

Name of the Student: _____

Max. Marks : 23 Marks

Time : 23 Minutes

Mark Schemes

Q1.

- | | | | |
|-----|-------|--|---|
| (a) | (i) | HgO | 1 |
| | (ii) | $\text{Hg}^{2+} + 2\text{e}^- \rightarrow \text{Hg}$ | 1 |
| | (iii) | $2\text{H}_2\text{O} + \text{SO}_2 \rightarrow \text{H}_2\text{SO}_4 + 2\text{e}^-$ etc | 1 |
| | (iv) | $\text{Cl}_2 + 2\text{e}^- \rightarrow 2\text{Cl}^-$ | 1 |
| (b) | (i) | Vanadium species: VO_2^+ | 1 |
| | | Oxidation state: 5 | 1 |
| | | Half-equation: $\text{V}^{2+} + 2\text{H}_2\text{O} \rightarrow \text{VO}_2^+ + 4\text{H}^+ + 3\text{e}^-$ | 1 |
| | (ii) | Cell e.m.f 0.06 V | 1 |
| | | Change in e.m.f , Increases | 1 |
| | | More Fe^{3+} ions to accept electrons | 1 |
| | | $\text{Fe}^{3+}/\text{Fe}^{2+}$ electrode becomes more positive | 1 |
| (c) | (i) | $2\text{H}_2 \rightarrow 4\text{H}^+ + 4\text{e}^-$ | 1 |
| | | $4\text{e}^- + \text{O}_2 + 2\text{H}_2\text{O} \rightarrow 4\text{OH}^-$ | 1 |
| | | Overall equation $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$ | |
| | (ii) | Unchanged | 1 |
| (d) | | Economic disadvantage; Use of CH_4 or cost of producing or high temp | 1 |

Environmental disadvantage; Makes CO₂

1

(e) Cost of manufacture of solar cells

1

[17]

Q2.
A

[1]

Q3.
D

[1]

Q4.
B

[1]

Q5.
D

[1]

Q6.
D

[1]

Q7.
A

[1]