**PHYSICS PP3 SCHEME**

a) iii) **PART A**

 **Table III**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **L(cm)**  | 100 | 80 | 60 | 40 | 20 | 0 |
| **V(volts)** | 0.5 – 0.70.08 – 0.12 | 0.6 – 1.00.13 – 0.17 | 0.7 – 1.10.18 –1 0.22 | 0.8 – 1.20.33 – 0.37 | 0.9 – 1.30.68 – 0.72 | 1.1 – 1.51.23 – 1.27 |
| **I (A)**  | 0.12 – 0.160.04 – 0.08 | 0.14 – 0.180.06 – 0.10 | 0.15 – 0.190.08 – 0.12 | 0.16 – 0.200.12 – 0.16 | 0.17 – 0.210.14 – 0.18 | 0.18 – 0.220.16 – 0.20 |

Try both tables and use the one that gives advantage to the candidate . For each correct value / entry give 🗸 ½ for a maximum of 5 for both v and I

**Total (5mrks)**

 iv)

 Axes :- should be well labeled with correct units 🗸1

 Scale :- Simple and uniform🗸1

Plotting : correct should be smooth and passing through at least 3 correctly plotted points within 1 small square🗸1

 ***N/B curve should be continuous***

 **Total (5mrks)**

1. For drawing a tangent at I = 0.15A 🗸1

Slope = ΔV

 ΔI

 = 0.85 - 0.65 🗸 ½ correct intervals from tangent

 0.175 – 0.13

 = 4.4444 V/A

 Or 4.4444 Ω 🗸 1 For correct evaluation to 2 d.p rounded or truncating

 🗸 ½ For units

***N/B if curve is wrong***

***i.e Co, this part is awarded zero.***

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0.12 0.13 0.14 0.15 0.16 0.17 0.18 0.19 0.20 0.21

 I (A)

 b) (viii)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Angle i0 | 10 | 20 | 30 | 40 |
| Distance x (cm) | 5.2 | 4.5 | 3.9 | 3.4 |

 (ix) b = 6.2 cm✓

 (x) Ax = 4.25 cm ✓

 (xi) Refractive index = 6.2✓ = 1.45 ± 0.05✓

 4.25

1. **iii)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Length from A to B (cm) | 80 | 76 | 72 | 68 | 64 | 60 |
| Time for 10 oscillations(s) | 10 | 11 | 12 | 13 | 14 | 15 |
| Period time T (s) | 1.0 | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 |
| T2(S2) | 1.00 | 1.21 | 1.44 | 1.69 | 1.96 | 2.25 |
| 2θ | 1500 | 1380 | 1300 | 1080 | 1040 | 960 |
| θ | 750 | 690 | 650 | 540 | 520 | 480 |
| Cos θ | 0.2588 | 0.3883 | 0.4226 | 0.5878 | 0.6157 | 0.6691 |

f)

 **g)** $Slope s=\frac{change in y}{change in x}=\frac{∆y}{∆x}=\frac{1.5-1.0}{50-25}=2$

 **h)** $K=\frac{1.6π^{2}}{s}=\frac{1.6x\left(\frac{22}{7}\right)^{2}}{2}=0.8x\left(\frac{22}{7}\right)=7.9$