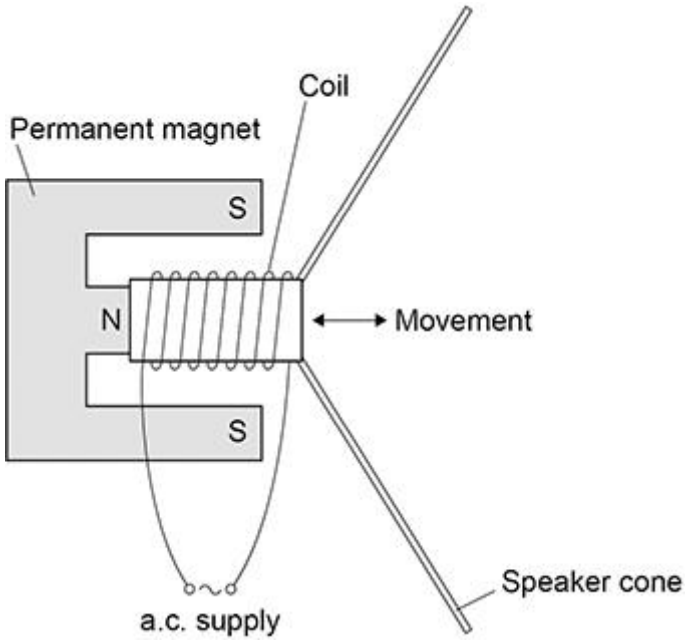
Name of the Student:_____

Max. Marks : 20 Marks **Time : 20 Minutes**

Q1.

A student made a moving-coil loudspeaker.

The figure below shows a diagram of the loudspeaker.



(a) What is the name of the effect used by the moving-coil loudspeaker to produce sound waves?

_____

(1)

(b) Explain how a moving-coil loudspeaker produces a sound wave.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

(4)

(c) A student investigated how the loudness of sound from the loudspeaker depends on:

- the number of turns on the coil
- the frequency of the supply.

The table below shows the results.

Number of turns	Frequency of supply in Hz	Loudness of sound in arbitrary units
100	200	32
200	400	47
300	600	63

Explain why the results **cannot** be used to make a valid conclusion.

_____

_____

_____

_____

(2)

(Total 7 marks)

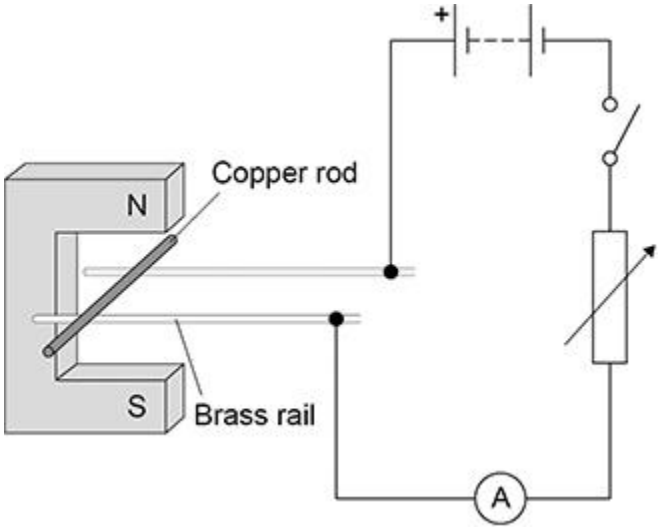
Q2.

A teacher demonstrated how a magnetic field can cause a copper rod to accelerate.

The teacher placed the copper rod on two brass rails in a magnetic field.

The copper rod was able to move.

The figure below shows the equipment used.



(a) The teacher closes the switch and the copper rod accelerates.

Explain how Fleming's left hand rule can be used to predict the direction in which the copper rod will move.

(5)

(b) Suggest **two** changes to the equipment that would increase the force on the copper rod.

1 _____

2 _____

(2)

(c) The teacher closed the switch and the copper rod accelerated uniformly from rest for 0.15 s.

The current in the copper rod was 1.7 A.

mass of copper rod = 4.0 g

length of copper rod in the magnetic field = 0.050 m

magnetic flux density = 0.30 T

Calculate the maximum possible velocity of the copper rod when it left the magnetic field.

_____

_____

_____

_____

_____

Maximum velocity = _____ m/s

(6)

(Total 13 marks)