**232/3/**
**PHYSICS**
**PAPER 3**

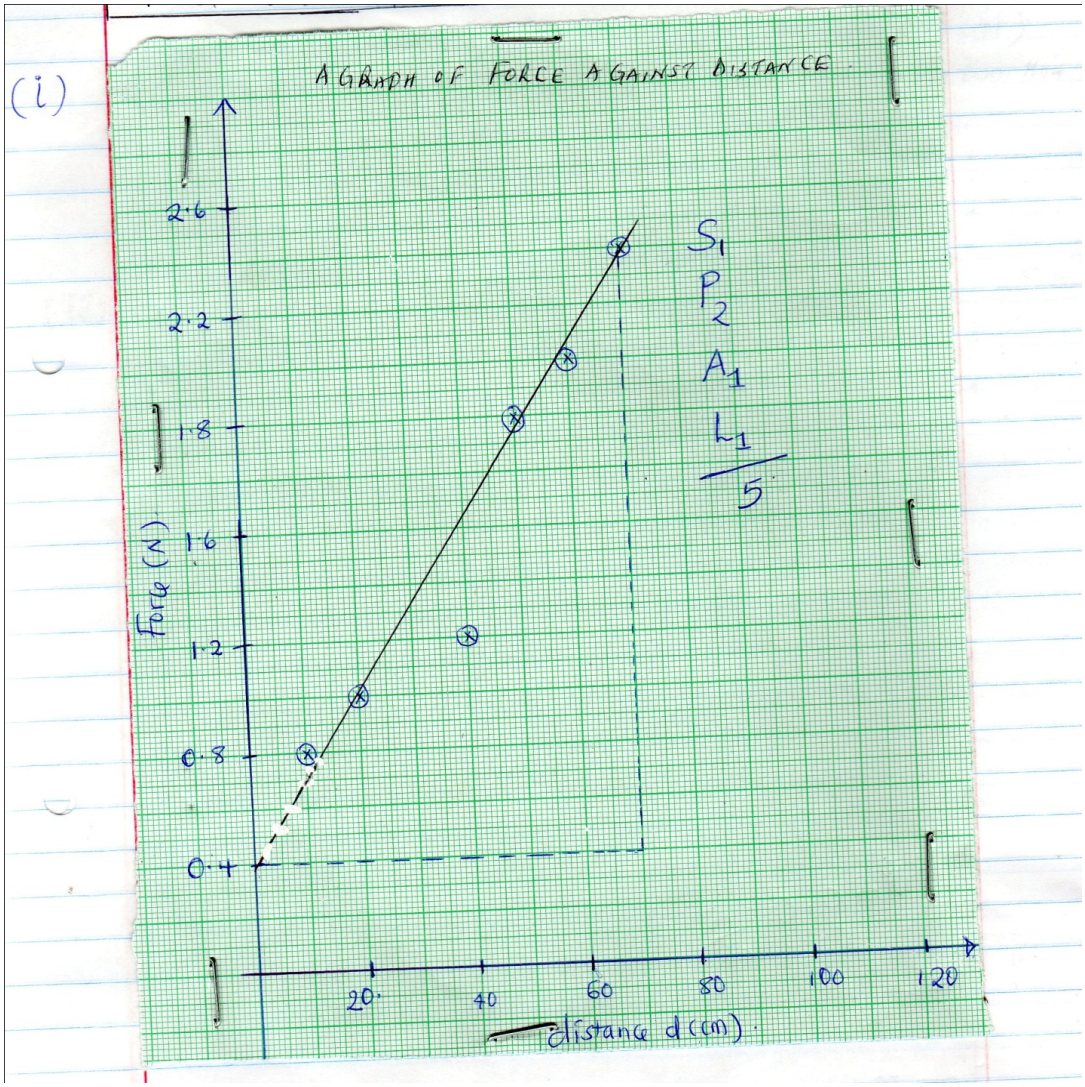
**MARKING SCHEME**

1. e)

| Distance (cm) | 10 | 20 | 30 | 40 | 50 | 60 | 70 |
|---|---|---|---|---|---|---|---|
| Force (N) | 0.8 | 1.0 | 1.2 | 1.2 | 1.8 | 2.0 | 2.4 |

±0.01 1mark for each correct value -max. 7marks

f)



g) (i) The slope

(0, 0.4) (70, 2.4) ½ mk for each change

$= \underline{2.0}$

$70 \times 10^{-2}$

$= 2.857$ N/cm 1mk for evaluation, with units ,4s.f or exact

Or $2.857 \times 10^{-2}$ N/M

ii) When d = 0, Force = 0.4N i.e the y – intercept

(1mk for identify it's a value for y – intercept)

(1mk for correct reading from the graph)

h) Comparing $y = mx + c$ with $F = 2md + 40k$

Then gradient = 2m

$2.857 = 2m$

$\frac{2.857}{2} = m$

Y= intercept = 40k

$= \frac{0.4}{40} = \frac{40k}{40}\sqrt{1}$

$= \frac{0.04}{40}$

0.01 N√1

2. a) i) $V_1 = 3.1 \pm$ Volts ✓ (1mk) (at least 1 d.p)

ii) $V_2 = 2.6 \pm 0.1$V ✓ (1mk) (at least 1 d.p)

$I_1 = 0.12 \pm 0.02$A ✓ (1mk)

iii) $P = \frac{3.1-2.6}{0.12}$ *Substitution* ✓ (1mk)

$= 4.167\Omega (1mk)$

b) i) V = 2.2 ±V 0.1 ✓ (1mk) (at least 1 d.p)

I = 0.22 ±0.02A ✓ (1mk)

ii) $R = \frac{2.2}{0.22}$ $= 10\Omega$ ✓

1mk for ohms law/ substitution

1mk correct evaluation with correct unit

e)

| Temp L (cm) | 100 | 80 | 60 | 40 |
|---|---|---|---|---|
| Length ¼ ($^1/_{cm}$) | 0.01 | 0.0125 | 0.01667 | 0.025 |
| Voltmeter Reading (V) | 1.5 | 1.3 | 1.1 | 0.9 |
| $^1/_V$ ($^1/_V$) | 0.6667 | 0.7692 | 0.9091 | 1.111 |
| $Z = \frac{\frac{1}{L}}{\frac{1}{V}}$ **V/cm** | 0.01496 | 0.01625 | 0.01834 | 0.02250 |

Allow both rounding off and truncation

- Correct conversion of 1/L ✓ (1mk)
- Voltmeter Reading within range ✓ ($^1/_2$mk each) to a max of 2mks
- Correct evaluation of $^1/_V$ ✓ (1mk)
- Correct evaluation of Z ✓ (1mk)

g) $f = 20.0 \pm 1.0$ cm  1mk 1d.p a must

(j)

| | | |
|---|---|---|
| U (cm) | 40.0 | 50.0 |
| V (cm) | 41.0 | 34.0 |
| Magnification m=v/u | 1.025 | 0.68 |