PHYSICS PAPER 3 (232/3)

PRACTICAL MARKING SCHEME

OCT/NOV. 2005

PART A

a)Balance point = 50.0 cm (1 mk)

b) x = 16.8 CM (1mk)

D= 41.5 cm (1 mk)

16.8 x 100 = 41.5 x mass in water

W x 40.7 = 1x 21. 6

W_1 = 0.045Gn

W_1 = 0.045 Gn (2mks)

= 0.45 N.

U_w = wt air – wt water (1 mk)

= 0.5 – 0.05

= 0.05 N

c) x = 19.03 cm (1mk)

100 x 19.03 = 41.5 x mass in L

$W_2 = \frac{100 \times 19.03}{41.5} g \times 10^{-3}$

= 0.458

= 0.46 N (1 mk)

U_L = $Wt_{air} - wt_L$ (1 mk)

= 0.5 – 0.46

= 0.04 (1 mk)

d)R.D. = $\frac{U_L}{U_w}$

= $\frac{0.04}{0.05}$

= 0.8 (1 mk)

PART B

d)

θ(deg)	25	35	40	45	55	60	65
d(cm)	1.0	1.5	1.8	2.0	2.9	3.2	3.7

(3 mks)

E.i) Graph (5 mks)

ii)When – $\theta 0^0$

d= 0.15 cm (2mks)

QUESTION TWO

a)D = 0.38mm (1 mk)

d = 0.28 mm (1mk)

$\frac{D}{d} = \frac{0.38}{0.28} = 1.4$ (1 mk)

d)

ℓ(cm)	50	45	40	35	30	25	20
x(cm)	35.8	38.2	41.0	44.4	48.7	52.9	57.9
1/x (cm^{-1})	0.028	0.026	0.024	0.023	0.021	0.019	0.017

(6 mks)

E i)Graph (5 mks)

ii $\frac{(2.6-1.7)x\ 10-2}{45-20}$

$= \frac{0.9\ x\ 10-2}{25} = 36 \times 10^{-4}$ (3 mks)

$\frac{D^2}{500d^2} = 3.6 \times 10\text{-}^4$

$\frac{D^2}{D^2} = 3.6 \times 10^{-4} \times 5.0 \times 10^3$

$\frac{D}{D} = 1.34$ (3 mks

PHYSICS PAPER 3 (232/3)

PRACTICAL MARKING SCHEME

PAPER 3

OCT/NOV. 2006

1. a)Diameter of the marble = 1.70cm (1 mk)
   Radius of the marble r = 0.85 cm (1 mk)

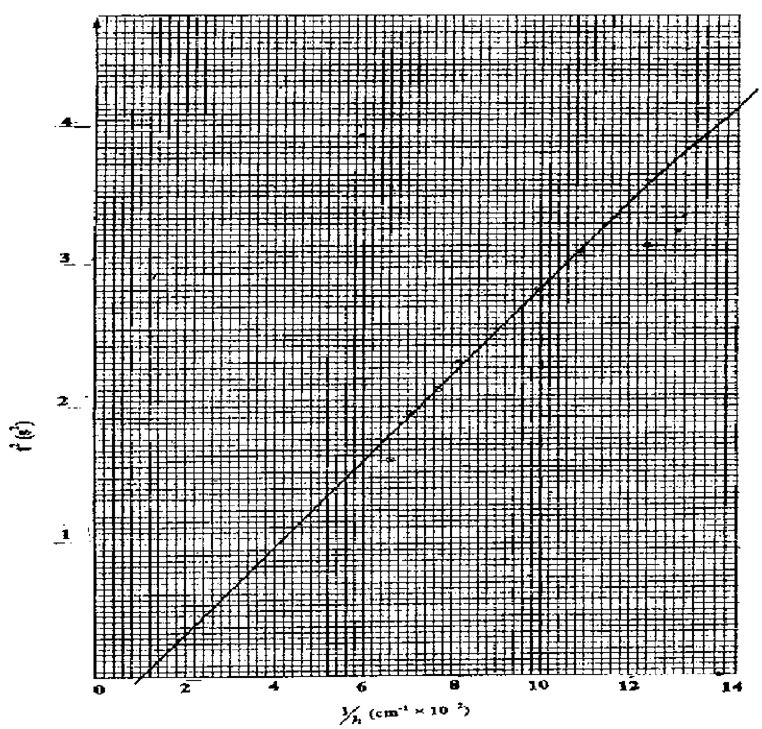
b)i)M = 5.7g (1 mk)
ii) P = $0.4mr^2$
= $0.4 \times 5.7 \times 0.85^2$ (1 mk)
= $1.65\ gcm^2$

(c)

Height h (cm)	8	9	10	11	12	13	14	15
Average time (s)	1.75	1.74	1.61	1.49	1.52	1.43	1.38	1.25
t^2 (s^2)	3.06	3.03	2.59	2.22	2.31	2.04	1.90	1.56
$^1/_h$ (cm^{-1})	0.125	0.111	0.100	0.090	0.083	0.077	0.071	0.067

(6 marks)

(d) (i)



(5 marks)

(ii) Slope $S = \frac{3.6 - 0}{(12.6 - 1.0) \times 10^{-2}}$

$= 31.03 \pm 0.10$ *(3 marks)*

i) $G = Mr^2 \left[\frac{s}{20} - 1\right] = 5.7 \times 0.85^2 \left(\left[\frac{31.1}{20} - 1\right]\right)$

=2.27 (2 mks)

2. a) (i)

L_o=80 cm

d_1=0.35 mm d_2=0.37mm (1 mk)

d=0.36 (1mk)

radius r = 0.18 mm

r =1.8 x 10^{-4}m (1 mk)

ii)VR=IR

Therefore, $I = \frac{VR}{R} = \frac{0.7}{4} A$

= 0.175 A (1 mk)

