MARKING SCHEME

232/3

PHYSICS PAPER 3

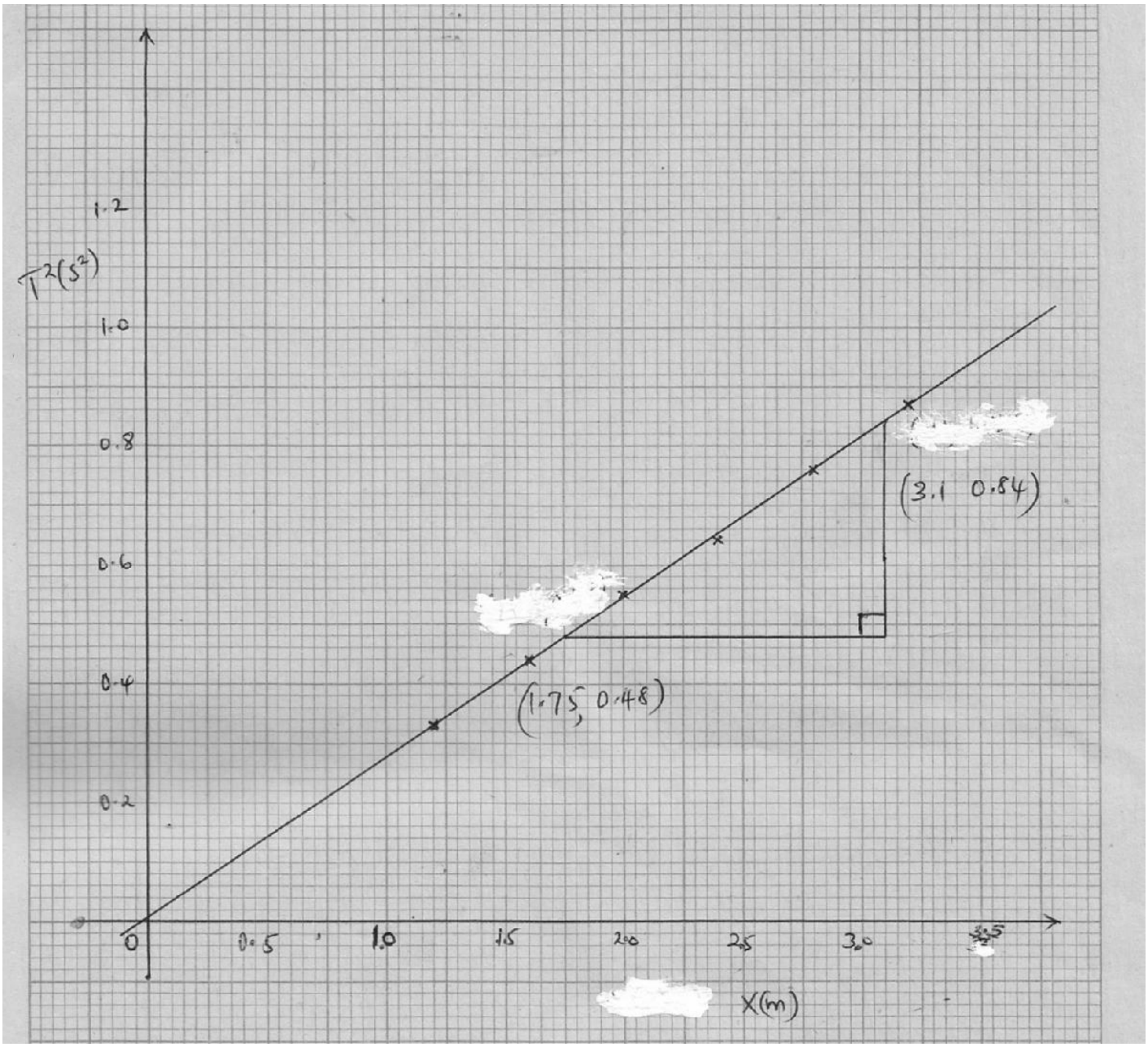
(a)

Table 1

Length X cm	32	28	24	20	16	12	
Time t for 10 oscillations (s)	**9.32**	**8.72**	**8.00**	**7.40**	**6.62**	**5.75**	✓✓2
Period T=$\frac{t}{10}$ (s)	**0.932**	**0.872**	**0.8**	**0.74**	**0.662**	**0.575**	✓✓2
T^2 (S^2)	**0.87**	**0.76**	**0.64**	**0.55**	**0.44**	**0.33**	✓1

(any 4 to 6 correct values, 2 marks, 2 to 4 values, 1 mark, less than 2 values, no mark)

(b) Plot a graph of T^2 (y-axis) against X (metres) on the graph paper provided. (5 marks)



Scale =1 mark

Axes with units=1 mark

Plots = 2 marks

Line = 1 mark

(c) i)

slope= $\frac{0.84-0.48(S^2)}{3.1-1.75(m)}$ ✓

slope = $\frac{0.36}{1.35}$ ✓

slope = 2.67s²/m ✓ (3 marks)

ii) Obtain the value of K in the equation S= $\frac{8\pi}{3k}$ (2marks)

2.67s²/m= $\frac{8\times3.142}{3k}$ ✓

$3k = \frac{8\times3.142}{2.67}$

$k = \frac{8\times3.142}{3\times2.67}$

$k = 3.1381\ m/s^2$ ✓

PART B

(d) (3 marks)

Table 2

t_1((s)	t_2(s)	t_3(s)	Average t(s) $t = \left(\frac{t_1 + t_2 + t_3}{3}\right)$	$T = \frac{t}{5}$(s)
3.68 ✓ ½	**3.75** ✓ ½	**3.81** ✓ ½	$\frac{3.68+3.75+3.81}{3}$ ✓ ½	$T = \frac{3.747}{3} = 0.7494$ ✓ 1

