AQA GCSE PHYSICS (HIGHER) · 8463

PHYSICS



EXAM QUESTION PACK

4.3.2.1 INTERNAL ENERGY (PACK 3)

SCORE	PERCENTAGE
/38	%

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Q1.

Water exists as ice, water or steam.

(a) Complete the sentences.

Choose the answers from the box.

ice	steam	water

The particles are arranged in a regular pattern in _____ .

The particles are close together but not in a pattern in _____ .

The particles move quickly in all directions in _____ .

(2)

(b) Which will have the most internal energy?

Tick **one** box.

1 kg of ice ☐

1 kg of steam ☐

1 kg of water ☐

(1)

(c) Which will have the lowest density?

Tick **one** box.

Ice ☐

Steam ☐

Water ☐

(1)

The image shows an iceberg floating in the sea.

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(d) The iceberg has a mass of 11 200 kg

The volume of the iceberg is 12.0 m^3

Calculate the density of the iceberg.

Use the equation:

$$\text{density} = \frac{\text{mass}}{\text{volume}}$$

Density = _____ kg/m^3

(2)

(e) Explain why the iceberg will melt.

(2)

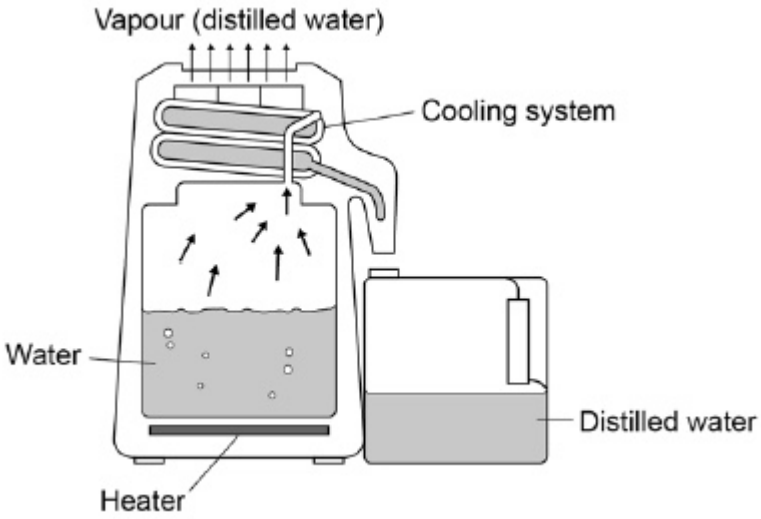
(Total 8 marks)

Q2.

Figure 1 shows a water distiller which is used to purify water.

Figure 1

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The distiller boils water and then condenses most of the water vapour back to water.

(a) The water distiller is filled with 5.0 kg of water at 20 °C

The specific heat capacity of water = 4 200 J/Kg °C

Calculate the energy needed to raise the temperature of the water to 100 °C

Use the Physics Equations sheet.

_____

_____

_____

_____

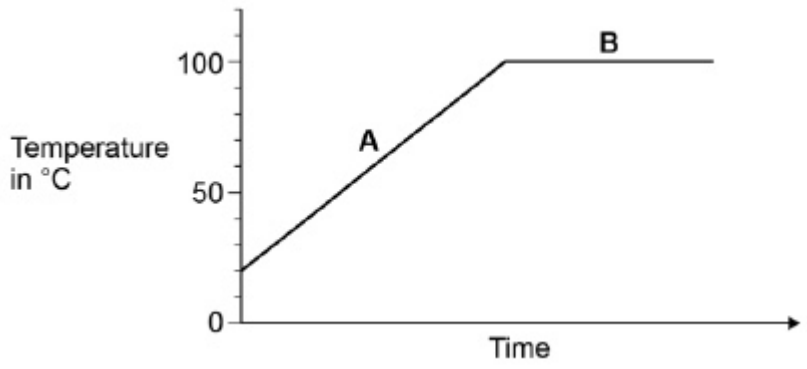
_____

Energy = _____ J

(3)

Figure 2 shows how the temperature of the water in the distiller changes with time.

Figure 2



(b) Energy is transferred to the water at a constant rate.

