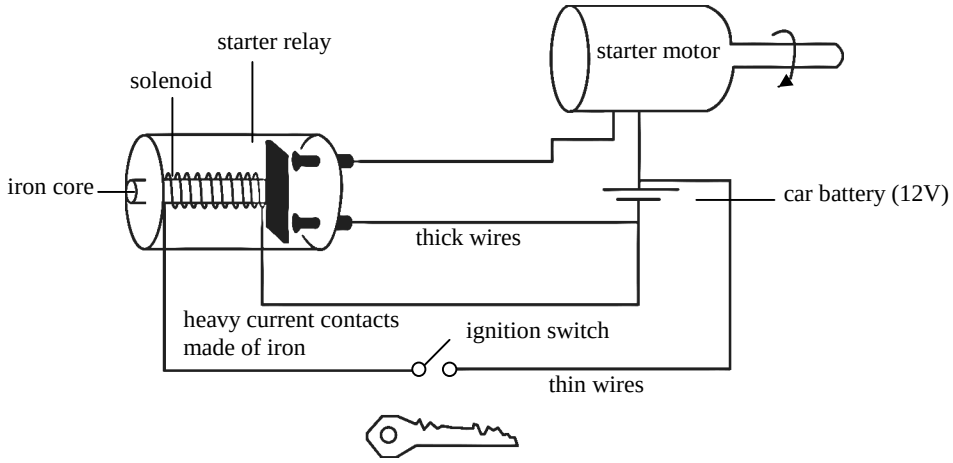
.....[2]

TOTAL / 6

GCSE PHYSICS **ELECTROMAGNETISM**

High Demand Questions QUESTIONSHEET 5

(a) The diagram shows a relay circuit used in a car starter motor.



What happens when the ignition is switched on ?

.....

.....

.....[3]

(b)Why is the battery always connected to the starter motor with very thick cables ?

.....[1]

(c)Draw a circuit diagram showing the battery connections.

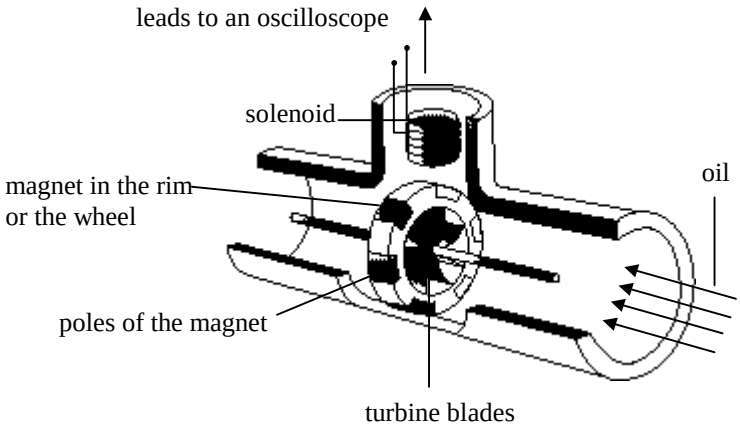
[3]

TOTAL / 7

High Demand Questions QUESTIONSHEET 6

(a) The diagram below shows a device that could be used for measuring the rate at which water flows through a pipe.

An electromagnetic flow meter



Explain why a reading is obtained on the meter when the water flows in the pipe.

.....

.....

.....

.....

.....[4]

(b) State the effect on the meter of

(i) increasing the flow rate of the water

.....[1]

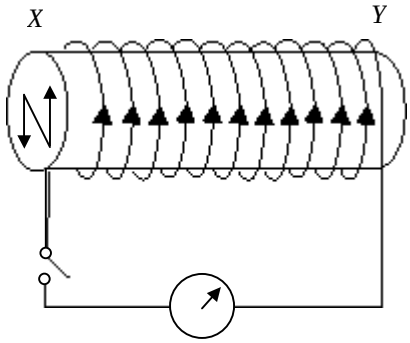
(ii) making the water flow in the opposite direction

.....[1]

TOTAL / 6

High Demand Questions QUESTIONSHEET 7

(a) To avoid cutting through cables, a gas company uses a device to detect their position before digging holes. The magnetic field produced by the cable induces a voltage across the coil. This is registered on a meter attached to the device.



The device cannot detect cables that carry a steady direct current. Explain the reason for this.

.....

.....

.....[2]

(b)Why is it better to use the coil vertically than horizontally?

.....

.....[2]

(c)State two ways in which you could get a larger reading on the meter.

1. .....[1]

2. .....[1]

TOTAL / 6

High Demand Questions QUESTIONSHEET 8

(a) The heating effect of an electric current is given by

$H = I^2R$
where I = current, R = resistance.

If the power generated from a power station is 150 kW at a voltage of 275 kV, calculate the current in the cable.

.....

.....

.....

.....[4]

(b) (i) The resistance of the cable is 0.01 Ω per km.
Calculate the total resistance of a 200 km length of the cable.