(e) (2 marks)

$P = \frac{40\times0.12(m)}{0.7494^2}$ ✓

P=8.547m/s² ✓

QUESTION TWO

h= **6.3**cm ✓ (1 Marks)

$$R = \sqrt{\frac{100}{h}}$$

R= $\sqrt{\frac{100}{6.3}} = \mathbf{3.98}$ cm ✓ (1 Marks)

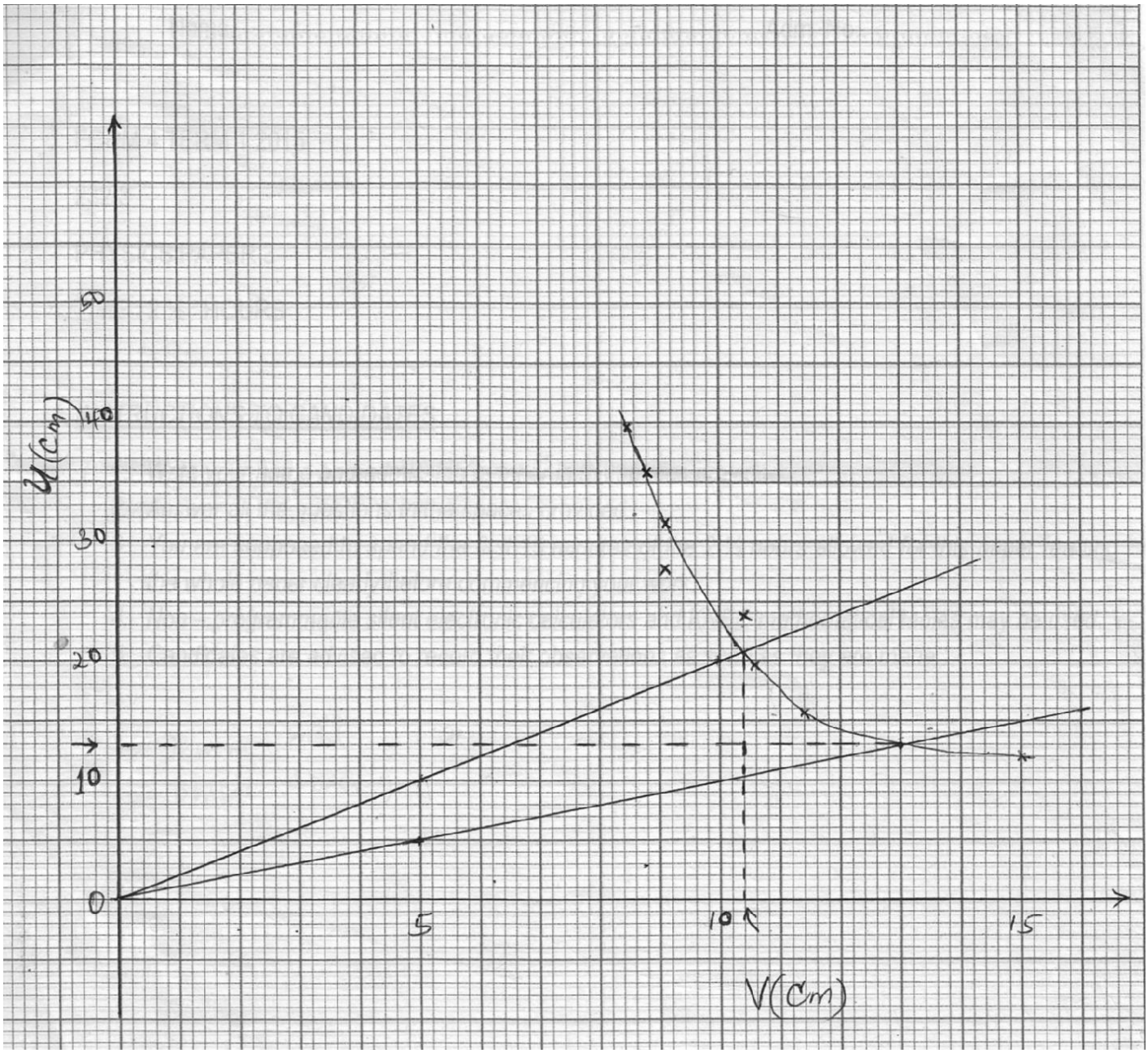
(i) (8 marks)

	10R	9R	8R	7R	6R	5R	4R	3R
U (cm)	***39.8***	***35.9***	***31.9***	***27.9***	***23.9***	***19.9***	***15.9***	***12.0***
V (cm)	***8.5***	***8.8***	***9.1***	***9.1***	***10.4***	***10.6***	***11.4***	***15.0***

NB: Any other appropriate value of u and v depending on the value of R obtained can be awarded.

-each correct value = ½ mark

(5 marks)



Scale =1 mark

Axes with units=1 mark

Plots = 2 marks

Smooth Curve = 1 mark

i) From the graph determine

'V' the value of V for which v=u (1 Mark)

'V'=13cm✓

a) 'U' the value of U for which u=2v (1 Mark)

'U' = 10.4cm ✓

ii) **Determine** the effective focal length of the 'lens' from the formulae $f=\frac{'u'+'v'}{5}$ (2 Marks)

$$\boldsymbol{f = \frac{10.4+13.0}{5}} \checkmark$$

$$\boldsymbol{= \frac{23.4}{5}}$$

$$\boldsymbol{f = 4.68cm} \checkmark$$

iii) Hence determine the value of $\frac{R}{f}$ (1 Mark)

$$\frac{R}{f} = \frac{3.98cm}{4.68cm} = 0.85 \checkmark$$