

- 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** molecules in random motion
- B** molecules vibrating regularly
- C** smoke particles in random motion
- D** smoke particles vibrating regularly

- 22** A lift is supported by two steel cables each of length 20 m.

Each of the cables consists of 100 parallel steel wires, each wire of cross-sectional area  $3.2 \times 10^{-6} \text{ m}^2$ . The Young modulus of steel is  $2.1 \times 10^{11} \text{ N m}^{-2}$ .

Which distance does the lift move downward when a man of mass 70 kg steps into it?

- A** 0.010 mm      **B** 0.020 mm      **C** 0.10 mm      **D** 0.20 mm

- 23** What is equal to the Young modulus of a material that is extended elastically within the limit of proportionality?

- A** area under the force-extension graph
- B** area under the stress-strain graph
- C** gradient of the force-extension graph
- D** gradient of the stress-strain graph

**Space for working**