ii) $H = \frac{100 \times 1.8}{0.175 \times 80}$

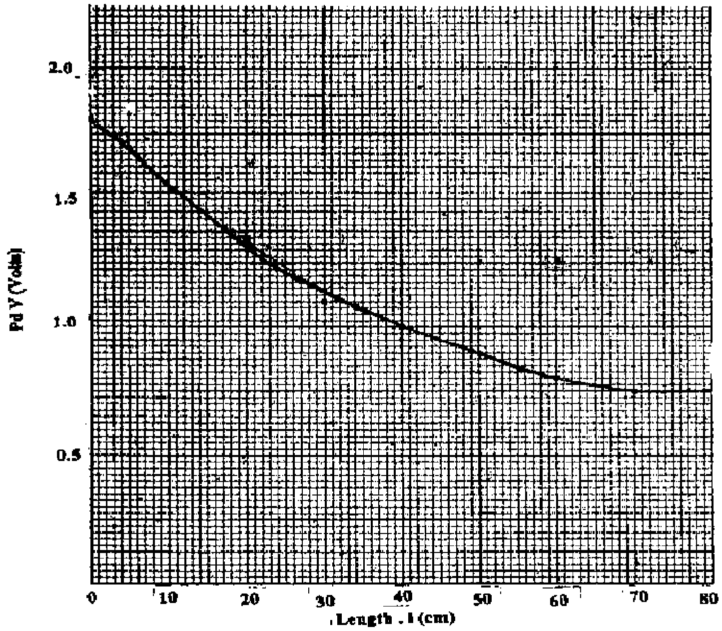
=12.86Ωm^{-1}

(c) and (d)

distance *l* (cm)	0	5	10	20	30	40	50	60	70
pd across R (V)	1.80	1.70	1.55	1.35	1.10	1.00	0.90	0.80	0.75

(3 marks)

(e) (i)



(5 marks)

ii) $V_1 = \frac{V_0}{2} = \frac{1.8}{2}$

$= 0.9$ Volts

Therefore 1, = 50 cm (correct reading form graph)

f) $D = \frac{R}{1_1} \times \frac{300}{1.8} = \frac{4}{50} \times \frac{300}{1.8}$

$=1333.3\Omega m^{-1}$ (1 mk)

g) $p = \frac{\pi r^2}{2} (D + H)$

$p = \frac{\pi r^2 (1.8 \text{ X } 10^{-4})^2}{2}$

$= (1333.3 + 1285.7)$

$=13322 \times 10^{-8}$ m

1.33×10^{-4} m (1mk)

PHYSICS PAPER 3 (232/3)

PRACTICAL MARKING SCHEME

PAPER 3

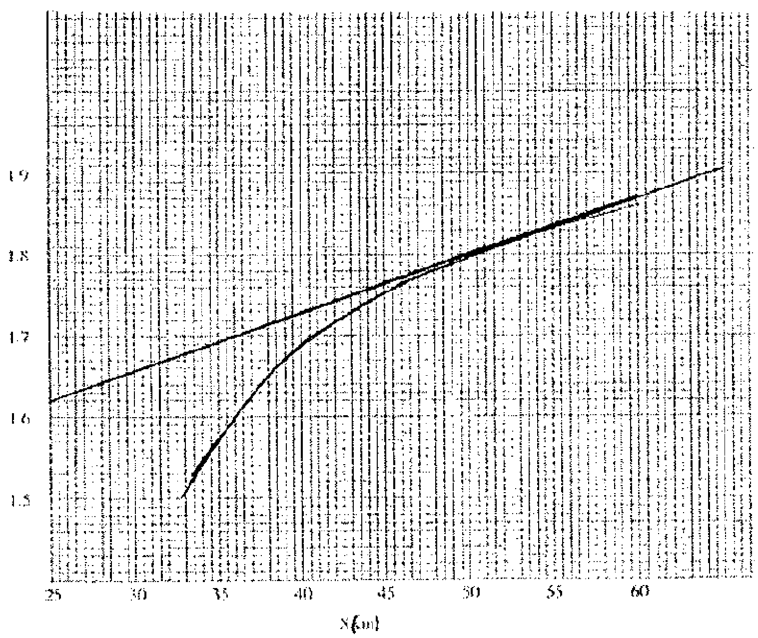
OCT/NOV. 2007

1.

(c)

Distance x (cm)	35	40	45	50	55	60
Time t for 20 Osc(s)	31.8	33.8	35	36	36.8	37.2
Period $T = \frac{t}{20}(s)$	1.59	1.69	1.75	1.8	1.84	1.86

d)



(5 marks)

e)Slope; tangent at x = 52 cm

$\frac{\Delta T}{\Delta X}$

S= 6.7 x 10-^{3} (3 mks)

f) n = 52 x (6.7 x 10^{-3})^{3}

= 2.33 x 10^{-3} (2 mks)

g)P = $\frac{\pi^2}{4 \times 2.33 \times 10^{-3}}$

= 1.05 x 10^{3} (2 mks)

2b i) E = 3.1 volts

c) For range 0-5 v (1 mk)

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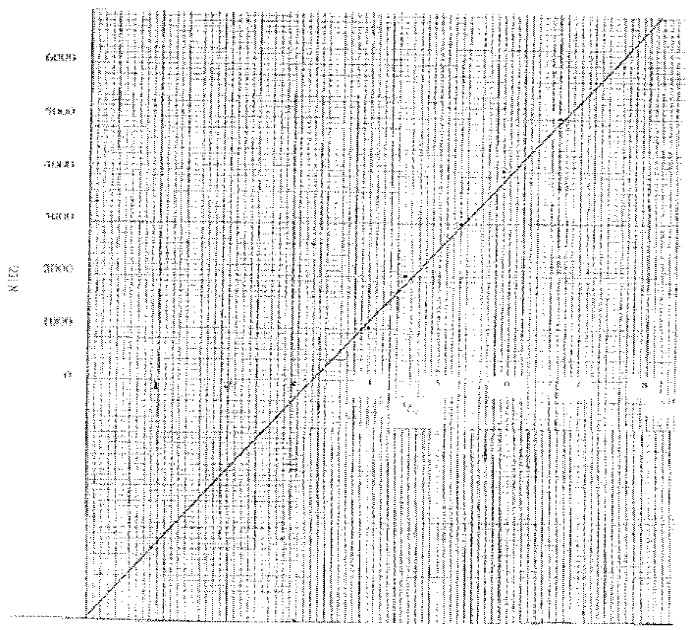
R(Ω)	1000	2000	3000	4000	5000	6000
V	2.5	2.2	1.9	1.7	1.5	1.3
V^{-1}	0.4	0.45	0.53	0.59	0.67	0.77

(6 marks)

(d)



e)Slope $\frac{\Delta R}{\Delta\, i/v}$

$= \frac{10.5 \times 1000}{0.75} = 14000$ (3 mks)

f) $G = \frac{14000}{3.1} = 4.5 \times 10^3 \Omega$

G i) I/V = 0.32 (when R = O)

V0 = 3.1

ii) $R_g = 4.5 \times 10^3 \Omega$ (1 mk)

i) $\frac{G}{Rg} = \frac{451\ 6 \times 10^3}{4.5 \times 10^3}$

= 1.003

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PHYSICS PAPER 3 (232/3)

