

V.P. AND R.P.T.P. SCIENCE COLLEGE  
VALLABH VIDYANAGAR  
INTERNAL TEST-2015



COURSE : US01CCHE01 (GENERAL CHEMISTRY)

DATE : 03-10-2015

TIME : 1.30 p.m. TO 2.30 p.m.

DAY : SATURDAY

TOTAL MARKS: 25

Q.1. Choose the correct option for the following

[3]

- (i) When a pH value of a solution is change from 3.0 to 2.0, the increase in concentration of  $H_3O^+$  will be :
- (a) Two times      (b) Ten times      (c) Four times      (d) One times.
- (ii) Which of the following compound is alkenol ?
- (a) Allyl alcohol      (b) Cyclohexanol      (c) Amyl alcohol      (d) 2-butenal.
- (iii) Which of the following geometry is exist in  $[Ni(DMG)_2]^0$  ?
- (a) Tetrahedral      (b) Linear      (c) Square planar      (d) Octahedral.

Q.2. Answer the following (ANY TWO)

[4]

- (i)  $CO_2$  is a Lewis acid but not a Lowery-Bronsted acid.
- (ii) Boiling point of n-, iso and neo pentanes are  $36^\circ C$ ,  $28^\circ C$  and  $9.5^\circ C$  respectively.
- (iii) Give the correct IUPAC name for the following complexes.



Q.3. Answer the following

- (i) Give in detail limitations of Arrhenius concept. [3]
- (ii) A solution contains 0.1M  $Cl^-$  ion and 0.01M  $CrO_4^{2-}$  ion. (a) When solution of  $AgNO_3$  [3] added to above solution then which salt will ppted first ? (b) What will be the value of  $[Ag^+]$  when the first salt just ppted ? Given :  $K_{sp}$  of  $Ag_2CrO_4 = 1.9 \times 10^{-12}$  and  $K_{sp}$  of  $AgCl = 2.8 \times 10^{-10}$

OR

[P.T.O.]

**Q.3. Answer the following**

- (i) What do you understand by solubility product ? Discuss its application in qualitative [3]  
inorganic analysis.
- (ii) Calculate the solubility of  $\text{Mg}(\text{OH})_2$  in (a) pure water and (b) What is the [3]  
concentration of  $\text{OH}^-$  ion in the saturated solution (c) What is the pH of the solution?  
Given:  $K_{\text{sp}}$  of  $\text{Mg}(\text{OH})_2 = 1.8 \times 10^{-11}$  and  $K_w = 1 \times 10^{-14}$ .

**Q.4. Answer the following.**

- (i) The following names are objectionable. Write the correct name and their structure. [3]  
(a) 2-isopropyl-1-propene (b) 2,2-diethyl butane (c) 2-methyl-3-chloro-4-bromo  
hexane.
- (ii) A Dumas nitrogen analysis of a 5.72 mg sample gave 1.31 ml of nitrogen at  $20^\circ\text{C}$  [3]  
and 746 mm. The gas was collected over saturated aqueous KOH solution (the  
vapor pressure of water is 6 mm). Calculate the percentage of nitrogen in the  
compound. (Given : Atomic weight of N = 14)

OR

**Q. 4. Answer the following**

- (i) Combustion of a 5.17 mg sample of a compound gives 10.32 mg of  $\text{CO}_2$  and 4.23 [3]  
mg of  $\text{H}_2\text{O}$ . The molecular weight of compound is 88 gm/mole, What is the  
molecular formula of the compound ?(Given: Atomic weight of C = 12 ;H = 1; O=16).
- (ii) Describe the Lassaign test for detection of nitrogen and sulphur elements only. [3]

**Q.5. Answer the following**

- (i) What is chelation ? Why  $[\text{Cu}(\text{en})_2]^{+2}$  is more stable than  $\text{Cu}(\text{NH}_3)_2^+$ . [3]
- (ii) What is ligand ? Give classification of ligand (giving at least one example) based [3]  
on the number of donor atoms present in it.

OR

**Q.5. Answer the following.**

- (i) Describe the uses of chelates. [3]
- (ii) What is coordination number ? Describe the possible geometries of complex [3]  
having coordination number six.

THE END

