VITTHALBHAI PATEL & RAJRATNA P.T. PATEL SCIENCE COLLEGE
VALLABH VIDYANAGAR
INTERNAL TEST-2016

Date : 03-10-2016 **B.Sc. (Semester-V)**
Day : Monday
Time: 11.00 a.m. to12.30 p.m. **Total Marks: 25**

Subject: INORGANIC CHEMISTRY (US05CCHE03)

Note: (i) All questions are to be attempted.
(ii) Figures to the right indicate marks.

Q: 1 Answer the following multiple choice questions : [03]

(i) The plane of rotation contains principle axis is called..... plane.
(a) vertical (b) horizontal (c) dihedral (d) none of these

(ii) The colouration of metal complex depends on ..... .
(a) magnetic strength (b) metal ion (c) ligand field strength (d) number of ligand

(iii) The relationship between the ..... at a particular wavelength and concentration is expressed by Beer's law.
(a) absorption (b) sorption (c) chemisorption (d) absorbance

Q: 2 Answer the following (ANY TWO): [04]

(i) Distinguish between σ_v and σ_h.
(ii) Explain the microstates for e_g^2 state.
(iii) Define labile and inert complexes.

Q: 3 (a) Using suitable example, prove that C_3V point group is a non-abelian group. [03]
(b) Identify the symmetry element and detect the point group of following: [03]
(i) Methane (ii) SF_6 (iii) Benzene (iv) Ammonia

OR

Q: 3 (a) Prove with proper example: $S_n^n = E$ for n = even number. [03]
(b) Give an account of improper rotation (rotation-reflection). [03]

Q: 4 (a) Discuss the tetragonal distortion in octahedral field. [03]
(b) Write note on John-Teller effect. [03]

OR

Q: 4 (a) Explain: $[V(H_2O)_6]^{+3}$ is green in colour. [03]
(b) Calculate in the unit of Δ_o the LFSE of Fe^{+3} high spin ion in octahedral complex. [03]
Given : Δ_o= 13700 cm^{-1} and P = 30000 cm^{-1}

Q: 5 (a) Discuss the continuous variation method for the determination of composition of a complex. [03]
(b) Discuss S_N1 mechanism in ligand substitution reaction in octahedral complex. [03]

OR

Q:5 (a) Discuss the acid hydrolysis reaction of six coordinated Co(III) ammine complexes. [03]
(b) What is trans effect ? Discuss the electrostatic polarization theory for trans effect. [03]

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