PRACTICAL MARKING SCHEME

PAPER 3

OCT/NOV. 2008

Question 1

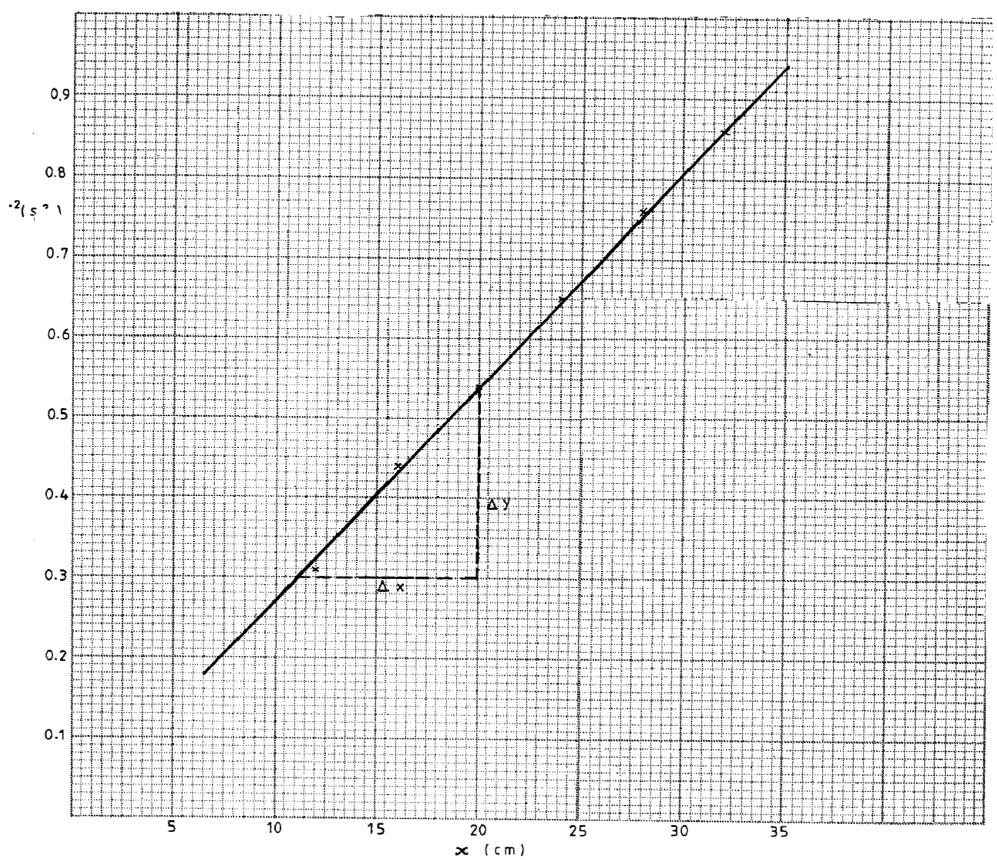
PART A

(c)

Length X (cm)	*32*	*28*	*24*	*20*	*16*	*12*
Time t for 20 oscillations	18.50	17.40	16.15	14.75	13.30	11.20
Period $T = \frac{t}{20}(s)$	0.925	0.870	0.808	0.738	0.665	0.560
$T^2(s^2)$	0.856	0.757	0.652	0.544	0.442	0.314

(5 mks)

(d) ***(5 mks)***



(e) (i) slope S = $\frac{0.54-0.30}{20-11}$

= $\frac{0.24}{9} = 0.0267\frac{s^2}{cm}$ ***(3 mks)***

(ii) S = $\frac{8\pi}{3k}$

$0.0267 = \frac{8\pi}{3k}$

$\therefore$ k = $\frac{8\pi}{3\times0.0267}$

= 313.767 cm/s^2. ***(2 mks)***

PART B

(g)

t(s)	*$t_{1\,(s)}$*	*t_2 (s)*	*t_3 (s)*	*Average t(s)*	$T = \frac{t}{5}(s)$
	3.46	3.25	3.44	3.34	0.67

(3 mks)

(h) P - $\frac{40L}{T^2}$ = $\frac{40\times12}{0.67^2}$

= 1069 cm/s^2

= 10.7 m/s^2 (accept values between 9 and 11 m/s^2). ***(2 mks)***

Question 2

PART A

(a) $A = 60^\circ$

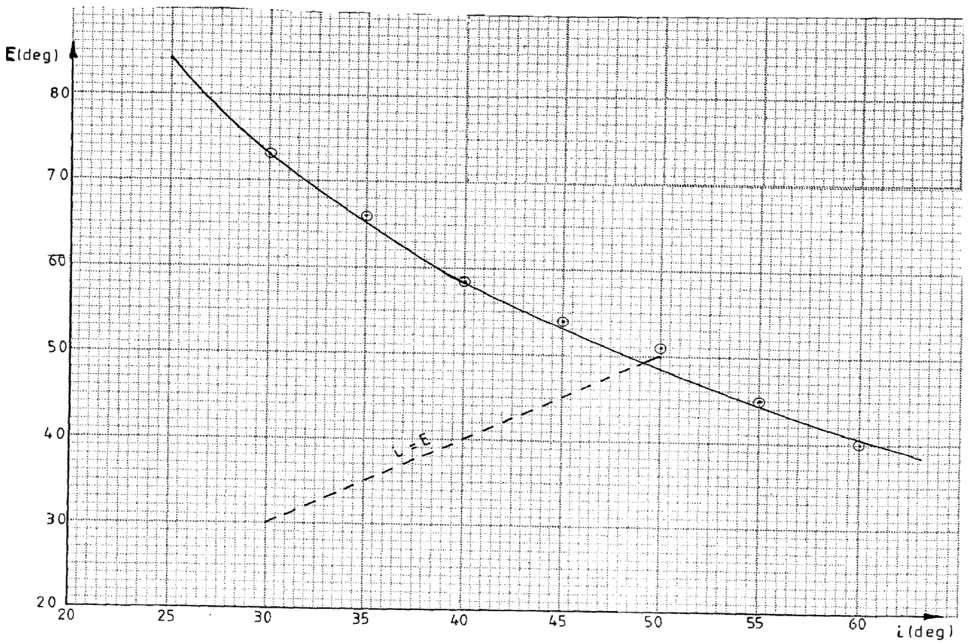
(1 mk)

(e)

Angle of incidence i (deg)	***30***	***35***	***40***	***45***	***50***	***55***	***60***
Angle Q (deg)	16.5	24.0	31.5	36.0	38.9	45.0	50.0
Angle of emergence E=90-Θ	73.5	66.0	58.5	54.0	51.1	45.0	40.0

(6 mks)

(f) (i)



(5 mks)

