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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST -1 EXAMINATION- Feb 2018
B.Tech II[nd] Semester

COURSE CODE: 10B11CL212 MAX. MARKS: 15
COURSE NAME: CHEMISTRY
COURSE CREDITS: 4 MAX. TIME: 1Hr

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. Use of calculator is allowed

Q1. Answer/explain the following questions. [1x6=6]

a) How will you ensure that the optical rotation of $+60^0$ observed in polarimeter is actually $+60^0$ not -300^0?
b) What are different types of symmetry present in crystal lattice?
c) Calculate packing fraction of FCC unit cell?
d) What is the relationship between pK_a and pH?
e) What will happen if acid is added to a mixture of acetic acid and sodium acetate?
f) Determine the Molarity of 50% Nitric acid.

Q2. a) Explain CIP rules for determining R/S configuration of enantiomer by taking suitable example. [1.5]

b) Explain how intermolecular hydrogen bonding effect properties of compounds. Why water has highest density at 4^0 C. [1.5]

Q3. Answer the following questions. [1.5 x 4=6]

a) An element exists in the BCC structure whose cell edge is 3.3 A^0. The density of element is 7.2 g/cc. Calculate number of atom 112 g of the element contains.
b) Calculate the pH of a 10^{-3} M solution of $Ba(OH)_2$ if it undergoes complete ionization.
c) If pure (S)-(+)-2-bromobutane has $+23.1^0$ observed specific rotation. What will be your conclusion if your sample of 2-bromobutane has 1) observed specific rotation of 0^0. 2) Observed specific rotation is +ve but less than $+23.1^0$ 3) Observed specific rotation is -23.1^0.
d) The density of a FCC element (Atomic mass =60.2 g/ml) is 6.2 g/cm^3. Calculate the length of the edge of the unit cell. (Avogadro's Constant N_A= 6.02 X10^{23})