Electrical current (I), electrical charge (Q) and time (t) calculations.

[Total 18 marks]

1. How much electrical charge flows past a point in a circuit every 10 second when the current is 3 amps? [3]

   $Q = I \times t = 3 \times 10 = 30\ C = 30$ coulombs

2. If an electrical charge of 12 Coulombs flows past a point in a circuit every 1.5 seconds what is the current? [3]

   $I = Q / t = 12 / 1.5 = 8\ A = 8$ amperes $= 8$ amps

3. How long does it take a charge of 60 Coulombs to flow through an ammeter if the current is 12 Amps ? [3]

   $t = Q / I = 60 / 12 = 5\ s$

4. What is the reading on an ammeter in a circuit if 810 Coulombs of charge flows through it every 4½ minutes? [3

   $I = Q / t = 810 / (4.5 \times 60) = 3\ A$

5. If an ammeter reads 200 mA how long does it take for 40 Coulombs of charge to flow through it? [4]

   $t = Q / I = 40 / (200 \times 10^{-3}) = 200\ s$

6. How many electrons would be required to carry the electrical charge calculated in question 1? [2]

   No. electrons $= 30 \times 6.25 \times 10^{18} = 1.875 \times 10^{20} = 188$ million million million electrons!