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Explain why the graph is a different shape in parts **A** and **B**.

_____

_____

_____

_____

_____

_____

(3)

(c) When the water drops to a low level, the heater automatically switches off.

Explain what problem would be caused if the heater did **not** automatically switch off.

_____

_____

_____

_____

_____

_____

(3)

(d) The distiller is connected to the mains by a three-core cable.

The wires are covered by different coloured insulation.

What colour is the insulation covering each of the wires?

Live wire _____

Neutral wire _____

Earth wire _____

(2)

(e) Which statement gives the purpose of the earth wire?

Tick **one** box.

It carries an alternating potential difference. ☐

It melts if the current in the circuit is too high. ☐

It provides a connection to complete the circuit. ☐

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It stops the casing of the appliance becoming live. ☐

(1)

(f) The heating element has a power of 2.5 kW

The resistance of the heating element is 17 Ω

Calculate the current in the heating element.

Give your answer to 2 significant figures.

Write any equations that you use.

Current = _____ A

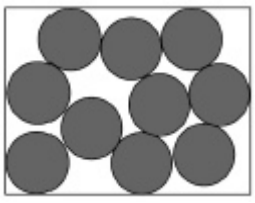
(5)

(Total 17 marks)

Q3.

Figure 1 shows a model of the particles in a liquid.

Figure 1



(a) Give **one** similarity and **one** difference you would see in **Figure 1** if it showed the same substance as a gas.

Similarity _____

Difference _____

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(2)

(b) Describe **two** limitations of the model shown in **Figure 1**.

1. _____

_____

2. _____

_____

(2)

(c) Explain why substances have different melting points.

_____

_____

_____

_____

(2)

(d) Some fire extinguishers contain liquid carbon dioxide.

Suggest how carbon dioxide gas can be changed to liquid carbon dioxide without reducing its temperature.

_____

_____

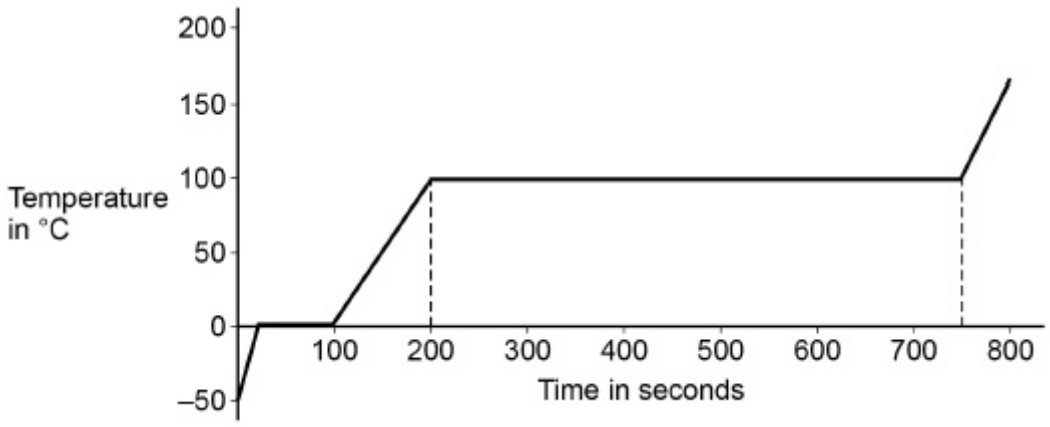
(1)

Ice was heated at a constant rate.

Eventually all the ice changed to a gas.

Figure 2 shows how the temperature changed over 800 seconds.

Figure 2



(e) What change of state occurs between 200 seconds and 750 seconds?

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_____

_____

(1)

(f) Explain how **Figure 2** shows that the specific latent heat of vaporisation is greater than the specific latent heat of fusion.

Use data from **Figure 2**.

_____

_____

_____

_____

(2)

(g) 1695 kJ of energy is transferred to water at 100 °C

The specific latent heat of vaporisation of water is 2.260×10^6 J / kg

Calculate the mass of water changed into a gas at 100 °C

Use the Physics Equations Sheet.

_____

_____

_____

_____

_____

_____

Mass of water = _____ kg

(3)

(Total 13 marks)

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