.....

.....

.....[2]

(ii) Find the power loss in the cable over 200 km.

.....

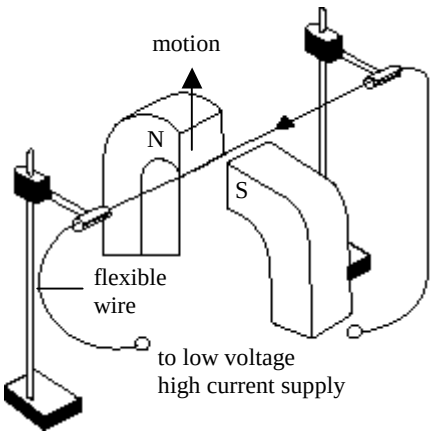
.....

.....

.....[2]

TOTAL / 8

(a) A wire is positioned between two magnets. The wire is connected to a battery.



Describe what happens.

.....

.....[2]

(b) (i) The connections are reversed.
Describe what happens now.

.....

.....[2]

(ii) The battery is replaced by a power supply that gives an alternating current.
What is observed ?

.....[1]

TOTAL / 5

Medium Demand Questions QUESTIONSHEET 10

(a) Chloe makes an electromagnet by coiling a length of wire around a pencil. What must she do to make it work ?

.....[1]

(b)(i) Chloe is given some paper clips and asked to test the strength of her electromagnet.
How could she do this ?

.....

.....[2]

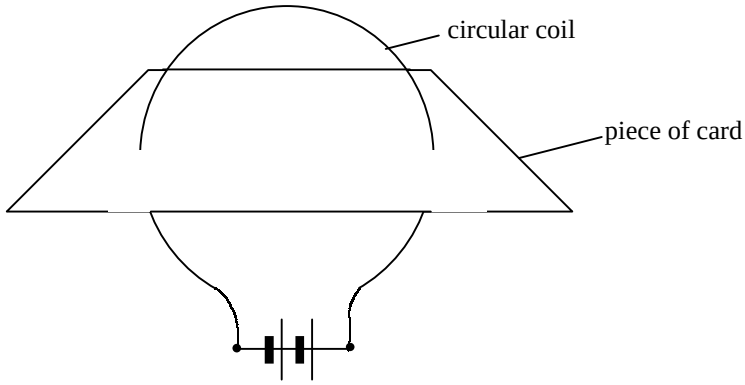
(ii) State two ways in which Chloe could increase the strength of her electromagnet.

1. .....[1]

2. .....[1]

TOTAL / 5

(a) A coil of wire is attached to a battery. An electric current flows through it.



The coil acts like a bar magnet.
Draw the magnetic field pattern around it. [2]

(b) (i) A compass needle held near to the left-hand end points away from the coil.
What does this tell you ?

.....[1]

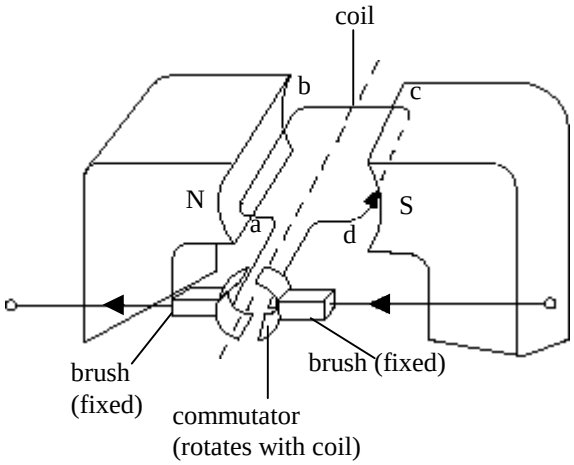
(ii) Show the direction of the magnetic field lines on your diagram. [1]

TOTAL / 4

Medium Demand Questions QUESTIONSHEET 12

(a) A simplified electric motor consists of a coil of wire connected to a battery and positioned between two magnets (see diagram).

simple d.c. motor



(i) Use Fleming's left-hand rule to predict the direction of the force on each arm of the coil.

.....

.....[2]

(ii) State the direction of motion of the coil.

.....[1]

(b) (i) After half a turn the coil will stop.
What piece if equipment do you need to use to keep the coil moving ?

.....[1]

(ii) What does the piece of apparatus do ?

.....

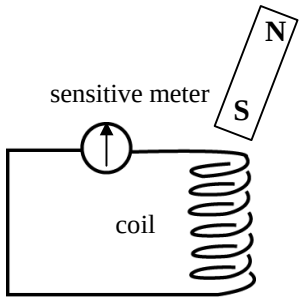
.....[2]

TOTAL / 6

GCSE PHYSICS **ELECTROMAGNETISM**

Medium Demand Questions QUESTIONSHEET 13

(a) The diagram shows a coil of wire connected to a sensitive ammeter. A bar magnet is moved towards the coil.



