

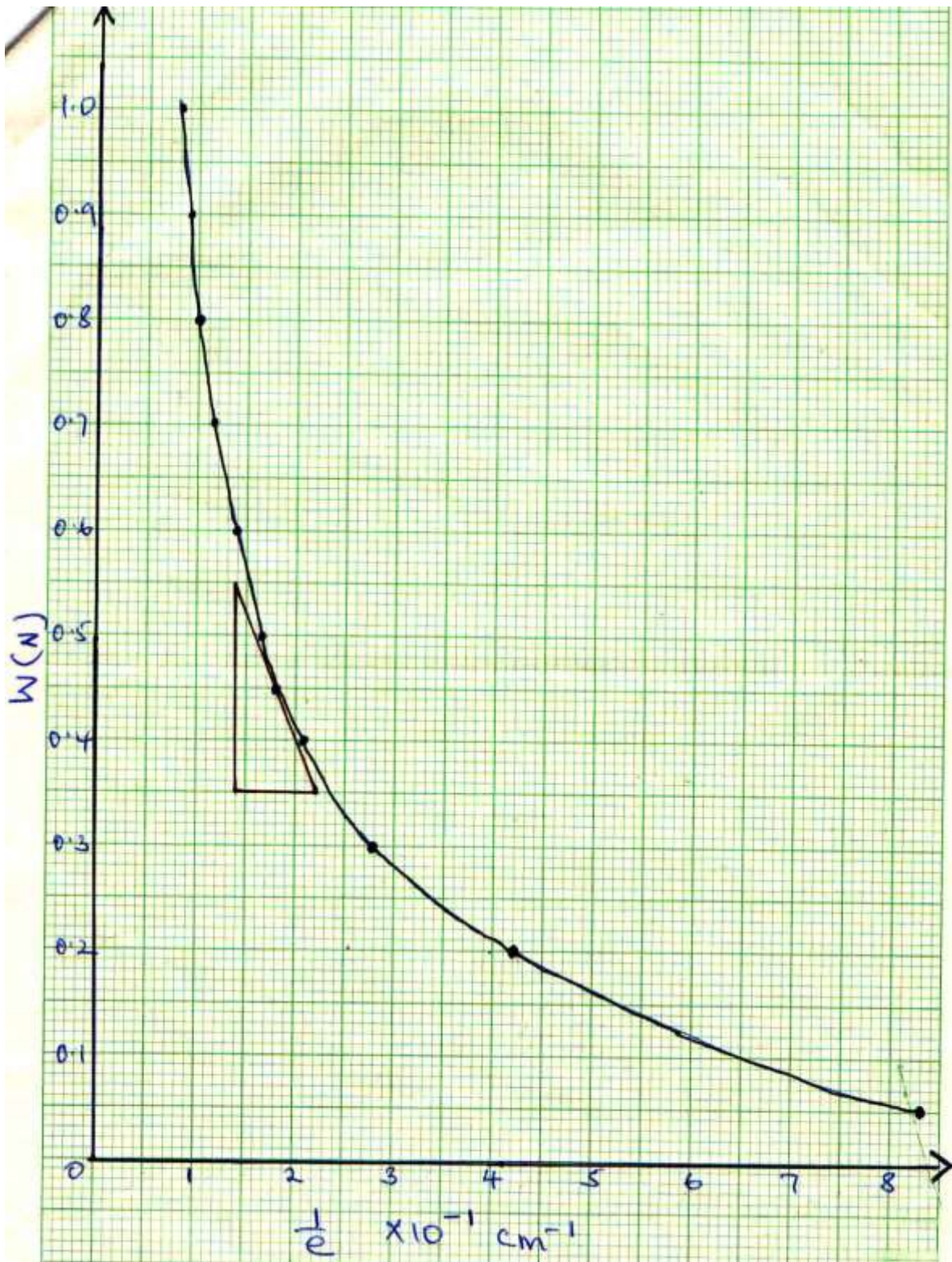
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PHYSICS
PAPER 3
MARKING SCHEME

QUESTION 1

- a) $N=83\checkmark 1$
 b) $D=0.0116M(4d.p)\checkmark + 0.0002\checkmark 1$
 c) $d=6.3 \times 10^{-4}m\checkmark 1$
 d) $N = \frac{0.4D}{dm}\checkmark 1/2$
 $M = \frac{0.4D}{dN} = \frac{0.4 \times 0.0116}{6.3 \times 10^{-4} \times 83}\checkmark 1 = 0.0887\checkmark 1/2(4d.p)$
 e) $L_0=50.0$
 f)

1mk	W(N)	0	0.01	0.02	0.03	0.04	0.05	0.6	0.7	0.8	0.9	1N
1mk	L(cm)	50	51.2	52.4	53.6	54.8	56.0	57.2	58.4	59.6	60.8	62.0
2mk	e(CM)	0	1.2	2.4	3.6	4.8	6.0	7.2	8.4	9.6	10.8	12.0
2mk	$\frac{1}{e} cm^{-1}$	0	0.8333	0.4166	0.2777	0.2083	0.1666	0.1389	0.1190	0.1042	0.0926	0.0833

- g) Axes= $1/2$ mk well labelled unit a must.
 Scale= $1/2$ mk appropriate scale
 Plots= 2 mks 8-11 plots correctly plotted
 4-7 correctly plotted 1mk
 Less than 4 - 0mks
 Smooth curve -1mk
 h) Slope= $\frac{5.5}{2.2} - \frac{3.5}{1.4} = \frac{2.0}{0.8} = 2.5NCM$
 $T = \frac{mx(5+60)^2}{-255}\checkmark$
 $= \frac{0.0887x(2.5+60)^2}{-255}\checkmark$
 $T=1.3588N^2CM^2\checkmark$



QUESTION 2

b)

- i) $EP = 10.0 \text{ cm} \pm 0.2 \checkmark$
- ii) $EI = 5.2 \pm 0.2 \checkmark$
- iii) $N = \frac{EP0}{EI} = \frac{10}{5.2} = 1.923$
- iv) Refractive index

v)

20	30	40	50	60	70
46	48	50	45	45	41

- c) Axes-1mk-well labelled
Scale-1mk-appropriate scale
Plots-5-6 plots-2mks
3-4plots-1mk
0-2 -0mk
Two extrapolated lines-straight lines-1mk
- d) $H_{\max} = 50.95 \text{ cm}$

e) $R = \frac{\cos 40}{\sin^2(16 + \frac{H_{\max}}{3})} \sqrt{1/2}$
 $= \frac{0.7660}{\sin^2(16 + \frac{50.95}{3})} \sqrt{1} = \frac{0.7660}{\sin^2(32.98)} \sqrt{1/2}$
 $= \frac{0.7660}{0.29629} \sqrt{1/2} = 2.5853 \text{ (at least 4d.p.)} \sqrt{1/2}$

