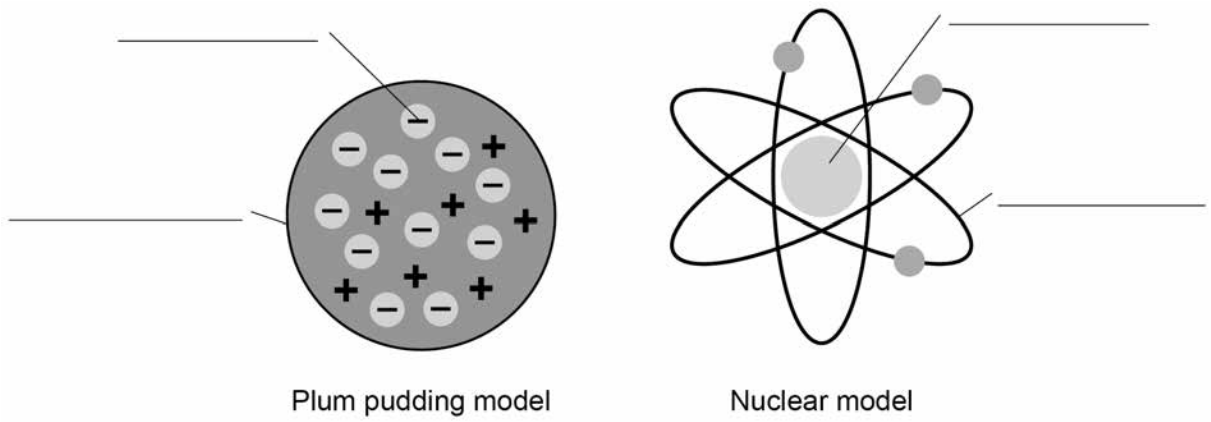
Do not write outside the box

0 6 **Figure 9** shows two models of the atom.

Figure 9



0 6 . 1 Write the labels on **Figure 9**

Choose the answers from the box.

[4 marks]

atom	**electron**	**nucleus**
neutron	**orbit**	**proton**

0 6 . 2 Explain why the total positive charge in every atom of an element is always the same.

[2 marks]

_____

_____

_____

_____

Question 6 continues on the next page

Do not write outside the box

0 6 . 3 The results from the alpha particle scattering experiment led to the nuclear model.

Alpha particles were fired at a thin film of gold at a speed of 7% of the speed of light.

Determine the speed of the alpha particles.

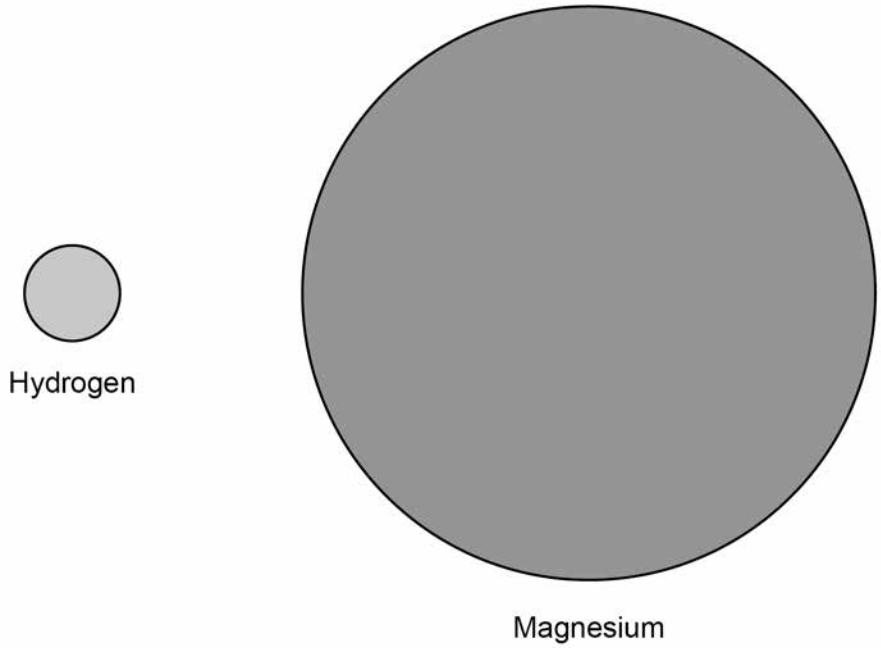
Speed of light = 300 000 000 m/s

[2 marks]

Speed = _____ m/s

0 6 . 4 **Figure 10** shows two atoms represented as solid spheres.

Figure 10



A hydrogen atom has a radius of 2.5×10^{-11} m

Determine the radius of a magnesium atom.

Use measurements from **Figure 10**

[2 marks]

Radius = _____ m

10

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.1	electron atom nucleus orbit		1 1 1 1	AO1 6.4.1.3 5.1.1.3
06.2	positive charge is provided by protons (every atom of the same element contain the) same number of protons	 do **not** accept same number of protons and neutrons ignore reference to electrons	1 1	AO1 6.4.1.2 6.4.1.3
06.3	$v = 300\ 00\ 000 \times \left(\frac{7}{100}\right)$ v = 21 000 000 (m/s)	an answer of 21 000 000 scores **2** marks allow any correct method of determining 7% of 300 000 000 allow 2.1×10^7 (m/s)	 1 1	AO2 6.4.1.3
06.4	$r = 6 \times 2.5 \times 10^{-11}$ $r = 1.5 \times 10^{-10}$ (m)	an answer in the range 1.4×10^{-10} to 1.6×10^{-10} scores **2** marks allow a ratio in the range of 5.7–6.3 or measurements that would give this range, correctly substituted allow 1.4×10^{-10} to 1.6×10^{-10} their ratio × 2.5×10^{-11} correctly calculated scores **1** mark	 1 1	AO2 6.4.1.1
Total			**10**	