

No. of printed pages : 02

VITTHALBHAI PATEL & RAJRATNA P. T. PATEL SCIENCE COLLEGE

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INTERNAL TEST: OCTOBER-2015

Date: 05/10/2015,

F. Y. B. Sc. (Semester-I)

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 of each question indicate full marks.

Q : 1 Give the correct choice to the following multiple choice questions. [3]

(i) How the magnitude of Z_{eff} varies on going down a group?

(a) decreases (b) increases (c) remain constant (d) none

(ii) How many electron pairs are present around valence shell of central I-atom of I_3^- ion?

(a) 3 (b) 5 (c) 4 (d) 6

(iii) Which one of the following molecular species has unpaired electron(s)?

(a) N_2 (b) F_2 (c) O_2^- (d) O_2^{2-}

Q : 2 Answers the following short questions(any two). [4]

(1) Define intervening electrons and what the role of these electrons is on effective nuclear charge?

(2) Why any hybrid orbital can form stronger bond than atomic orbital?

(3) H_2 does exist but He_2 does not exist. Explain.

Q : 3[A] Derive the three dimensional Schrodinger's wave equation. [3]



[B] Calculate de-Broglie wavelength of CO_2 molecule moving with velocity of 1.2×10^6 cm/sec at 300°K . (Atomic weight of C=12.0 gm/mole, O=16 gm/mole, $h=6.626 \times 10^{-34}$ J.Sec). [3]

OR

Q : 3 [A] State and explain Heisenberg's uncertainty principle. [3]

[B] Calculate σ and Z_{eff} for $3d$ and $4s$ electron in Mn ($Z=25$) [3]

Q : 4 [A] Define hybridization. Discuss the sp^2 hybridization in BF_3 molecule. [3]

[B] Explain 'octate rule' in detail with suitable illustration which obeys this rule and also note obey this rule. [3]

OR

Q : 4 [A] Discuss the structure of NH_3 and SF_6 molecules with the help of VSEPR theory [3]

[B] The shape of molecules is distorted in presence of lone pair. Explain giving suitable examples. [3]

Q : 5 [A] $p-p$ combination of orbitals yields two different type of molecular orbitals. Explain. [3]

[B] Describe molecular orbital treatment of: C_2 molecule [3]

Q : 5 [A] Describe LCAO method to obtain wave function of molecular orbital. [3]

[B] Describe molecular orbital treatment of: F_2 molecule [3]

BEST OF LUCK !