**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Organometallic compounds Class: B.S (IV)

**Semester:** 1st Test: 1st Sessional

**Session:** 2012 Date: 04-10-2012

**Maximum Marks** 15 Time allowed: 1hr

**Note: Attempt all Questions**

**Q. No. 1** (a) What are organometallic compounds? Elaborate with examples how the organotransition metal compounds are named on basis of IUPAC system

(b) Describe that how following organotransition metal compounds obey the eighteen electron rule

[Ni(CO)4] (ii) Ferrocene (iii)[ V(CO)6] (iv) [Ag(NH3)8]

**Q. No. 2** Describe the bonding of any two of following organotransition metal compounds

(i) Metal alkyls (ii) Metal carbonyls (iii) Metal allyls

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic chemistry Class: B.S. III / M. Sc.(Previous)

**Semester:** 1st Test: 1st Sessional

**Session:** 2011 Date 04- 10 - 2011

**Maximum Marks** 15 Time allowed: 1hr

**Note: Attempt any Two Questions**

Q. No. 1 What are complex compounds? Explain with experimental evidences how wener describe the structure of complex compounds

Q. No. 2 What are chelating agents, how they are classified, why they form stable complex compounds and what are their applications?

Q. No. 3 (a) Give the IUPAC name to following complex compounds

(i) K3[Fe(CN)6] ii [Ni(CO)5Cl]-1 iii [Co(Py)Cl2] iv [Cr(NO2)2(en)2]

(b) Give the hybridization shape and number of unpaired electrons in following complex compounds

(i) K3[Fe(CN)6] (ii) [Ni(CO)4] (iii) [Mn(CN)6] (iv) [CuCl4]

Atomic Number Fe =26, Ni= 28, Mn = 25, Cu = 29

**THE END**

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF Chemistry**

**Subject:** Inorganic Chemistry **Class**: B. S. (i)

**Semester:** 1st **Test:** 1st Sessional

**Session:** 2012 **Date** 02- 10 - 2012

**Maximum Marks** 15 **Time allowed:** 1hr

**Note: Attempt Two Questions Q. No2. is compulsory**

Q. No. 1 What is difference between modern periodic law and Mendlee’s periodic law? How defects of Mendlees periodic table removed by arrangement of elements on basis of modern periodic table

Q. No. 2 (a) What are four quantum number values for electron when they are present in 3d, 4f, 4p and 6s subshells

(b) Show the position of elements in periodic table when their atoms have valence shell electronic configuration as below

(i) 4s2, 4p4 (ii) 6s2, 4f14, 5d10, 6p5 (iii) 5s2, 3d6 (iv) 4s1, 3d10 (v) 6s2, 4f14 3d10 6p1

(c) Write electronic configuration of following elements indicating spin of electrons (According to Hund’s rule)

Sulfur (Z= 16), Copper (Z= 29) , Phosphorus (Z= 15), Tellurium (Z= 52)

(d) In which block elements will found when their electronic configuration is

(i) 1s2, 2s2, 2p6 (ii) 1s2, 2s2, 2p6, 3s2, 3p6, 4s2 (iii) 1s2 2s2, 2p6, 3s2, 4s2, 3d2

Q. No. 3 Write short note on following

(i) Law of octave (ii) Paulis Exclusion principle (iii) Azimuthal Quantum Number

**THE END**

**Work Load of Dr. Ahmed-u-ddin, Professor**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **S. No.** | **Title of Course** | **Class** | **Course**  **Credit HRS** | **Approved** | **Not Approved** | **Amount** |
| **05** | **Inorganic Chemistry Theory** | **B.S. (I)** | **03** |  |  |  |
| **06** | **Inorganic Chemistry (Practical)** | **B. S. (I)** | **01** |  |  |  |
| **07** | **Environmental Inorganic Chemistry** | **M. S.** | **04** |  |  |  |
| **08** | **Practical** | **M. S** | **o1** |  |  |  |
|  |  |  |  |  |  |  |

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic chemistry **Class:** B.S. (I)

