1 A student investigates how the resistance of a thermistor varies with temperature.

(a) The student uses the equipment shown in Figure 18 to measure the temperature of the thermistor.

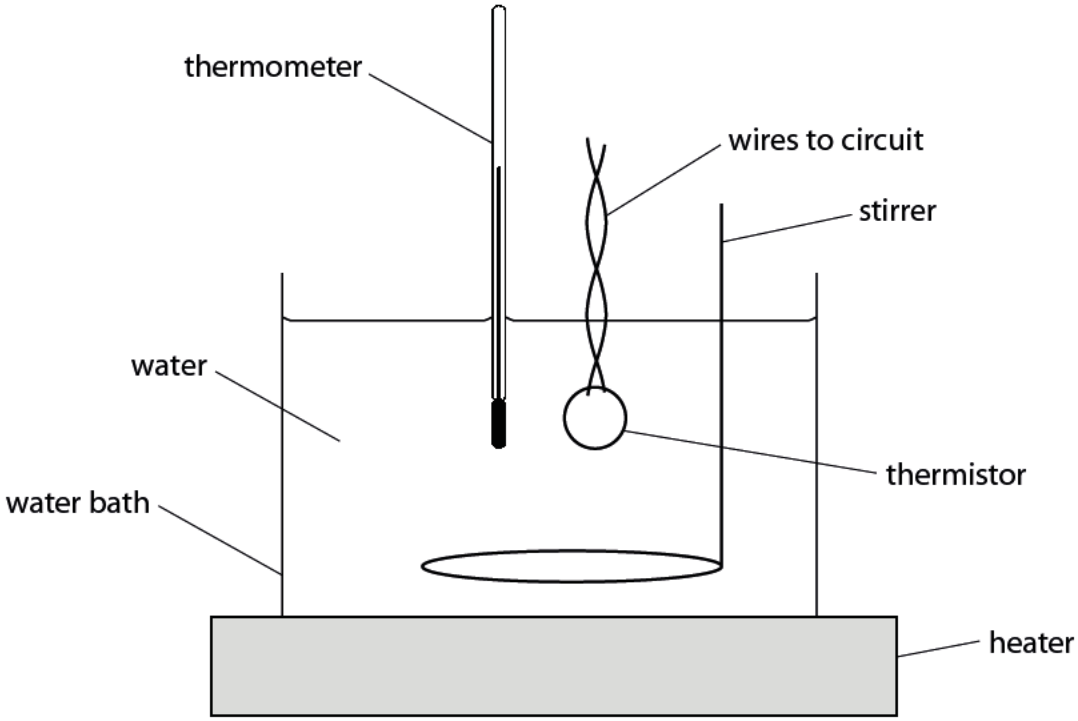


Figure 18

(i) Give **one** reason for using a water bath.

(1)

.....

.....

(ii) The equipment shown in Figure 18 is for investigations in the temperature range from 20 °C to 100 °C.

State **one** way the student could develop this experimental procedure to investigate temperatures outside this range.

(1)

