SNS COLLEGE OF TECHNOLOGY
(An Autonomous Institution)
Coimbatore -641035.
Department of CHEMISTRY

23CHT101- ENGINEERING CHEMISTRY
QUESTION BANK

UNIT -1 –ELECTROCHEMISTRY

PART-A

1. What is meant by the term "electrochemical cell"?
2. Explain how a galvanic cell generates electricity.
3. Define standard electrode potential. How is it determined experimentally?
4. Describe the construction and working of a Daniell cell.
5. State the Nernst equation and explain its significance in electrochemistry.
6. Differentiate between electrolytic cells and galvanic cells.
7. Explain how the electrolysis of water occurs and write the balanced chemical equation.
8. Describe the factors affecting the electrode potential of an electrochemical cell.
9. Define an electrochemical power source and give an example.

PART B

1. Derive the Nernst equation of the above reaction and calculate its Electrode potential.
2. With neat diagram discuss the construction and working of standard hydrogen electrode.
3. Illustrate glass electrode with a neat diagram and Explain how pH is measured using Glass electrode.
4. Construct the calomel electrode and describe its working and determine the electrode potential of Zn by using calomel electrode
5. Give an account of the method used in electroplating of gold with its reaction.

Unit – 2 –ELECTROCHEMICAL POWER SOURCES

PART-A

1. Explain the working principle of a primary (non-rechargeable) battery.
2. Compare the advantages and disadvantages of primary and secondary (rechargeable) batteries.
3. Describe the construction and working of a lead-acid battery.
4. What is the significance of the electrode potential in determining the performance of a battery?
5. Discuss the environmental impact of different types of batteries.
6. Explain the concept of battery life and factors affecting it.
7. Define specific energy and specific power of a battery. How are these parameters important in battery selection?
8. Compare the construction and working of a lithium-ion battery and a nickel-metal hydride (NiMH) battery.
9. Discuss the future trends in electrochemical power sources and their potential impact.

PART B

1. Classify the types of Batteries with examples and explain in detail about the construction and working of a Primary battery and mention its few advantages and applications
2. What type of cell is lead-acid battery? Construct a Lead acid battery with Neat and labelled diagram, explain it working with discharging and charging chemical reactions and Mention its few applications
3. Illustrate the construction and working of Zinc-Air battery with a neat diagram
4. Discuss about the construction and working of battery used in laptops and Mobile phones.
5. With a neat diagram discuss the construction and working of Super capacitors
6. Explain how Hydrogen can be separated from water and used as fuel.
7. Explain the construction and working of fuell cell used for spacecraft applications.

UNIT -3 –NANOMATERIALS

PART-A

1. Define nanotechnology
2. What is a quantum dot?
3. What is the sizerange of nanomaterials?
4. What are NanoMaterials, Givean Example
5. What is the significance of the surface are a to volumeratioin nanomaterials?
6. Distinguish between Nano and bulkmaterials
7. What are types of nanomaterials?
8. Mention the types of approaches to synthesize Nanoparticles
9. What are bottom upapproach? Give an example
10. What are Top down approach? Give an example
11. Name two methods of synthesizing nanoparticles
12. What are carbon nanotubes?
13. List out the properties of carbon nanotubes
14. List out the uses of carbon nanotubes.
15. How are nanomaterials used in medicine?

PART B

1. Discuss about the difference between molecules, nanoparticles and bulk materials.
2. Discuss the preparation of carbon nanotubes by chemical vapour deposition method.
3. List out the properties and uses of CNT.
4. Describe the synthesis of nanomaterials by laser ablation and solvothermal process.
5. Discuss the various steps involved in synthesis of nanomaterials by sol gel method.
6. Identify the applications of nanotechnology in medicine, energy science and electronics.

Unit -4 – POLYMERS AND COMPOSITES

PART-A

1. Define a polymer and give an example.
2. Explain the difference between addition and condensation polymerization.
3. Describe the structure and properties of natural polymers.
4. Discuss the advantages of using synthetic polymers over natural polymers.
5. Define composites and provide an example.
6. Explain the role of reinforcement in composite materials.
7. Compare thermoplastics and thermosetting polymers.
8. Discuss the environmental impact of polymers and composites.
9. Describe the application of polymers in the automotive industry.
10. Explain the concept of polymer blending and its significance in material design.

PART B

1. Examine how PE, Teflon and Bakelite are prepared and highlight the properties associated with them to be used as engineering plastics.
2. Write the preparation and uses of Nylon 6,6, PVC
3. Relate the usage of Fiber reinforced plastics in engineering field
4. Explain the preparation of organic polymers and their importance in engineering applications.

Unit -5 –ANALYTICAL TECHNIQUES AND ELECTRONIC MATERIALS

PART- A

5. Define UV-Visible spectroscopy and explain its principle of operation.
6. Describe the components of a UV-Visible spectrophotometer.
7. Discuss the applications of UV-Visible spectroscopy in analytical chemistry.
8. Explain the factors affecting the absorption spectrum in UV-Visible spectroscopy.
9. Discuss the advantages and limitations of UV-Visible spectroscopy.
10. Describe the procedure for obtaining a UV-Visible absorption spectrum.
11. Define Atomic Absorption Spectroscopy (AAA) and explain its principle.
12. Discuss the role of a hollow cathode lamp in AAA.
13. Explain the difference between atomic absorption and atomic emission spectroscopy.
14. Describe the process of atomization in AAA.
15. Discuss the advantages and limitations of AAA.
16. Explain the concept of background correction in AAA.
17. Describe the procedure for preparing a sample for AAA analysis.
18. Discuss the applications of AAA in environmental and clinical analysis.
19. Define Flame Photometry and explain its principle of operation.
20. Discuss the role of a flame in flame photometry.
21. Compare flame photometry with other analytical techniques for cation analysis.
22. Explain the significance of emission lines in flame photometry.
23. Describe the components of a flame photometer.
24. Discuss the factors affecting the sensitivity of flame photometry.
25. Explain the concept of interferences in flame photometry.
26. Discuss the advantages and limitations of flame photometry.
27. Discuss the applications of flame photometry in clinical and environmental analysis
28. Define Liquid Crystal Display (LCD).
29. Explain the working principle of an LCD
30. What is the role of polarizers in LCDs
31. What is response time in an LCD

32. What is a pixel in the context of LCD technology
33. Explain the function of liquid crystals in an LCD.
34. What is the significance of refresh rate in LCDs?
35. Describe the concept of 'dead pixels' in LCDs
36. Define Organic Light-Emitting Diodes (OLEDs) and explain their principle of operation.
37. Compare OLEDs with traditional LEDs in terms of structure and performance.
38. Discuss the advantages of OLEDs over LCDs in display technology.
39. Describe the role of organic semiconductors in OLEDs.
40. Discuss the challenges associated with the lifetime and efficiency of OLEDs.
41. Describe the construction of a typical OLED device.
42. Explain the mechanism of electroluminescence in OLEDs.
43. Discuss the application of OLEDs in lighting and display technology.
44. Compare the manufacturing processes of OLEDs with traditional display technologies.

PART B

1. Analyze the principle and instrumentation of atomic absorption spectroscopy in detail.
2. Explain how sodium ions are estimated by flame emission spectroscopy.
3. Analyze the principle and instrumentation of UV-Vis spectroscopy in detail.
4. Compare the working principle, importance and uses of LEDs and LCDs