Mark schemes

Q1.

(a) $Q = 2 \times 10^{-6}$ (C)

1

$0.6 = 2 \times 10^{-6} \times V$

allow a correct substitution of an incorrectly / not converted value of Q

1

$V = \frac{0.6}{2 \times 10^{-6}}$

allow a correct rearrangement of an incorrectly / not converted value of Q

1

$V = 300\,000$ (V)

allow an answer consistent with an incorrectly / not converted value of Q

1

[4]

Q2.

(a) 340 mW = 0.34 W

1

$0.34 = 0.75^2 \times R$

allow a correct substitution of an incorrectly / not converted value of P

1

$R = \frac{0.34}{0.75^2}$

allow a correct rearrangement of an incorrectly / not converted value of P

1

$R = 0.60$ (Ω)

allow an answer consistent with an incorrectly / not converted value of P

allow a correct answer given to more than 2 sf

1

[4]

Q3.

(a) t = 1800 (s)

1

Q = 0.21 × 1800

all subsequent marks can score if an incorrectly / not converted value of t is used

1

Q = 378 (C)

1

E = 378 × 6.0

1

E = 2268 (J)

allow an answer to 2 or 3 s.f.

OR

P = 0.21 × 6.0 (1)

P = 1.26 (W) (1)

t = 1800 (s) (1)

all subsequent marks can score if an incorrectly / not converted value of t is used

E = 1.26 × 1800 (1)

E = 2268 (J) (1)

allow an answer to 2 or 3 s.f.

1

[5]

Q4.

(a) $3.24 \times 10^{11} = Q \times 230$

1

$$Q = \frac{3.24 \times 10^{11}}{230}$$

1

Q = 1408 695 652 (C)

1

Q = 1.41×10^{9} (C)
or
Q = 1 410 000 000 (C)

allow correct rounding of an incorrect answer using data from the question

1

[4]

Q5.

(a) E = 3600 (J)

1

3600 = 120 × t

this mark may score if E is incorrectly / not converted

1

$$t = \frac{3600}{120}$$

this mark may score if E is incorrectly / not converted

1

t = 30 (s)

allow an answer consistent with their value of E

1

[4]