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Exam Preparation and Free Resources

Name of the Student:_____

Max. **Marks : 19 Marks**   **Time : 19 Minutes**

Mark Schemes

Q1.

(a)   the heating element of the kettle takes time to heat up
allow the kettle takes time to heat up

1

(b) $\Delta\Theta = 78$ (°C)

1

155 000 = m × 4200 × 78
allow a correct substitution using an incorrect value of ΔΘ

1

$$m = \frac{155\ 000}{4200 \times 78}$$
allow a correct rearrangement using an incorrect value of ΔΘ

1

m = 0.4731 (kg)
allow a correct calculation of mass using an incorrect value of ΔΘ

1

m = 0.47 (kg)

1

(c)   Gradient = $\dfrac{\Delta\theta}{t}$
allow gradient = rate of temperature increase
allow calculation of gradient

1

Pt = mcΔΘ

1

P = gradient × mc

1

[9]

Q2.

(a)   The particles move in random directions.

1

The particles move with a range of speeds.

1

(b)   100 000 × 0.030 = 3000

1

p × 0.025 = 3000

allow a correct substitution using an incorrectly calculated value using $pV =$ constant

1

$$p = \frac{3000}{0.025}$$

allow a correct rearrangement using an incorrect value of the constant

1

p = 120 000 (Pa)

allow a correct calculation using an incorrect value of the constant

allow correct substitution into $p_1V_1 = p_2V_2$ for first 2 marking points

1

(c)   particles would have a higher (mean) kinetic energy

allow particles would have a higher (mean) speed

do not accept particles vibrate more

1

(so) increased number of collisions with the walls of the balloon per second

allow greater frequency of collisions with the walls of the balloon

1

greater forces exerted in collisions (between particles and balloon walls)

allow greater rate of change of momentum (of particles)

1

greater force exerted on same area

allow description using p=F/A

1

[10]