

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



Date : 03-10-2016

B.Sc. (Semester-I)

Day : Monday

Time: 1.30 p.m. to 2.30 p.m.

Total Marks: 25

Subject: INORGANIC CHEMISTRY (US01CCHE02)

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) Who has given the Uncertainty principle ?

(a) de-Broglie (b) Heisenberg (c) Einstein (d) Plank

(ii) What is the geometrical arrangement of sp^2 hybrid orbital ?

(a) linear (b) tetrahedral (c) trigonal planar (d) trigonal bipyramid

(iii) What is the bond order of H_2^+ molecule ?

(a) 0.5 (b) 2 (c) 1 (d) 1.5

Q: 2 Answer the following (ANY TWO):

[04]

(i) Define electron probability function and effective nuclear charge.

(ii) Why bond angle is $107^{\circ}48'$ in an NH_3 molecule ?

(iii) Why He_2 molecule does not exist?

Q: 3 (a) Derive de-Broglie's wave equation.

[03]

(b) Calculate the screening constant and effective nuclear charge for the last electron in Cl-atom ($Z=17$).

[03]

OR

Q: 3 (a) Discuss the factors affecting the magnitude of σ and Z_{eff} and their variation in periodic table.

[03]

(b) A cricket ball weighing 100 gms is to be located within 0.1 \AA . What is the uncertainty in its velocity ? Comment on your result.

[03]

Q: 4 (a) ClF_3 has distorted trigonal bipyramidal shape while I_3^- ion has linear shape. Explain by VSEPR theory.

[03]

(b) Define hybridization. Discuss the sp hybridization in BeF_2 molecule.

[03]

OR

Q: 4 (a) Using VSEPR theory, predict the geometry of SF_4 and H_2O molecule.

[03]

(b) Discuss the hybridization of atomic orbitals of carbon atom in CH_4 molecule.

[03]

Q: 5 (a) Describe LCAO method to obtain wave function of molecular orbital.

[03]

(b) Describe molecular treatment of F_2^- molecule.

[03]

OR

Q:5 (a) Give the essential requirement for orbital to undergo linear combination of atomic orbitals. How molecular orbitals are defined ?

[03]

(b) Explain s-p combination of orbitals.

[03]
