

## FORM 3

### PHYSICS PAPER 3 MARKING SCHEMS

#### Question1

(v) Table of results

x (cm)	5.0	10.0	15.0	20.0	25.0	30.0	
u (cm)	33.0	31.0	29.0	28.0	27.0	26.0	± 2 -3mrks
v (cm)	38.0	41.0	44.0	48.0	52.0	56.0	
(u + v )cm	71.0	72.0	73.0	76.0	79.0	82.0	± 2 -3mrks
uv (cm <sup>2</sup> )	1254	1271	1276	1344	1404	1456	-1mrk

(vi) See the graph on the grid below

(a) Slope =  $\frac{D u + v \sqrt{1}}{D uv}$   
 $= \frac{(78 - 75)cm \sqrt{1}}{1400 - 1328}$  must be shown on the graph.  
 $= \frac{4}{72cm}$   
 $= \frac{1}{18cm^{-1}}$   
 $= 0.05556cm^{-1} \sqrt{1}$

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(b)  $1/f = 1/u + 1/v$

$$1/f = \frac{u+v}{Uv}$$

$$u+v = uv/f \sqrt{1} \text{ correct evaluation}$$

Slope of the graph of u+v against uv is a straight line with a slope of 1/f hence

$$1/f = 0.05556cm^2$$

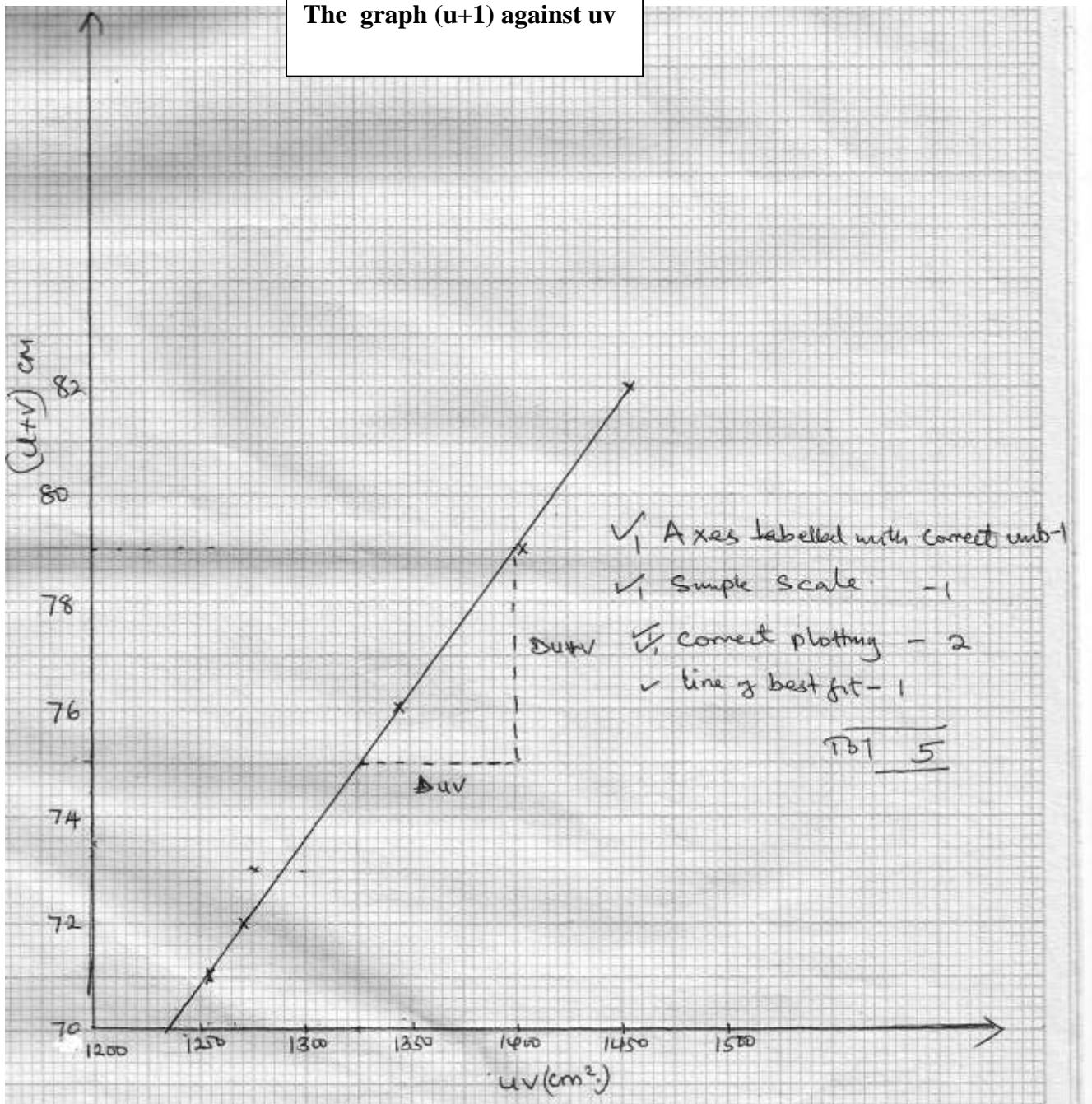
$$F = 18cm \sqrt{1}$$

(c)  $R = 4 \times 18cm \sqrt{1}$  correct substitute

$$0.05556\text{cm}^{-1}$$

$$R = 23328\text{cm}^2\sqrt{1} \text{ correct answer}$$

The graph  $(u+1)$  against  $uv$



L (cm)	L (m)	V (volts)	I (AMP)	R = V/I(Ω)
20	0.2	0.3	0.20	1.5
30	0.3	0.5	0.20	2.5
40	0.4	0.6	0.20	3.0
50	0.5	0.7	0.20	3.5
60	0.6	0.9	0.20	4.5
70	0.7	1.0	0.20	5.0
80	0.8	1.2	0.20	6.0

**Question2**

(i) Average diameter =  $0.35 \pm 0.01 \text{ mm} \sqrt{1}$

$\pm 0.1$

$\pm 0.05$

$\sqrt{1}\text{mrk} \quad \sqrt{3}\text{mrks} \quad \sqrt{3}\text{mrks} \quad \sqrt{1}\text{mrk} \quad \text{Total} = 8\text{mrks}$

(iv) See the graph on the grid provided

(a)  $\text{Slope} = \frac{DR}{Dt\sqrt{1}}$

$$= \frac{(3.0 - 1.5)\Omega}{0.4 - 0.2 \text{ M} \sqrt{1}}$$

$$= \frac{1.5\Omega}{0.2\text{M}}$$

$$= 7.5\Omega \text{ M}^{-1}$$

(b)  $R = R \ell L/A$

$$= 3.142 \times \frac{0.35}{2} \times \frac{0.35}{2}$$

$A = 0.09622 \times 10^{-6} \text{ m}^2 \sqrt{1}$  for area of cross-section of the wire slope of the graph  $e/A$   
 $E = \text{slope} \times a \sqrt{1}$

$$= 7.5 \Omega \text{ m}^{-1} \times 9.622 \times 10^{-9} \text{ m}^2$$

$$= 7.2165 \times 10^{-5} \Omega \text{ M}\sqrt{1} \text{ with correct units}$$

**The graph of  $(u+v)$  against  $uv$**

