Question			Expected response	Max mark	Additional guidance
4.	(a)		$(\text{distance}=6\cdot4\times10^{6}+36\cdot0\times10^{6})$ $=42\cdot4\times10^{6}$ m	1	
	(b)		$F=G\frac{m_1m_2}{r^2}$ **(1)** $57=6\cdot67\times10^{-11}\times\frac{6\cdot0\times10^{24}\times m_2}{(42\cdot4\times10^{6})^2}$ **(1)** $m_2=260$ kg **(1)**	3	Or consistent with (a) Accept: 300, 256, 256·1
	(c)		$W=mg$ **(1)** $57=260\times g$ **(1)** $g=0\cdot22$ N kg^{-1} **(1)**	3	Or consistent with (b) Accept: 0·2, 0·219, 0·2192 Accept: $F=mg$ Do not accept: $F=ma$ - **(0 marks)** Alternative method: $g=G\frac{M}{r^2}$ **(1)** $g=6\cdot67\times10^{-11}\times\frac{6\cdot0\times10^{24}}{(42\cdot4\times10^{6})^2}$ **(1)** $g=0\cdot22$ N kg^{-1} **(1)**
	(d)		Force is the same **(1)** ¼ the mass has an effect of quartering the force **(1)** ½ the orbital height has an effect of quadrupling the force **(1)**	3	Look for this statement first - if incorrect or missing then 0 marks. Can justify by calculation Correct substitution of $\frac{1}{2}r$ and $\frac{1}{4}m$ or consistent with (a) and (b) **(1)** Correct final answer **(1)**