Name: **Enrolment No:**	UPES UNIVERSITY WITH A PURPOSE

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2019

Course: Inorganic Chemistry I — **Semester: I**
Program: B.Sc. (H) Chemistry — **Time 03 hrs.**
Course Code: CHEM 1003 — **Max. Marks: 100**

Instructions: Read the instructions given below carefully:

1. **All questions are compulsory.**
2. **Internal choice given in question number 10 and 12.**

SECTION A

S. No.		Marks	CO
Q 1	Which is larger in size Cs or Fr?	**4**	**CO2**
Q 2	Which quantum numbers revels information about the energy and orientation of orbitals?	**4**	**CO1**
Q 3	What are bonding and antibonding molecular orbitals?	**4**	**CO3**
Q 4	List the rules for the linear combination of atomic orbitals.	**4**	**CO3**
Q 5	How can we find out the %ionic character in a covalent compound?	**4**	**CO3**

SECTION B

Q 6	Describe Allred-Rochow's scale of electronegativity taking Fluorine as an example	**8**	**CO2**
Q 7	Discuss the various properties of ionic compounds.	**8**	**CO3**
Q 8	Predict the structure of ClF_3 and indicate whether the bond angle is likely to be distorted from theoretical value.	**8**	**CO3**
Q 9	Plot Radial probability functions for n= 2,3 for Hydrogen atom	**8**	**CO1**
Q 10	Briefly discuss electron gain enthalpy trends in groups and periods **OR** What is variable valency in covalent bonds? Discuss it taking phosphorous as an example.	**8**	**CO2**

SECTION-C

Q 11	**a)** Discuss the defects found in solids. **b)** What are vander Waals forces? Explain with examples. **c)** From the Bohr postulates, derive expression for radius of Hydrogen atom.	**5** **5** **10**	**CO3** **CO3** **CO1**
Q 12	**a)** Derive Born-Lande equation and explain Madelung constant. **b)** Explain the trend followed by ***s***-block elements with respect to atomic radii, ionic radii and ionization potential	**10** **10**	**CO3** **CO2**

	OR **a)** Draw MO energy level diagram for O_2 molecule. Work out on its bond order and magnetic property. **b)** Write the set of empirical rules proposed by Slater for calculating shielding constant and calculate shielding constant of valance electron in Zn		