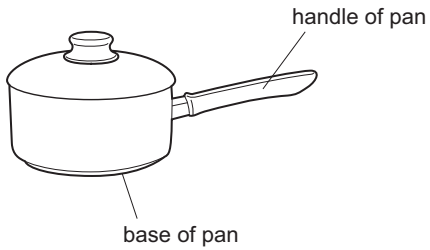
10 The diagram shows a pan used for cooking food.



Which row is correct for the materials used to make the base of the pan and the handle of the pan?

	base of pan	handle of pan
A	good thermal conductor	good thermal conductor
B	good thermal conductor	poor thermal conductor
C	poor thermal conductor	good thermal conductor
D	poor thermal conductor	poor thermal conductor

11 Solar heating panels consist of pipes carrying water that absorb radiation from the Sun.

Which texture and colour is the surface of the pipes so that the temperature of the water rises at the quickest rate?

A dull black

B dull white

C shiny black

D shiny white

17 A bar of metal, which is a good thermal conductor, is heated at one end.

What is the main method of transfer of thermal energy along the bar?

A lattice vibration

B movement of atoms of the metal along the bar

C transfer by electrons

D vibration of atoms of the metal bar

4 Fig. 4.1 shows a metal pan on an electric hotplate. The pan contains 200 cm^3 of water.

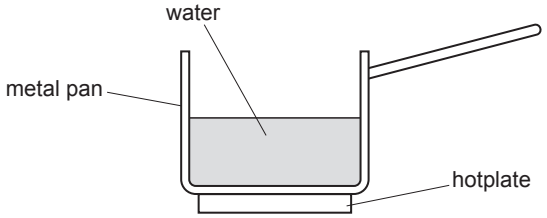


Fig. 4.1

The pan is heated. The temperature of the water in the pan increases.

(a) Thermal energy is transferred through the metal pan by conduction.

State and explain the **two** ways that thermal energy is conducted in a metal.

.....

.....

.....

.....

..... [3]

(b) **(i)** The water boils and leaves the liquid as a gas.

Explain, in terms of forces and distances between particles, why the gas occupies a much greater volume than it does as a liquid.

.....

.....

.....

..... [2]

(ii) State **two** ways in which boiling differs from evaporation.

1 .....

2 .....

[2]

(c) The water is replaced with 200 cm^3 of milk.

The initial temperature of the milk is 20.0 °C. The boiling point of milk is 95.0 °C.

The milk starts to boil when 60 700 J of thermal energy has been transferred to it. The density of milk is 1.03 g/cm^3.

Calculate the value of the specific heat capacity of milk. Give your answer to 3 significant figures.

specific heat capacity = ... [4]

[Total: 11]

4 **(a)** A sample of sand has a volume of 0.050 m^3. The density of the sand is 1900 kg/m^3. The specific heat capacity of the sand is 1500 J/(kg °C).

(i) Calculate the mass of the sample of sand.

mass = ... [2]

(ii) Calculate the thermal capacity of the sample of sand.

thermal capacity = ... [2]

(iii) The initial temperature of the sample of sand is 7.0 °C. The sample of sand is heated using an electrical heater. The power of the heating element is 50 W.

Calculate the time taken to increase the temperature of the sand to 19.0 °C.

time = ... [3]

(b) In some countries, the soil is too cold for plants to grow well. In these countries, plants are grown in plastic pots and kept inside. The pots, containing soil, are placed on sand. The sand is heated using an electrical heater, as shown in Fig. 4.1.

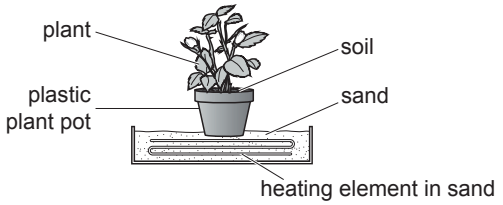


Fig. 4.1

(i) Describe, in terms of molecules, how thermal energy is transferred from the heated sand through the base of the plastic pot.

.....

.....

.....

[2]

(ii) The heating element in Fig. 4.1 remains switched on. The temperature of the sand remains constant at a value above room temperature.

Explain why the temperature of the sand remains constant.

.....

.....

..... [2]

[Total: 11]