(ii) $i_o = 49°$ ***(1 mk)***

(iii) (I) y $= 2i_0 - R$

$= 2(49)-60 = 38°$ ***(1 mk)***

(II) k $= 2\sin 49° = 1.51$ ***(1 mk)***

PART B

(g) (i) V = 60 cm

(ii) $f = \frac{uv}{u+v} = \frac{(30)(60)}{90} = 20cm$ ***(2 mks)***

(h) (i) d = 10 cm ***(1 mk)***

(ii) I = $\frac{df}{f-d} = \frac{10\times20}{10} = 20$ ***(1 mk)***

II x = $\frac{L}{2f} + 1 = \frac{20}{40} + 1 = \frac{20}{40} + 1$

$= 1.5$ ***(1 mk)***

PHYSICS PAPER 3 (232/3)

PRACTICAL MARKING SCHEME

PAPER 3

OCT/NOV. 2009

1. (i) Amplitudes of the two pendulums increase from zero to maximum and then decrease to zero alternately. ***(1 mk)***

(ii) Alternate interchange/transfer of energy from one pendulum to the other. ***(1 mk)***

D (cm)	20	25	30	35	40	45	50
T(s)	12.8	10.2	7.7	5.6	4.4	3.4	2.8
$f = \frac{L}{T}(s^{-1})$	0.08	0.10	0.13	0.18	0.23	0.30	0.36

Table 1 7 mks

f)See graph axes labeled + units (1 mks)

scale (1mk)

Points plotted (1 mk)

Smooth curve (1 mk)

g) f_b=0.21s^{-1} (1mk)

(h) n=3 (1 mk)

t=4.7.7s (1 mk)

i) $f_b \frac{3}{4.7} = 0.64\ s^{-1}$ (1 mk)

j) $f_b = f_1 - f_0$

$0.21 = f_1 - 0.64\ s^{-1}$ (1mk)

$f_0 = 0.8s^{-1}$ (1 mk)

2b)E=1.55∓ 0.05V (1mk)

c)I= 0.35A (1 mk)

V=1.45∓ 0.05V (1mk)

d) $X = \frac{1.45}{0.35} = 4.1\Omega$ (1 mk)

$R = \frac{0.1}{0.35} = 0.29\Omega$ (1 mk)

g)

Number of carbon resistors	One	Two	Three	Four	Five	Six
PB a(cm)	70.1	56.0	44.2	39.0	33.0	29.1
$\frac{1}{R}$ = (Ω)	0.1	0.2	0.3	0.4	0.5	0.6
a^{-1} (cm^{-1})	1.43	1.79	2.26	2.56	3.03	3.43

Table 2 **(6 mks)**

h)Graph

Axes labeled + units (1mk)

Scale (1 mk)

points correctly plotted (2mks)
straight line through points (1mk)

i) slope – correct extraction (1mk)
evaluation (1mk)
slope $= 4.0 \times 10^{-2}\ \Omega cm^{-1}$ (1mk)

j) $m = x / 100 = 4.0 \times 10^{-2}\ \Omega cm^{-1}$ (1mk)
$x = 4.0 \pm 0.1\Omega$ (1mk)

PHYSICS PAPER 3 (232/3)

PRACTICAL MARKING SCHEME

PAPER 3

OCT/NOV. 2010

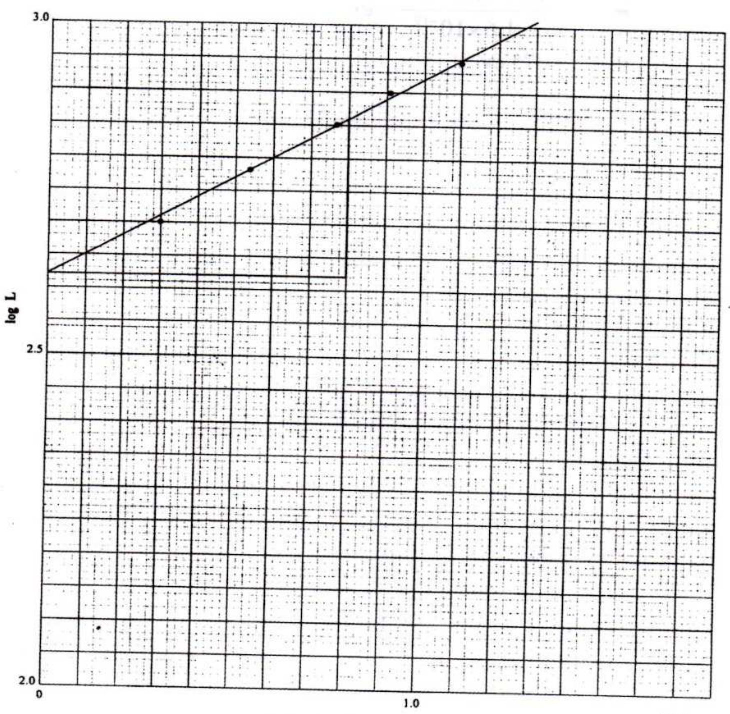
1. (a) $h_o = 92.8$ mm (1 mark)

(d) Table 1

Length L mm	900	800	700	600	500
Height h mm	79.8	84.7	86.9	89.4	90.8
Depression $d(h_o - h)$ mm	12.9	8.1	5.9	3.4	2.0
Log L	2.95	2.90	2.85	2.78	2.70
Log d	1.11	0.91	0.77	0.53	0.30

(7 marks)

(e) (5 marks)



(f) (i) Extraction $\frac{2.86 - 2.62}{0.80 - 0}$ (1 mark)

Subtraction and division $\frac{0.24}{0.80}$ (1 mark)

Value of S. 0.30 (1 mark)

f (ii) $\frac{1}{0.30} = 0.33$ (1 mark)

f (iii) Extrapolation (1 mark)

Reading G = 2.62 (1 mark)

iv)

Correct substitution of ΔX and ΔY in the equation (½)
Correct evaluation to the nearest whole number
Or 1 decimal place (½) (1mk)

