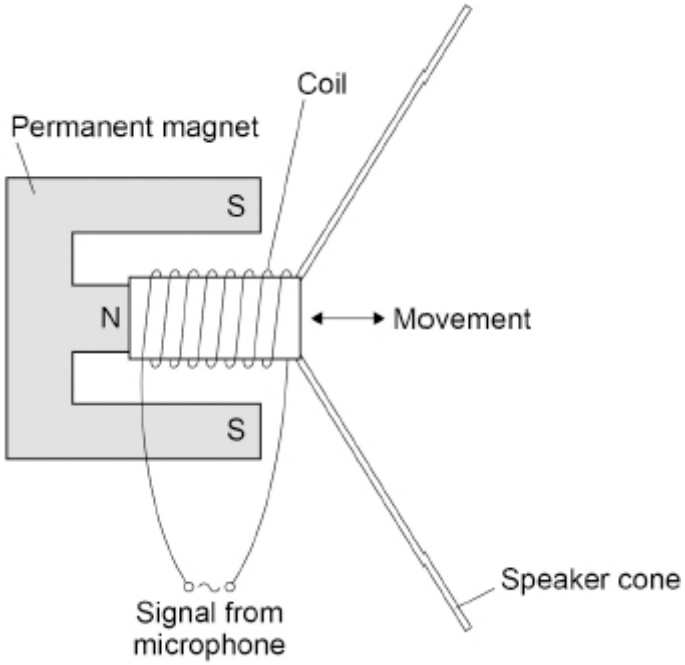
Q1.

Figure 3 shows the parts of the loudspeaker in the megaphone. **(HT only)**

Figure 3



A current in the coil of the loudspeaker causes the coil to move.

(a) What is the name of the effect that causes the coil to move?

Tick (✓) **one** box.

Electromagnet effect ☐

Induction effect ☐

Motor effect ☐

Speaker effect ☐

(1)

(b) When the current in the coil is 16 mA, the force on the coil is 0.013 N.

The length of the wire that makes up the coil is 6.5 m.

Calculate the magnetic flux density around the coil in the electromagnet.

Use the Physics Equations Sheet.

_____

_____

_____

_____

_____

_____

_____

Magnetic flux density = _____ T

(4)

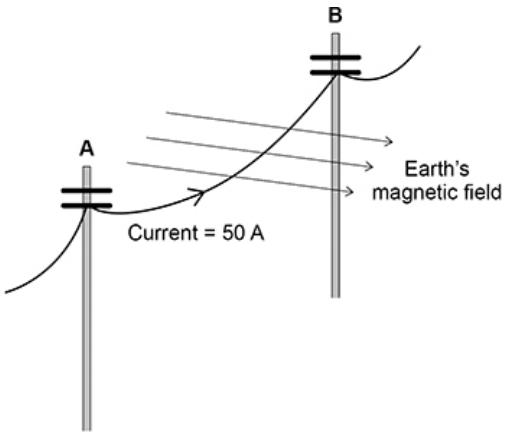
(Total 5 marks)

Questions are for both separate science and combined science students unless indicated in the question

Q2.

Figure 2 shows a large cable supported by two wooden poles. The cable is connected to an electricity supply.

Figure 2



(a) There is a force on the cable due to the Earth's magnetic field when the current is in the direction **A** to **B**.

What is the direction of this force?

Tick (✓) **one** box. **(Physics only) (HT only)**

Down ☐

Left ☐

Right ☐

Up ☐

(1)

(b) The cable experiences a force of 0.045 N due to the Earth's magnetic field.

magnetic flux density = 60 μT

current = 50 A

Calculate the length of the cable between **A** and **B**.

Use the Physics Equations Sheet. **(HT only)**

_____

_____

_____

_____

_____

_____

_____

_____

Length = _____ m

(4)

(Total 5 marks)