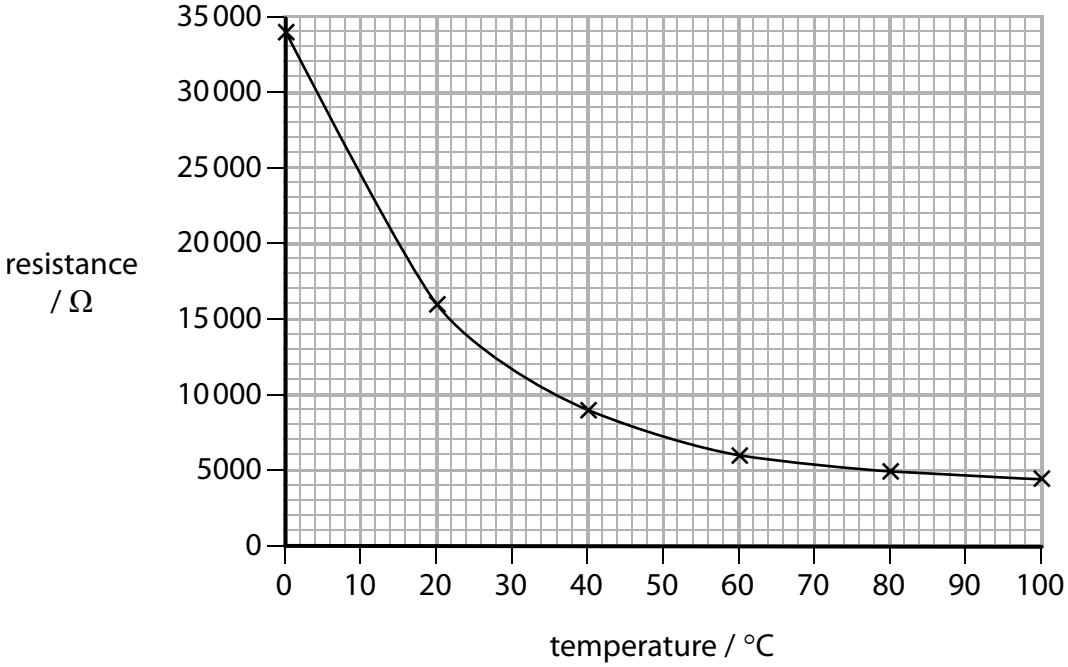
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(b) The student takes measurements for two other components, **A** and **B**.

The results for both these components are shown in Figure 19.

Component A



Component B

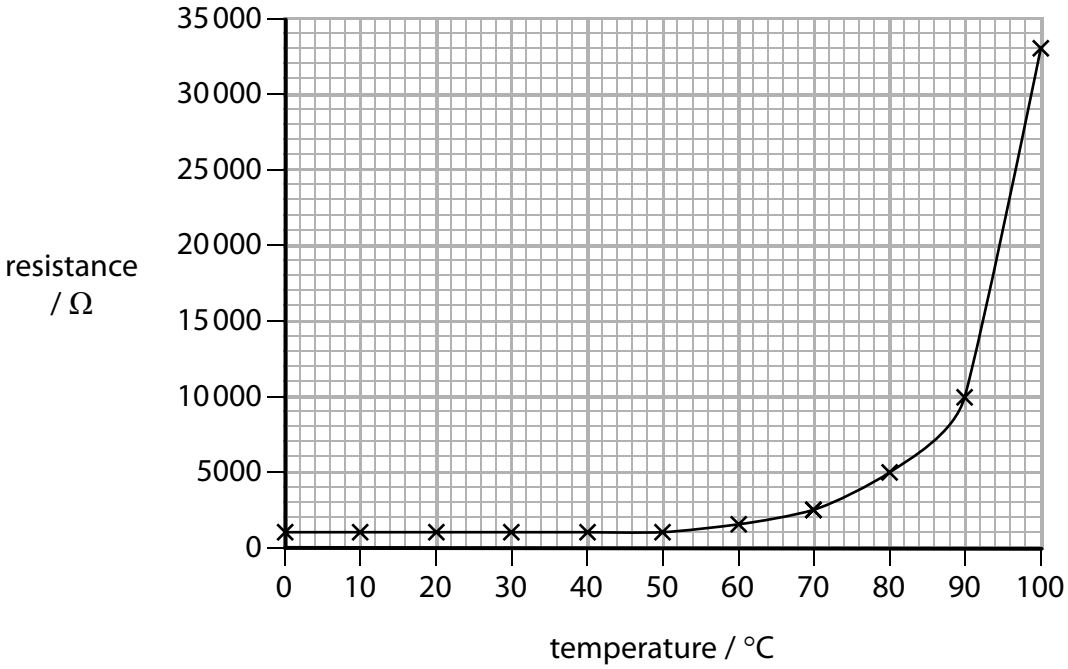


Figure 19

Compare and contrast how the resistances of component **A** and component **B** vary with temperature.

(3)

*(c) Describe how the student should carry out an experiment to determine the specific heat capacity of water.

(6)

(Total for Question 8 = 11 marks)

2 (a) Figure 2 shows a tank for holding water.