What is observed on the ammeter?

.....[1]

(b) What is observed if:

(i) the magnet is removed from the coil?

.....[1]

(ii) the magnet and coil move in the same direction at the same speed?

.....[1]

(c) (i) What name is given to the phenomenon referred to in (b)?

.....[1]

(ii) State three factors which determine the size of the current produced.

1. .....[1]

2. .....[1]

3. .....[1]

TOTAL / 7

Medium Demand Questions QUESTIONSHEET 14

(a) Some bicycles are fitted with a dynamo.
What is the purpose of a dynamo ?

.....[1]

(b) It is not a good idea to have only lights which are powered by a dynamo.
Why not ?

.....

.....

.....[2]

(c) A bicycle dynamo has a coil that is stationary, whilst the magnet turns inside it when you turn the pedals.

(i) How does this differ from a simple ac generator ?

.....

.....[1]

(ii) What advantage does the dynamo arrangement have ?

.....

.....

.....[2]

TOTAL / 6

Medium Demand Questions QUESTIONSHEET 15

(a) The National Grid is made up of a network of cables transmitting electricity from power stations across the country.
A typical power station generates electricity at 25000 V.
The electricity is actually transmitted at 400 000 V.

(i) How is this achieved ?

.....

.....[2]

(ii) Why is this done ?

.....

.....

.....[3]

(b)(i) Why might you see a notice warning that it is dangerous to fly kites near to overhead voltage cables ?

.....

.....[2]

(ii) Why is it safe for a bird to perch on an overhead voltage cable ?

.....

.....

.....[2]

TOTAL / 9

Medium Demand Questions QUESTIONSHEET 16

(a) From what material is the core of a transformer made ?

.....[1]

(b) What is the purpose of the core ?

.....[1]

(c) A transformer will only work on ac and not on dc.
Explain why.

.....

.....

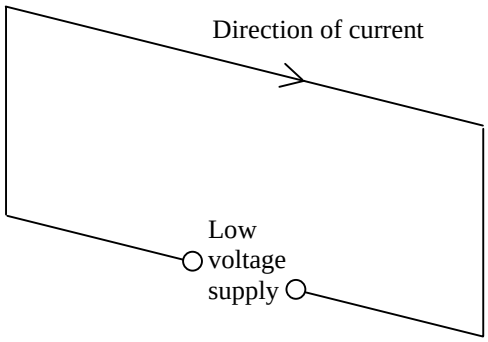
.....

.....[3]

TOTAL / 5

Low Demand Questions QUESTIONSHEET 17

(a) A wire is connected to a low voltage supply. A current flows as shown and a magnetic field is produced.



State two ways in which the magnetic field could be detected.

1. .....

.....[2]

2. .....

.....[2]

(b)Make a sketch of the magnetic field pattern.
Show the direction of the magnetic field.

[2]

TOTAL / 6

Low Demand Questions QUESTIONSHEET 18

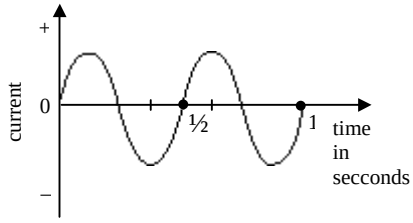
(a) What is meant by an alternating current ?

.....

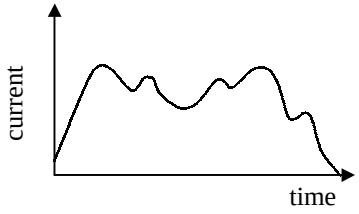
.....[2]

(b)Which of the following graphs show an alternating current ?

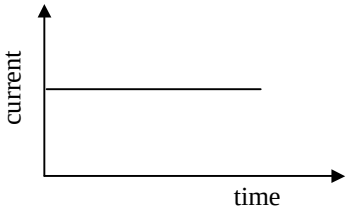
A



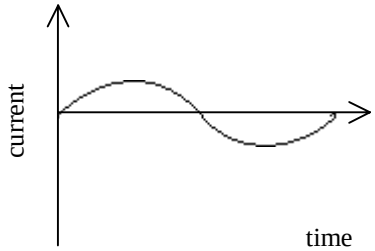
C



B



D



.....[2]

TOTAL / 4

Low Demand Questions QUESTIONSHEET 19

Below is a block diagram of a fossil fuel power station.

(a)(i) What is meant by a fossil fuel?

.....[1]

(ii) Name two commonly used fossil fuels

.....

.....[2]

(b) Explain how the power station works

.....

.....

.....

.....

.....

.....

.....

.....[6]

TOTAL / 9

Low Demand Questions QUESTIONSHEET 20

(a) Name three machines, which make use of motors.

.....

.....

.....[3]

(b) Electric motors make use of carbon brushes.
What two properties of carbon make it a good material to use?

.....

.....[2]

(c) State one way in which a motor can be made more powerful.

.....

.....[2]

TOTAL / 7