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PG (NEW) CBCS

M.Sc. Semester-IV Examination, 2020

CHEMISTRY

PAPER: CEM 403

ADVANCED INORGANIC CHEMISTRY-II

Full Marks: 40 **Time: 2 Hours**

Answer any one question from the following (within 250words): 40X1=40

1. (a) What is intimate (I) mechanism?

(b) What are the difference between I_a and I_d mechanism?

(c) What do you mean by substitutionally inert and labile complexes?

2. (a) Write the characteristics of 'supporting electrolyte' for the cyclic voltammetry (CV) experiment.

(b) What is cyclic voltammetry? What it is called so?

3. (a) Write the characteristics of solvent used for cyclic voltammetry (CV) experiment.

(b) Discuss the effect of pH on polarograms.

4. (a) What is polarographic maximum? How do you eliminate this problem?

(b) What is complementary and non-complementary reaction? Mechanistically explain the oxidation of Cr (III) to Cr (IV) by peroxodisulphate catalyzed by Ag^+.

5. (a) State and explain the application of cyclic voltammetry (CV).

(b) Write down an inner sphere and outer sphere mechanism for Cr^{2+} reduction of $[Co(NH_3)_5Cl]^{2+}$.

6. (a) Discuss conjugate base mechanism with a suitable example.

(b) Write a short note on saturated calomel electrode.

7. (a) State the merits of polarographic analysis.

(b) What do you mean by acid catalyzed pseudo substitution? Explain with a suitable example.

8. Deduce the relationship between half wave potential and standard redox potential of a system.

9. (a) Show how the energy of electron inside the electrode change with electrode potential.

(b) Explain the TG curve for $CaC_2O_4.H_2O$ (calcium oxalate)

10. Derive the rate equation for associative mechanism for L_5MX complex where seven coordinate intermediate has appreciable life time. Consider Y as attacking molecule.

11. (a) Acid catalyzed aquation of chromium complex of ethylenediammine is slower than that of the biguanide complex. Explain

(b) $[Co(NH_3)_5X]^{2+} + H_2O \rightarrow [Co(NH_3)_5(H_2O)]^{3+} + X^-$

Propose a base catalyzed mechanism of the above reaction.

12. (a) Derive Ilkovic equation.

(b) What condition should be maintained in polarographic analysis?

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