

TAP: 102-3: Introductory questions on charge and current

1. Convert 25 mA to A
2. Convert 0.50 A to mA
3. A torch bulb passes a current of 120 mA.
 - (a) How many coulombs of charge flow through the lamp in 1 minute?
 - (b) How many coulombs of charge flow through the lamp in 1 hour?
 - (c) How many electrons leave the negative terminal of the cell each second?
4. A car battery is rated as 36 A h. In principle this means it could pass a current of 1 A for 36 h before it runs down. How much charge passes through the battery if it is completely run down?
5. An electron beam in a beam tube carries a current of 125 μA .
 - (a) What charge is delivered to the screen of the tube every second?
 - (b) How many electrons hit the screen each second?

Solutions to introductory questions on charge and current

1. 0.025 A
2. 500 mA
3. (a) $Q = It = 0.120 \times 60 = 7.2 \text{ C}$
(b) $Q = It = 0.120 \times 60 \times 60 = 432 \text{ C}$
(c) $N = Q/e = It/e = (0.120 \times 1) / 1.6 \times 10^{-19} = 7.5 \times 10^{17} \text{ s}^{-1}$
4. $Q = It = 36 \times 60 \times 60 = 129\,600 = 130\,000 \text{ (2 sf.)}$
5. (a) $Q = It = 1.25 \times 10^{-4} \times 1 = 1.25 \times 10^{-4} \text{ C}$
(b) $N = Q/e = 1.25 \times 10^{-4} / 1.6 \times 10^{-19} = 7.8 \times 10^{14} \text{ s}^{-1}$