**M. SC. (Analytical Chemistry) / M. SC. (Organic Chemistry) / M. SC. (Inorganic Chemistry) Sem-I (CBCS – 2018 Course) : SUMMER - 2019**

**SUBJECT: INORGANIC CHEMISTRY – I**

Day: Wednesday
Date: 10/04/2019

Time: 03.00 PM TO 06.00 PM
Max Marks. 60

**S-2019-1162**

**N.B.**

1) All questions are **COMPULSORY**
2) Figures to the right indicate **FULL** marks.
3) Answers to both the sections should be written in **SEPARATE** answer books.
4) Draw neat and labelled diagrams **WHEREVER** necessary.
5) Use of non – programmable **CALCULATOR** is allowed.

## SECTION - I

**Q.1** Answer any **THREE** of the following **(15)**

**a)** Write the Schrodinger's wave equation and give the significance of each term present in it.

**b)** What is VSEPR theory? Write the basic assumptions of VSEPR theory.

**c)** Write and explain Pauli's exclusion principle.

**d)** Explain the hybridization and geometry in the following molecules

i) $NH_3$ ii) $PF_5$ iii) $IF_6$

**e)** Write a note on – Lattice Energy

**Q.2 A)** Answer any **TWO** of the following **(10)**

**a)** Derive an expression for a particle moving in a three dimensional box.

**b)** What are LP and BP electrons? How they affect the bond angle? Discuss with suitable examples.

**c)** Write a note on – Bond Multiplicity

**B)** Answer any **ONE** of the following **(05)**

**a)** Assign the four quantum numbers for the last electron present in Na (Z = 11) atom.

**b)** Determine the number of unpaired electrons in the following molecules

i) NO ii) $O_2$

## SECTION - II

**Q.3** Answer any **THREE** of the following **(15)**

**a)** What are stoichiometric defects? Explain Frenkel defect with suitable example.

**b)** Describe PON polymers with suitable examples.

**c)** Define Pseudohalogen compounds and compare the properties of Halogens and Pseudohalogen compounds.

**d)** Explain 'Metal Deficiency' type of defects.

**e)** Why group 18 elements are more correctly called as Noble gases instead of inert and Rare? Also write general properties of Noble gases.

**P.T.O**

**Q.4** Answer any **THREE** of the following **(15)**

**a)** What are Ionic solids? Explain general properties of ionic solids.

**b)** What are semiconductors? Describe Intrinsic semiconductivity with suitable example.

**c)** Explain the bonding in following compounds on the basis of VBT.

i) $XeF_6$ ii) $XeF_2$

**d)** Write a comparison between Amorphous solids and crystalline solids.

**e)** What is Inorganic benzene? Explain structure and properties of Inorganic benzene.

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