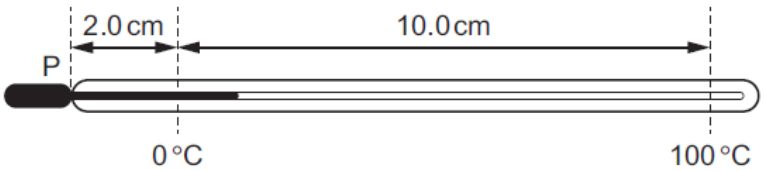
Thermal Properties of Matter – 2022 June O Level 5054

1. June/2022/Paper_11/No.14

A liquid column in a liquid-in-glass thermometer is 2.0 cm long at 0 °C. The column expands by 10.0 cm when heated to 100 °C.



Measuring from P, how long is the liquid column at 30 °C?

A 2.3 cm **B** 3.0 cm **C** 5.0 cm **D** 7.0 cm

2. June/2022/Paper_11/No.15

In many applications, a thermocouple is used to measure temperature instead of a liquid-in-glass thermometer.

Which property of a thermocouple is a major advantage?

A its greater heat capacity

B its smaller temperature range

C its quicker response time

D it has a non-linear output

3. June/2022/Paper_11/No.16

A liquid-in-glass thermometer consists of a bulb containing a liquid which expands into a thin capillary tube.

The liquid in the thermometer is replaced by the same volume of a different liquid that expands more for the same temperature rise. The length of the capillary tube remains the same.

How does the new thermometer compare with the old thermometer?

A It has greater sensitivity and a greater range.

B It has greater sensitivity but a smaller range.

C It has the same sensitivity and the same range.

D It has the same sensitivity but a greater range.

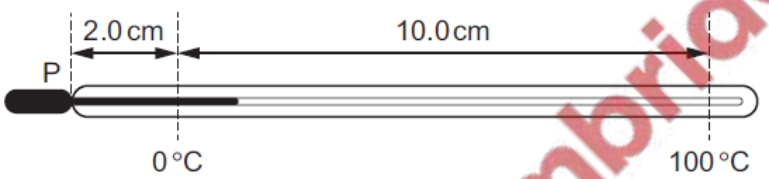
4. June/2022/Paper_11/No.17

What is the usual symbol and what is the unit for the heat capacity of an object?

	symbol	unit
A	*C*	J / °C
B	*C*	J / (kg °C)
C	*H*	J / °C
D	*H*	J / (kg °C)

5. June/2022/Paper_12/No.18

A liquid column in a liquid-in-glass thermometer is 2.0 cm long at 0 °C. The column expands by 10.0 cm when heated to 100 °C.

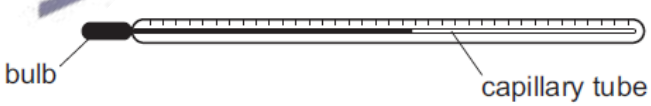


Measuring from P, how long is the liquid column at 30 °C?

A 2.3 cm **B** 3.0 cm **C** 5.0 cm **D** 7.0 cm

6. June/2022/Paper_12/No.19

A liquid-in-glass thermometer consists of a bulb containing a liquid which expands into a thin capillary tube.



The liquid in the thermometer is replaced by the same volume of a different liquid that expands more for the same temperature rise. The length of the capillary tube remains the same.

How does the new thermometer compare with the old thermometer?

A It has greater sensitivity and a greater range.

B It has greater sensitivity but a smaller range.

C It has the same sensitivity and the same range.

D It has the same sensitivity but a greater range.

7. June/2022/Paper_12/No.20

Steam at 110 °C condenses on a surface to form water droplets at 100 °C.

What happens after the steam comes into contact with the surface?

A The molecules slow down and absorb energy from the surroundings.

B The molecules slow down and emit energy to the surroundings.

C The molecules stay at the same speed and absorb energy from the surroundings.

D The molecules stay at the same speed and emit energy to the surroundings.

8. June/2022/Paper_21/No.3

(a) Define latent heat of fusion.

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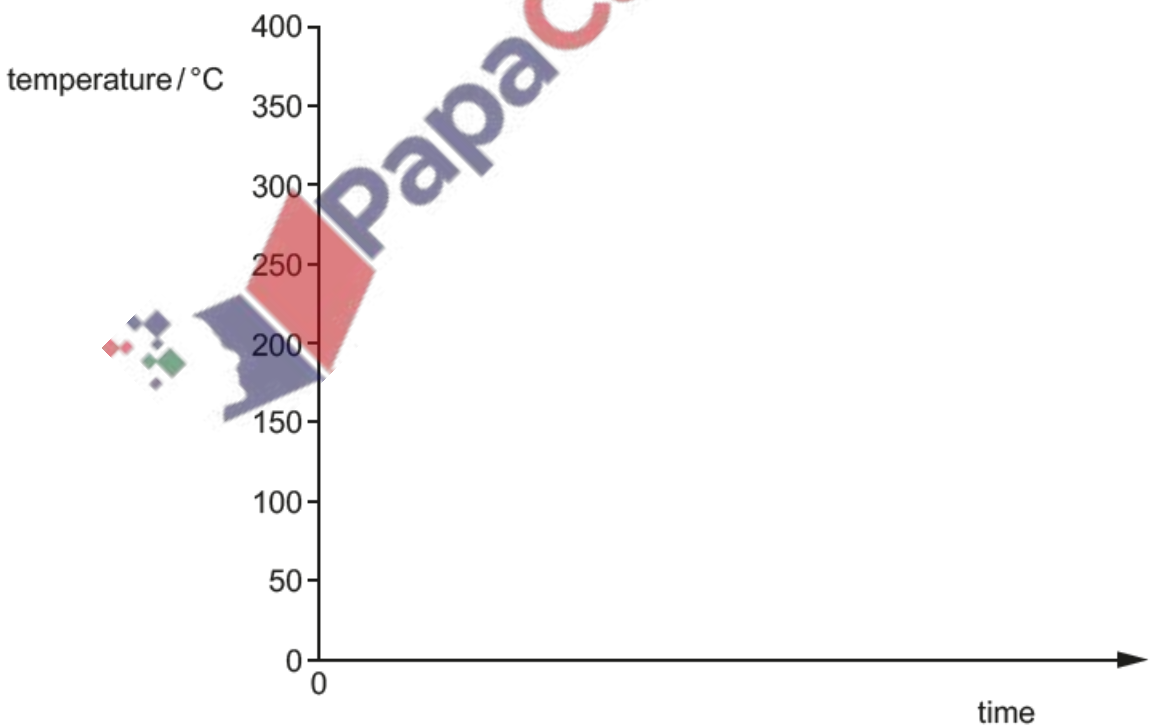
(b) A sample of metal P at 100 °C is heated steadily until its temperature reaches 400 °C.

The melting point of the metal is 250 °C.

(i) On Fig. 3.1, sketch a graph to show how the temperature of the metal changes with time.



[2]

Fig. 3.1

(ii) A sample of a different metal Q has a greater latent heat of fusion than the sample of P.

P and Q are metals with the same melting points and the samples have the same heat capacity.

The experiment is repeated with the sample of Q. This sample is supplied with the same amount of energy per second as is supplied to the sample of P.

Explain how the graph of temperature against time for Q differs from the graph in **(b)(i)**.

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[Total: 6]