**END TERM 2**

**232/3**

**PHYSICS**

**PAPER 3**

**MARKING SCHEME**

1.d)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Mass m (g) | 100 | 150 | 200 | 250 | 300 | 350 |
| Time for 20 oscillation t (s) | 6.59 | 8.03 | 9.60 | 10.91 | 11.57 | 12.56 |
| Period time T (s) | 0.3295 | 0.4015 | 0.4800 | 0.5455 | 0.5785 | 0.6280 |
| T2 (S2) | 0.1086 | 0.1612 | 0.2304 | 0.2976 | 0.3347 | 0.3944 |

 \* For t each correct value ½mk max 3mks

 \* For T all values correct 2mks more than 3 correct

 1mk less than three correct 0mk. max 2mks

 \* For T² all values correct 1mk max 1mk

 f) Gradient = ∆ Y = ∆T² $=\frac{0.25-0}{0.225-0}$✓1 =1.111 s²/kg ✓¹

 ∆X ∆m

 g) y = mx +c

 T²=π² M+0 =Slope = π²

 K K

 K= π² ✓ = π² = 8.972N/m ✓

 slope 1.11

 k) Lines P1 P2 & P3 P4 intersecting at I ✓

 I) Q P0 = 10.0cm✓

 Q 1= 6.6 cm✓

 m) n$=\frac{QP\_{0}}{QI} $ $=\frac{10.0}{6.6}$ =1.5152✓

 n) Refractive index✓



**QUESTION 2**

 b) I= 0A✓

 E=3.0 ± 0.2 V✓

 c)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Length L (cm) | 70 | 50 | 40 | 30 | 20 | 10 |  |
| p.d V (V) | 2.4 | 2.3 | 2.2 | 2.1 | 2.0 | 1.8 | $\pm $ 0.2v |
|  Current 1 (A) | 0.18 | 0.21 | 0.25 | 0.29 | 0.32 | 0.38 | $\pm $0.01v |

 @½mk

 max 6mks

 e) Slope $=\frac{∆V}{∆I}$ $=\frac{\left(3.0-2.5\right)V}{\left(0-0.15\right)A}$✓

 $=\frac{0.5}{0.15}$

 = -3.33Ω✓

 f) y = m x +c

 $=$ -rI +E

 i) E. m. f of the battery = y intercept

 = 3.0v✓

 since the two cell are in series, the e. m .f of one cell $=\frac{E}{2}$ =1.5V✓

 ii) Slope = -r

 therefore the internal resistance of the battery = -slope

 = -(3.33)✓

 =3.33Ω

e)

 Since the cells are in series, the internal resistance of one cell $=\frac{r}{2}$ $=\frac{3.33}{2}$ $=$1.665Ω✓

iii) From the graph:

 when 1= 0.4A

 V=1.75V✓