30.5.3 Physics Paper 3 (232/3)

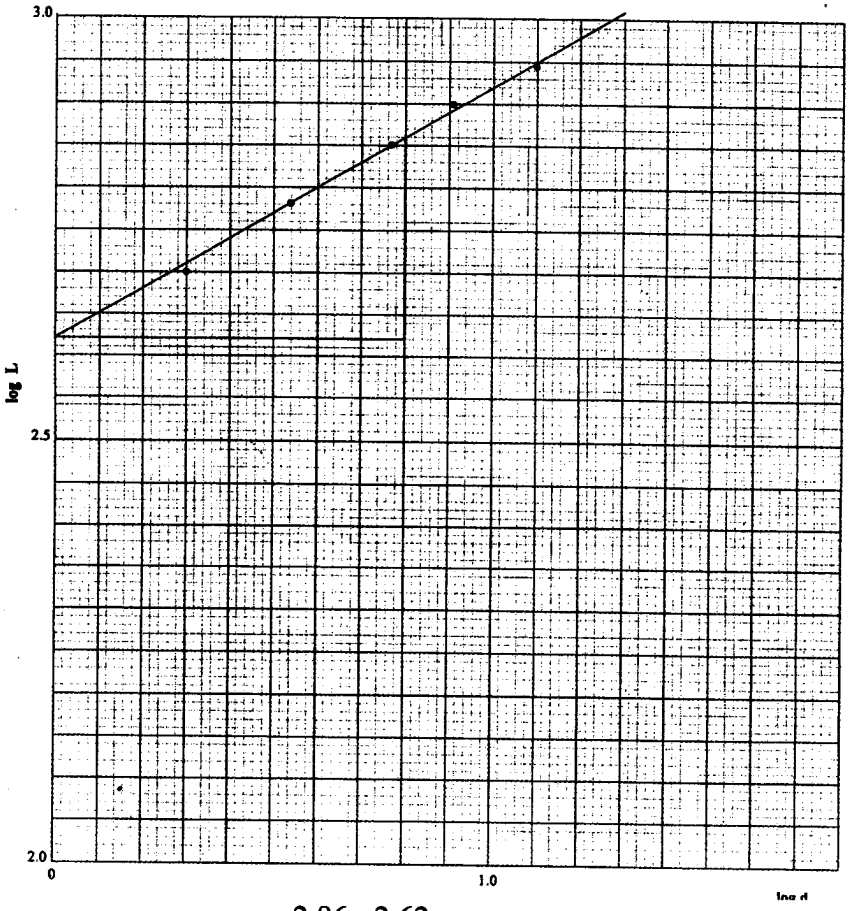
1. (a) $h_o = 92.8$ mm (1 mark)

(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)

f(iv)

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

2. (a) d_1 = 4.68 cm
d_2 = 5.08 (1 mark)
X = $\frac{d_2 - d_1}{2} = \frac{5.08 - 4.68}{2} = \frac{0.4}{2} = 0.2$

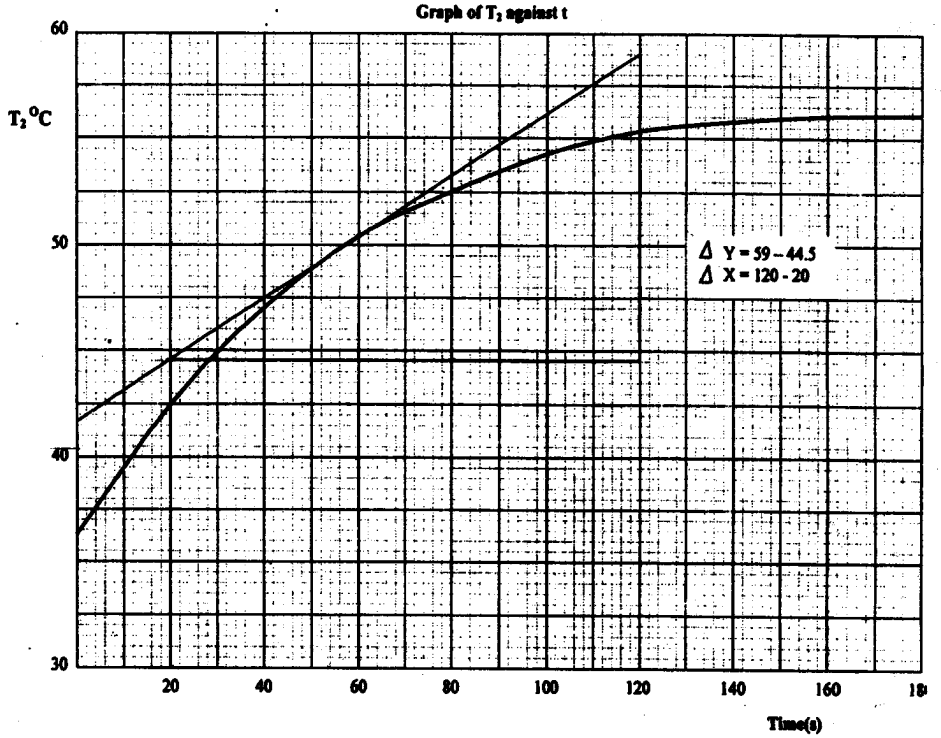
(b) h = 4.3
A = 68.8 cm^2 (1 mark)

(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 marks)

(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 marks)