**Semester:** 1st **Test:** 2nd Sessional

**Session:** 2011 **Date** 28- 10 - 2011

**Maximum Marks** 15 **Time allowed**: 1hr

**Note: Attempt all questions**

**Q. No. 1** What is acid and base? Describe with examples any two of following modern acid base concepts

1. Arrhenius acid base concept
2. Solvent system acid base concept
3. Lewis Acid base concept

**Q. No. 2** Attempt any three of following

(a) Give the conjugate acid of base and conjugate base of acid of following acid base pair

(i) HCl + H2O (ii) CH3COOH + NH3 (iii) H2SO4 + Na2CO3

(b) Arrange the following acids in increasing order of their strength by giving reason behind that

(i) HClO3, HClO4, HClO2, HClO (ii) HCl, HF, HBr, HI (iii) CH4, NH3, H2O, HF

© From following complex compounds select stable and unstable complexes by giving suitable reason behind that

NaF, AgS, AgNO3, CaCl, Pb2CO3

(d) Explain the following by giving suitable reason

1. In salt analysis first group cations are precipitated by HCL
2. AlCl3 is lewis acid but not Bronted acid
3. Explain whether the following reactions takes place or not on the basis of HSAB concept
4. LiF + CsI ------------------------ LiI + CsF
5. CaCL + HgF ------------------------ CaF + HgCl

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Organometallic Compounds Class: B.S (IV)

**Semester:** 1st Test: 2nd Sessional

**Session:** 2011 Date: 29-10-2011

**Maximum Marks** 15 Time allowed: 1hr

**Note: Attempt any all Questions**

**Q. No. 1** Explain eighteen electron rule? How it is satisfied in following complex compound

(i) Fe(C8H12) CO3 (ii) Mn2(CO)12 (iii) Ni(CO)4  (iv) Fe2(C8H8)(CO)5

When atomic number of Fe (Z=26), Mn (Z=25), Ni (Z=28)

**Q. No. 2** Describe synthetic methods for the preparation of any three of following organometallic compounds

1. Metal acetylene complexes
2. Ƞ3 \_Allylic metal complex compounds
3. Metal carbine complexes
4. Ƞ5 - Cyclopentadiene complex

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic chemistry Class: B.S. III / M. Sc.(Previous)

**Semester:** 1st Test: 2nd Sessional

**Session:** 2011 Date 29- 10 - 2011

**Maximum Marks** 15 Time allowed: 1hr

**Note: Attempt any Two Questions**

Q. No. 1 Explain how Crystal field theory describe the color of complex compounds and distorted octahedral complex when the valence bond theory was not able to describe these properties

Q. No. 2 Describe arrangement of the electrons in the complex compounds when they possesses d4, d8 and d3 electrons in case of high spin and low spin octahedral complex compounds and determine their crystal field stabilization energy

Q. No. 3 Describe with diagrammatical representation the molecular orbitals formed in the following molecules, accommodation of electrons in their molecular orbitals, determine their bond order and magnetic properties

(i) N2 (ii) NO-1 (iii) CO

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF Phrmacy**

**Subject:** Pharmaceutical Inorganic Chemistry **Class**: 1st Professional Pharm. D

**Semester:** 2nd **Test:** 2nd Sessional

**Session:** 2011 **Date** 31- 10 - 2011

**Maximum Marks** 15 **Time allowed:** 1hr

**Note: Attempt any Two Questions**

Q. No. 1 How and why atoms are linked with each other and form bond? Describe with examples the polar, nonpolar, double and single covalent bonds

Q. No. 2 Write short note on following

1. Wander walls forces
2. Metallic bonding
3. Chelates

Q. No. 3 Explain the following by giving suitable reason

1. H2O is liquid while H2S is gas
2. AlCl3 is covalent while AlF3 is ionic compound
3. PCl5 is stable while NCl5 can
4. Chlorine has only one unpaired electron in their valence shell even then it shows the covalency of 1,3,5,7
5. AlCl3 is electrophile while NH3 is nucleophile

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Organometallic Compounds Class: B.S (IV)

