Physics practical marking scheme

Question 1

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|  |  | Marks |
| A1 | Value of t = (37.0 – 39.0)Sc:idp,sw:2dp; unit:s | 1 ½ |
| A2 | Correctly calculated To,Sc:2dp,SW:3dp;units:s | 1 |
| A3 | Correctly calculated g1 = (9.30 – 10.4)  2dp if g1 < 10.0, 1dp if g1 ≥10.0  (provided correct SI units subs in g1 = 4∏2lo) unit : ms-2  To2 | 1 ½ |
| B1 | Length l measured atleast 3 times | ½ |
| B2 | Value of l = 69.5 – 70.5, unit: cm | 1 ½ |
| B3 | Columnar table of: Ө2, h, time for 20 oscillations, T1, T2 f2 (*each ½ mark)* | 3 |
| B4 | Indication of units :o, cm, s, s, s2, Hz2 (*@ ½* ) | 3 |
| B5 | Values of h, 1dp (increasing) (*@ ½*) | 3 |
| B6 | Values of time for 20 oscillations  35.0 – 19.0, SC 1dp, SW 2dp, decreasing, diff between cons values 1.0 – 4.0 (if all diff are const, zero marks) @ ½ | 3 |
| B7 | Correctly calculated values of T, SC:2dp, SW:3dp @ ¼ | 1 ½ |
| B8 | Correctly calculated values of T2, SC: 2dp, SW: 3dp @ ¼ | 1 ½ |
| B9 | Correctly calculated values of f2: SC:3dp, SW:4dp @ ¼ | 1 ½ |

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| **Ө(o)** | **h(cm)** |
| 150 | 7.9 – 11.9 |
| 140 | 11.4 – 15.4 |
| 130 | 13.7 – 17.7 |
| 120 | 15.6 – 19.6 |
| 100 | 21.1 – 25.1 |
| 70 | 30.0 – 34.0 |

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|  |  | **Marks** |
| C1 | Title of graph: A graph of f2 against h(no units) | ½ |
| C2 | Perpendicular axes drawn with arrows, correctly labelled i.e vertical axis: f2(Hz2), horizontal axis: h(cm) or h(m) @ ½ | 1 |
| C3 | Uniform scale covers ½ or more, starting values indicated, each axis marked @ ½ | 1 |
| C4 | Correctly plotted points, no thick dots, not\*, axes uniform, axes correctly labelled @ ½ | 3 |
| C5 | Line of best fit drawn, provided at least 4 points are correctly plotted | ½ |
| C6 | Triangle for slope S covers all points, must touch line of best fit. | ½ |
| C7 | Correctly calculated slopes = 1.0 – 2.0, 1dp/2dp (provided coordinates are correctly read, not table values) unit: Hz2m-1 | 1 ½ |
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| D1 | Correctly calculated g2 = (9.3 – 10) 1dp if g2 <10, 0dp if g2 = 10 (provided correct SI units subs in g2 = 2.00∏2l2 units: ms-2  0.695 | 1 ½ |
| D2 | Correctly calculated g = (9.30 – 10.4), 2dp if g < 10.0,  1dp if g ≥ 10.0 (provided correct subs in g = (g1 + g2) unit : ms-2  2 | 2 |
|  | **Total marks = 34** |  |
| Question 2 | |  |
| A1 | Length y measured at least three times | ½ |
| A2 | Value of y = (10.00 – 12.00), 2dp; unit: cm | 1 ½ |
| A3 | Value of ho = (2.9 – 4.5), 1dp; unit: cm | 2 |
| A4 | Correctly calculated µ = (1.4 – 1.6), 1dp (provided correct subs in  (y – ho) = y , no unit  µ | 2 |
|  |  | 6 |
|  |  |  |
| B1 | Columner table of :l, ……., (l - …..), sin(I - ……), cos…., dcos….. @ ¼ | 2 |
| B2 | Indication of units; o, o, cm, o, \_\_, \_\_, cm @ ¼ | 2 |
| B3 | Values of …., 0dp (increasing) @ ½ | 3 |
| B4 | Values of d, 1dp (increasing) @ 1 | 6 |
| B5 | Correctly calculated values of (l - ….) 0dp @ ¼ | 1 ½ |
| B6 | Correctly recorded values of sin(I - ….), 3dp @ ¼ | 1 ½ |
| B7 | Correctly recorded values of cos…., 3dp @ ¼ | 1 ½ |
| B8 | Correctly calculated values of dcos…, 1dp @ ¼ | 1 ½ |
|  |  | 19 |

