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CAIE A LEVEL Chemistry Topic Questions / 9701

# 1.3.2-Determine-Electronic-Configuration-of-Atoms-and-Ions-set-2-qp

Total Questions: 6

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**Note:**

- For questions with answer choices as statements 1, 2 and 3, follow these instructions for selecting options A/B/C/D:
- A= 1, 2 and 3 are correct
- B=1 and 2 only are correct
- C=2 and 3 only are correct
- D=1 only is correct

# Questions

## Question 1:

*Use of the Data Booklet is relevant to this question.*

The electronic structures of calcium, krypton, phosphorus and an element **X** are shown.

Which electronic structure is that of element **X**?

**A** $1s^2 2s^2 2p^6 3s^2 3p^3$

**B** $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2$

**C** $1s^2 2s^2 2p^6 3s^2 3p^6 3d^6 4s^2$

**D** $1s^2 2s^2 2p^6 3s^2 3p^6 3d^{10} 4s^2 4p^6$

## Question 2:

*Use of the Data Booklet is relevant to this question.*

In forming ionic compounds, elements generally form an ion with the electronic structure of a noble gas.

Which ion does **not** have a noble gas electronic structure?

**A** $I^-$ **B** $Rb^+$ **C** $Sn^{2+}$ **D** $Sr^{2+}$

## Question 3:

A simple ion $X^+$ contains eight protons.

What is the electronic configuration of $X^+$?

**A** $1s^2$ $2s^1$ $2p^6$

**B** $1s^2$ $2s^2$ $2p^3$

**C** $1s^2$ $2s^2$ $2p^5$

**D** $1s^2$ $2s^2$ $2p^7$

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# Questions (Continued)

## Question 4:

In 1999, researchers working in the USA believed that they had made a new element and that it had the following electronic configuration.

$$[Rn]\ 5f^{14}6d^{10}7s^{2}7p^{6}$$

In which Group of the Periodic Table would you expect to find this element?

**A** II **B** IV **C** VI **D** 0

## Question 5:

Four electronic configurations are shown below. Three of these configurations belong to atoms of the elements chlorine, sodium and vanadium.

Which electronic configuration belongs to an atom of another element?

**A** $1s^{2}2s^{2}2p^{6}3s^{1}$

**B** $1s^{2}2s^{2}2p^{6}3s^{2}3p^{5}$

**C** $1s^{2}2s^{2}2p^{6}3s^{2}3p^{6}3d^{3}4s^{2}$

**D** $1s^{2}2s^{2}2p^{6}3s^{2}3p^{6}3d^{6}4s^{2}$

## Question 6:

**31** An isolated gaseous atom of element X has paired electrons in at least one of its 3d orbitals and has a filled 4s subshell.

What could be the identity of element X?

**1** iron

**2** gallium

**3** copper

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