2. a)d1 = 4.68 cm

d_2 = 5.08

X = $\frac{d_2-d_1}{2}$ = $\frac{5.08 - 4.68}{2}$ = $\frac{0.4}{2}$ = 0.2

b) h = 4.3

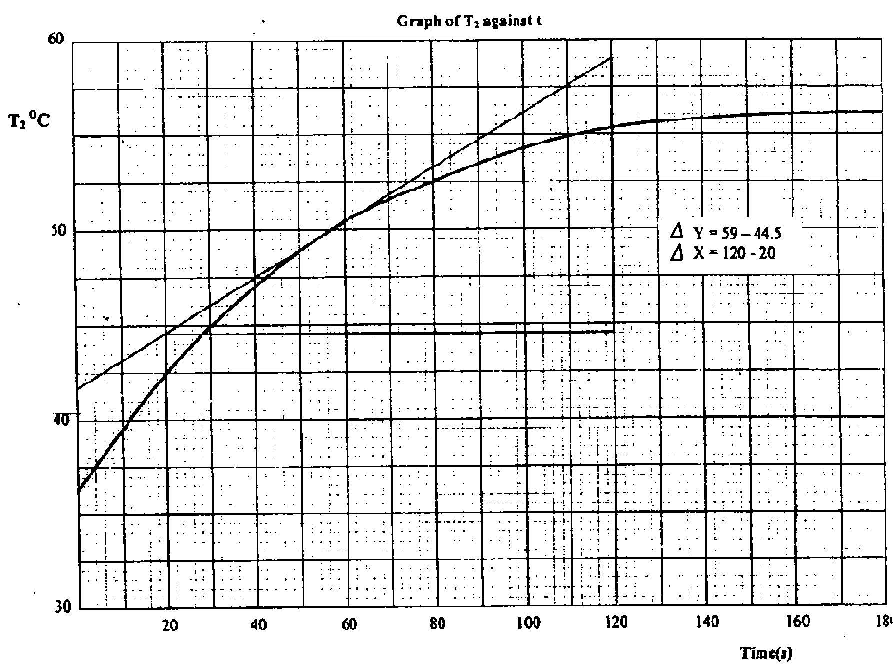
A = $68.8cm^2$ (1 mk)

e)

Time (s)	0	20	40	60	80	100	120	140	160	180
Temperature T_1 °C	75	73.5	72.0	68.5	67	66.5	65.5	64.0	62.5	62.0
Temperature T_2 °C	37	37	42	51.5	52	54	55	55.5	56	56.5

(6 marks)

f)



g)i) Slope $\frac{\Delta Y}{\Delta X} = \frac{14.5}{100} = 0.145$ (3 mks)

ii)K = $\frac{315SX}{A(T_1-T_2)}$ = $\frac{315 \times 0.145 \times 0.21 \times 10^{-2}}{68.8 \times 10^{-4} \times 17}$

= 0.82 (2 mks)

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PHYSICS PAPER 3 (232/3)

PRACTICAL MARKING SCHEME

PAPER 3

OCT/NOV. 2011

1. part A

a)Eo= 3.0 ∓0.2 v (1 mk)

d)Table 1

AO= Bo = Xcm	25	30	35	40	45	50
p.dV(V)	0.58	0.66	0.74	0.80	0.90	0.92
$^{1}/_{X}$ (cm-^{1})	0.04	0.033	0.029	0.025	0.022	0.02
$^{1}/_{V}$ + (V-^{1})	1.72	1.52	1.35	1.25	1.11	1.10

for V ½ mk for each correct value (3 mks)

1/x 1 mk for at least 4 correct values (1 mk)

$^{I}/_{V}$ 1 mk for at least 4 correct values (1 mk)

e) graph (see attached)

axes labelled + units (1 mk)

suitable scale (1 mk)

points plotted i mk for 4 points (1 mk)

straight line (1 mk)

(f) Slope - correct interval $\frac{\Delta y}{\Delta x}$ (1mk)

correct evaluation (1 mk)

S = 34±3 (1 mk)

(g) h correctly evaluated from $\frac{8}{EoS}$

Substituting (1 mk)

evaluating

PART B

(i) OM and ON shown on outline. (1 mk)

<MON= 24 = 144°

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(ii) q correctly evaluated (1 mk)

Total (19 mks)

2. PART A

(a) $M_1 = 53.5g$ (1mk)

(b) M_2-73.0g (1 mk)

(c) Correct mass liquid L = 19.5 g.

density = evaluate from candidates values of M and M, (1 mk)

PART B

f) Table 2

Time in minutes	0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5
Temperature of W(°C)	80	79	77.5	76	75	74	72.5	71	70	69
Temperature of L(°C)	80	76	75	72	70	68	66	64.5	62.5	61.0

5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0
68	67	66	65	64.5	63.5	62.5	61.5	61	60	
59										

Correct temperatures of distilled water

6 points x (3 mks)

5 to 9 points (1 mk)

Correct temperatures of L

8 and more (3 mks)

4 to 7 points (1 mk)

Graphs (see attached graphs)

(i) - axis labelled + units (1 mk)
appropriate scale
points plotted correctly (2 mks)
6 correct points (1 mk)
3- 5 correct points (1 mk)
smooth curve (1 mk)

ii)Points plotted correctly.

6 correct points	(2 mks)
3-5 correct points	(1 mk)
Smooth curve points	(1mk)

I(i) Value obtained from the graph	(1mk)
(value obtained from the graph	(1 mk)

i) $r = \frac{4.2 \times 2.5}{0.78 \times 4.5}$ correct evaluation (1 mk)

$R=3.0 \pm 0.1$ total (20 mks)

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PHYSICS PAPER 3 (232/3)

PRACTICAL QUESTIONS

PAPER 3

OCT/NOV. 2012

1a) f i=20 cm ∓ 2cm

c) f2=15 cm ∓ 2 cm (1 mk)

f)

d(cm)	65	67	69	71	73	77	80	
v(cm)	37.5	33.8	31.1	29.1	27.5	25.2	24.0	∓2

g i)Graph (6 correctly plotted points)

Labeling axes (1 mk)

Plot (2mks)

Curve /line on at least 4 correctly plotted points (1 mk)

ii)I. Value of V = 30 ±1 (1 mk)

