

4.5.3 Physics Paper 3 (232/3)

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
Period $T = \frac{t}{20}$ (s)	1.22	1.29	1.34	1.38
T^4 (S ⁴)	2.22	2.77	3.22	3.57
d^2 (cm ²)	4900	3600	2500	1600

(3 marks)

(1 mark)

(1 mark)

(1 mark)

Table 1

(6 marks)

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

Scale and axis
Plotting
Line

(1 marks)

(2 marks)

(1 mark)

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

$= -4.2 \times 10^{-4} \text{ S}^4\text{cm}^{-2};$

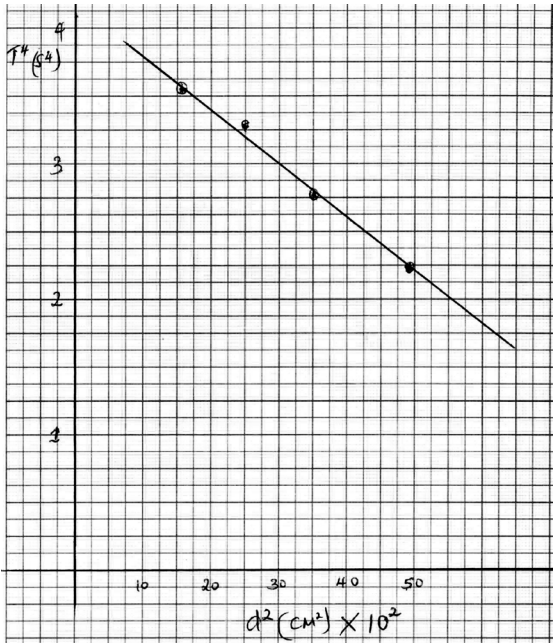
(3 marks)

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

$= 963 \text{ S}^4\text{cm}^{-2};$

(3 marks)

d (i)



1. PART B

(e) $l = 0.1 \text{ m}$
 $b = 0.01 \text{ m}$ (1 mark)

(f) $m = 0.06 \text{ kg}$ (1 mark)

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

(i) (I) $t = 75\text{s}$ (1 mark)

(II) $T = 7.5\text{s}$ (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) $V_o = 3.0\text{V}$ (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) $t_{\frac{1}{2}} = 6.4 \text{ S}$ (1 mark)

(f) $R = \frac{6.4 \times 10^6}{0.693 \times 2200}$
 $= 4200 \Omega$ (1 mark)

PART B

(h) (i) $L_1 = 47.4 \text{ cm}$ (1 mark)

(ii) $W_1 = \frac{0.474 \times 0.05 \times 10}{0.35}$
 $= 0.68 \text{ N}$ (1 mark)

(i) (I) $L_2 = 28 \text{ cm}$ (1 mark)

(II) $W_2 = \frac{0.28 \times 0.05 \times 10}{0.35}$
 $= 0.4 \text{ N}$ (1 mark)

(j) $T_1 = 26^\circ\text{C}$
 Accept (18 - 32°C) (1 mark)

(k) (i) $L_3 = 28.5 \text{ cm}$ (1 mark)

(ii) $T_2 = 83^\circ\text{C}$
 Accept (60 - 95°C) (1 mark)

(iii) $W_3 = \frac{0.285 \times 0.05 \times 10}{0.35}$
 $= 0.41$ (1 mark)

(l) $K = \frac{(0.68 - 0.4) - (0.68 - 0.41)}{(0.68 - 0.41)(83 - 26)}$
 $= \frac{0.28 - 0.27}{0.27 \times 57}$
 $= 6.5 \times 10^{-4} \text{ K}^{-1}$ (2 marks)

(e) (i)

