1.

Mass m(g)	m(kg)	Time for 10 oscillations	Period T(s)	T^2S^2
20	0.20	3.00 ± 1	0.3	0.09
40	0.40	3.50	0.35	0.123
60	0.60	4.00	0.40	0.16
80	0.80	5.00	0.50	0.25
100	1.00	5.100	0.51	0.26
120	1.20	6.00	0.60	0.36

(f) - Correct labelling plus units. √ (1mark)

-Simple and uniform scale.√ (1mark)

-Plotting ½ mark each maximum.√ (2marks)

-Best line of fit through at least 3 correctly plotted points. √ (1mark)

(g) (i) P=slope.√ (1mark) correctly intervals from candidates graph.√ (1mark)

Accuracy 3.33 s2/kg1√ (1mark) (ii) Q=T2 –intercept.√ (1mark)

-correct value of Q read from candidates graph.√ (1mark) -accuracy 0.9+ 0.1√ (1mark)

2. (a) (i) D=2.11 $\pm$0.01 cm √**(1mark)**

(ii) $A = \pi r^2$

$= 3.142 \times (1.06)^2$ **(½mark)**

$= 3.56\,cm^2$ **(½mark)**

Mass of ball bearings(g)	0	1	2	3	4	5	6
Change in height (h) cm	3.5	3.7	3.9	4.2	4.5	4.7	4.9 ± 0.4

(d) (i) -Labelling of axis plus correct units.√ (1mark)

-Scale simple and uniform.√ (1mark)

-Plotting ½ each maximum.√ (2marks)

-Straight line passing through at least 3 correctly plotted points.√ (1mark)

(e) (i) A=gradient.√ (1mark)

-Correct intervals.√ (½mark)

-Correct evaluation to 2 d.p min. (½mark)

-Accuracy 3.85 ± 0.2 g/cm^3√ 3√ (1 mark)

(ii) m_0 Intercept.√ (1 mark)

- Correctly read from the candidate's graph.√ (1mark)