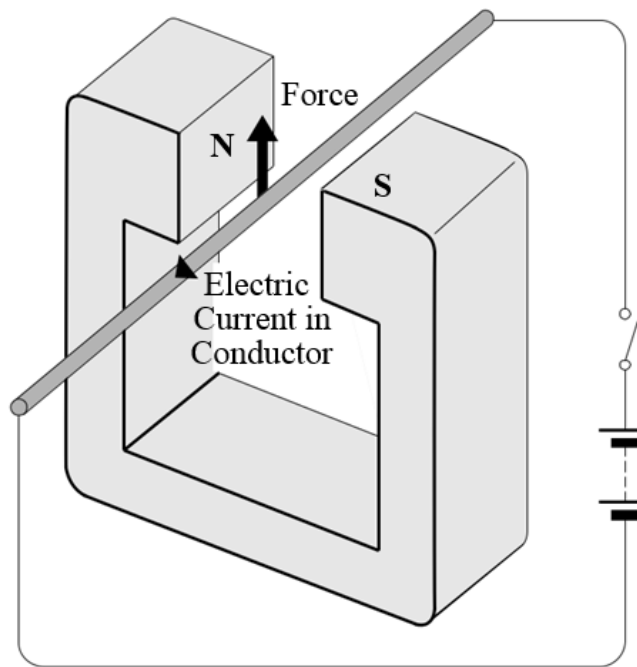


MOTOR EFFECT, ELECTRIC MOTOR AND LOUDSPEAKERS

Q 1 When a conductor carrying an electric current is placed in a magnetic field a force may act on it.



(a) State two ways in which this force can be increased.

1.

2.

(2 marks)

(b) State two ways in which this force can be made to act in the opposite direction.

1.

2.

(2 marks)

(c) In what circumstance will no force act on a conductor carrying an electric current and in a magnetic field?

(1 mark)

Q2. Many electrical appliances use the circular motion produced by their electric motor.

(a) Put ticks (☑) in the boxes next to all the appliances in the list which have an electric motor.

electric drill

electric fan

electric food mixer

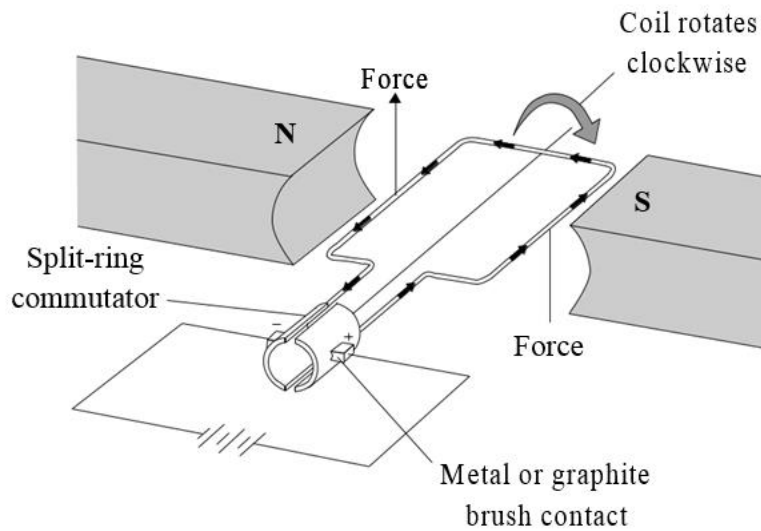
electric iron

electric kettle

electric screwdriver

(2 marks)

(b) One simple design of an electric motor is shown in the diagram. It has a coil which spins between the ends of a magnet.



(b) (i) Give two ways of reversing the direction of the forces on the coil in the electric motor.

1.

2.

