AQA GCSE PHYSICS (HIGHER) · 8463

PHYSICS



MARK SCHEME

4.3.2.1 INTERNAL ENERGY (PACK 3)

SCORE	PERCENTAGE
/38	%

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Q1.

(a) ice
water
steam

*allow **1** mark for 1 or 2 correct answers*

2

(b) 1 kg of steam

1

(c) steam

1

(d) ρ = 11 200 / 12.0

1

ρ = 933 (kg/m^3)

*an answer of 933 (kg/m^3) scores **2** marks*

1

(e) the internal energy of the iceberg increases

allow there is a temperature difference between ice and water / air

1

because

therefore

energy is transferred from the sea/water to the ice(berg)

1

[8]

Q2.

(a) 80

1

E = 5.0 × 4200 × 80

1

E = 1 700 000 (J)

an answer of 1 700 000 (J) or
*1 680 000 (J) scores **3** marks*
allow 1 680 000

1

(b) in part **A** the increase in internal energy raises the temperature of the water

1

in part **B** the increase in internal energy changes the state

1

without changing the temperature

1

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(c) the heater would continue to transfer energy which would not be transferred to the water

1

so would raise the temperature of the device

1

causing it to be damaged

1

(d) brown

blue

green and yellow stripes

*allow **1** mark for 2 correct*

2

(e) it stops the casing of the appliance becoming live

1

(f) $P = I^2R$

$I = \sqrt{(P/R)}$

1

P = 2 500 (W)

1

$I = \sqrt{(2\ 500 / 17)}$

1

I = 12.1267812

1

I = 12 (A)

*an answer of 12 (A) scores **5** marks*

1

[17]

Q3.

(a) (similarity) same size / shape particles

1

(difference) further apart / fewer in same area

allow none / not many touching

1

(b) any **two** from:

- no movement shown
- atoms / molecules / ions / particles are not solid spheres
- no forces between the spheres
- only 2D

2

(c) • different forces between particles

allow substances have different types of bond

1

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- (so) different amounts of energy required (to break forces)

1

(d) high(er) pressure (within fire extinguisher)

1

(e) liquid to gas

1

(f) (change from solid to liquid) 80 seconds

and

(change from liquid to gas) takes 550 seconds

1

(therefore) takes longer so more (thermal) energy is supplied (to change state)

1

(g) $1\ 695\ 000 = m \times 2.260 \times 10^6$

1

$$m = \frac{1\ 695\ 000}{2.260 \times 10^6}$$

1

0.75

*an answer of 0.75 scores **3** marks*
allow conversion of kJ to J

1

[13]

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