



# Alagappa University, Karaikudi

(A state University Accredited with A+ Grade by NAAC (CGPA: 3.64) in the third cycle & Graded as Category – I University by MHRD – UGC: QS India Rank -20, QS BRICS Rank-104)

**Directorate of Distance Education**

Karaikudi – 630 003, Tamil Nadu

**II Year IV semester M.Sc. Chemistry**

**34441 Analytical Chemistry**

**Assignment Question**



1. Explain in details about the classification of errors.
2. What is significant figure and write the rules to determine the significant figures?
3. Define standard deviation and variance with examples
4. Define correlation and regression
5. Write down the concept of F-test and Q-test
6. Give some applications of Ion-selective electrodes.
7. Explain potentiometric methods
8. Differentiate the kinds of polarography.
9. Explain electro transfer reactions in cyclic voltammetry.
10. Explain the principle of paper chromatography.
11. What is the principle of size exclusion chromatography?
12. What is mean by capillary electrophoresis?
13. Describe AC polarography
14. Differentiate between chronoamperometry and chronopotentiometry
15. Describe principle and instrumentation of TLC
16. write down the application of Gas chromatography
17. Discuss the instrumentation of gel permeation chromatography
18. Write about the controlling factors involved in electro dialysis
19. Discuss about the types of cells involved in polarographic reactions
20. Describe about Dropping mercury electrode (DME)
21. Explain the principle and theory behind GC-MS
22. write about the significant features and types of HPLC
23. Schematically explain the purification method of fractional crystallization and sublimation process.
24. Briefly explain Electrophoresis.
25. Discuss in detail about Gel permeation chromatography.



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**34442 Applied Chemistry**

**Assignment Question**



1. Explain the causes and consequences of ozone layer depletion
2. Define hazardous materials and their characteristics?
3. Explain in detail about (i) Green house effect (ii) acid rain
4. Explain the method of waste water treatment by trickling filters
5. Explain detail about fuel cell
6. Give an account on passivity.
7. Write a note on Corrosion Inhibitors
8. Write a note on intergranular corrosion
9. Discuss about the process of sacrificial anodic protection.
10. Discuss any method of surface cleaning method
11. Write the advantages and limitation of electroforming process
12. Explain about spray pyrolysis process
13. Write a program to calculate bond energy of chemical bond.
14. Discuss the importance of FT-IR in the structural determination of nano particles.
15. Discuss the Pourbaix diagram of Fe- H<sub>2</sub>O system.
16. Explain in detail about the electroplating of nickel
17. Briefly explain the Principle advantages and limitation of Electroless Plating
18. Explain how SEM studies helps in the structural determination of nano particles
19. Explain in detail about XPS for characterization of nano particles.
20. Explain the following a. Virtual Lab b. Sol-gel method c. concept of MOOCs



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## **34443 Advanced Physical Chemistry Assignment Question**



1. Explain in details about Maxwell - Boltzmann distribution law of molecular energies
2. Explain the following 1. Partition functions 2. Thermodynamic functions 3. Equilibrium constant from partition function
3. Explain Fermi-Dirac distribution law
4. Discuss detail about Non equilibrium thermodynamics
5. Derive the equation for Vibrational partition function
6. Explain Onsager reciprocal relations
7. Derive the equation for One dimensional harmonic oscillator and rigid rotor
8. Give Application of perturbation method to helium
9. Account the following with example Symmetry elements and symmetry operations
10. Assign the point group systematically for a molecules
11. Arrive the Character table of  $C_{2v}$  and  $C_{3v}$  point groups.
12. Explain the great orthogonality theorem
13. Explain in details about Application of group theory to electronic spectra of HCHO molecule
14. Discuss detail about factors which affect the reaction rates in solution.
15. Give application of ARRT to solution kinetics –
16. Explain Bronsted – Bjerrum equation,
17. Differentiate Primary salt and secondary salt effect
18. Derive Hammett and Taft equations
19. Derive Michaelis – Menton equation for enzyme kinetics
20. Explain effect of pH and temperature on enzyme catalyzed reactions