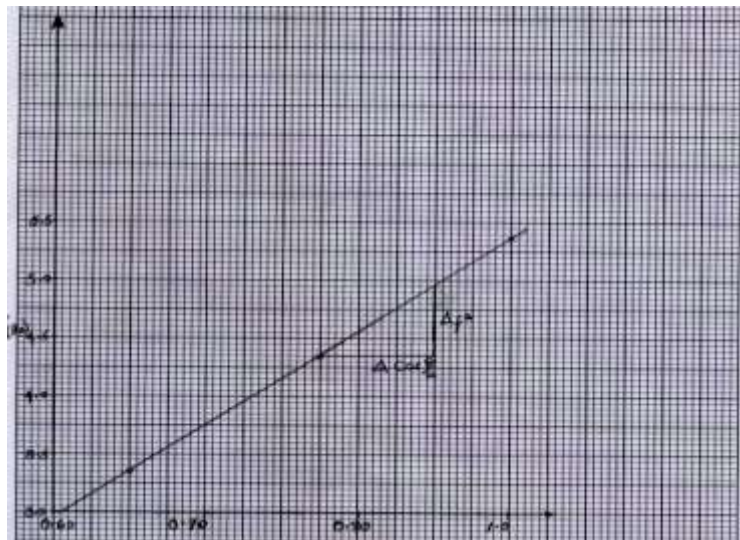


FORM FOUR JOINT EVALUATION 2017
232/3 PHYSICS PRACTICAL PAPER 3
MARKING SCHEME

Question 1(Part A) – (13 MARKS)

Angle θ^0	Time for 10 oscillations (sec)	Periodic Time, T	Frequency f (Hz)	$f^2(\text{Hz})^2$	$\text{Cos } \frac{\theta}{2}$
50	4.28	0.43	2.33	5.43	0.9063
60	4.41	0.45	2.26	5.12	0.8660
70	4.60	0.46	2.17	4.71	0.8192
80	5.09	0.51	1.96	3.85	0.7660
90	5.20	0.52	1.92	3.60	0.7071
100	5.42	0.54	1.84	3.39	0.6428



ii) Gradient of the graph

$$\begin{aligned}
 \text{ii) } &= \frac{\Delta f^2}{\Delta \text{Cos } \frac{\theta}{2}} \\
 &= \frac{4.90 - 4.20}{0.84 - 0.76} \\
 h &= 0.70 \\
 &= 0.08 \\
 &= 8.75(\text{s}^{-2})
 \end{aligned}$$

e iii) Compare with $y = mx + c$

$$f^2 = \frac{1.5}{4\pi L} K \cos\left(\frac{\theta}{2}\right)$$

$$m = \frac{1.5}{4\pi L} K$$

$$K = \frac{mx 4\pi L}{1.5}$$

$$= \frac{8.75 \times 4 \times \pi \times 0.15}{1.5}$$

$$= 10.99 m^{-2}$$

Q 1 (Part b) –(7mks)

ii) $A=60^\circ$ 1

iv)a) $D=37^\circ$ 2(Evidence required)

$$b) \eta = \frac{\cos(90^\circ - A + D)}{\sin \frac{A}{2}}$$

$$= \frac{\cos 90^\circ - \frac{60 + 37}{2}}{\sin \frac{60}{2}} \quad 1$$

$$= \frac{\cos(90 - 48.5)}{\sin 30} \quad 1$$

$$= \frac{\cos 41.5}{\sin 30} \quad 1$$

$$= \frac{0.7489}{0.5}$$

$$= 1.49 \quad 1$$

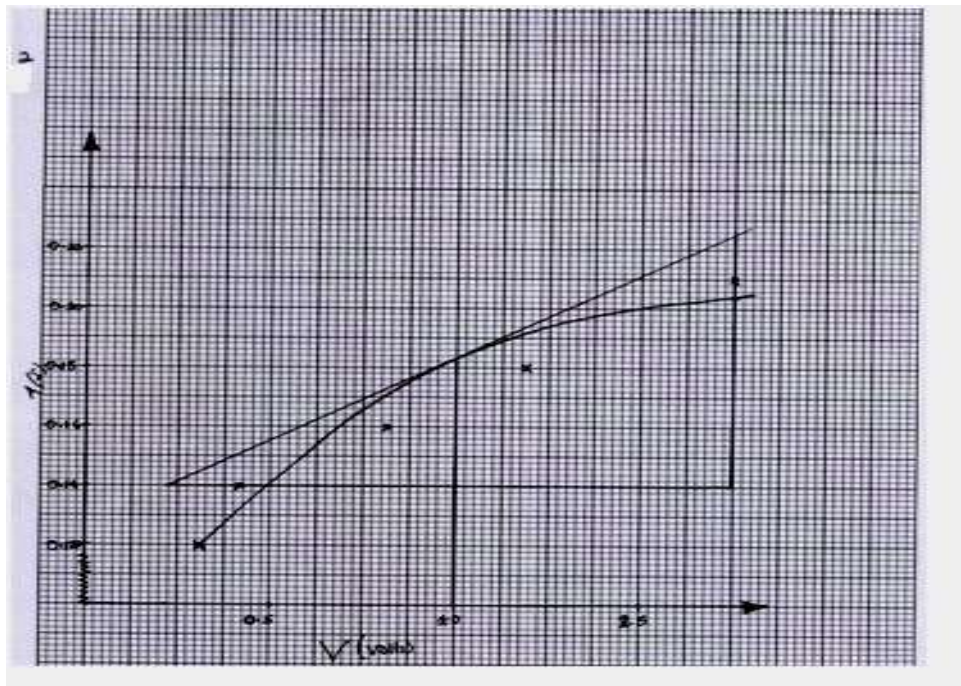
c) Refractive index glass. 1

Question 2 –(20 marks)

Length L(cm)	100	80	60	40	20	0
Voltage V(v)	0.25	0.45	0.55	0.75	1.15	1.60
Current I (A)	0.12	0.14	0.15	0.16	0.18	0.21

($\frac{1}{2}$ mk each –max5)

iii) Brightness increase. 1



- iv) Axes - 1
- Scale - 1
- Plotting - 2 at least four each ½ mark.
- Curve - 1

v) Tangent at the point

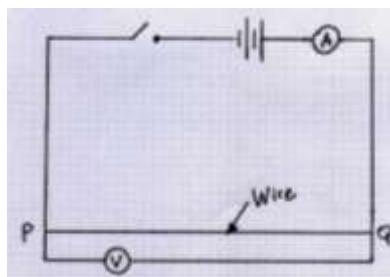
$$\text{Slope} = \frac{0.16 - 0.14}{1.4 - 0.3} \quad 1 \text{ correct intervals}$$

$$= 0.02$$

$$1.1$$

$$= 0.018 \Omega^{-1} \quad 1 \text{ correct evaluation.}$$

vi) Reciprocal of resistance 1



NB – ammeter in cell switch in series voltmeter parallel to wire.

ii) $V = 1.8V$ 1

$I = 0.14A$ 1

iii) $d = 3.6 \times 10^{-4}m$ 1

$$P = 0.785 \times \frac{1.8}{0.14} \times \frac{(3.6 \times 10^{-4})^2}{1} \quad 1 \text{ correct substituti on}$$

$$= 1.308 \times 10^{-6} \Omega m$$

NB: Every teacher is expected to perform the experiment and adjust values given as appropriate.