

B.SC Examination Semester IVTH (CBCS)

Subject- Chemistry

M.Marks:80

Time Allowed: 3 Hrs

Course No. :- UGHTC – 401

Section – A

(Attempt all questions. Each question carries three marks.)

- Q 1. Give various oxidation states of Mn , Fe and Cu.
- Q 2. Define critical phenomenon and critical constants.
- Q 3. Define liquid crystals. Illustrate with examples.
- Q 4. What is CFSE ? Calculate CFSE for d^5 ion in octahedral field.
- Q 5. Define Activation energy. Calculate Activation energy from Arrhenius equation.

Section – B

(Attempt all questions . Each question carries seven marks)

- Q 6. Discuss latimer diagrams of Mn and Fe.
- Q 7. Explain splitting of d – orbital in square planar complexes.
- Q 8. On the basis of VBT, explain why $[\text{Co}(\text{NH}_3)_6]^{3+}$ is outer octahedral complex whereas $[\text{Co}(\text{Cl})_6]^{3-}$ is outer octahedral complex.
- Q 9. Derive the equation for first order reaction and show that half –life period of a first order reaction is independent of initial concentration.
- Q 10. Define Viscosity of a liquid. How will you calculate viscosity of liquid using Ostwald's Viscometer.

Section – C

(Attempt any two questions . Each question carries fifteen marks)

- Q 11. a) Compare the chemistry of d—block elements with that of Lanthanides and actinides.
b) Discuss any two laws of Crystallography. (8,7)
- Q 12. A) Explain why
- Most of the examples of d—block are paramagnetic in nature.
 - d—block elements form coloured complexes.
 - d—block elements shows variable valency.

B) What are liquid crystals? Give their classification. (12,3)

Q 13. a) Discuss Collision Theory of Bimolecular reactions.

b) What is John – Teller Distortion ? Explain it. (9,6)

Q 14. What are most probable , average and root mean square velocities? Explain Maxwell Boltzmann Distribution law of molecular velocities and molecular energies. (15)

Q 15. a) Give main postulates of VBT . Also give its limitations.

b) Why $\Delta_t = (4/9)\Delta_0$

c) Discuss Ostwald's isolation method and Graphical method for determination of order of reaction. (6,3,6)