Name of the Student:_____
Max. Marks : 18 Marks **Time : 18 Minutes**

Mark Schemes

Q1.

(a) the current creates a magnetic field in the wire **1**

which interacts with the magnetic field from the permanent magnet **1**

Flemming's left hand rule says the force on the wire is upwards **1**

so the force on the permanent magnets is downwards **1**

(b) x-axis labelled current **and**
y-axis labelled (magnetic) force
ignore units on labels **1**

straight line through the origin **1**

(c) $W = mg = 1.2 \times 10^{-3} \times 9.8$ **1**

$W = 0.01176$ **1**

$0.01176 = B \times 0.80 \times 4.8 \times 10^{-2}$ **1**

$$B = \frac{1.2 \times 10^{-3} \times 9.8}{0.8 \times 4.8 \times 10^{-2}}$$ **1**

$B = 0.31$
*an answer of 0.031 scores **3** marks*
*an answer of 0.31 scores **5** marks* **1**

[11]

Q2.

(a) (i) (closing the switch makes) a current (through the wire) **1**

(the current flowing) creates a magnetic field (around the wire)

this field interacts with the permanent magnetic field

accept links / crosses attracts / repels is insufficient

1

(ii) arrow drawn showing upwards force on XY

judge vertical by eye the arrow must be on or close to the wire XY

1

(iii) motor

accept catapult

1

(b) (i) the wire moves up and down
or
the wire vibrates

back and forth or side to side is insufficient for vibrate

1

(ii) the force (continually) changes direction (from upwards to downwards, on the wire)

accept the direction of the magnetic field (of the wire) changes

1

[7]