**MWAKICAN JOINT EXAMINATION 2016**

**PHYSICS PAPER 232/3**

**MARKING SCHEME**

1. (a) (i) d = 3.5 x 10-4m ✓1

(ii) E = 1.5± 0.1V✓1

 (b) Table

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| L (cm) | 2.5 | 7.5 | 10 | 20 | 30 | 40 |
| p.d (V) | 0.70 | 0.80 | 0.90 | 1.05 | 1.15 | 1.20✓ |
| I | 0.55 | 0.46 | 0.40 | 0.31 | 0.25 | 0.22✓ |
| VI (watts) | 0.3850 | 0.3680 | 0.3600 | 0.3255 | 0.2875 | 0.2640✓ |

(ii) A graph of VI against L.



**1**

A graph of VI against L.

0.4

0.3

0.2

0.1

VI

(Watts)

10 20 30 40 50 60 70 80 90 100 120 140 160 180 200

L (CM)

(iii) From the graph

 Lo = 110cm ✓ 1

(c) V = 1.30V ✓

 I = 0.17A ✓ 1

 r = $\frac{E-V}{I}$ = $\frac{1.5-1.3}{0.17}$ ✓ 1= 1.17Ω ✓ 2

(d) e = $\frac{πrd^{2}}{2.52}$ = $\frac{3.142 x 1.176 (3.5 X 10^{-4})^{2}}{2.52}$ ✓ 1= 1.796x10-7Ωm✓ 2

1. (a) (i) L = 3.83cm✓ 1 Diameter = 1.46cm✓ 1

(b) t 5.85sec ✓ 1 T = 0.29sec✓ 1

(iv)

|  |  |  |  |
| --- | --- | --- | --- |
| Mass M(Kg) | Time of 2 oscillation | T | T2 |
| 0.1 | 5.85 | 0.29 | 0.09 |
| 0.2 | 9.35 | 0.47 | 0.22 |
| 0.3 | 11.40 | 0.57 | 0.32 |
| 0.4 | 13.16 | 0.66 | 0.43 |
| 0.5 | 14.78 | 0.74 | 0.55 |
| 0.6 | 16.16 | 0.81 | 0.65 |

 ✓ 2 ✓ 2 ✓ 2

(i) A graph of T2 against M.

 A graph OF T2 against M

 0.1 0.2 0.3 0.4 0.5 0.6

M (kg)

(ii) slope = $\frac{∆T^{2}}{∆m}$ = $\frac{0.60-0.18}{0.55-0.17}$ = $\frac{0.42}{0.37}$

 = $1.11s^{2}/m$✓

d) T2 = 4ᴨ2 mn

g

T2 = 4ᴨ2 n = n = 0.3m/kg

 g

T2 = 4ᴨ2 n gradient =

m g

 1.11 = 4 x (3.14) 2 x 0.3m/kg✓1

 g

 g = 4 x (3.14) 2 x 0.3 ✓1

 1.11

 g = 10.669

 g $≈$ 10N/kg✓1