Exam. Code: 0001
Sub. Code: 0049

2012
B.A./B.Sc. (General) First Semester
Chemistry
Paper - I: Inorganic Chemistry – A
(Same for B. Sc. Microbial and Food Technology)

Time allowed: 3 Hours Max. Marks: 22

NOTE: *Attempt five questions in all, including Question No. IX (Unit-V) which is compulsory and selecting one question each from Unit- I – IV.*

x-x-x

UNIT – I

I. a) Derive Heisenberg's uncertainty principles and why electron cannot reside inside the nucleus.

b) An electron is accelerated from rest through a potential difference of 1KV. Calculate de Broglie wave length. (2,2)

II. a) Describe Aufbaur's Rule and why 4s is filled before 3d?

b) Give the significance of Radral and Onguler part in Schrodinger wave equation in polar coordinates. (2,2)

UNIT – II

III. a) What are isoelectronic ions? How the size of following ions varies Al^{+3}, N^{-3}, Mg^{+2}, O^{-2}.

b) Write the general electronic configuration of transition elements and inner transition elements. (2,2)

IV. a) Define electron affinity why EA of F < Cl?

b) Calculate electronegtivity of carbon is C- H bond if B.E. of C - H, H - H, C - C bond are 98.8, 104 & 83 KJ/Mol respectively. (2,2,)

UNIT – III

V. a) Why Be and Mg do not respond to flame test but Ca, Sr does.

b) Why Li, Na, K react with oxygen to form oxide, peroxide and superoxide respectively.

c) Discuss role of Na^+ and K^+ in biological system. (1,2,1)

P.T.O.

VI. a) Why noble gas possess largest radii?

b) Discuss the str. of XeF_2.

c) Why He, Ne, do not for compound? (1,2,1)

UNIT – IV

VII. How MO theory account on:-

a) Bond order of $O_2^+ > O_2 > O_2^- > O_2^{2-}$

b) Stability of NO. NO^+, NO^- (2,2)

VIII. a) Why bond angle in $H_2O > NH_3 > CH_4$

b) Bond angle in $NH_3 > NF_3$ but bond angle in $PH_3 < PF_3$.

c) Calculate % ionic character of XY having dipole moment 2.3D and bond distance $1.5A^0$. (1,1,2)

UNIT – V

IX. Answer the following:-

a) Write all four quantum number of 3d

b) Name M.O. formed by combination of δ px and 2px

c) Name the hybridization of XeO_3.

d) Shape of $BeCl_2$ in vapour phase

e) Give unit of eletronegativity

f) IUPAC symbols of element with Z = 115. (6x1)

x-x-x