**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  ± 2 -3mrks  ± 2 -3mrks  -1mrk  -1mrk  Total 8mrks |
| u (cm) | 33.0 | 31.0 | 29.0 | 28.0 | 27.0 | 26.0 |
| 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 |
| uv (cm2) | 1254 | 1271 | 1276 | 1344 | 1404 | 1456 |

(vi) See the graph on the grid below

1. Slope = D u + v√ 1

D uv

= (78 – 75)cm√ 1 must be shown on the graph.

1400 -1328

= 4

72cm

= 1

18cm-1

= 0.05556cm-1√ 1

03

1. 1/f = 1/u + 1/v

1/f = u +v

Uv

u+v = uv/f √1 correct evaluation

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

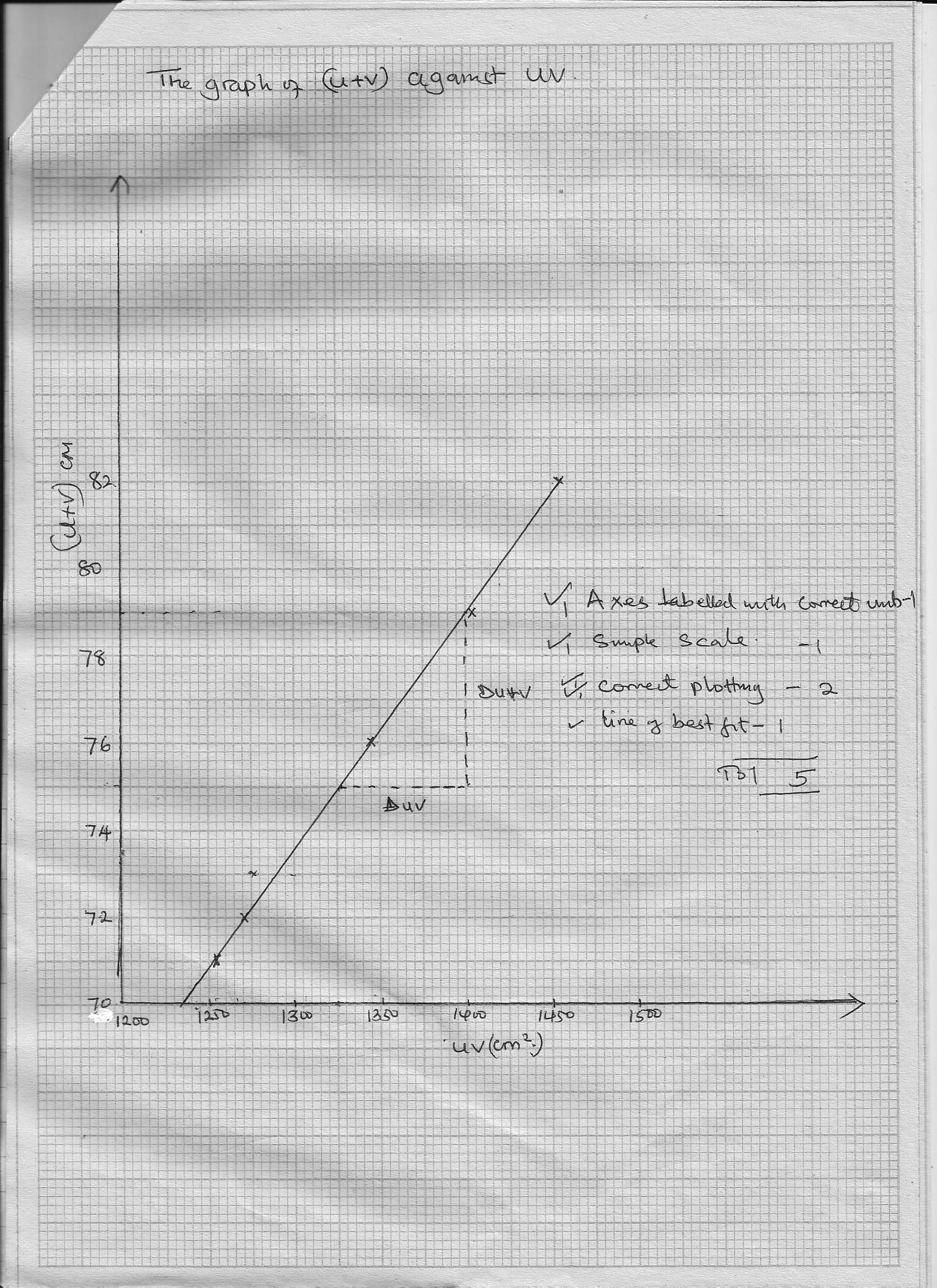
1/f = 0.05556cm2

F= 18cm√ 1

1. R = 4 x 18cm√1 correct substitute

0.05556cm-1

R = 23328cm2√ 1 correct answer



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

**Question2**

1. Average diameter = 0.35 +n 0.01 mm√ 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 |

± 0.1 ±0.05

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

(iv) See the graph on the grid provided

1. Slope = DR

Dt√ 1

= (3.0 – 1.5)Ω

0.4 – 0.2 M √1

= 1.5Ω

0.2M

= 7.5Ω M-1

(b) R = R ℓ L/A

A =r2

=3.142 x 0.35 x 0.35

2 2

A= 0.09622x10-6 m2√ 1 for area of cross-section of the wire slope of the graph e/A

E = slope x a √1

= 7.5 Ω m-1 x 9.622 x10-9 m2

= 7.2165 x 10-5Ω M√1 with correct units

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