II. Slope $S = \frac{35-20}{81.25-63.75}$

= -0.86

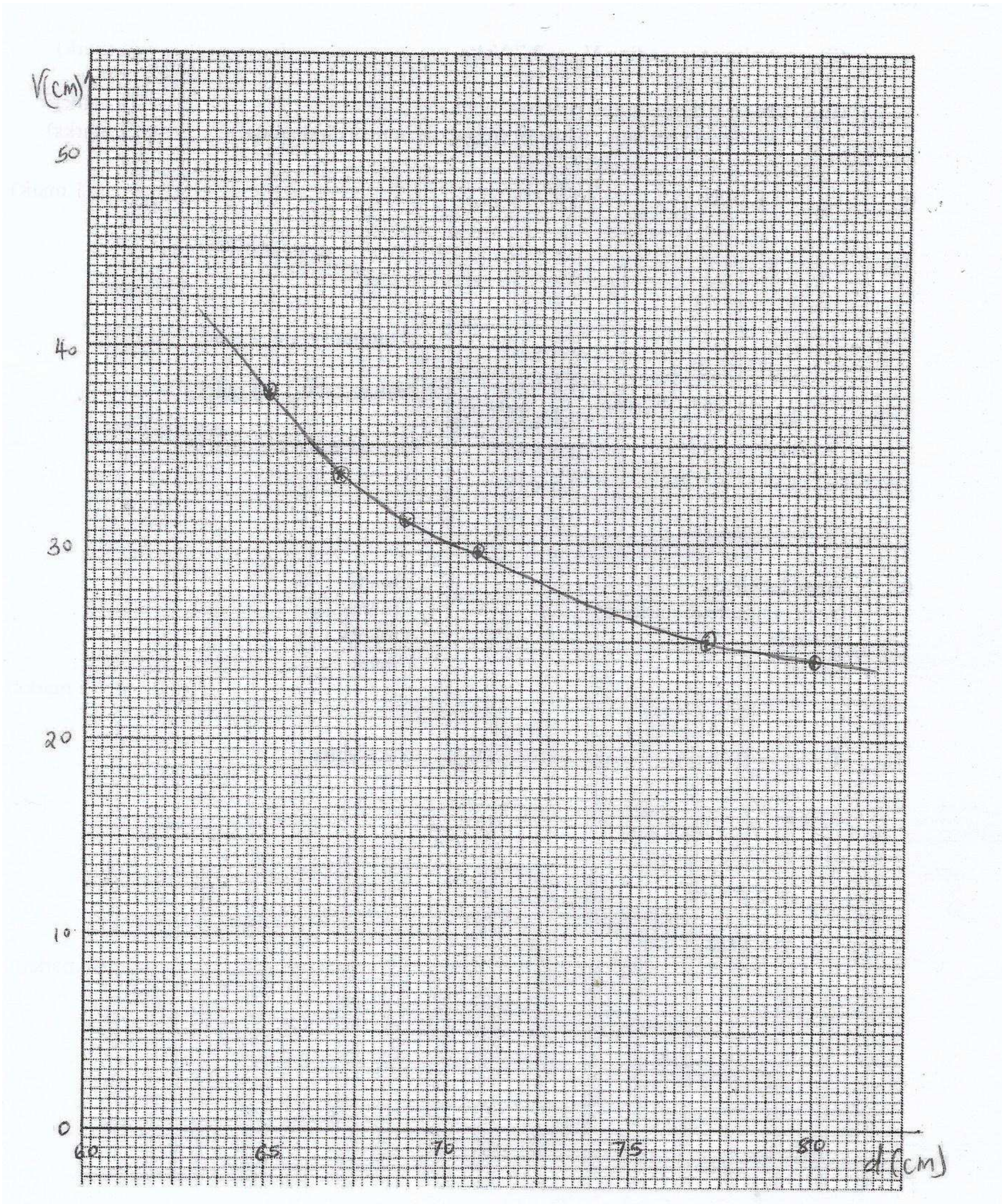
~-0.9

No curve / line no slope (3 mks)

ii) $K = \frac{-225}{(d-55)^2} = \frac{-225}{225} = -1$ (2 mks)

iv)M - $\frac{S}{K}$ $\frac{-0.9}{-1}$ = 0.9 (2 mks)

Graph 1



2. (b) (i) Maximum Voltmeter reading = 4.4 Volts (1mk)

(ii) Voltmeter reading V_B = 3.7 Volts (1 mk)

(iii) In (i) p.d. measured is across both. (1 mk)

diode and resistor, while in (ii) p.d. is across diode only. (1 mk)

c) V_B = 0.8 volts (1 mk)

$^{VA}/_{V}$	$^{VB}/_{V}$	$I = \frac{V_A - V_B}{1000}$ A
1.5	1.2	0.3 x 10°
2.0	1.7	0.3 x 10-^{3}
2.5	2.1	0.4 x 10-^{3}
3.0	2.5	0.5 x 10^{-3}
3.5	2.9	0.6 x10^{-3}
4.0	3.4	0.6 x 10^{-3}

Column I = 1

Values of V_n = 5 mks

Total for table = 6mks

(e) Axes labeled (1 mk)

Scale (simple & uniform) (1 mk)

Plotting (3 mks

Curve (line (1 mk)

(5 mks)

