Name of the Student:_____
Max. Marks : 19 Marks **Time : 19 Minutes**

Mark Schemes

Q1.

(a) gravity or force acts towards centre **(1)**
force acts at right angles to velocity or direction of motion
[or velocity is tangential] **(1)**
no movement in direction of force **(1)**
no work done so no change of kinetic energy so no change in speed **(1)**

3

(b) (i) $B = (56^2 + 17^2)^{½} = 59\ \mu T$ **(1)**

(ii) $\tan\theta = \frac{17}{56}$ **(1)**

$\theta = 17°$ **(1)** (± 1°)

(iii) rod sweeps out or cuts (magnetic) flux
[or rod cuts field] **(1)**

4

[7]

Q2.

(a) $V_0 = 8.0$ V **(1)**

(b) $V_{rms} = 8/\sqrt{2} = 5.7$ (V) **(1)**
(allow e.c.f. from (a))

(c) $T = 3.0$ ms **(1)**

(d) $f = \frac{1}{T} = 330$ (333) Hz **(1)**

(allow e.c.f. from (c))

[4]

Q3.

(a) (i) interaction between current and B-field gives force on wire **(1)**
equal and opposite force on magnet (down) **(1)**

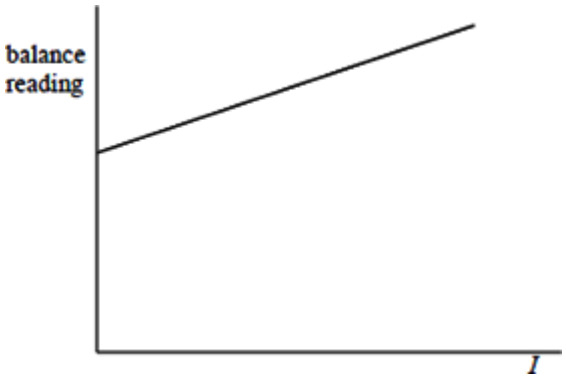
(ii) force on wire must be up **(1)**
∴ current right to left **(1)**
by left hand rule **(1)**

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(iii) (force = BIl = mg = change in mass × 9.8)
B × 5.0 × 0.060 = 1.54 × 10^{-3} × 9.8 **(1)**
B = 0.050 T [50.3 mT] **(1)**

(max 6)

(b)



straight line **(1)**
intercept, upward slope **(1)**

(2)

[8]

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