UNIT –II

ELECTROCHEMICAL CELLS AND SOLAR ENERGY

QUESTION BANK

1. Define standard electrode potential?
2. The Standard reduction potentials of Zn= -0.763v and Cu = 0.337v.
   Calculate the cell potential if the cell is made up of these two electrodes
3. The Standard reduction potentials of Zn= -0.763v and Cu = 0.337v. Apply the Knowledge of electrochemical series and predict the products of the reaction
   Cu + ZnSO4 $\longrightarrow$
4. Outline the importance of Electrochemical series with examples
5. What is electrode potential? Derive the Nernst equation for single electrode Potential
6. Calculate the emf of the cell at 25 0C, when the concentrations of ZnSO4 and CuSO4 are 0.001M and 0.1M respectively. Predict the reaction is spontaneity of reaction Zn(s)/Zn2+ (0.0001)//Cu2+(0.1)/Cu(s), E0 of cell = 1.2 V)
7. Describe the construction and working of Reference electrodes
   i. SHE ii. Calomel electrode
8. Differentiate primary cells from secondary cells
9. Explain in detail the working of a Dry cell and its disadvantages and applications?
10. Why Dry cell cannot be used in high motion devises like zoom cameras?
11. What is a secondary cell? Explain in detail the construction and working of a lead acid cell. Where we use these batteries?
12. Define standard potential? Describe the working of H2 – O2 Fuel cell and where these fuel cells are more useful?
13. Give any two applications of H2 – O2 Cell.
14. What is fuel cell? Describe the construction and working of CH_3OH - O2 fuel cell.
15. What is a PV cell? Explain the construction and working of a solar cell
16. How a p-n junction can be used as solar cell?
17. Develop a solar panel and Summarize the applications of Solar cell
18. What are the cells used in mobile and laptop applications
19. Describe the construction and working of Lithium ion batteries give their applications.
20. Discuss the working process of Lithium ion Battery.
21. Derive the Nernst equation of electrode potential. Explain the significance of this equation.
22. Explain the construction and working of lead acid battery with the output EMF, Apply the concept and Construct a Lead battery to your Motor vehicle. having capacity to 12V.
23. Explain the construction and working of the H2 – O2 fuel cell. Why its best use is in space craft and military artilleries.or what kind of electrochemical device is more suitable in Submarines and space stations. Elaborate its mechanism with necessary equations.
24. Why Solar cells are environmentally benign, Explain the construction, working and applications of PV cells.

1. What is the difference between an oxidation-reduction reaction and a half-reaction?

2. What do you mean by redox reaction?

3. What is the function of the salt bridge in an electrochemical cell?

4. Define an Electrochemical cell. Give one example.

5. What is electrode potential? Mention its significance?

6. Define oxidation potential and reduction potential.

7 What are the applications of electrochemical cell?

8. Define electrochemical series. Write the significance of electrochemical series or Discuss electrochemical series with its significance. /What is electrochemical series? Give its applications with suitable examples.

9. Write the mathematical form of Nernst equation and give one application.

10. Mention some differences between Primary cells and Secondary cells?

11. What is Reference Electrode? Mention some Applications of Reference Electrodes?

12. What is meant by fuel cell? Explain the working of H 2 - O 2 fuel cell.

13. Explain the construction and working of Lead acid battery?

14. Explain the construction and working of Lithium Ion Batteries?

15. Derive Nernst equation for the calculation of cell emf? Or Discuss Nernst equation for single electrode potential and explain the terms involved in it. Write its applications?

16. What is meant by reference electrode .Explain SHE & calomel electrode with cell representation and half cell reactions?

17. What is a Standard Hydrogen Electrode? Explain Hydrogen Electrode? or How can you measure single electrode potential by using reference electrode?

18. What is a secondary electrode? Explain Calomel electrode?

19. Describe the following electrodes giving the diagram, electrode notation, and electrode reaction: i) Standard hydrogen electrode ii) Calomel electrode

20. Explain the construction and working of dry cell?

21. What is a Solar Cell? Explain its working along with applications? Or a brief note on working of solar cell with its applications. /Write a short note on Solar cells? Or Write a brief note on working of solar cell with its applications.

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