Oxford Cambridge and RSA

GCSE Chemistry B (Twenty First Century Science)

J258/03 Breadth in chemistry (Higher Tier)

Question Set 19

1 This question is about Rutherford's model of the atom.

Rutherford's model describes:
- a small positive nucleus
- the nucleus surrounded by empty space
- electrons orbiting in this empty space.

(a) Thomson's 'plum pudding' atom was an earlier model of the atom.

Describe **one** way in which Thomson's model of the atom was different from Rutherford's. **[1]**

(b) Rutherford asked Hans Geiger and Ernest Marsden to do an experiment to test his model.

They fired positive particles at a piece of gold foil.

What did they see that surprised them?

Tick (✓) **one** box.

All the positive particles went straight through. ☐

Some positive particles lost their charge. ☐

Many positive particles 'bounced back'. ☐

Very few positive particles 'bounced back'. ☐

[1]

(c) A nut has an average diameter of 2 cm.

The diameter of an atom is on average 50 000 times bigger than the diameter of its nucleus.

Estimate the diameter of the nucleus if the atom is as big as the nut.

Give your answer in metres **and** in standard form.

Diameter = ... m **[2]**

Total Marks for Question Set 19 : 4