(2 marks)

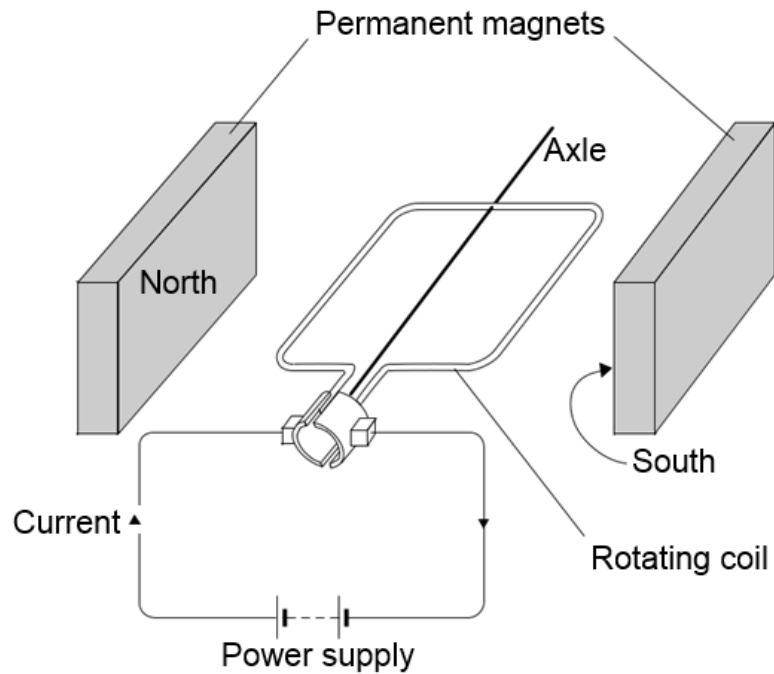
(b) (ii) Give two ways of increasing the forces on the coil in the electric motor.

1.

2.

(2 marks)

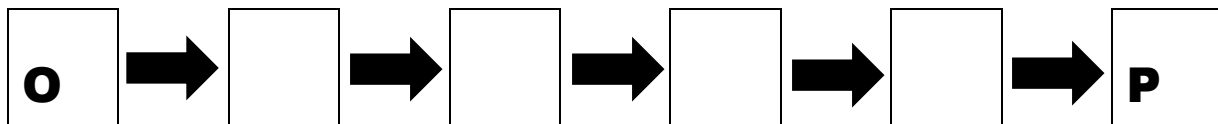
Q3. The G-machine is rotated by an electric motor. The diagram shows a simple electric motor.



The following statements explain how the motor creates a turning force. The statements are in the wrong order.

- M** – The magnetic field interacts with the magnetic field of the permanent magnets.
- N** – A magnetic field is created around the coil.
- O** – The power supply applies a potential difference across the coil.
- P** – This creates a force that makes the coil spin.
- Q** – A current flows through the coil.

Arrange the statements in the correct order. Two of them have been done for you.



(d) The electric motor produces a turning force.

Give two ways of increasing the turning force.

1.

2.

(2 marks)

(e) Draw a ring around the correct answer to complete the sentence.

It costs a lot of money to send astronauts into space.

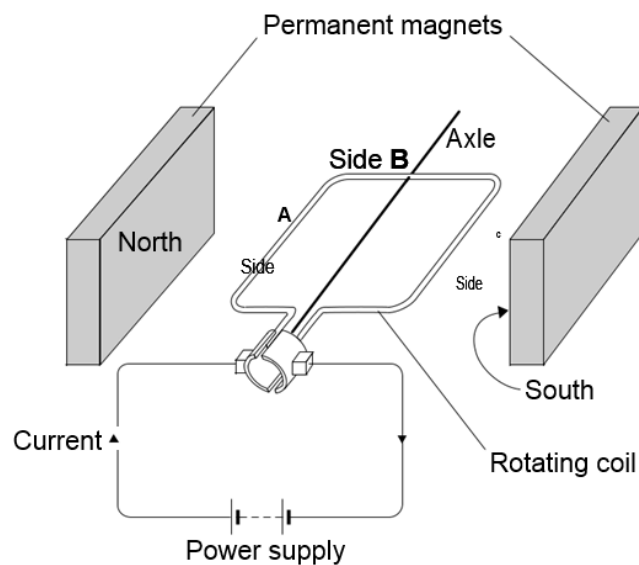
This is

an economic
an environmental
a social

 issue.