**Semester:** 1st Test 3rd Sessional

**Session:** 2011 Date: 28-11-2011

**Maximum Marks** 15 Time allowed: 1hr

**Note: Attempt any all Questions**

**Q. No. 1** How air sensitive organometallic compounds are synthesized? Describe the nmr spectrophotometric method for characterization of organometallic compounds

**Q. No. 2** What are the fundamental methods of reactions of transition metal complexes? Describe ligand substitution reaction in general and square planar complex compounds of

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic chemistry Class: B.S. III / M. Sc.(Previous)

**Semester:** 1st Test 3rd Sessional

**Session:** 2011 Date 01- 12 - 2011

**Maximum Marks** 15 Time allowed: 1hr

**Note: Attempt any Two Questions**

**Q. No. 1** What are π- acceptor ligands? Explain that how the ligands containing multiple bonds are in range of strong field ligands also describe effect of π-bonding on the bond length of ligand molecules

**Q. No. 2** What is eighteen electron rule? Elaborate with examples how it is satisfied in case of mononuclear and polynuclear metal carbonyls

**Q. No. 3** Explain the VSEPR theory? Discus with examples that how geometry of covalent compounds containing four and five electron pairs surrounding central atom may be determined by applying this theory

**THE END**

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF Phrmacy**

**Subject:** Pharmaceutical Inorganic Chemistry **Class**: 1st Professional Pharm. D

**Semester:** 2nd **Test:** 3rd Sessional

**Session:** 2011 **Date** 08-12-2011

**Maximum Marks** 15 **Time allowed:** 1hr

**Note: Attempt any Two Questions**

Q. No. 1 What are essential elements, how they are classified? Give the biological functions and toxicity of following essential elements

(1) Carbon (ii) Phosphorus (iii) Nitrogen (iv) Magnesium

Q. No. 2 Give the preparation properties and pharmaceutical applications of sodium bicarbonate

Q. No. 3 Write short note on following

(i) Half life time

(ii) Artificial Radioactivity

1. The ionization Chamber

**Assighnment:-**  Give properties, preparations, uses and pharmacological action of following elements and their compounds

1. Calcium and its compound calcium carbonate
2. Gold and its compound gold sodium thiosulfate

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Organometallic Compounds Class: B.S (IV

**Semester:** 1st Test: Final

**Session:** 2011 Date: 13-12-2011

**Maximum Marks** 50 Time allowed 2hr

**Note: Attempt all Questions**

**Q. No. 1** Explain any five of following by giving suitable reason

1. For synthesis of organotransition metal complexes Schlank apparatus is used
2. NMR spectrophotometer is important tool for identification of organometallic compounds
3. PR3acts as strong field ligand and NH3 is weak field ligand
4. Olefins form complex with transition metals not with other molecules or ions
5. Cyclopentadiene is linked with Fe(CO)3 through four carbon atoms while in Fe(C8H8)(CO)6 through eight carbon atoms
6. Bond stretching frequency of carbonyl in increased when it form complex with transition metals as *compared* to free carbonyl
7. Tetrahedral complexes obey 18- electron rule while square planar 16- electron rule

**Q. No. 2** Describe with examples nature of bonding in any two of following organotransition metallic compounds

(i) π-bonding in dienes and polyenes

(ii) Bonding in metal carbonyl complexes

1. Bonding in carbene and carbyne complexes

Q. No. 3 Give synthetic methods for preparation of any two of following organotransition metal compounds

(i) Ƞ5 –cyclopentadienyl complexes

(ii) Ƞ3-Allylic complex compounds (iii) Ƞ3-Arene complexes

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Organometallic Compounds Class: B.S (IV) Failure/Improver

**Semester:** 1st Test: Final

**Session:** 2012 Date: 24-12-2012

**Maximum Marks** 100 Time allowed 2.30hr

**Note: Attempt any four Questions**

**Q. No. 1** What are organometallic compounds how they are named? Discuss the classification of organometallic compounds on the basis of their nature of bonding

