



KL-1621

Seat No. _____

M. Sc. (Sem. I) Examination

November / December - 2017

CHN - 401 : Inorganic Chemistry : Paper - I

Time : 3 Hours]

[Total Marks : 70

- 1 (a) Answer any two : 10
- (1) Explain the valence shell electron pair repulsion theory.
 - (2) Explain : Energy of hybridization.
 - (3) Explain atomic inversion by proper illustration.
- (b) Answer any one : 4
- (1) Explain : Bent rule.
 - (2) Explain : $d\pi - p\pi$ bond.
- 2 (a) Answer any two : 10
- (1) Explain the factors affecting the stability of metal complexes.
 - (2) Explain chelate effect and thermodynamic origin for metal complexes.
 - (3) Explain relationship between stepwise and overall stability constants.
- (b) Answer any one : 4
- (1) Discuss and determination of stepwise stability constants by pH metric.
 - (2) Explain the spectrophotometric method for determination of binary formation constant.

- 3 (a) Answer any two : 10
- (1) Explain the substitution reactions in square planar sp^2 (II) complex.
 - (2) Write a note in detail on - Trans effect.
 - (3) Write and discuss Labile and Inert complexes.
- (b) Answer any one : 4
- (1) Explain the following terms affecting the rate of reaction.
 - (a) Trans effect
 - (b) Leaving group.
 - (2) Give a brief account on Inner Sphere and outer sphere reactions.
- 4 (a) Answer any two : 10
- (1) Explain the M.O. diagram of CO (III) ions in Oh strong field complex.
 - (2) Explain the limitation of CFT.
 - (3) Explain Tanabe-Sugano diagram for the d^2 .
- (b) Answer any one : 4
- (1) Calculate CFSE for $[Fe(CN)_6]^{-3}$ ($z = 26$) and $[Co(F)_6]^{-3}$ ($z=27$) complexes.
 - (2) Explain the factor affecting the value of Δ_o .
- 5 Answer any seven : 14
- (1) Limitation of VSEPR theory.
 - (2) Limitation of Walsh diagram.
 - (3) Predict the shape of H_2O on the basis of Walsh diagram.
 - (4) What is ligand ? Give an example of hexadentat.
 - (5) Write the definition and example of Redox reaction.
 - (6) Calculate the μ_s for d^4 in weak Oh field.
 - (7) Define $d\pi - p\pi$ bond.
 - (8) What is thermodynamic stability ?
 - (9) What is trans effect ?
 - (10) What is bond order ? Calculate B.O. in N_2 molecule.