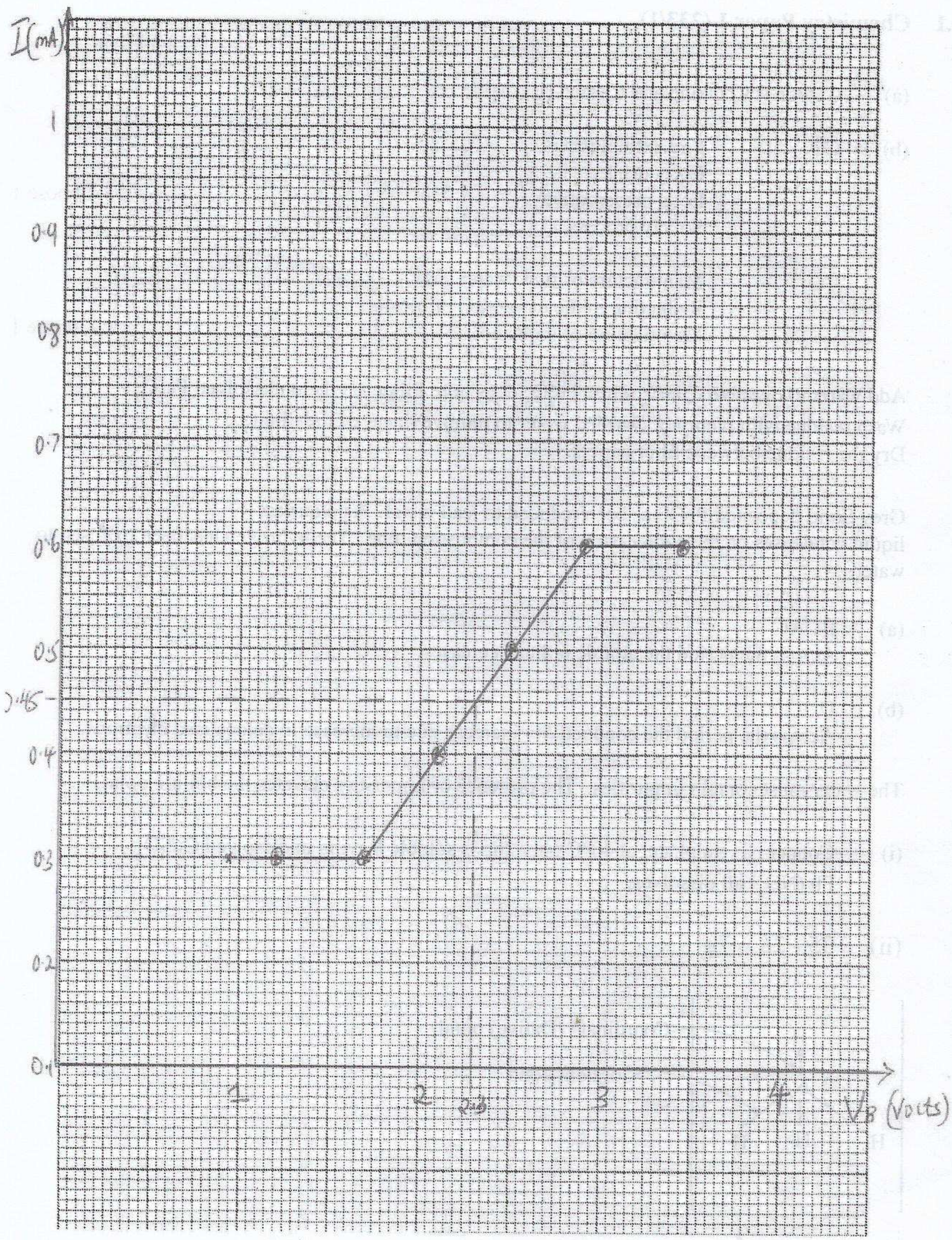
f) I = 0.45 mA, VB = 2.3 volts

$$R = \frac{Va}{I} = \frac{2.3}{0.45 \times 10^{-3}}$$

$= 5.1 \times 10^3$

= 5.1kΩ

GRAPH 2



PHYSICS PAPER 3 (232/3)

PRACTICAL MARKING SCHEME

PAPER 3

OCT/NOV. 2013

1.

PART A

(c)

Distance d (cm)	70	60	50	40	
Time t for 20 oscillations(s)	24.3	25.8	26.7	27.5	(3 marks)
Period $T = \frac{t}{20}$ (s)	1.22	1.29	1.34	1.38	(1 mark)
T^4 (S^4)	2.22	2.77	3.22	3.57	(1 mark)
d^2(cm^2)	4900	3600	2500	1600	(1 mark)

Table 1 (6 marks)

(d) (i) See graph (5 marks)

Scale and axis (1 marks)
Plotting (2 marks)
Line (1 mark)

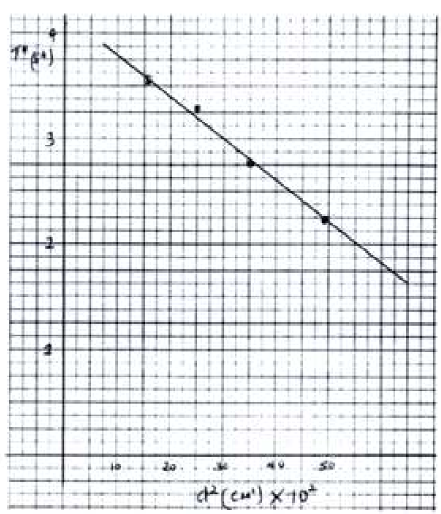
(ii) Slope $= \frac{2.50 - 3.50}{(42 - 18) \times 10^2}$;

$= {}^{-}4.2 \times 10^{-4}\ S^4cm^{-2}$; (3 marks)

(iii) K $= \sqrt{\frac{4\pi^4}{4.2 \times 10^{-4}}}$;

$= 963\ S^4cm^{-2}$; (3 marks)

d (i)



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1. **PART B**

(e) l = 0.1 m
b = 0.01 m (1 mark)

(f) m = 0.06 kg (1 mark)

(g) $p = \frac{0.06}{3}(0.1^2 + 0.01^2)$
$= 2.02 \times 10^{-4}$ (2 marks)

(i) (I) t = 75s (1 mark)

(II) T = 7.5s (1 mark)

(III) $7.5 = 2\pi\sqrt{\frac{2.02 \times 10^{-4}}{G}}$

$G = 1.42 \times 10^{-4}$

(2 marks)

unit not required.

2. **PART A**

(b) Vo = 3.0V (1 mark)

(d)

Voltage(V)	2.5	2.25	2.0	1.75	1.5	1.25
Time(s)	1.7	2.6	3.9	4.8	6.5	7.9

(e) (i) see graph (5 marks)

(ii) $t_{\frac{1}{2}}$ =6.4 S (1 mark)

(f) $R = \frac{6.4 \times 10^{6}}{0.693 \times 2200}$

= 4200 Ω (1 mark)

PART B

(h) (i) L_1 = 47.4 cm (1 mark)

(ii) $W_1 = \frac{0.474 \times 0.05 \times 10}{0.35}$

= 0.68 N (1 mark)

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(i) (I) $L_2 = 28$ cm (1 mark)

(II) $W_2 = \frac{0.28 \times 0.05 \times 10}{0.35}$

$= 0.4$ N (1 mark)

(j) T1 = 26°C

Accept (18 - 32°C) (1 mark)

(k) (i) $L_3 = 28.5$ cm (1 mark)

(ii) $T_2 = 83°C$

Accept (60 - 95°C) (1 mark)

(iii) $W_3 = \frac{0.285 \times 0.05 \times 10}{0.35}$

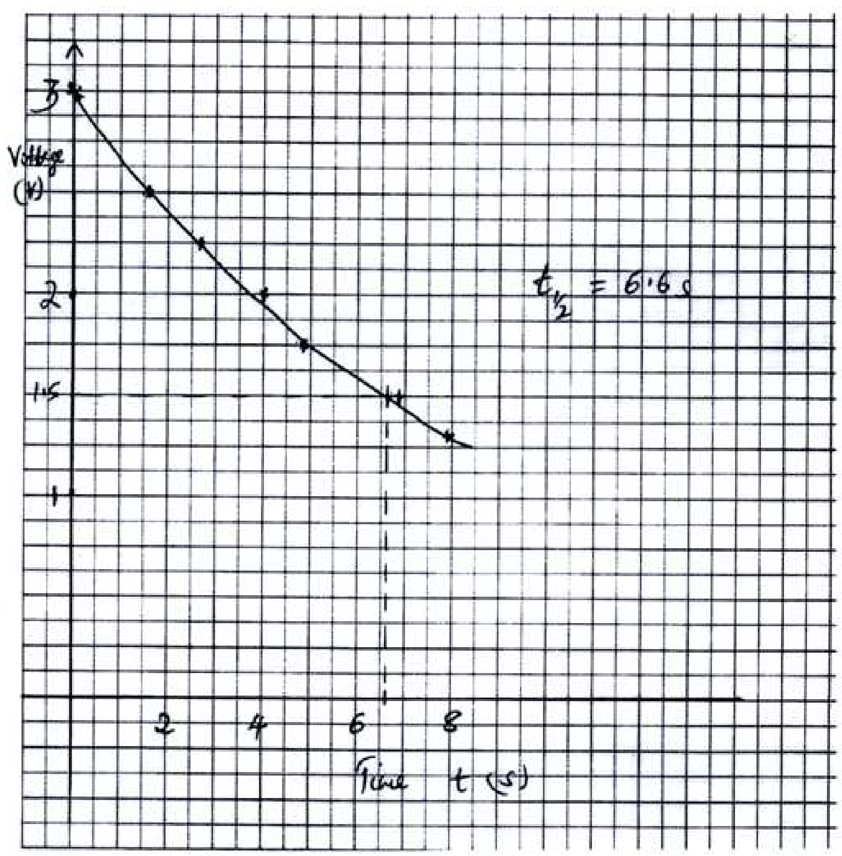
$= 0.41$ (1 mark)

