Density Mark Scheme

Q1.

Question Number	Acceptable Answer	Additional Guidance	Mark
	• Use of $V = \frac{4}{3}\pi r^3$ (1) • Use of $\rho = \frac{m}{V}$ (1) • $\rho = 2580\ (\text{kg m}^{-3})$ (1)	Example of calculation $V = \frac{4}{3}\pi\left(\frac{5.06 \times 10^{-2}\ \text{m}}{2}\right)^3 = 6.78 \times 10^{-5}\ \text{m}^3$ $\rho = \frac{0.175\ \text{kg}}{6.78 \times 10^{-5}\ \text{m}^3} = 2580\ \text{kg m}^{-3}$	3

Q2.

Question Number	Acceptable answers	Additional guidance	Mark
(a)	• use of density = mass / volume (1) • use of $V = 4/3\ \pi r^3$ (1) • $r =$ 1720 m (1)	Example of calculation: $V = 1.0 \times 10^{13}\ \text{kg} \div 470\ \text{kg m}^{-3}$ $= 2.13 \times 10^{10}\ \text{m}^3$ $= 4/3\ \pi r^3$ $r = \sqrt[3]{(2.13 \times 10^{10}\ \text{m}^3 \times 3) \div 4\pi}$ $= 1720$ m	(3)

Q3.

Question Number	Acceptable answers	Additional guidance	Mark
(i)	• Use of $\rho = \frac{m}{V}$ (1) • $V = 8.1 \times 10^{-6}\ (\text{m}^3)$ (1)	Example of Calculation. $V = \frac{0.043\ \text{kg}}{5300\ \text{kgm}^{-3}}$ $V = 8.1 \times 10^{-6}\ \text{m}^3$	2