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

Mark Schemes

Q1.

(a) 0.1 °C

1

(b) a bigger

1

(c) identifies 75 (°C) **and** 62.5 (°C)

1

$\Delta\theta$ = 12.5 (°C)

allow a correct calculation of temperature change from misread values

1

E = 0.12 × 4200 × 12.5

allow a correct substitution using an incorrect temperature change

1

E = 6300 (J)

allow an answer consistent with an incorrect temperature change

1

(d) point at 7 minutes for material **X** ringed

1

(e) any **two** from:

- water wrapped in material X cooled more slowly

  allow water wrapped in material X transfers less energy to the surroundings (in 10 minutes)

  allow water wrapped in material X has a higher final temperature

- material X is a better insulator
  or
- the thermal conductivity of material X is lower

  allow material X is a worse (thermal) conductor

- the rate of cooling decreased with time (for both X and Y)

  allow temperature decreased with time (for both X and Y)

  allow converse answers for material Y

2

(f) the rate of cooling would be lower

1

(g) the temperature would be higher

1

[11]

Q2.

(a) A: transmission / power cables

allow transmission / power lines

allow cables

ignore wires

1

B: <u>step-down transformer</u>

1

(b) less thermal energy is transferred to the surroundings.

1

(c) charge flow = $\frac{500\,000\,000}{25\,000}$

1

charge flow = 20 000 (C)

1

(d) total current = 7.20 (A)

1

P = 230 × 7.20

allow a correct substitution of an incorrect total current

1

P = 1656 (W)

allow a correct calculation using an incorrect total current

1

(e) dishwasher

1

has the largest current
or
has the largest power (input)

1

(f) E = 600 × 32 000 000

1

E = 19 200 000 000 (J)
or
E = 1.92×10^{10} (J)

1

[12]