**Q. No. 2** What is eighteen electron rule? How it is satisfied in following metal carbonyl complexes

**(i) Cr(CO)6 (ii) Mn2(CO)6 (iii) Fe NH3(CO)4**

Q. No. 3 Describe nature of bonding in following organometallic compounds

(i) Metal acetylene Complexes

(ii) Metal Carbene and allyl complexes

Q. No. 4 Give synthetic methods for preparation of following organometallic compounds

(i) Synthesis of metal Acetylene

(ii) Ƞ5-Cyclopentadiene

Q. No. 5 Elaborate with example following reactions of organometallic compounds

(i) Oxidative addition and reductive elimination reaction

(ii) Insertion and deinsertion reaction

Q. No. 6 Describe with experimental evidences that how the bonding in CO ligand is affected when it forms complex with transition metals at lower oxidation state

THE END

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic chemistry **Class:**  B.S. III / M. Sc.(Previous)

**Semester:** 1st **Test** Final

**Session:** 2011 **Date**  16- 12 - 2011

**Maximum Marks** 50 **Time allowed**: 2hr

**Note: Attempt three Questions Q.No.1 is compulsory**

**Q. No. 1** Do as directed

**(a)** Explain the following by giving suitable reason

1. Chelates are more stable than complex compounds
2. [Co(NH3)6]3+ is *diamagnetic* while [Co(F)6]3+ is paramagnetic
3. [Ni(CN)4]2- is square planar complex while [Ni(F)4)]2- is tetrahedral
4. Heat of hydration is minimum at Mn2+and maximium at Ni2+

**(b )**  Predict shape of following molecules on the basis of VSEPR theory

1. PH3 (ii) C2H6 (iii) CH2CH2 (iv) H2S

**(c )** Calculate effective atomic number of central metal atom in given complex

[Cu(NH3)4]2+, [Ni(CO)4], [Fe(CN)3]3+, [Mn(NH3)6]2+

Cu (Z)= 29, Ni(Z) = 28, Fe(Z)=26, Mn (Z)=25

**(d )** Give the name to following complex compounds by IUPAC system

Na2[Fe(CN)5NO], [Cr(en)3]Cl, [Co(NH3)5H2O]Cl3, [(NH3)5Cr-OH-Cr(NH3)5]Br5

**Q. No. 2** Explain that how Jorgenson chain theory was failed in explaining the structure of complex compounds and werner’s theory successfully explained the structure of complexes

**Q. No. 3** Give central idea of Crystal field theory? How d orbitals are spillted in different energy levels in case of tetrahedral and octahedral complexes and filled by electrons in ca e of strong field and weak field ligands

**Q. No. 4** What are π-Acceptor ligands? Explain the nature of bonding in metal carbonyl complexes with experimental evidences which reflects the back bonding in metal carbonyls

**WISH YOU GOOD LUCK**

*SHAH ABDUL LATIF UNIVERSITY KHAIRPUR*

*DEPARTMENT OF CHEMISTRY*

*Subject: Pharmaceutical Inorganic (Practical Class 1st Professional Pharm-D*

*Semester: 2nd Test Final*

*Session: 2011 Date 19- 01- 2012*

*Maximum Marks Time allowed: 35min*

*Name Father’s Name Roll No*

*­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

***Q. No.1 Fill in the blanks***

1. *Hardness of water is due to the presence of salts of ---------------------------------Ions*
2. *Concentration of substance may be determined from the volume by --------------------------------------------------------------------------------------------Formula*
3. *Indicator which is used in EDTA titration is -------------------------------------------------*
4. *Buffer solution may defined as-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------*
5. *Structural formula of EDTA is -----------------------------------------------------------------------------------------------------------------------------------------------------------------*
6. *Temporary hardness is removed by ------------------------------------------------------------*
7. *% Yield can be calculated by formula-----------------------------------------------------------*
8. *0.1 solution of NaOH can be prepared by dissolving ------------ amount of NaOH in lire of solution*
9. *Hardness of water can be calculated by formula-------------------------------------------*
10. *IUPAC name of N2O3 is ---------------------and HgCl2 is ------------------------------*
11. *When acid and base reacts with each other form -----------------and ------------------*
12. *Gram equivalent of salt can be determined by dividing their molecular weight with---------------------------------------------*
13. *Striochiometric mass of NaCl is -----------when it is formed by reaction of NaOH and HCl*
14. *The formula of potash alum is ------------------------------------------------------*
15. *The normality of H2SO4 is -----------when its % purity is 96 and density is 1.6*
16. *--------------------volume is required for preparation of 100ml of 0.2mol solution from their concentrated 12M solution*
17. *One mole of MgCl2 is equal to-----------------------------grams (atomic weight of Mg= 24 and Cl = 35.5*
18. *Solution is homogenous mixture of ----------------------------and ---------------------------*
19. *Gram equivalent weight of H2SO4 is ----------------- (atomic weight of S =32 and O = 16)*
20. *Indicator shows ------------------------------ of chemical reaction*

