Question number	Answer	Notes	Marks
8 (a)	Callisto drawn with a circular orbit around Jupiter; Jupiter positioned at the centre of the orbit;	judge circular shape by eye	2
(b)	conversion of time from hours to seconds; substitution into orbital speed formula; evaluation; final answer given to 3s.f.; e.g. time = (400 × 60 × 60 =) 1 440 000 (s) (orbital speed =) 2 × π × 1 880 000 / 1 440 000 (orbital speed =) 8.203… (km/s) (orbital speed =) 8.20 (km/s)	allow use of 1 440 000 seen anywhere allow ecf from incorrect time conversion mark independently	4
(c) (i)	any one from: MP1. Callisto has a larger radius; MP2. Callisto has a lower density; MP3. Callisto has a smaller core;	allow RA allow Callisto is larger ignore references to orbital radius/distance from Sun	1
(ii)	use of weight = mass × g; setting up ratio OR evaluation of mass of object; evaluation of weight on Callisto; e.g. $W = m \times g$ $W_c / g_c = W_m / g_m$ OR m = 37 (kg) (W_c =) 44 (N)	seen anywhere in working answer of 78-79 gets 2 marks allow 44.3, 44.25	3

Total for Question 8 = 10 marks