Seat No: _____ Enrollment No:_____

PARUL UNIVERSITY

FACULTY OF APPLIED SCIENCE

M.Sc. Supplementary, Winter 2017-18 Examination

Semester: 2 **Date: 04/01/2018**
Subject Code: 11205152 **Time: 10.30 am to 1.00 pm**
Subject Name: Inorganic Chemistry-II **Total Marks: 60**

Instructions:
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1. A) Answer the following questions
(a) Explain the different types of quantum numbers and their significance **(04)**
(b) The kinetic energy of an electron has been found to be 6.32 ×10-18 J. Calculate the wavelength associated with the electron (mass of electron is 9.1×10^{-31} kg, h = 6.626 ×10-34 J **(04)**

Q.1. B) Answer the following question (Any two)
(a) 1. Explain Compton effect **(02)**
2. Give the experimental evidence for wave character of electron **(02)**
(b) Find the least energy of an electron moving in one-dimensional potential box (infinite height) of width 0.05nm **(04)**
(c) Discuss the relationship of quantum numbers with shapes of orbitals with examples **(04)**

Q.2. A) Answer the following questions.
(a) 1. Define cooperativity effect and Bohr effect **(02)**
2.What are contrast agents in MRI? **(02)**
(b) Describe the role of Na and K in sodium pump **(04)**

Q.2. B) Answer the following questions (Any two)
(a) Explain the structure and the role of Myoglobin and haemoglobin in biological systems **(03)**
(b) Discuss the probable difference in carboxy peptidase and carbonic anhydrase **(03)**
(c) Explain the structure and the use of cis-platin as antitumor drug **(03)**

Q.3. A) Answer the following questions (Each of 04 marks) **(08)**
(a) Write in brief the factors affecting the stability of a complex ion
(b) Explain with example the total number of symmetry operation for tetrahedral molecule molecule

Q.3. B) Answer the following questions (Any two)
(a) 1. Explain the different types of ligands with examples **(02)**
2. Write the formulae of the following i) Triamminetrinitrito-Ncobalt(III) ii) Ammonium hexathiocyanato-S palatinate(IV) **(02)**
(b) Draw the structure of the following complexes: i) trans-diaquadichloroplatinum (II) ii) diammine tetra(isothiocyanato)chromate (III) **(04)**
(c) Explain the different kinds of isomerism possible in coordination complexes. Give one example of each kind **(04)**

Q.4. A) Answer the following questions.
(a) Identify the genuine improper rotation from the symmetry operation **(04)**
i)S_4^4 ii) S_5^2 iii) S_5^9 iv) S_5^3
(b) Determine the transformation matrix and calculate the character for the proper rotation C_2 along x,y and z axis **(04)**

Q.4. B) Answer the following questions (Any two)
(a) 1. ----- is present in Vitamin B12 a) Co b) Cu c) Zn d) None **(03)**
2. --------- is the common isotope for imaging a) Tc b) Mo c) Cu d) Zn
3. 8. Which orbitals cannot exist of these 2p, 3p, 4d, 3f, 6s, 2d?
(b) Prove $C_2'C_2 = C_3'$ from the symmetry operations carried out on a equilateral triangle **(03)**
(c) Explain with example proper rotation and improper rotation **(03)**