

Vitthalbhai Patel & Rajratna P. T. Patel Science College,
Vallabh Vidyanagar
B. Sc. (Semester-V)

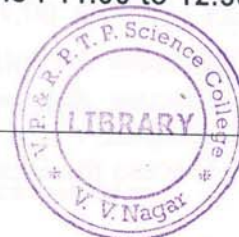
Subject : INORGANIC CHEMISTRY (US05CCHE03)

Date : 05-10-2017
Day : Thursday

Internal Test – October, 2017

Marks : 25
Time : 11.00 to 12.30 p.m.

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



- Q.1 Choose the correct option for the following :** [3]
- (i) Infinite fold axis of symmetry present in which type of molecule ?
(a) Linear (b) Pyramidal (c) Octahedral (d) Tetrahedral
- (ii) How many bands are observed in the spectra of $[V(H_2O)_6]^{+3}$ ion ?
(a) 5 (b) 2 (c) 3 (d) 1
- (iii) The difference of energy between reactants and products is called
(a) activation energy (b) potential energy (c) reaction energy (d) none
- Q.2 Answer the following (Attempt any two) :** [4]
- (i) Give the comparison between σ_v and σ_h .
- (ii) Explain the microstates of t_{2g}^2 configuration.
- (iii) Mention all the factors affecting the stability of complexes.
- Q.3 Answer the following:** [6]
- [a] Prove that $S_n^{2n} = E$, for $n =$ odd number with proper example.
- [b] Write short note on cubic point group.
- OR
- Q.3 Answer the following:** [6]
- [a] Give multiplication table for C_{3v} point group and answer (a) $C_3' \times \sigma_{va}$
(b) $\sigma_{va} \times \sigma_{vb}$
- [b] Identify symmetry element and detect the point group of Pyridine and SF_6 .
- Q.4 Answer the following :** [6]
- [a] Discuss the splitting of d-orbitals in an octahedral field.
- [b] Distinguish between diamagnetism and paramagnetism.
- OR
- Q.4 Answer the following:** [6]
- [a] Explain: $[Ti(H_2O)_6]^{+3}$ is violet in colour.
- [b] Calculate LFSE of Co^{+2} ($Z=27$) in high spin state in an octahedral complex.
Given: $\Delta_o = 22500$ and $P = 9300$

Q.5 Answer the following :

[6]

- [a] Discuss the Spectrophotometric method for the determination of composition of a complex.
- [b] Discuss the base hydrolysis reaction of six coordinated Co(III) ammine complexes.

OR

Q.5 Answer the following :

[6]

- [a] Discuss S_N2 mechanism in ligand substitution reaction in an octahedral complex.
- [b] Discuss the factors affecting lability of complexes.

