

**Marks**  
**2**

- Give the full electron configuration for the ground state K atom.

|  |
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|  |
|--|

What are the three quantum numbers that describe the orbital that contains the electron furthest from the nucleus in the K atom?

|       |       |         |
|-------|-------|---------|
| $n =$ | $l =$ | $m_l =$ |
|-------|-------|---------|

- Complete the following table, providing the ground state electron configuration for each of the following species.

**3**

| Species           | Ground state electron configuration |
|-------------------|-------------------------------------|
| nitrogen atom     |                                     |
| chloride ion      |                                     |
| manganese(II) ion |                                     |

- Complete the following table, providing the ground state electron configuration for each of the following species.

**3**

| Species        | Ground state electron configuration |
|----------------|-------------------------------------|
| chlorine atom  |                                     |
| magnesium ion  |                                     |
| arsenic(V) ion |                                     |

**Marks**  
**2**

- Glucose labelled with  $^{11}\text{C}$  is used to monitor brain function in positron emission tomography (PET) scans. Identify the missing particles in the following nuclear reactions showing the synthesis and decay of  $^{11}\text{C}$ .

