Aluminium Extraction: Answers

Version A

1. (a) Many possible answers including:
   - No cheap electricity supply – eg hydroelectric
   - Cheaper labour costs
   - Closer to supply of ore, thus reducing transport costs
   - Less rigid pollution laws
   
   [1]

   (b) Many possible answers including
   - Deep water port for importing alumina and cryolite
   - Electricity supply considerations
   - Good links to users by road, rail and sea
   
   [2]

   (c) (i) 27 g is produced by 3 F
   1,000,000 g is produced by:

   $\frac{3 \times 1,000,000 \text{ F}}{27} = 111,111 \text{ F}$

   [1]

   (ii) Number of coulombs = 157,000 x 24 x 60 x 60 x 308 C
   Number of faradays = $\frac{157,000 \times 24 \times 60 \times 60 \times 308 \text{ F}}{96,000}$

   $= 43,520,400 \text{ F}$

   [1]

   Number of tonnes = $\frac{43,520,400 \text{ tonnes}}{111,111}$

   $= 391.7 \text{ tonnes}$

   [1]
Aluminium extraction: Answers

Version B

1. (a) Many possible answers including

No cheap electricity supply – eg hydroelectric
Cheaper labour costs
Closer to supply of ore reducing transport costs
Less rigid pollution laws

(b) Many possible answers including

Deep water port for importing alumina and cryolite
Electricity supply considerations
Good links to users by road, rail and sea

(c) (i) 3

\[
3 \times 1,000,000 \ F = 111,111 \ F
\]

(ii) Number of coulombs = \(157,000 \times 24 \times 60 \times 60 \times 308\) C

Number of faradays = \(\frac{157,000 \times 24 \times 60 \times 60 \times 308}{96,000}\) F

\[= 43,520,400 \ F\]

Number of tonnes = \(\frac{43,520,400}{111,111}\) tonnes

\[= 391.7 \text{ tonnes}\]