

SATHYABAMA UNIVERSITY

(Established under section 3 of UGC Act, 1956)

Course & Branch: B.E/B.Tech - CSE/ECE/EEE/IT/E&C/EIE/ETCE

Title of the paper: Applied Chemistry – II/

Principles of Electrochemical Sciences & Instrumentation

Semester: II

Max.Marks: 80

Sub.Code: 4ET204A-5ET204A-6C0019

Time: 3 Hours

Date: 24-05-2009

Session: FN

PART - A (10 X 2 = 20)

Answer ALL the Questions

1. What are reversible and irreversible cells? Give examples.
2. Define the term molar conductance.
3. What are inhibitors? Give examples.
4. Why pretreatment of a surface is essential before the application of protective coating?
5. Write the conventional representation of dry cell.
6. Distinguish primary cell and secondary storage cell.
7. How are adhesives classified? Give examples.
8. What are extreme pressure additives?
9. Mention the various types of detectors used in HPLC
10. What are the merits and demerits of quinhydrone electrode.

PART – B (5 x 12 = 60)

Answer ALL the Questions

11. (a) What is single electrode potential? How is it determined?
(b) A conductivity cell has two parallel electrodes of 1.4 cm^2 area and 1.2 cm apart. When filled with N/50 solution of an electrolyte at 25°C , the resistance was found to be 250 ohms. Calculate the cell constant, specific conductance and equivalent conductance of the solution.

(or)

12. (a) Derive the Nernst equation expression for electrode potential.
(b) State Kohlrausch's law of independent migration of ions and explain its applications.
13. (a) Explain the cathodic protection methods of corrosion control.
(b) What are the constituents of oil paint? Give its functions.

(or)

14. (a) What is differential aeration corrosion? Explain with examples.
(b) What is anodizing? Explain the process of anodizing of Aluminium. How does it differ from electroplating?
15. (a) Explain the construction of lead acid accumulator and give the reactions during discharging and charging.
(b) Explain the terms (i) Energy density (ii) Energy efficiency and (iii) internal resistance of the battery.

(or)

16. (a) Explain the various types of nickel cadmium batteries. Give the discharge reactions and mention its applications.
(b) What are fuel cells? Explain with an example.
17. (a) what are abrasives? How are they classified? Mention their uses.
(b) Write short note on solid lubricants.

(or)

18. (a) Explain the various chemical factors which influence the adhesive action and give the advantages and disadvantages of adhesive bonding.
(b) What are semisolid lubricants? Explain with examples.
19. (a) Explain the principle and basic components of gas chromatography.
(b) Write short note on conductometric titrations.

(or)

20. (a) Describe the working of glass electrode in the determination of pH of an aqueous solution.
(b) Explain the basic principles of liquid chromatography.

