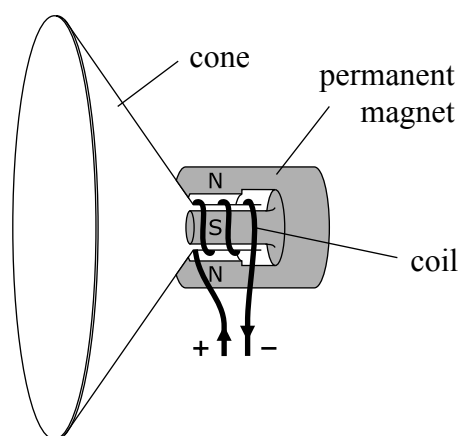


- 16.** The diagram shows the inside of a loudspeaker. It contains a cone attached to a coil of insulated wire.

The coil is in the gap between the cylindrical poles of a permanent magnet. When there is a current in the coil, both the coil and the cone are forced to move.



- (a) Why is the coil made of insulated wire?

.....
.....
(1)

- (b) (i) In which direction will the coil move?

.....
(1)

- (ii) State two changes you could make to increase the force acting on the coil.

1
2
(2)

- (c) When the current in the coil changes direction the cone vibrates.

- (i) When the cone vibrates at a frequency of 3.6 kHz, what is the frequency in kHz of the sound which is produced?

Frequency = kHz
(1)

- (ii) Name the unit represented by the symbol kHz.

.....
(1)

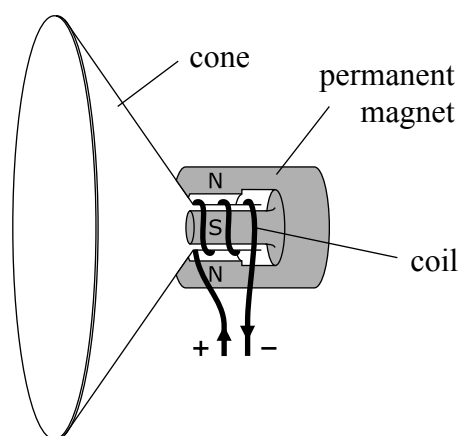
(Total 6 marks)

Q16



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Frequency = kHz
(1)

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.....
(1)

(Total 6 marks)

Q16



(b) either 15 (mA) (3)

$$\text{or } V_p I_p = V_s I_s \text{ (1)}$$

$$I_p = V_s I_s \div V_p \text{ (1)}$$

$$\text{or } 230 \times I_p (\div 1000) = 6 \times 575 (\div 1000)$$

$$\text{or } I_p (\div 1000) = 6 \times 575 (\div 1000) \div 230$$

3

Total 8 marks

Question 16

(a) to ensure that the current flows through all of the coil

or to prevent a short circuit
do not credit references to electric shock or to heat insulation

1

(b) to the right/inwards

(i)

allow 'towards the magnet'
do not credit 'away from the cone'

1

(b) any two, (1) each

(ii)

- (use a) more powerful/stronger (permanent) magnet
- have more turns on the coil
- larger current

allow 'have more coils on the coil'
do not credit 'have a bigger coil'
allow 'larger voltage'

2

(c) 3.6 (kHz)

(i)

1

(c) kilohertz

(ii)

allow 'kiloHertz'
allow 'phonetic' spellings

1

Total 6 marks

Question 17

(a) Isotopes (1)

protons ... neutrons (1)

both in the correct order

2

(b) alpha/ α

(i)

1

(b) helium nucleus/ ${}^4_2\text{He}$ is an alpha/ α particle

(ii)

1

(c) neutron/n

(i)

1

(c) fission

(ii)

accept minor misspelling but not if it could be read as 'fusion'

1

(c) nuclei (1)

(iii)

accept 'nucleuses'

neutrons (1)

kinetic (1)

accept 'movement'

3