Name of the Student:_____
Max. Marks : 20 Marks **Time : 20 Minutes**

Mark Schemes

Q1.

(a) motor (effect)

1

(b) current creates a magnetic field (around the coil)

1

(which) interacts with the permanent magnet field

1

producing a (resultant) force causing the coil/cone to move

1

(when the) direction of the current reverses, the direction of the (resultant) force reverses (producing a sound wave)

allow coil/cone for force allow backwards for reverses

1

(c) the student changed two variables at the same time

allow only one variable should be changed at a time

1

(so) it is not possible to know the effect of each variable

1

[7]

Q2.

(a) hold thumb first finger and second finger (of left hand) at right angles to each other

allow first two fingers/index and middle for first and second finger throughout

1

second finger represents the current pointing out of the paper

1

first finger represents the field pointing downwards

1

thumb points in the direction of the force / thrust / acceleration

1

(therefore) the rod moves left to right

allow correct description (eg away from the magnet)
dependent on scoring marking point 3 or 4

1

Downloaded from www.merit-minds.com

(b) decrease the resistance of the variable resistor

allow increase the current/pd

1

use a stronger magnet

allow use a magnet with a greater flux density

1

(c) F = 0.30 × 1.7 × 0.050

1

F = 0.0255 (N)

1

m = 0.004(0 kg)

1

0.0255 = 0.0040 × a

this mark may be awarded if m is incorrectly / not converted and / or F is incorrectly calculated

1

a = 0.0255 / 0.0040
or
a = 6.375

this mark may be awarded if m is incorrectly / not converted and / or F is incorrectly calculated

1

Δv = 6.375 × 0.15 = 0.95625 (m/s)

allow a correct calculation using an incorrectly / not converted m and / or an incorrectly calculated F

allow 0.96 ***or*** *0.956 (m/s)*

1

<u>alternative method</u>

F = 0.30 × 1.7 × 0.050 (1)

F = 0.0255 (N) (1)

m = 0.004(0 kg) (1)

$$0.0255 = \frac{0.0040 \times \Delta v}{0.15} \quad (1)$$

this mark may be awarded if m is incorrectly / not converted and / or F is incorrectly calculated

$$\Delta v = \frac{0.0255 \times 0.15}{0.0040} \quad (1)$$

this mark may be awarded if m is incorrectly / not converted and / or F is incorrectly calculated

Δv = 0.95625 (m/s) (1)

allow a correct calculation using an incorrectly / not converted m and / or an incorrectly calculated F

allow 0.96 ***or*** *0.956 (m/s)*

[13]

Downloaded from www.merit-minds.com