***Q. No.2 Write theory and procedure***

***Object***  *Prepare 0.01N solution of EDTA and determine hardness of tap water using that solution*

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic chemistry **Class:** B.S. (I)

**Semester:** 1st **Test:** Final

**Session:** 2011 **Date** 21-12-2011

**Maximum Marks** 50 **Time allowed**: 2½hr

**Note: Attempt four questions two questions from each section**

**Section A**

Q. No. 1 (a) Describe proton donor acceptor system of acid and base. Discuss merits and of this system

(b) In each of the following acid base pair which acid should be stronger give reason behind that?

(i) HF or HI (ii) H2SO4 or H2SeO4 (iii) HClO4 or HClO (iv) H2S or H2O

Q. No. 2 How the pearson classified the lewis acid base as hard and soft acid base. Elaborate with examples some applications of HSAB concept

Q. No. 3 (a) Describe self-ionization of water. Write expression for Kw what is its value at 250C

(b) Determine concentration of H+ and OH- in following solution at 250C

1. 2.5M HCl (ii) 0.35m NaOH

**Section B**

Q. No. 1 Define modern periodic law? Describe that how elements are arranged in groups and periods according to modern periodic table. Discuss general characteristics, merits and demerits of this table

Q. No. 2 What is covalent radius how it can be calculated what the factors which effect upon it are. Describe that how atomic size vary in groups and periods of the periodic table

Q. No.3 Write short note on following

(i) Newland’s law of octave (ii) Ionization energy (iii) Electronegativity

**THE END**

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic chemistry **Class:** B.S. (I) Failure/Improver

**Semester:** 1st **Test:** Final

**Session:** 2011 **Date** 21-12-2011

**Maximum Marks** 100 **Time allowed**: 2½hr

**Note: Attempt any four questions all questions carry equal marks**

Q. No.1 State modern periodic law? How elements are classified in periods and groups according to modern periodic table give merits and demerits of this table

Q. No.2 Describe following properties of elements how these properties vary in periods and groups of periodic table

(i) Ionization energy (ii) Electronegativity (iii) Atomic radius

Q. No. 3 Elaborate with examples following modern acid base concepts give their merits and demerits over each other

(i) Lewi’s acid base concept

(ii) Bronsted and lowrry acid base concept

Q. No. 4 (a) Describe self-ionization of water. Write expression for Kw what is its value at 250C

(b) Determine concentration of H+ and OH- in following solution at 250C

1. 2.5M HCl (ii) 0.35m NaOH

Q. No. 5 What is the octet law? Describe with examples how elements follow this law when they form chemical bond and some elements do not obey this law in different compounds

Q. No. 6 What is covalency? Describe with lewis dot symbols that how atoms of elements are covalently bonded with each other and also elaborate with examples formation of polar and nonpolar covalent compounds

