



**B.Sc. VI Semester Degree Examination, Sept./Oct. - 2024**

**CHEMISTRY**

**DSC-7 : Advanced Inorganic and Physical Chemistry**

**(NEP)**

Time : 2 Hours

Maximum Marks : 60

**Note :** Answer **all** sections.

**SECTION - A**

Answer the following sub-questions. Each sub-question carries **one** mark. **10x1=10**

1. (a) Define stepwise stability constant. 1
- (b) What is kinetic stability of metal complexes ? 1
- (c) Write the structure of trans-isomer of co-ordination number 4. 1
- (d) Give an example of weak field ligand. 1
- (e) What is Spectroscopic ground state ? 1
- (f) What is Racah parameter ? 1
- (g) Define partial molar volume. 1
- (h) Define activity coefficient. 1
- (i) What is ionic atmosphere ? 1
- (j) When ion pair formation is possible according to Bjerrum mode ? 1

**SECTION - B**

Answer **any four** of the following questions. Each question carries **five** marks.

**4x5=20**

2. Write a note on determination of binary formation constant by Polarographic method. 5
3. Explain the geometrical isomerism in co-ordination number 6 with example. 5
4. Discuss the colour of transition metal complexes on the basis of CFT. 5
5. Write a note on Tanabe-Sugano diagrams. 5



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6. Explain the following excess thermodynamic functions. 5  
(a) Excess Gibbs free energy  
(b) Excess Entropy
7. Explain Debye-Huckel theory for the problem of activity coefficient. 5

**SECTION - C**

Answer **any three** of the following questions. Each question carries **ten** marks.

**3x10=30**

8. (a) Discuss briefly the factors affecting the stability of metal complexes with reference to nature of metal ion and ligand. 6  
(b) Derive the relationship between stepwise formation constants and overall formation constant. 4
9. (a) Draw crystal field splitting diagram in tetrahedral and square planar geometry. 6  
(b) Discuss the magnetic properties of octahedral complexes on the basis of CFT. 4
10. (a) Explain the determination of magnetic susceptibility of complexes by Gouy method. 6  
(b) Write a note on orbital contribution to magnetic property. 4
11. (a) Define phase rule. Derive the phase rule from the concept of chemical potential. 6  
(b) Discuss the ideal and non-ideal systems in thermodynamics. 4
12. (a) Derive an expression for electro capillary Lippmann's equation. 6  
(b) Explain briefly activation over potential. 4

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