Name of the Student:_____
Max. Marks : 23 Marks **Time : 23 Minutes**

Mark Schemes

Q1.

(a) 78 (°C)

*allow **2** marks for correct temperature change ie 22 °C*
*allow **1** mark for correct substitution*
ie 46 200 = 0.5 × 4200 x θ
or

$$\frac{46200}{0.5 \times 4200} = \theta$$

3

(b) 6.4 (W)

*allow **2** marks for an answer that rounds to 6.4*
*allow **1** mark for correct substitution*
ie 46 200 = P × 7200
an answer of 23 000 or 23 100 or 385 gains 1 mark

2

[5]

Q2.

(a) range of speeds

1

moving in different directions

accept random motion

1

(b) internal energy

1

(c) density = mass / volume

1

(d) 0.00254 / 0.0141

1

0.18

1

*accept 0.18 with no working shown for the **2** calculation marks*

kg / m^3

1

[7]

Q3.

(a) density = $\frac{\text{mass}}{\text{volume}}$

or

$\rho = \frac{m}{V}$

1

(b) $998 = \frac{\text{m}}{6\ 500\ 000}$

1

$m = 998 \times 6\ 500\ 000$

1

$m = 6\ 487\ 000\ 000$

1

$m = 6.487 \times 10^9$ (kg)

allow a correct conversion of their calculated value of mass into standard form

1

(c) energy transferred = power × time

or

$E = Pt$

1

(d) $t = 18\ 000$ (s)

or

$t = 5 \times 60 \times 60$

1

$E = 1.5 \times 10^9 \times 18\ 000$

allow a correct substitution using an incorrectly/not converted value of t

1

$E = 2.7 \times 10^{13}$ (J)

allow a correct calculation using an incorrectly/not converted value of t

1

(e) the variation in demand is (much) greater than 1.5×10^9 W

allow the increase in demand is greater than the (power) output of the (hydroelectric) power station

1

demand remains high for longer than 5 hours

allow 04:00 to 16:00 is 12 hours

allow 04:00 to 16:00 is greater than 5 hours

1

[11]