

(b) $Q = It = 2.05 \times 5 \times 60 \times 60 = 3.69 \times 10^4 \text{ C}$ 1 mark

$$n(e^-) = \frac{Q}{9.649 \times 10^4} = \frac{3.69 \times 10^4}{9.649 \times 10^4} = 0.382 \text{ moles } e^-$$

1 mark

$n(\text{Na}) = 0.382 \text{ moles}$ 1 mark

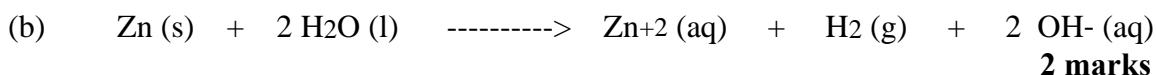
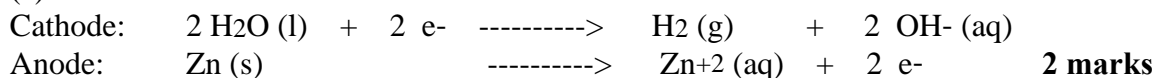
$m(\text{Na}) = n(\text{Na}) \times A \text{ Wt} = 0.382 \times 22.99 = 8.79 \text{ g}$ 1 mark

4. Corrosion of Iron:

- (a) Coat with paint, grease, plastic, ceramic - excludes O₂ and H₂O
- (b) Coat with less reactive metal (Eg: Sn) - excludes O₂ and H₂O
- (c) Use sacrificial anode - connect to more reactive metal (Eg: Zn, Mg)
 - oxidises in preference to the Fe
- (d) Galvanize - coat with Zn - excludes O₂ and H₂O,
 - oxidises in preference to the Fe if surface scratched
- (e) Connect up to negative of a power source - supplies e⁻s which prevents loss of e⁻s and oxidation by Fe

(1 mark each any four different methods) **4 marks**

5 (a)



(c) $m(\text{Zn}) = 1.00 \text{ g}$ $n(\text{Zn}) = \frac{1}{65.39} = 1.53 \times 10^{-2} \text{ moles}$ 1 mark

$n(e^-) = 2 \times n(\text{Zn}) = 2 \times 1.53 \times 10^{-2} = 3.06 \times 10^{-2} \text{ moles}$ 1 mark

$Q_T = n(e^-) \times 9.649 \times 10^4 = 3.06 \times 10^{-2} \times 9.649 \times 10^4$
 $= 2.95 \times 10^3 \text{ C}$ 1 mark

$Q_T = I \times t$
 $2.95 \times 10^3 = 5 \times 10^{-5} \times t$

$t = \frac{2.95 \times 10^3}{5 \times 10^{-5}} = 5.90 \times 10^7 \text{ sec} = 683 \text{ days}$

1 mark **1 mark**