Practice Question Set For GCSE
Subject : Physics
Paper-1 Topic: Electricity (High Demand)

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Name of the Student:_____
Max. Marks : 19 Marks **Time : 19 Minutes**

Mark Schemes

Q1.

(a) electrons collide with particles in the heating element

allow there is a current in the heating element

1

which increases the (kinetic) energy of the particles (in the heating element)

allow internal store of energy increases

allow the particles (in the heating element) vibrate more rapidly

1

(b) the starting temperature of the water

allow the starting temperature of the kettle

1

(c) (the heating element of) the kettle took time to heat up

1

(d) the (rate of) energy transfer (per kg of water) to the surroundings decreases as the mass of water increases

allow the efficiency of the kettle changes as the mass of water changes

or

the efficiency of the kettle increases as the mass of water increases

allow the (rate of) energy transfer (per kg of water) to the surroundings changes as the mass of water changes

1

(e)

*an answer of 4800 (J/kg °C) scores **6** marks*

*a correct answer given to more than 2 s.f. scores **5** marks*

E = 2600 × 120

allow a correct substitution of an incorrectly/not converted value of P and/or t.

1

E = 312 000 (J)

this answer only

the equation E = Pt must have been used to score subsequent marks.

1

312 000 = 0.80 × c × (100-18)
or

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312 000 = 0.80 × c × (82)

allow use of their value of E calculated using E = Pt for this and subsequent steps

1

$$c = \frac{312\,000}{0.80 \times 82}$$

1

c = 4 756

1

c = 4 800 (J/kg °C) (2 s.f.)

this mark can only be scored for a correct rounding of a value of c calculated using correct equations

1

[11]

Q2.

(a) (i) 1.7

1

(ii) 51
or
30 × their (i) correctly calculated

*allow **1** mark for correct substitution i.e. 1.7* $= \frac{Q}{30}$

or their (i) $= \frac{Q}{30}$

2

coulomb / C

*do **not** accept c*

1

(iii) 612
or
their (ii) × 12 correctly calculated
or
their (i) × 360 correctly calculated

*allow **1** mark for correct substitution i.e. E = 12 × 51*
or 12 × their (ii)
or their (i) × 360

2

(b) ions vibrate faster
or
ions vibrate with a bigger amplitude

accept atoms for ions throughout
accept ions gain energy
accept ions vibrate more
ions start to vibrate is insufficient

1

electrons collide more (frequently) with the ions
or

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(drift) velocity of electrons decreases

electrons start to collide is insufficient

there are more collisions is insufficient, unless both electrons and ions are implied

1

[8]

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