SHIVAJI COLLEGE, UNIVERSITY OF DELHI
DEPARTMENT OF CHEMISTRY
INTERNAL TEST
(Academic Year 2023-24)

Name of the Course	:	GE- Chemistry
Name of the Paper	:	Atomic structure and chemical bonding (UPC -2174001001)
Semester	:	I
Maximum Marks	:	16
Duration	:	1 hr
Date of Test	:	06/11/2023
Faculty Name	:	Dr. Parveen Gahlyan

Instructions for candidates:
i) Attempt any four questions:
ii) All questions carry equal marks (4 x 4 = 16)

Q.1 Draw Born Haber cycle and calculate the lattice energy of NaCl from the following data:
Heat of sublimation of sodium = 108 KJ mol^{-1}
Dissociation energy of Cl_2 = 243.0 KJ mol^{-1}
Ionization energy of sodium = 495.2 KJ mol^{-1}
Electron affinity of chlorine = -348.3 KJ mol^{-1}
Enthalpy of formation of NaCl = -381.8 KJ mol^{-1}

Q. 2 a) Why is the bond angle of H-O-H in water 104.5° while the bond angle of H-N-H in ammonia is 107°?
b) Calculate the % ionic character for HCl molecule when the electronegativities of H and Cl are 2.2 and 3.16, respectively.

Q.3 Discuss the geometry, hybridization and shape of the following molecules on the basis of VSEPR Theory: ClF_3 and SF_6

Q.4 Define Lattice energy and solvation energy. What is the role of these terms in deciding the solubility of ionic solid?

Q.5 Explain Fajan's rule and on the basis of these rules compare the covalent character in the following salts:
(i) NaCl and CuCl
(ii) AgI and AgCl

Signature of the Teacher: