BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION)

CLASS: IMSC **SEMESTER: I**
BRANCH: CHEMISTRY **SESSION: MO/2018**

SUBJECT: CH103 INORGANIC CHEMISTRY-I

TIME: 2 HOURS **FULL MARKS: 25**

INSTRUCTIONS:
1. The total marks of the questions are 25.
2. Candidates may attempt for all 25 marks.
3. Before attempting the question paper, be sure that you have got the correct question paper.
4. The missing data, if any, may be assumed suitably.

Q1. (a) Write the radial distribution functions for 2s and 2p orbitals. [2]
Q1. (b) From the plot of radial distribution functions with distance of electron from nucleus show the nodes for the following orbitals: 3s. 3p, 3d. [3]

Q2. (a) What is de Broglie Matter wave? [2]
Q2. (b) Show the de broglie matter wave is not applicable in the macroscopic world. [3]

Q3. (a) Calculate the Zeff for (i) Cl (ii) Mn (iii) Na (iii) F [2]
Q3. (b) What is ionization enthalpy? Discuss the factor governing ionization enthalpy. [3]

Q4. (a) Energy of an electron in the ground state of the hydrogen atom is -2.18×10^{-18} J. Calculate the ionization enthalpy of atomic hydrogen in terms of J mol^{-1}. [2]
Q4. (b) Explain the Mulliken's scale of electronegativity. [3]

Q5. (a) Justify the following: [2]
(i) NaCl and BaO have similar internuclear distance but NaCl has a melting point 800 ^{0}C while BaO melts at 1923 ^{0}C.
(ii) MgS and LiCl have similar structure but MgS is harder than LiCl.
Q5. (b) Define lattice energy. Discuss Kapustinskii equation. [3]

:::::: 10/10/2018 M ::::::