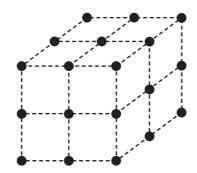
21 In an experiment to demonstrate Brownian motion, a transparent container is filled with smoke particles suspended in air.

What can be seen when the contents of the container are strongly illuminated and viewed through a microscope?

- A air molecules that are colliding with smoke particles
- B air molecules that are moving in straight lines
- **C** smoke particles that are moving in random zigzag paths
- D smoke particles that are moving in straight lines
- 22 The diagram shows the arrangement of atoms in a particular crystal.



Each atom is at the corner of a cube.

The mass of each atom is  $3.5 \times 10^{-25} \, kg$ . The density of the crystal is  $9.2 \times 10^3 \, kg \, m^{-3}$ .

What is the shortest distance between the centres of two adjacent atoms?

- **A**  $3.8 \times 10^{-29} \, \text{m}$
- **B**  $6.2 \times 10^{-15}$  m
- **C**  $3.4 \times 10^{-10} \, \text{m}$
- **D**  $3.0 \times 10^{-9}$  m

**Space for working**