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Physics
PAPER 3
MARKING SCHEMES

1. c) $K = 40.0 \pm 0.4\text{cm}$ ✓ ½
 $t = 30.2 \pm 0.4\text{cm}$ ✓ ½

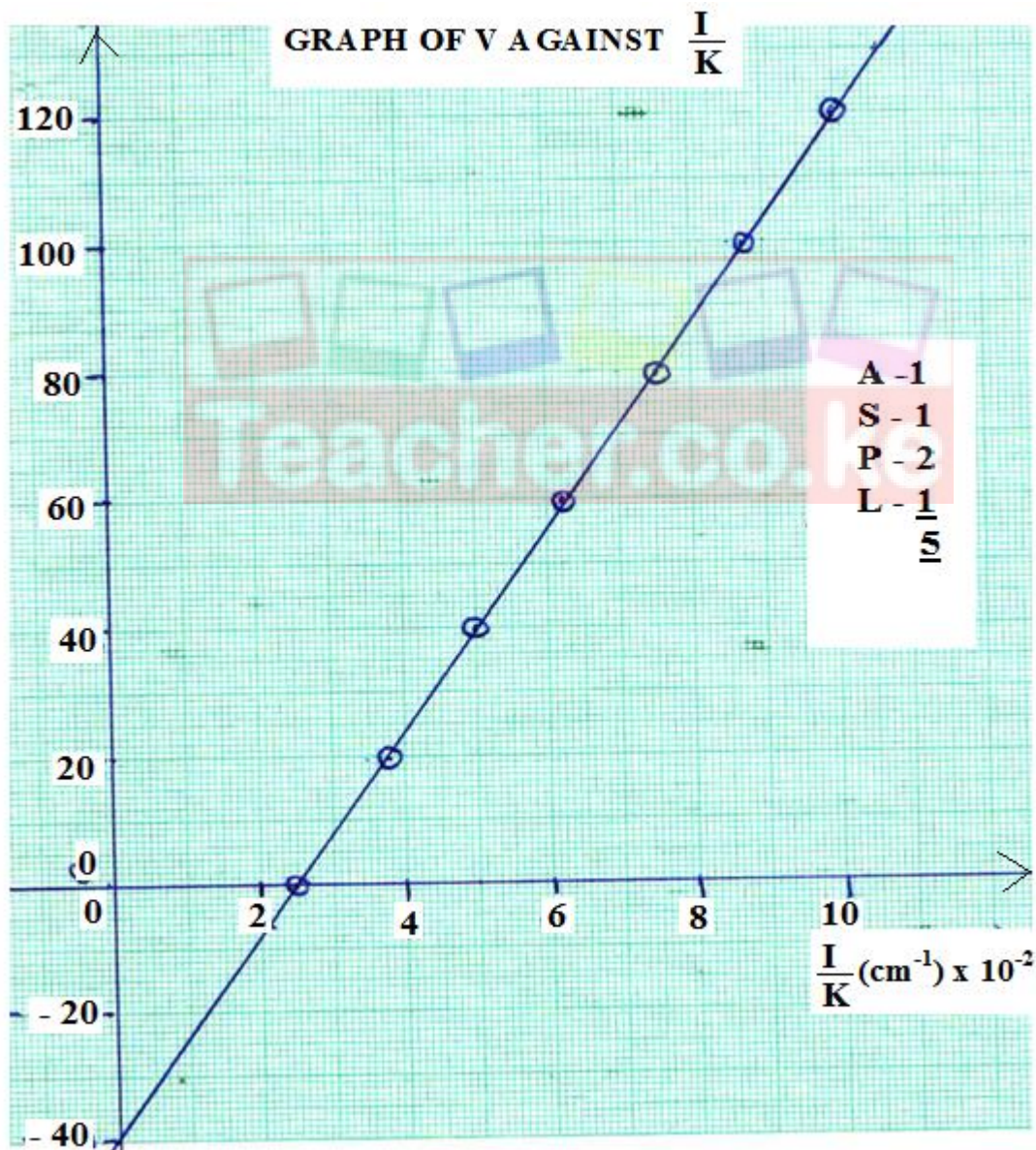
e)

Vol, $V(\text{cm}^3)$	0	20	40	60	80	100	120
Distance; K (cm)	40.0	26.6	20.0	16.1	13.4	11.5	10.0
$\frac{1}{K}$ (cm^{-1}) $\times 10^{-2}$	2.5	3.76	5.00	6.21	7.46	8.70	10.0

K – row, 4 mks, All values $\pm 0.4\text{cm}$

$\frac{1}{K}$ – row, 2 mks, All values

f)



A – 1, well labelled with units

S- 1, Linear and appropriate

P – 2, All values

L – 1

$$\text{g) Slope, } S = \frac{\Delta V}{\frac{1}{\Delta k}} = \frac{120-40(\text{cm}^3)}{(10-5) \times 10^{-2}(\text{cm}^{-1})} \checkmark$$

$$= 1600\text{cm}^4 \text{ with units } \checkmark$$

$$\text{h) (i) } S = \frac{50000t}{d} \checkmark \text{ For realising}$$

$$\Rightarrow 1600\text{cm}^4 = \frac{5000 \times 30.2\text{cm}}{d} \checkmark$$

$$d = \frac{50000 \times 30.2\text{cm}}{16002}$$

$$= 943.75\text{cm}^{-3} \checkmark$$

$$\text{(ii) } V - \text{axis intercept} = \frac{1000m}{d} \checkmark \text{ for reading}$$

$$-40 = \frac{-1000m}{943.75\text{cm}^{-3}} \checkmark$$

$$m = \frac{943.75\text{cm}^{-3} \times 40}{1000}$$

$$= 37.75 \checkmark$$

2. (d) $d = 18 \pm 1\text{cm}$

(f) Table

u (cm)	25	30	35	40	45	50
v (cm)	49.0	36.5	32.0	28.0	26.0	25.0
$m = \frac{v}{u}$	1.96	1.22	0.91	0.7	0.58	0.50

v – 1m each for maximum – 5mks

m – 5-6 values – 2mks

3-4 values – 1mks

(g) Graph

Axes labelled with units – 1mk

Scale – 1mk

Plotting – 2mks

Straight line with positive gradient – 1mk

$$\text{(h) Slope } S = \frac{\Delta m}{\Delta v} = \frac{(20-8.5)10^{-1}}{50-29} = 0.0595$$

Accuracy 0.052 – 0.058

$$\text{(i) } n = \frac{1}{\text{slope}} = \frac{1}{0.0595} = 16.81$$

$$\text{(j) } n_1 = 16.5$$

(k) n is the focal length of the lens