Chapter 1 and 2 Test Solutions

Total marks 38

Question 1

[1 mark for the order, 1 mark each for the explanation]

Radiation : The flame heats the pan by radiation

Conduction : heat is transferred through the pot by conduction

Convection : heat rises through the water to the surface via convection. (1 mark)

Question 2

C. Heat transfer through molecular or atomic collisions without overall transfer of the substance itself. (1 mark)

Question 3

C. Hot air expands and rises to the ceiling, while cooler air sinks to the floor. The ceiling fans mix the hot and cool air, making the whole room warm. (1 mark)

Question 4

B. When work is done *on* a system, energy is added so there is an increase to its internal energy. When work is done *by* a system, energy is removed so its internal energy decreases. (1 mark)

Question 5

There is no change in temperature as all of the energy supplied is used to increase the potential energy in the bonds ( 1mark) to overcome the inter-particle or intermolecular forces between particles. ( 1 mark)

Question 6

Heating of ice to 0°C:  (1 mark)

Melting of ice to water at 0°C:  (1 mark)

Total energy required: *Q*Total = 840 + 3.34 × 104 = 3.42 × 104 J (1 mark)

Question 7

At the midpoint in the mixture of steam and ice, *Q* gained by ice = *Q* lost by steam. (1 mark)

Melting ice to water at 0°C:  (1 mark)

Turning steam to water at 100°C:  (1 mark)

Midpoint:

 (1 mark)

 (1 mark)

Or:

(1 mark)



(2 mark)

(1 mark)

(1 mark)

Question 8



Question 9

Metals are good conductors of heat. (1 mark)

Heat moves easily from your warm hand to the metal and so the metal feels colder. (1 mark)

Wood is a poor conductor of heat and only a small amount of heat is transferred from your hand to the wood, so that your hand does not sense it is touching something cooler. (1 mark)

Question 10

They are black to increase the absorption of radiation. Matte black surfaces absorb radiant energy more than shiny white surfaces. (1 mark)

Question 11

Double-glazed windows slow down heat transfer by conduction—as air is a poor conductor of heat, the narrow air gap acts as an insulator. (2 marks)

Double-glazed windows slows down heat transfer by convection—as the air gap is narrow, convection currents are not easily established. (2 marks)

Question 12

a efficiency (%) =  (1 mark)

= 

= 45% (1 mark)

**b** heat (thermal) energy and sound energy (1 mark)

**Question 13. Solution**

The compressor compresses the refrigerant turning it from gas into liquid. (1)

The refrigerant loses energy due the latent heat of vaporisation (1)

The latent heat of vaporisation is radiated from the pipes (1)

Therefore the compressor has to be in position B (1) so the hot air is radiated to the outside (1)