Answers to Self-assessment practice tests Block 2

1 a The vibrate about fixed positions.

b Particles vibrate more (greater amplitude) so they occupy more space.

c Particles move freely, at random, bouncing off each other and walls of container.

d Molecules leave the surface of the liquid and gradually spread out within the air (diffusion), speeding up, slowing down and changing direction as they collide with particles of the air.

2 a pV = constant (or $p_1V_1 = p_2V_2$)

b temperature

c 16 dm^3

3 a 100 °C; the boiling point of pure water at atmospheric pressure

b The mercury expands as it is heated; since its volume has increased, it occupies more of the tube.

4 a downwards

b The copper expands more so its length is greater than that of the invar; the outer side of the curve is longer than the inner side.

c For example, in a fire alarm; a circuit is completed if the strip bends sufficiently, setting off a warning bell.

5 a 453 600 J

b 454 s approx. (≈ 7.5 minutes)

c Temperature remains constant; energy is required to boil the water, creating steam/water vapour.

6 a Attach a thermometer/temperature probe to one end of a rod; heat the other end; observe the temperature rise, showing that heat has travelled along the rod.

b Heat all rods at same rate; compare rates at which temperatures rise (e.g. by drawing graphs of temperature against time).

7 a Hot air rises above the heater, spreads across ceiling; colder air sinks, flows into the heater where it is heated and starts to rise (i.e. a convection current has been set up).

b Warm air is less dense than the surrounding cooler air so it rises.

8 a Cover the floor with carpet or other insulating material.

b Fit double glazing (and change window frames to a material which insulates better).

c Install cavity wall foam to prevent convection currents.