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| **i(o)** | **…..(o)** | **d(cm)** |
| 20 | 12 – 16 | 0.5 – 0.9 |
| 30 | 18 – 22 | 1.0 – 1.4 |
| 40 | 23 – 27 | 1.6 – 2.0 |
| 50 | 28 – 32 | 2.3 – 2.7 |
| 60 | 32 – 36 | 3.1 – 3.5 |
| 70 | 35 - 39 | 4.0 – 4.4 |

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|  |  | Marks |
| C1 | Title of graph: A graph of dcos….against sin(i-…) (no units | ½ |
| C2 | Perpendicular axes drawn with arrows correctly labelled i.e vertical axis : dcos…9cm), horizontal axis : sin (i - …..) @ ½ | 1 |
| C3 | Uniform scale covers ½ or more, starting values indicated, each axis marked @ ½ | 1 |
| C4 | Correctly plotted points, no thick dot, not\*, axes uniform, axes correctly labelled. @ ½ | 3 |
| C5 | Line of best fit drawn, provided at least 4 points are correctly plotted. | ½ |
| C6 | Triangle for slope b covers all points, must touch line of best fit | ½ |
| C7 | Correctly calculated slope b = 6.0 – 7.0, 0dp or 1dp (provided coordinates are correctly read, not table values), unit : cm | 1 ½ |
|  |  | 8 |
|  | **Total** **Marks 33** |  |
|  | Question 3 |  |
| A1 | Value of Vo = (2.00 – 2.70) 2dp | 1 |
| A2 | Value of Io = (0.20 – 0.32) 2dp | 1 |
| A3 | Correctly calculated D1 = (0.29 – 0.33) x 10-3  Provided correct SI unit subs in D1 = 10.4 x 10-4 (IoXo )½ unit  Vo | 1 ½ |
|  |  | 3 ½ |
| B1 | Value of R = 10, unit :….. | 1 |
| B2 | Columnar table of: X, L1, L2, 1 , L2 @ ½  X L1 | 2 ½ |
| B3 | Indication of units: m, cm, cm, m-1, \_\_@ ½ | 2 ½ |
| B4 | Values of L1 = 55.0 – 15.0) 1dp, decreasing 1st four differences  1.5 – 6.0, last diff 6.0 – 10.0, @ 1 | 6 |
| B5 | Values of L2, 1dp @ ¼ | 1 ½ |
| B6 | Correctly calculated values of 1 , 2dp @ ¼  X | 1 ½ |
| B7 | Correctly calculated values of L2, 2dp if 1st value of L1 < 50.0, 3dp if  L1  1st value L1≥ 50.0 @ ¼ | 1 ½ |
|  |  | 16 ½ |
| C1 | Title of graph: A graph of 1 against L2 (no units)  X | ½ |
| C2 | Perpendicular axes drawn with arrows correctly labelled i.e vertical axis: 1 (m-1), horizontal axis: L2 @ ½  X L1 | 1 |
| C3 | Uniform scale covers ½ or more, starting values indicated, each axis marked @ ½ | 1 |
| C4 | Correctly plotted points, no thick dots, not\*, axes uniform, axes correctly labelled @ ½ | 4 |
| C5 | Line of best fit drawn, provided atleast 4 points are correctly plotted. | ½ |
| C6 | Triangle for slope β covers all points, must touch line of best fit | ½ |
| C7 | Correctly calculated slope β = 1.00 – 3.00, 2dp  (provided coordinates are correctly read, not table values), unit:m-1 | 1 ½ |
|  |  | 8 |
|  |  |  |
| E1 | Correctly calculated D2 = (0.290 – 0.330) x 10-3  Provided correct subs in D2 = 1.35 x 10-3 , unit: m  (BR)½ | 1 ½ |
| E2 | Diameter D3 measured atleast three times | ½ |
| E3 | Value of D3 = (0.29 – 0.33)x10-3 | 1 ½ |
| E4 | Correctly calculated D = (0.29 – 0.33) x 10-3  Provided correct subs in D = D1 + D2 + D3 unit: m  3 | 1 ½ |
|  |  | 5 |
|  | **Total marks = 33** |  |