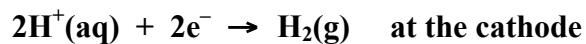
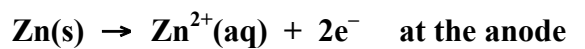


**Marks**  
**3**

- A strip of copper and a strip of zinc are embedded in a lemon, and are connected by wires to a voltmeter; a voltage is generated and can be read at the voltmeter. What chemical reactions are occurring that lead to the generation of current?



Assuming there are no losses in the circuit and the conditions are similar to standard, what voltage can be read at the voltmeter?

**The  $\text{Zn}^{2+} / \text{Zn}$  reduction potential is the more negative so is reversed to give  $E^{\circ}_{\text{ox}} = +0.76 \text{ V}$ . The  $\text{H}^{+} / \text{H}_2$  reduction potential is  $E^{\circ}_{\text{red}} = 0.00 \text{ V}$ . Overall**

$$E^{\circ} = E^{\circ}_{\text{ox}} + E^{\circ}_{\text{red}} = (+0.76 + 0.00) \text{ V} = +0.76 \text{ V}$$