Year 11 Physics
Current Electricity Assignment

1.

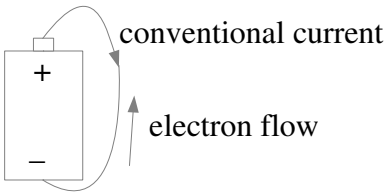
a) $E = F / q = 12 / 8.3\times10^{-18} = 1.4\times10^{18}$ NC^{-1} north /3

b) $\Delta V = Ed = 1.4\times10^{18} \times 1.2 = 1.7\times10^{18}$ V /2

2. A capacitor stores charge. It has two thin plates on which charges build up. These can be released quickly from here when needed later. /2

3.

a)



/2

b) Heat, Length of wire, Thickness of wire, Material the wire is made of /2

4.

a) 1 amp = 1 C/s so 12 coulombs every second. 12×5=60, so 60 coulombs flow every second. 1 coulomb = 6.24×10^{18} electrons, so $60\times6.24\times10^{18} = 4\times10^{20}$ electrons flow in five seconds (1 s.f.). /2

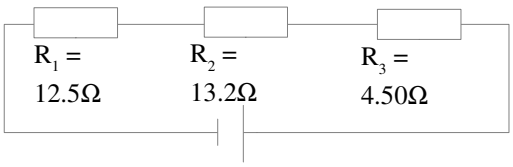
b) W = Vq = 10J (1 s.f.) /2

c) P = VI = 20W (1 s.f.) /2

d) Ah = A × h, so h = Ah / A = 2.5 / 3.125×10^{-1} = 8.000 hours (4 s.f.) /3

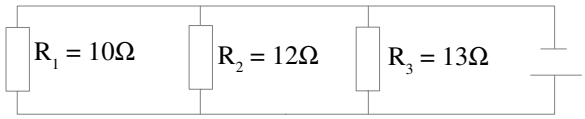
5. Consider the following circuits and determine the total resistance in each circuit.

a)



$R_T = R_1 + R_2 + R_3$
$= 30.2\Omega$ (3 s.f.) /2

b)



$R_T = 1 / (1/R_1 + 1/R_2 + 1/R_3)$
$= 3.8\Omega$ /2

c)

R = V / I = 25 / 2 = 10Ω (1 s.f.) /2

TOTAL /24