(l) $K = \frac{(0.68 - 0.4) - (0.68 - 0.41)}{(0.68 - 0.41)(83 - 26)}$

$= \frac{0.28 - 0.27}{0.27 \times 57}$

$= 6.5 \times 10^{-4} K^{-1}$ (2 marks)

(e) (i)



PHYSICS PAPER 3 (232/3)

PRACTICAL MARKING SCHEME

PAPER 3

OCT/NOV. 2014

Q1. PART 1

A. (I) D = 0.37 $\pm$ 0.05 mm (2dp) assume units
Accept other metric units in st.form — 1 mk

(ii) d = 0.29 $\pm$ 0.05mm (0.24 – 0.34) — 1 mk
Assume units, ept other metric units in st. form
Accept interchanged D and d for D<d

B. $c_{1=\frac{D}{d}} - corr\ sub\ of\ (and\ values\ or\ implied\ \frac{1}{2}$

- $corr\ eval(exact\ or\ 3sf)$

No units if any eval if there is unit

C. (iii) I L_1 0 40.0 $\pm$ 6.0 (34.0 – 46.0)cm /dp a must — 1 mk
Deny ½ mk for missing unit
No mk for wrong unit

II $L_1 + L_2$ = 100 OR 105 cm to the nearest wh. no. — 1 mk
Deny ½ mk for missing unit
No mk for wrong unit
NB accept $L_1 > L_2$ (interchanged $l_1 + l_2$) if d >D
When $L_1 < 25$cm refer to CE when $l_1 + l_2 = 50$ to the nearest with no. or strange results

D. I $\frac{R_P}{R_Q} = \frac{L_1}{L_2}$ - corr subst — 1 mk
corr eal (exact or 1dp) — 1 mk
Deny ½ mk for missing unit
No mk for wrong unit

- Wrong sub –no eval.

II $C2 = \sqrt{Rq/Rp}$ - corr sub

- Corr eval (exact or 3sf)

NB No unit – deny eval if there is unit
III for C1 to C2 corr eval and C1 = C2 to the wh. No.
C1 is approx equal to C2, C1 = C2 — 1 mk

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C1 > C2 or C2 < C1 Acc mk (0.5 -1.4)
Accept comparision done by divide C1 ± C2 provide the ratio is 1 to whole no.

PART B.

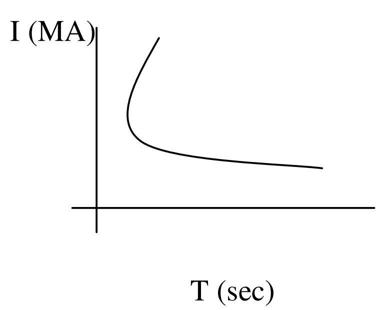
E. I V = 3.1 ± 0.1 (3.0 – 3.2) (1dp) 1 mk
Deny ½ mk for missing unit
No mk for wrong unit

II $I_0 = \frac{V}{R}$ - corr sub
- corr eval (3dp of MA or 2dp of A in st.f)

Deny ½ mk for missing unit
No mk for wrong unit
-acc I_0 = 0.638 – 0.681 M.A 1 mk
(*closed range*)

F. I I_0 = 0.72 ± 0.10 M.A (0.62 – 0.82) 2dp 1 mk
Deny ½ mk for missing unit
No mk for wrong unit
II t1 = 2.6 ± 1.05 (1.6 – 3.6) (1dp) 1 mk
Deny ½ mk for missing unit
No mk for wrong unit

G. I t_2 = 7.3 ± 3.05 (4.3 – 10.3) 1dp 1 mk
Deny ½ mk for missing unit
No mk for wrong unit
II Graph
- Axis laelling – Quantity only or unit only ½
- Scale - simple to uniform
  - accommodate all points ½
- plotting - corr plotted pts 2 x ½ mk
- curve - smooth with reducing slop thro 3pts with in 1cm sq. 1mk



Q2

D. table

L(cm)	5	10	15	20	25	30
t(s)	14.5	21.4	27.0	30.4	33.5	35.8
T(s)	Corr div. 10 . all corr 2dp or exact					
$T^2(S^2)$	Corr square exact or 2dp all					

8 mks

Screen values of t ⟶ CE

E. GRAPH

- axis labeling – Q + units or units only

Check heading or / and scale statement(s)

- Scale – simple and uniform accommodating all pts
- Plotting - exact within 1cm sq ½ mk@ x 4 = 2mk
  - Treat repeated values as one
  - T^2 must be retated to t
- Line - straight thro' atleast 3corr pts within 1cm sq
  - +ve gradient
- Penalize suspicious graph (i.e all pnts exactly on

F. gradient 5 = dy – corr to internal - ½ mk

Dx - corr to internal - ½ mk

Corr eval 2dp cm/s^2

Deny ½ mk for missing unit

G. tn = 77.1 ± 5 s 1dp

Deny ½ mk for missing unit

No mk for wrong unit

II Tn – corr dir. Bby 10 (s) 1mk

Deny ½ mk for missing unit

No mk for wrong unit

III Tn^2 – corr sub or implied

- corr sq (ignore unit) -3sf ½ mk

IV IF = 0.2 - corr sub

Tn^2 - corr evalution exact 3sf ½ mk or 2dp in 3sf ½

(Ignore unit)

V $^H/_S$ - corr sub ½ mk

- corr evalution exact 3sf ½ mk or 2dp in 3sf or ½ mk

(Ignore unit)