

232/3

**PHYSICS**

Paper 3

**MARKING SCHEME**

Question 1 Part A

(i)  $U_1 = 21.0\text{cm}$  (1mk)

(iv)  $U_2 = 79.0\text{cm}$  (1mk)

(v)  $d = 79.0 - 21.0$   
 $= 58.0\text{cm}$  (1mk)

working must be shown

(vi)  $f = \frac{4(100)^2 - (58)^2}{10000 - 3364}$ ; (1mk)

$= \frac{400}{400}$

$= \frac{6636}{400}$

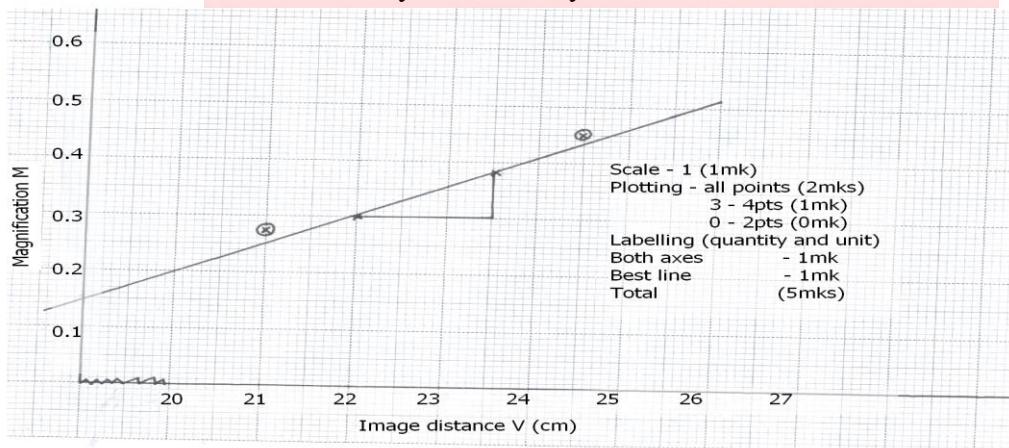
$= 16.59\text{cm}$ ; (1mk)

**Part B**

ii) Table I

L (cm)	100	95	90	85	80
U (cm)	79.0	73.0	67.5	61.5	55.5
V (cm)	21.0	22.0	22.5	23.5	24.5
$\frac{V}{U}$	0.27	0.30	0.33	0.38	0.44
$M = \frac{V}{U}$					

Award  $\frac{1}{2}$  mk for every correct entry of U and V  $10 \times \frac{1}{2} = 5\text{mks}$



iv) slope =  $\frac{0.38 - 0.3}{23.5 - 22}$  (1mk) (A student must indicate on his/her graph the range used)  
 (1mk)

$$= \frac{0.08}{1.5}$$

$$= 0.053 \text{cm}^{-1} \text{ (1mk)}$$

- v)  $\frac{1}{f} = \text{slope} = 0.053 \text{cm}^{-1} \text{ (1mk)}$   
 $f = 18.87 \text{cm} \text{ (1mk)}$

### Question 2

a)  $\Delta = 6.76 \text{mm} \checkmark \text{ 1mk}$

$$\Delta = 6.76 \times 10^{-3} \text{m} \checkmark \text{ 1mk}$$

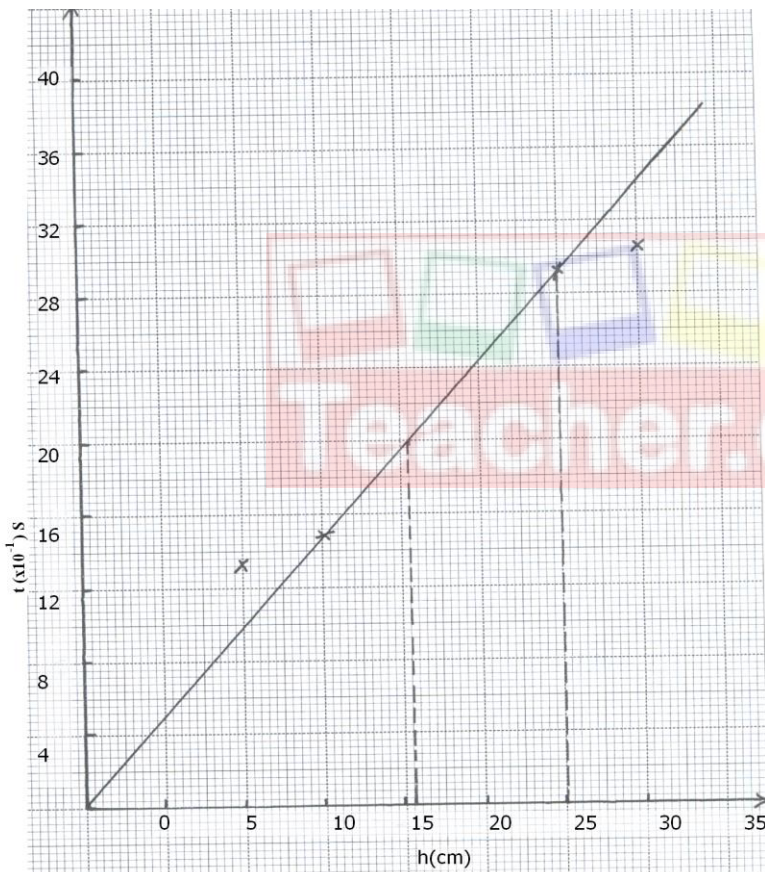
g) Table 2.0

h (cm)	35	30	25	20	15	10
t (sec)	3.06✓	2.91✓	2.44✓	1.91✓	1.47✓	1.34✓

(1mk for each correct entry)

Scale: Vertical: 1cm  $2 \times 10^{-1} \text{S}$

Horizontal: 1cm 2.5cm



- h) i) A graph of t(s) Vs h(see grid provided)  
 labelling (quantity and units) both axis  $\checkmark \text{ 1mk}$   
 scale (written or implied)  $\checkmark \text{ 1mk}$   
 Plotting all points  $\checkmark \text{ 2mks}$   
 4 – 5 points  $\checkmark \text{ 1mk}$   
 Less than 4 points  $\checkmark \text{ 0mk}$   
 Best line  $\checkmark \text{ 1mk}$

ii) Slope  $s = \frac{\Delta t}{\Delta h}$   
 $= \frac{(2.91 - 2.0)s}{(30 - 20.5)cm}$  must be shown ✓ 2mks on graph  
 $= 0.095789 \text{ s/cm}$  ✓ 1mk  
 Or 9.5789 s/m  
 Total = 3mks

2. i)  $K = \frac{D^2 g (a - b) T}{18h}$   
 $K = \frac{D^2 g (a - b) T}{18h}$   
 $T = 18kh$   
 $D^2 g (a - b)$  ✓ 1mk  
 Gradient (slope) =  $\frac{18k}{D^2 g (a - b)}$  ✓ 1mk  
 $9.56 = 18K$   
 $(6.76 \times 10^{-3})^2 \times (7 - 1.26) \times 10^3$  ✓ 1mk  
 $9.56 = 18k$   
 $262.304224 \times 10^{-3}$   
 $K = \frac{9.56 \times 262.304224 \times 10^{-3}}{18}$   
 $= 0.1393 \text{ kg/ms}$  ✓ 1mk

