PHYSICS 232/3
MARKING SCHEME

QUESTION 1

(a) V = $11.3 \pm 0.5 cm^3$ ***(3mrks)***

(b) (i) G = 50cm ± 1 ***(1mrk)***

(ii)

Ymm	40	90	131	175	225	265

± 1 ½ mrk for each correct entry

(iii) SEE GRAPH

- Labeling – quantity and unit on both axes. ***(1mrk)***
- Scale - Simple and uniform intervals √ ***(1mrk)***
- Plotting – plot to accuracy of small square at ½ mrk each correctly plotted point for max 2
- Line – should have positive slope and pass through at least 3 correctly plotted points.

(iv) $S = \frac{DY}{DX}$

$= \frac{225}{250}$ } Formula or substitution – ***(1mrk)***

= 0.9 ± 0.05 (Use student's values from the graph) – ***(1mrk)***

(v) $W_x = SW_y$

= 0.9 x 1

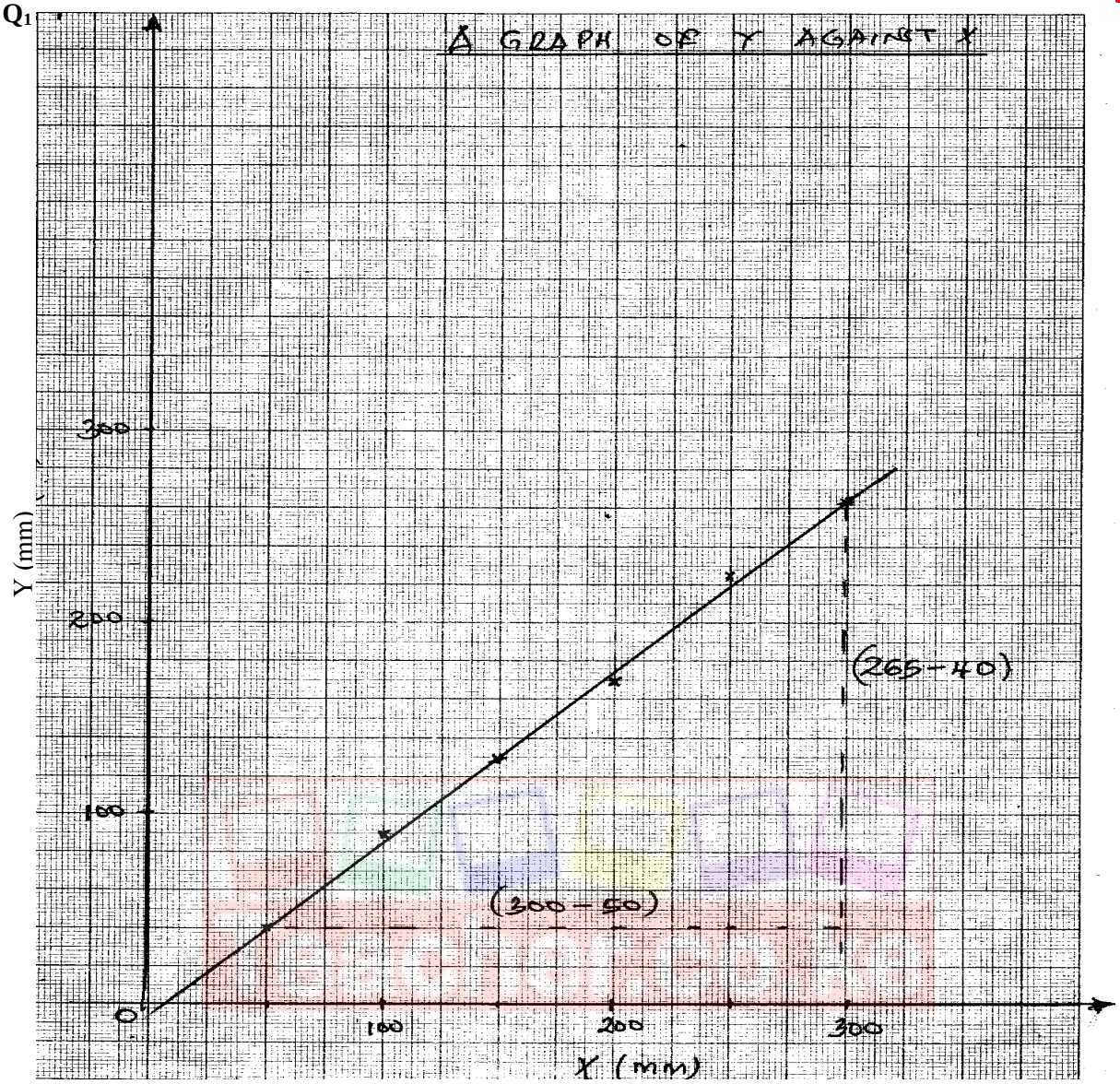
= 0.9N

$U = W_y - W_x$ formula – ***1mrk***

= 1.0 -0.9 substitution – ***1mrk***

= 0.1N ans – ***1mrk*** } Use student's values

Q1



(vi) Up thrust = Weight of liquid displaced = 0.1N

Mass of liquid L = $\frac{U}{g} = \frac{0.1}{10}$ = 0.01Kg OR 10g ***(1mrk)***

$$\mathbf{p} = \frac{M}{V} = \frac{0.01Kg}{1.13 \times 10^{-5}}$$ ***(1mrk)***

P = $8.85 \times 10^{2} Kgm^{-3}$ OR $10/11.3 = 0.88 g/cm^{3}$ ***(1mrk)***

QUESTION 2

PART 1

L_1cm	L_2(cm)	$\frac{L_1}{L_2}$
30	50.0 ± 2	60
60	27.5 ± 2	2.18

- Each correct L_2 value ½ mrk (max. 1mrk)

- N/B – L_2 values should be to 1 d.p

- For each correct valuation of L_1/L_2 TO 2 d.p ½ mrk (max. 1mrk)

(v) For each correct value off $= \frac{L_1}{M + 1}$ correctly calculate to I d.p ***(½ mrk)***

