

Section A

Answer **all** questions in this section.

1 This question is about the elements in Group 2 and their compounds.

0 1 . **1** Use the Periodic Table to deduce the full electron configuration of calcium.

[1 mark]

0 1 . **2** Write an ionic equation, with state symbols, to show the reaction of calcium with an excess of water.

[1 mark]

0 1 . **3** State the role of water in the reaction with calcium.

[1 mark]

0 1 . **4** Write an equation to show the process that occurs when the first ionisation energy of calcium is measured.

[1 mark]

0 1 . **5** State and explain the trend in the first ionisation energies of the elements in Group 2 from magnesium to barium.

[3 marks]

Trend _____

Explanation _____

- 0 2** . **1** A sample of sulfur consisting of three isotopes has a relative atomic mass of 32.16
Table 1 gives the relative abundance of two of these isotopes.

Table 1

Mass number of isotope	32	33
Relative abundance / %	91.0	1.8

Use this information to determine the relative abundance and hence the mass number of the third isotope.

Give your answer to the appropriate number of significant figures.

[4 marks]

Mass number = _____

- 0 2** . **2** Describe how ions are formed in a time of flight (TOF) mass spectrometer.

[2 marks]
