

FORM 3

PHYSICS PAPER 3

MARKING SCHEME

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 ²)	1254	1271	1276	1344	1404	1456	-1mrk

(vi) See the graph on the grid below

(a) Slope = $\frac{D u + v \sqrt{1}}{D uv}$

$D uv$

= $\frac{(78 - 75)cm \sqrt{1}}{1400 - 1328}$ must be shown on the graph.

= $\frac{4}{72cm}$

= $\frac{1}{18cm^{-1}}$

= $0.05556cm^{-1} \sqrt{1}$

03

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

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

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

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

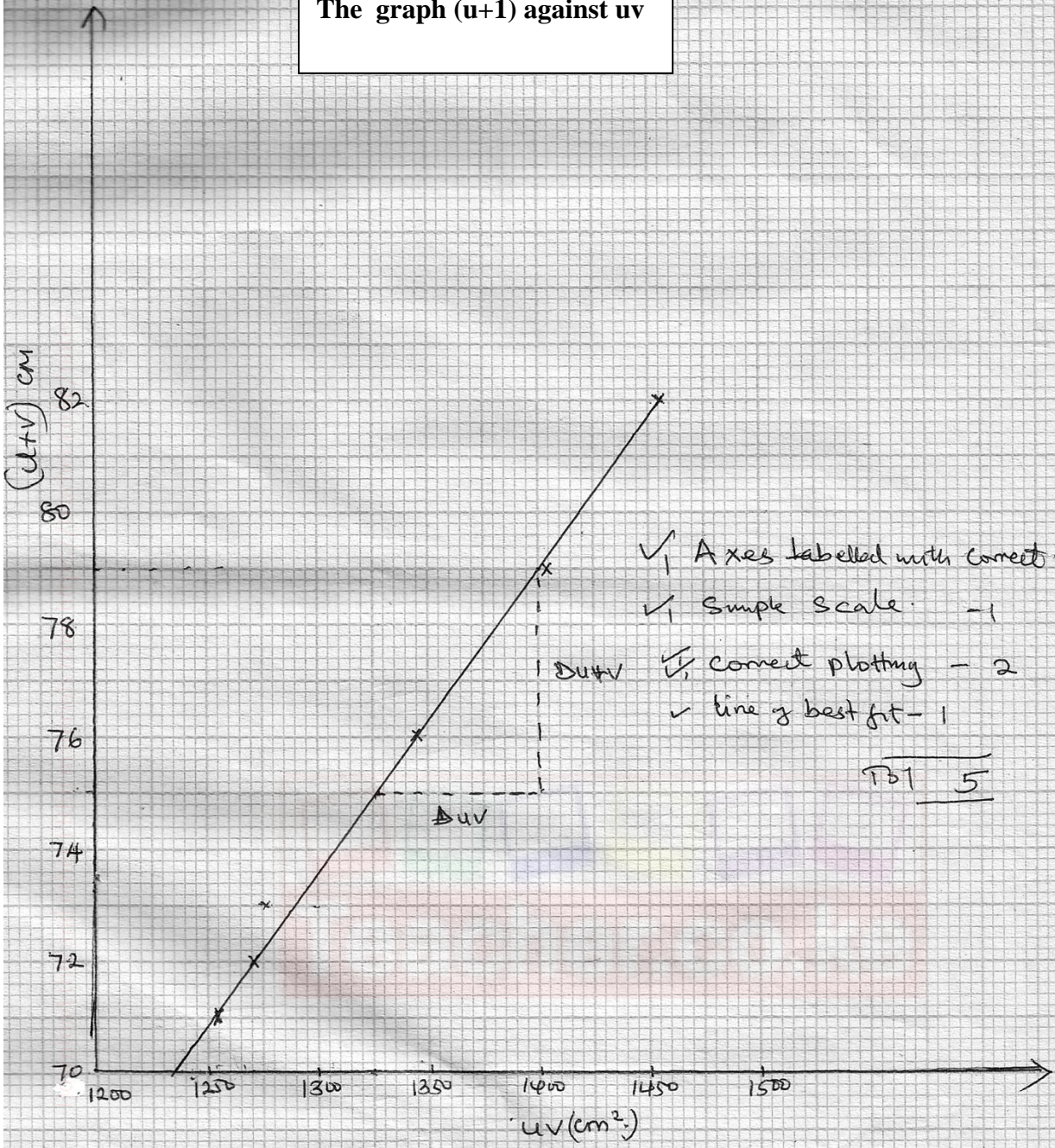
$$1/f = 0.05556cm^{-1}$$

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

(c) $R = \frac{4 \times 18cm \sqrt{1}}{0.05556cm^{-1}}$ correct substitute

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

The graph (u+1) against uv



- ✓ Axes labelled with correct units - 1
- ✓ Simple scale - 1
- ✓ correct plotting - 2
- ✓ line of best fit - 1

7
5

Question2

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

± 0.1

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

√1mrk √3mrks √3mrks √3mrks √1mrk Total =8mrks

(iv) See the graph on the grid provided

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

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

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

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

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

A = r²

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

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

