

Q1.(2021)

a)

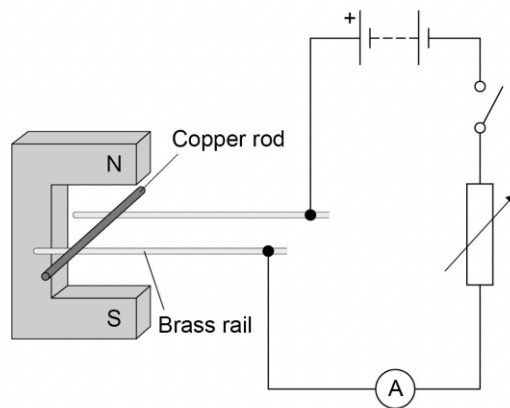
A teacher demonstrated how a magnetic field can cause a copper rod to accelerate.

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

The copper rod was able to move.

Figure 16 shows the equipment used.

Figure 16



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 marks]

b)

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

[2 marks]

1 _____

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.

[6 marks]

Maximum velocity = _____ m/s