Getting average $\frac{f_1 + f_2}{2}$ be substitution of f values ***(½ mrk)***

Correct evaluation of $\frac{f_1 + f_2}{2}$ ***(½ mrk)***

$f_1 = \frac{L_1}{m+1} = \frac{30}{1.6} = 18.75$

$f_2 = 60/3.18 = 18.87$

use student's values

$\frac{f_1 + f_2}{2} = \frac{18.75 + 18.87}{2} = 18.81\text{cm}$

Part II

(ii)

Length Lcm	20	30	40	50	60	70	
Length(100 –L)cm	80	70	60	50	40	30	
Current I (A)	0.10	0.12	0.14	0.16	0.18	0.2	± 0.02
$1/1(A^{-1})$	10.00	8.33	7.14	6.25	5.55	5.00	

- For (100 – L) award 1mrk for all values correct
- For current, ward ½ mrk@ correct value
- (Total marks =3mrks). Value should be correct to at least 2 d.p
- For 1/1 (A^{-1}) values should be correct at least 2d.p

0-3 values correctly evaluated 0mrk
4 & 5 values correctly evaluated ½ mrk
6 values correctly evaluated 1mrk

(v) **SEE GRAPH**

- Labeling – quality and unit on both axes ***(1mrk)***
- Scale – simple and uniform intervals √ ***(1mrk)***
- Plotting – plot to accuracy of small square at ½ mk each correctly plotted point for max 2
- Line – should have negative slope and pass through at least 3 correctly plotted points.

(vi) Drawing a tangent @ 60cm ***(1mrk)***

Extraction ***(1mrk)***

Answer ***(1mrk)***

Slope $= \frac{80 - 10}{9 - 2}$

$= \frac{70}{7} = 10$

$= 10\text{cmA}$

see student's values

(c) $K = \frac{S \times 1.5 \times d^2}{4} = \frac{10 \times 1.5 \times (0.08)^2}{4}$

$= 0.096\ Wcm^3$

Substitution of values √ ***(1mrk)***

Correct values to at least 1 d.p √ ***(1mrk)***

Q2 PART II GRAPH OF LENGTH (100 –L) AGAINST 1/**I**