

**D.K.M. COLLEGE FOR WOMEN (AUTONOMOUS), VELLORE-1**  
**INORGANIC CHEMISTRY-II**

**UNIT-I      THE CHEMISTRY OF SOLID STATE**

**Section-A (6 marks)**

1. Discuss in details about magnetic properties of solids
2. Explain band theory
3. Explain the theories of super conductors
4. Differentiate intrinsic and extrinsic semiconductors with suitable examples
5. Give an account on ferrites
6. Write a short note on nonlinear materials with examples
7. Define diffusion and types of mechanism
8. Give an account on spinels
9. Give a Comparison of X-ray and Neutron Diffraction
10. Explain Solid state lasers and inorganic phosphors,
11. Write a note on Fullerenes
12. Discuss about optical property of solids
13. Write a note on hysteresis

**Section-B (15 marks)**

14. Discuss in detail about coordination, properties and structure of Pyroovskite, cadmium iodide and nickel arsenide
15. Define superconductors. Explain in detail about Type I and Type II super conductors with suitable examples.
16. Give the comparison account on conductor, semiconductor and insulator
17. Discuss in detail about different types of defects in solids with suitable examples
18. Explain in detail about non-stoichiometric compounds.

19. Explain in detail about electrical, optical and magnetic property of solids
20. How will you determine the magnetic susceptibility by guoy and faraday method

## **UNIT - II**

### **SOLID STATE, BIOINORGANIC & COORDINATION CHEMISTRY-III**

#### **Section-A (6 Marks)**

1. Discuss in detail about Vacancy and Interstitial Diffusion
2. Explain in detail about the formation of spinels
3. Explain in detail about the biological role of carboxypeptidase.
4. Give a brief account on iron - sulphur proteins
5. Differentiate between porphyrins and corrins
6. Write a short note on macrocyclic Schiff bases

#### **Section-B (15 marks)**

7. Describe in detail about the photosynthesis process using chlorophyll as sensitizer.
8. Enumerate in detail about the following
  - (i) carbonic anhydrase
  - (ii) vitamin B<sub>12</sub>
9. Explain in detail about the Oxygen carriers.
10. Discuss in detail about the biological role of sodium, potassium, calcium, zinc and copper.
11. Explain in detail about the crown ethers and crypts.
12. (i) Describe in detail about the nitrogen cycle.  
(ii) Give a brief account on template effect.

## **UNIT - III COORDINATION CHEMISTRY-IV**

#### **Section-A (6 Marks)**

1. Explain in detail about the complementary and non complementary reactions
2. Give a brief account on two electron transfer reactions

3. Describe in detail about Marcus theory.
4. Discuss in detail about the trans effect using examples.

**Section- B (15 marks)**

5. Enumerate in detail about outer sphere and inner sphere mechanisms using examples
6. Explain in detail about the nature of the binding ligand and the fission of successor complexes.
7. Describe in detail about the substitution in square planar platinum complexes and also explain the influences of entering, leaving and other groups
8. Discuss in detail about the substitution of octahedral complexes of cobalt and chromium
9. Outline in detail about the replacement of coordinated water and the solvolytic (acids and bases) reactions

**UNIT-IV      NUCLEAR CHEMISTRY – I**

**Section-A (6 Marks)**

1. Explain about the Nuclear spin and moments.
2. Write the salient features of liquid drop model.
3. Write short notes on shell model of nucleus.
4. Give an account on Cloud chamber.
5. Discuss about the Nuclear Emission.

**Section-B (15 Marks)**

6. Describe about the Nuclear isomerism and Bubble chamber.
7. Explain in detail about the Nuclear spin, nuclear magnetic moments and G.M counter.
8. Discuss briefly about the Scintillation and Cherenkov counter.

## **UNIT – V    NUCLEAR CHEMISTRY – II**

### **Section-A (6 Marks)**

1. Write a short note on types of nuclear reaction.
2. Explain in detail about the Q-Value with example.
3. Give an account on threshold energy.
4. Write a short note on Nuclear Fission process.
5. Write a short note on Nuclear Fusion process.
6. Discuss about the Direct reaction.
7. Explain in detail about the photonuclear reaction.
8. Write a short notes on Thermonuclear reactions.

### **Section-B (15 Marks)**

9. Explain in detail about the Nuclear fission and fusion process.
10. Describe briefly about the Compound nucleus theory.
11. Explain in detail about the  $\alpha$ ,  $\beta$ ,  $\gamma$ ,  $\delta$  and  $\epsilon$  process .
12. Discuss in detail about the Particle and linear accelerators.