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

Mark Schemes

Q1.

(a) Length of sled

1

Time for sled to pass light gate

1

(b) E_p = 8330 (J)

1

8330 = m × 9.8 × 17.0
allow a correct substitution using an incorrectly/not converted value of E_p

1

m = $\frac{8330}{9.8 \times 17.0}$

allow a correct rearrangement using an incorrectly/not converted value of E_p

1

m = 50.0 (kg)
allow a correct calculation using an incorrectly/not converted value of E_p

1

(c) ½ mv^2 = mgh
or
decrease in E_p = increase in E_k

1

masses cancel on both sides of the equation
or
v^2 = 2gh

1

(final) speed only depends on vertical height (and gravitational field strength)

1

variations will be due to air resistance/friction
or
different initial speed

1

[10]

Q2.

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

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allow the kettle takes time to heat up

1

(b) $\Delta\Theta = 78$ (°C)

1

$155\,000 = m \times 4200 \times 78$

allow a correct substitution using an incorrect value of $\Delta\Theta$

1

$m = \frac{155\,000}{4200 \times 78}$

allow a correct rearrangement using an incorrect value of $\Delta\Theta$

1

$m = 0.4731$ (kg)

allow a correct calculation of mass using an incorrect value of $\Delta\Theta$

1

$m = 0.47$ (kg)

1

(c) Gradient = $\frac{\Delta\theta}{t}$

allow gradient = rate of temperature increase
allow calculation of gradient

1

$Pt = mc\Delta\Theta$

1

$P = \text{gradient} \times mc$

1

[9]

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