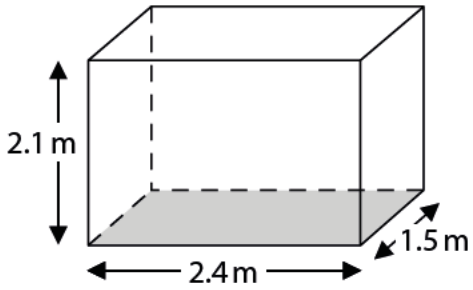


Figure 2

The tank has sides of 2.4 m, 2.1 m and 1.5 m.

The pressure at the bottom of the tank is 12 kPa.

(i) State the equation relating pressure, force and area.

(1)

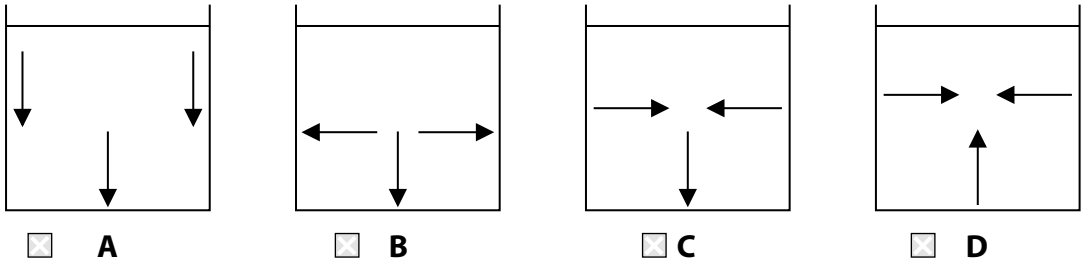
(ii) Calculate the weight of water in the tank.

(4)

weight = ... N

(iii) Which diagram shows the direction of the forces from the water on the inside of the tank?

(1)



(b) Figure 3 shows three containers A, B, and C.

Each container contains a liquid, as shown.

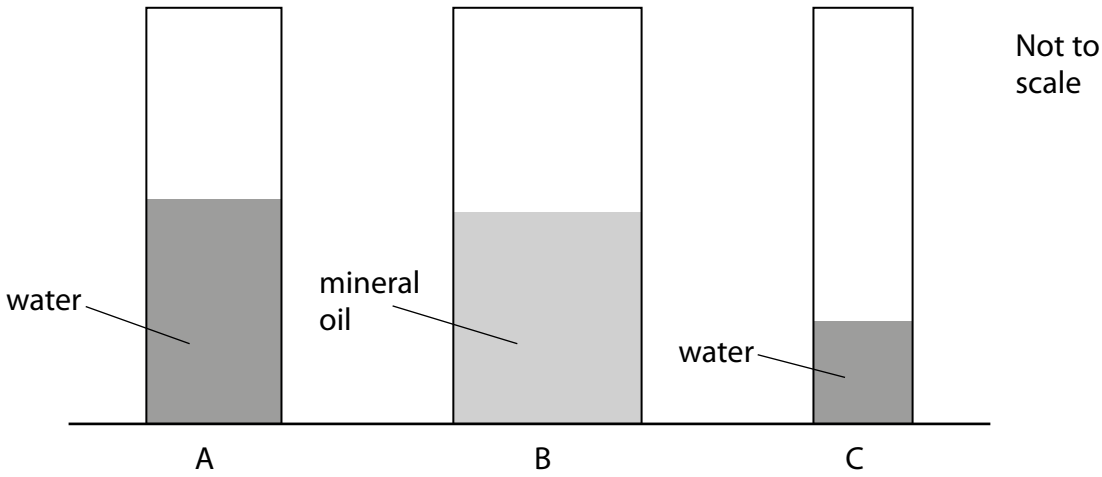


Figure 3

Figure 4 gives some data about the liquids and containers.

container	area of base (cm^2)	name of liquid	density of liquid (g/cm^3)	depth of liquid in container (cm)
A	16	water	1.00	50.00
B	32	mineral oil	0.91	50.00
C	12	water	1.00	25.00

Figure 4

Explain which container has the highest pressure at the bottom, and which container has the lowest.

Use information from Figure 3 and Figure 4.

(3)

(Total for Question 2 = 9 marks)