

Exam. Code: 0001
Sub. Code: 17049

2115
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. 9 (Unit-V) which is compulsory and selecting one question each from Unit- I – IV.

x-x-x
UNIT - I

- (a) Derive Schrodinger wave equation using $\psi = A \sin \frac{2\pi x}{\lambda}$. 2
(b) Define Heisenberg's uncertainty principle and how it predicts that electron cannot reside inside the nucleus. 2
- (a) State Pauli's exclusion principle, what is the significance of it? 2
(b) Write all the four quantum number of highest unpaired electron in (i) K (ii) Cu 2

UNIT - II

- (a) Why the size of Cl^- is larger than Cl atom? 1
(b) Why electron affinity of Cl is higher than F? 1
(c) The inter nuclear distance between Na^+ & F^- ion is 231 pm. Calculate their ionic radii. 2
- (a) Why 2nd electron affinity of oxygen is negative? 1
(b) Calculate the electronegativity of carbon in C-H bond if bond energies C-H, H-H and C-C are 98.8, 104 and 83 Kcal/mole respectively. 2
(c) What is cause of periodicity in modern periodic table? 1

UNIT - III

- (a) How Bertlett gave an idea that noble gas can form compounds. 1
(b) Complete the following reaction
i) $\text{XeF}_2 + \text{H}_2\text{O} \rightarrow$
ii) $\text{XeF}_4 \xrightarrow{\text{P}^+} \rightarrow$ 2
(c) Why noble gases has extremely low boiling points? 1
- (a) Why alkali metals form blue conducting and paramagnetic solution in liquid ammonia? 2
(b) Why alkali metal respond to flame colouration? 1
(c) Why Li resemble with Mg? 1

P.T.O.

(2)

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UNIT - IV

7. (a) Why bond angle in $\text{CH}_4 > \text{NH}_3 > \text{H}_2\text{O}$? 1
(b) Why axial bonds of PF_5 are longer than equatorial bonds? 1
(c) Why bond angle in $\text{NH}_3 > \text{NF}_3$ but $\text{PH}_3 < \text{PF}_3$? 2
8. (a) Why bond length in $\text{N}_2^+ < \text{N}_2$ but $\text{O}_2^+ < \text{O}_2$? 2
(b) Difference between bonding and antibonding molecular orbital. 1
(c) Explain relative stability of NO^+ , NO , NO^- the basis of M.O.T. 1

UNIT - V

9. (a) Which of following are paramagnetic in nature
 $\text{N}_2, \text{O}_2, \text{F}_2, \text{B}_2$
(b) Name molecular orbital formed by combination of $2p_x$ and $2p_x$.
(c) What are units of dipole moment?
(d) Which of following do not show flame test?
 $\text{Be}, \text{Mg}, \text{Na}, \text{K}$
(e) Define screening effect.
(f) Write Debrogue equation and its significance. (6x1)

x-x-x