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SARDAR PATEL UNIVERSITY
B.Sc. EXAMINATION
SEMESTER – I
General Chemistry (US01CCHE01)
Date: November 25, 2013 (Monday)
Time: 2:30 p.m. to 4:30 p.m.

Maximum Marks: 70

Q-1 Choose the correct option for each of the following. **[10]**

1. The precision of the result is also known as
   (a) Accuracy (b) Error (c) Reproducibility of the result (d) Questionable value
2. The error which arise due to voltage fluctuation is known as
   (a) systematic error (b) Random error (c) Personal error (d) Error due to method
3. _____is not sparingly soluble salt.
   (a) $Ca_3(PO_4)_2$ (b) AgI (c) $CaCl_2$ (d) CdS
4. The conjugate base of H_3O^+ is
   (a) H_2O (b) HCO_3^- (c) OH^- (d) HNO_3
5. During combustion of organic compound CuO is used as
   (a) Catalyst (b) Oxidizing agent (c) Solvent (d) Reducing agent
6. Which reagent is used in the estimation of halogen by carius method?
   (a) HNO_3 & H_2SO_4 (b) HNO_3 & HCl
   (c) HNO_3 & $AgNO_3$ (d) All of these
7. The correct IUPAC name for isobutene is
   (a) 3-methyl-1-propene (b) 2-methyl-1-propene
   (c) 2-methyl-2-propene (d) 3-methyl-2-propene
8. The oxidation state of Co in $[Co(NH_3)_6]Cl_3$ is
   (a) 2 (b) 3 (c) 4 (d) 5
9. The dentate character of the ligand "trien" is
   (a) 2 (b) 3 (c) 4 (d) None of these
10. The ligands are _____
    (a) Lewis base (b) Lewis acid (c) Always a cation (d) All of these

Q-2 Attempt the following.(Any Ten) **[20]**

1. List the factors affecting the selection of method for analysis.
2. Describe briefly standard addition method.
3. Describe briefly internal standard method.
4. Why the solubility of AgCl decreases in aqueous solution of $AgNO_3$?
5. Define P^H. How the P^H scale is useful to classify the solution.
6. The solubility product of AgCl is 2.8×10^{-10}. Determine the solubility of AgCl in pure water.
7. Give structure and IUPAC names for all possible isomers of C_5H_{12}.
8. What is % carbon present in C_3H_7Cl having molecular weight 78.5 gm/mole?
9. Give classification of hydrocarbon.
10. Define chelate and give its analytical application.
11. Define coordination number and explain stereochemistry of coordination number 2.
12. What is addition compound?

Conti...

Q-3 Attempt the following.

(a) Give complete classification of chemical analysis. **[05]**

(b) Define accuracy and precision. Show that Precision always accompanies accuracy but high degree of precision does not mean accuracy. **[05]**

OR

Q-3 Attempt the following.

(a) Define error. Describe various types of error. **[05]**

(b) Explain -"Analytical chemistry is an interdisciplinary branch" **[05]**

Q-4 What do you mean by strong acid and weak acid? Describe various concepts of acids and bases. **[10]**

OR

Q-4 Define solubility and solubility product. Calculate the solubility of CaF_2 in (i) 0.1M $Ca(NO_3)_2$ and (ii) 0.1M NaF solution.[K_{SP} of CaF_2 = 1.7×10^{-10}] **[10]**

Q-5 Attempt the following.

(a) Discuss Kjeldahal's methods for estimation of nitrogen present in organic compound. **[04]**

(b) Following names are objectionable. Write the correct name & their structure. **[03]**
(i) 3-methyl-2-butene (ii) 2,2-diethyl butane (iii) 2-propyl-1-propene

(c) Draw the structure & write the IUPAC name for the following. **[03]**
(i) Isobutylene (ii) Neohaxane (iii) sec-butyl chloride

OR

Q-5 Attempt the following.

(a) Discuss the test for the detection of N, S, and halogen present in organic compound. **[04]**

(b) Draw E/Z isomers for the following. **[03]**
(i) 2-bromo-1-chloropropene (ii) 2-bromo-2-butene (iii) 1-chloro-2-methyl-2-butene

(c) The boiling point of n-Butane, n-Pentane & n-Hexane is 0°, 36° & 69 °C respectively. Explain. **[03]**

Q-6 Attempt the following.

(a) In the coordination compound $[CrCl(H_2O)(en)_2]Cl_2$ **[05]**
(i) The oxidation state of chromium ion is _____
(ii) The coordination number of chromium is _____
(iii) The dentate character of different ligand are_____
(iv) Ionic charge on complex cation is _____
(v) The number of non-coordinated chlorine ion is _____

(b) Explain **[05]**
(i) Every multidentate ligand is not necessarily a chelating ligand.
(ii) Sulphate (SO_4^{-2}) is flexidentate ligand.

OR

Q-6 Attempt the following.

(a) Discuss stereochemistry of coordination numbers 3 to 6. Give at least one example of each. **[05]**

(b) Give IUPAC name of following coordination compounds. **[05]**
H_3CoCl_6, $[Ni(CN)_4]^{4-}$, $[CoBr_3(H_2O)(en)]^{2+}$
$K[SbCl_5(C_6H_5)]$, $[CrCl_2(H_2O)_4]^{+}$,