(Adopted from UNEB 2009)

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| **QUESTION 1** | | |
| **Code** | **Points to score** | **Marks** |
| A1  A2  A3  A4  A5 | Diameter for r recorded to 2 decimal places in mm & is 0.50 – 0.70 mm ½ + ½  R calculated to 5 decimal places in m ½ + ½  Diameter for R recorded to 2 decimal places in mm & is 9.00 – 11.00 mm ½ + ½  R calculated to 5 decimal places in m ½ + ½  N = 47 – 51 | 1  1  1  1  1 |
|  |  | **5** |
| B1  B2  B3  B4  B5  B6  B7  B8 | Initial position of the pointer recorded to 1 decimal place in cm ½  Columnar table of M, new position of pointer, x, t, T and T2 @  Units: kg, cm (or m), m, s, s and s2 @  New position of the pointer recorded to 1 decimal place in cm (or 3 pd in m) @  Values of x calculated to 3 decimal places in metres – increasing. @  Values of t increasing: 8.00 – 20.00 recorded to 2 decimal places in s @  T correctly calculated to 3 or 4 decimal places @  T2 correctly calculated to 3 or 4 decimal places (consistent with B7) @ | ½  1½  1½  3  1½  3  1½  1½ |
|  |  | **14** |
| C1  C2  C3  C4  C5  C6  C7  C8 | Title of the graph: *A graph of M against x*  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 : awarded 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  2.90 ≤ s1 ≤ 3.20 kg m-1 recorded to 1 or 2 decimal places …….. 1 + ½  n1 correctly calculated if correct substitution is available and  1.0 x 1011 ≤ n1 ≤ 1.4 x 1011 kg m-1 s-2, recorded to 0 or 1 decimal place ... 1 + ½ | ½  1  1  3  ½  ½  1½  1½ |
|  |  | **9½** |
| D1  D2  D3  D4  D5  D6  D7  D8 | Title of the graph: *A graph of T2 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 : awarded if at least 4 points were correctly plotted  Indication of triangle or equivalent for calculating s2, covering all points  s2 correctly calculated, if the coordinates were correctly read and  1.00..≤ s2 ≤ 1.40…s2 kg-1 recorded to 1 or 2 decimal places …….. 1 + ½  n2 correctly calculated if correct substitution is available and  1.0 x 1011 ≤ n2 ≤ 1.4 x 1011 kg m-1 s-2 , recorded to 0 or 1 decimal place ... 1 + ½ | ½  1  1  3  ½  ½  1½  1½ |
|  |  | **9½** |
| E1  E2 | Substitution into w = ½(n1 + n2)  w correctly calculated to 1 or 2 decimal places and is  1.0 x 1011 - 1.4 x 1011 kg m-1 s-2 ….. … 1 + ½ | ½  1½ |
|  |  | **2** |
| ***Total = 40*** | | |