**S5 PAPER 3 NOV 2013 Guide**

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| **QUESTION 1** | | |
| **Code** | **Points to score** | **Marks** |
| A1  A2  A3  A4  A5 | Xo recorded to 3 decimal places in metres ½ + ½  Columnar table of M, X and X – Xo …. All  Correct units for the columns: (kg), (m) and (m) …… All  Values of X recorded to 3 decimal places in metres …….@¼  Correct calculation of X – Xo: increasing, 1st diff. ≥ 3.3, last diff. ≤ 30.6 cm .. @½ | 1  1  1  1½  3 |
|  |  | **5½** |
| B1  B2  B3  B4  B5  B6  B7  B8 | Title of the graph: *A graph of (X – Xo) against M*  Axes: Each drawn with an arrow in the increasing direction, each labeled with quantity and unit ……….. ½ + ½    Scales: Uniform, each spanning at least ½ pg, demarcations marked, starting values  indicated ………... ½ + ½  Points correctly plotted: no shading ……….@½  Best fit : marked if at least 4 points were correctly plotted  Indication of triangle or equivalent for calculating s1, covering all points  s1 correctly calculated if the coordinates were correctly read and  0.35 ≤ s1 ≤ 0.45 m kg-1 recorded to 2 or 3 decimal place …….. 1 + ½  K correctly calculated if correct substitution is available and 22.0 ≤ K ≤ 28.0 kg s-2 or Nm-1 , recorded to 0 or 1 decimal place ………….. 1 + ½ | ½  1  1  3  ½  ½  1½  1½ |
|  |  | **9½** |
| C1  C2  C3  C4  C5  C6 | Columnar table of M, t, f, f2, 1/f2 …………. @¼  Correct units for the columns: (kg), (s), (Hz), (Hz2), (s2) ….. @¼  t recorded to 2 decimal places, increasing between 7.00 and 22.0 s ….. @½  f correctly calculated to 2 decimal places …… @¼  f2 correctly calculated to 1 decimal place …… @¼ | 1  1  3  1½  1½  1½ |
|  |  | **9½** |
| D1  D2  D3  D4  D5  D6  D7  D8  D9 | Title of the graph: *A graph of  against M*  Axes: Each drawn with an arrow in the increasing direction, each labeled with  quantity and unit ………..    Scales: Uniform, each spanning at least ½ pg, demarcations marked, starting values  indicated ………... ½ + ½  Points correctly plotted: no shading ……….@½  Best fit : marked if at least 4 points were correctly plotted  Indication of triangle or equivalent for calculating s1, covering all points  s2 correctly calculated if the coordinates were correctly read and 1.40 ≤ s2 ≤ 1.80 s2kg-1 recorded to 1 or 2 decimal places ……. 1 + ½  C correctly read and 0 ≤ C ≤ 0.04 to 2 or 3 decimal places …… ½ + ½  mo correctly calculated if correct substitution is available and 0 ≤ mo ≤ 0.010 kg , recorded to 0 or 1 decimal place ………….. 1 + ½ | ½  1  1  3  ½  ½  1½  1  1½ |
|  |  | **10½** |
| ***Total = 35*** | | |

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| **QUESTION 2** | | |
| A1  A2  A3  A4  A5  A6  A7 | Columnar table of β, a, b, r sin r and a/b …….. @¼  Correct units for the columns: (o), (cm), (cm), (o), - , - …. @¼  a: (12.3 – 13.5), (8.1 – 9.1), (5.6 – 6.4), (4.0 – 4.4), (2.6 – 3.0), (1.4 – 1.8)  decreasing, recorded to 1 decimal place in cm ……………@1  b: (13.6 – 14.8), (10.0 – 10.7), (8.1 – 8.9), (7.0 – 7.6), (6.4 – 6.8), (6.0 – 6.4)  decreasing, recorded to 1 decimal place in cm ……………..@1  r: (32 – 40), (29 – 35), (25 – 30), (20 – 24), (14 – 17), (8 – 10), decreasing,  recorded to 1 decimal place in cm ……………….@1  sin r correctly read to 3 decimal places …….. @¼ | 1½  1½  6  6  6  1½  1½ |
|  |  | **24** |
| B1  B2  B3  B4  B5  B6  B7 | Axes: Each drawn with an arrow in the increasing direction, each labeled with  quantity and unit ………..    Scales: Uniform, each spanning at least ½ page, demarcations marked, starting  values indicated ………... ½ + ½  Points correctly plotted: no shading ……….@½  Best fit : marked if at least 4 points were correctly plotted  Indication of triangle or equivalent for calculating n, covering all points  n correctly calculated if the coordinates were correctly read and  1.40 ≤ n ≤ 1.60 (no unit) recorded to 2 or 3 decimal place ….. 1 + ½ | 1  1  3  ½  ½    1½ |
|  |  | **8** |
| ***Total = 32*** | | |