(1 mark)

Q 4. Each G-machine is rotated by an electric motor. The diagram shows a simple electric motor.



(a) (i) A current flows through the coil of the motor.

Explain why side A of the coil experiences a force.

(2 marks)

(ii) Draw arrows on the diagram to show the direction of the forces acting on side A of the coil and side C of the coil.

(1 mark)

(iii) When horizontal, side B experiences no force. Give the reason why.

(1 mark)

(b) While a G-machine is rotating, the operators want to increase its speed.

What can the operators do to make the G-machine rotate faster?

(1 mark)

(c) The exploration of space has cost a lot of money.

Do you think spending lots of money on space exploration has been a good thing?

Draw a ring around your answer.

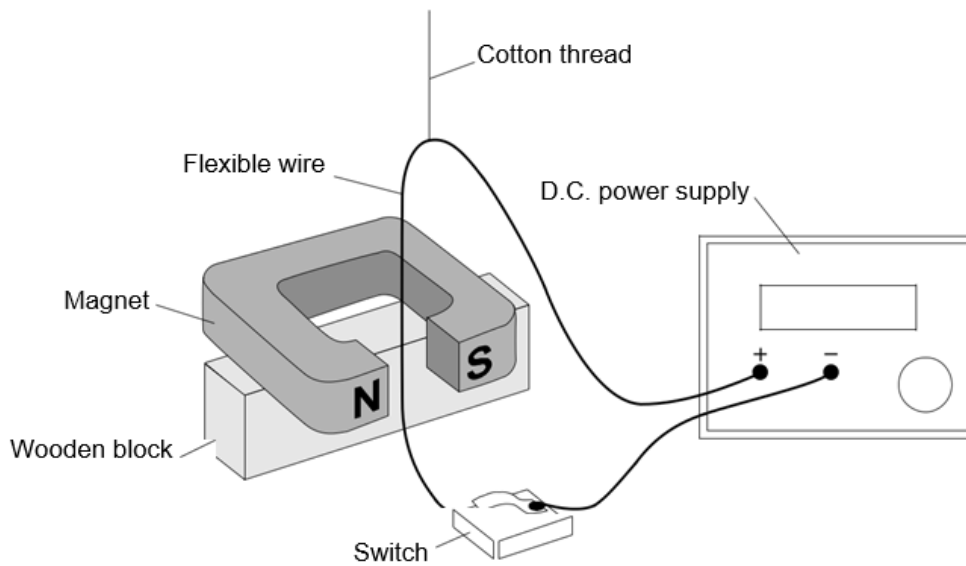
Yes No

Give a reason for your answer.

(1 mark)

Q5. Figure 7 shows a demonstration carried out by a teacher.

Figure 7



When the switch is closed, there is a current of 2 A through the wire. The wire experiences a force and moves.

(a) Use the correct word from the box to complete the sentence.

generator	motor	transformer
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The demonstration shows _____ the effect.

[1 mark]

(b) State two changes that the teacher could make to the demonstration, each of which would increase the force on the wire. The teacher does not touch the wire.

1.

2.

[2 mark]

(c) State one change that the teacher could make to the demonstration to change the direction of the force on the wire.

[1 mark]

(d) With the switch closed, the teacher changes the position of the wire so that the force on the wire is zero.

What is the position of the wire?

Tick (☑) one box.

The wire is at 90° to the direction of the magnetic field.

The wire is at 45° to the direction of the magnetic field.

The wire is parallel to the direction of the magnetic field.



[1 mark]

Total: 27 marks