LMDQ/M-24   **7517**
INORGANIC CHEMISTRY SPECIAL-IV
CHEM-402

Time : Three Hours]   [Maximum Marks : 60

Note :   Attempt *Five* questions in all, selecting at least *one* question from each Section. All questions carry equal marks.

Section A

1. (a)   Explain coulometric titrations by giving suitable example. Coulometric titration is better than electrogravimetry technique. Justify.   **8**

    (b)   Write a short note on anodic stripping voltammetry.   **4**

2. (a)   What is the basic principle of amperometry ? Discuss the different types of graphs in amperometry.   **10**

    (b)   Define depolarizers with suitable example.   **2**

Section B

3. (a)   Explain the general principle of Atomic Absorption Spectroscopy. Discuss the broadening in resonance line due to doppler effect.   **6**

(b) Give the mathematical value of absorbed light by the substance in AAS. **2**

(c) Draw the labelled diagram of Hollow Cathode Lamp. **4**

4. (a) Explain the principle of Flame Photometry and discuss the optimum working conditions for flame photometry by Boltzmann's distribution law. **8**

(b) Discuss the interferences in Flame Photometry. **4**

Section C

5. (a) Explain the role of lanthanide shift reagents in NMR by taking the suitable examples. **6**

(b) Explain the factors affecting the nuclear relaxation. **6**

6. (a) Discuss the applications of colorimetry. **4**

(b) Explain the different laws of absorption spectroscopy and discuss the interferences in this spectroscopy. **8**

Section D

7. (a) Give the basic principle of ESR spectroscopy. $\Delta E = g\beta H$, justify the relation. (ΔE = amount of energy required for transition, g = Lande's splitting factor, β = Bohr's Magneton, H = applied magnetic field). **6**

(b) Describe the effect of spin orbital coupling on the magnitude of 'g' value. **6**

8. (a) Describe the interaction of polarized light with optically active matter. **4**

(b) Explain Circular Dichroism spectra for the different possible isomers of trischelated complexes taking the suitable example. **8**