SHAH ABDUL LATIF UNIVERSITY KHAIRPUR

DEPARTMENT OF CHEMISTRY

Subject: Inorganic chemistry (Practical) Class: M.S

Semester: 1st Test Final

Session: 2011 Date 20- 04 - 2012

Maximum Marks 50 Time allowed: 30min

Name --------------------------- Seat No -----------------------------

Fil in the blanks

1. Amount required for preparation of 100mls of 0.01N solution of Na2C2O4 is-----------------------------------------------------
2. When 4.5g of of NaOH is dissolved in litre of solution the concentration of that solution will be---------------------------------------------------
3. When the H+ concentration of solution is 1x10-2 pH of that solution will be -------
4. ----------------------------- Amount is required for preparation of 100mls of 100ppm solution of NaCl
5. Unknown concentration of samples can be determined by comparing their strength with --------------------------------------------------
6. The volume required for preparation 100mls of 0.05N and 0.1N solution from 1M solution is------------------------------------------------
7. % Yield can be calculated by formula----------------------------------------------------------
8. Compounds can be characterized by using UV/Vis spectrophotometer by determining their--------------------------------------------
9. -------------------------- is used as source of electromagnetic radiations in IR region
10. Maximum absorbance of KMnO4 is -------------------------------------------
11. When concentration is increased the transmittance will---------------------------------------------(decrease, Increase, not changed)
12. In NMR spectrophotometer fequancy remains constant -------------------------------------------is variable
13. The normality of H2SO4 is -----------when its % purity is 96 and density is 1.6
14. --------------------volume is required for preparation of 0.2molar solution from their concentrated 12M solution
15. Lambert beer’s law may be defined as-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
16. Precipitation may be defined as -----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
17. Crystilization is defined as --------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

**Write theory and procedure**

**Object:** Prepare 10ppm solution of KMnO4 and determine its λmax of using spectronic-20 spectrophotometer

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic chemistry **Class:**  B.S. III/M. Sc.(Previous) Failure/Improv.

**Semester:** 1st **Test** Final

**Session:** 2011 **Date**  5-01-2012

**Maximum Marks** 100 **Time allowed**: 2½hr

**Note: Attempt any four questions**

**Q. No. 1** What are chelating agents how they are classified? Elaborate with examples how they form chelates with transition metals give their applications

**Q. No. 2** What are complex compounds how chain theory describe structure of complex compounds and on what grounds this theory failed in elaborating the structure of complex compounds

**Q. No. 3** How the valence bond theory describe nature of bonding in complex compounds keeping in view VBT discuss the type of hybridization, shape and magnetic properties of following complex compounds by giving box diagram electronic configuration

(i) [Co(CN)6]3- (ii) [Co(F)6]3- (iii) [Mn (Cl)4] 2-

**Q. No. 4** (a) Give IUPAC name to following complex compounds

(i) [Pt (en)2Cl4] (ii) [Pt(NH3)2NO2] (iii) Na2[Fe(CN)5]

(iv) [(en)2 Cu Cu (en)2]Cl3 (v) [Mn (H2O)6]Cl3

(b) Determine effective atomic number of central metal atom in given compounds

[Fe (CN)6 ]4- (ii) [PdCl4 ]2- (iii) [ Cu (CN)4 ]3- (iv) [ Ni (CO)4]

Atomic number of Fe = 26, Cu = 29, Pd = 46, Ni = 28, Mn = 25

**Q. No. 5** Describe how d orbitals are spillited in different energy levels in case of octahedral and tetrahedral complex compounds. How electrons are distributed in different energy levels in case of strong field and weak field ligands in octahedral complex compounds containing electrons from d1 to d10

**Q. No. 6** Describe diagrammatically molecular orbitals formed by atoms in O2, CO and NO+ molecules. Distribute their valence shell electrons in their molecular orbitals and determine their bond order and magnetic properties

**THE END**

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF Pharmacy**

**Subject:** Pharmaceutical Inorganic Chemistry **Class**: 1st Professional Pharm. D

**Semester:** 2nd **Test:** Final

**Session:** 2011 **Date** 07-01-2012

**Maximum Marks** 50 **Time allowed:** 2hr

**Note: Attempt any three Questions all questions carry equal marks**

**Q. No. 1** What is modern periodic law how discrepancies of Mendeleev’s periodic table disappear when elements are arranged on basis of modern periodic law? On the basis of electronic configuration determine position of elements having atomic number 25, 46, 53 and 20 in the periodic table

**Q. No. 2** (a) what is chemical bond describe that how chemical bonds are formed between atoms of elements and molecules of compounds

(b) What are chelates give some applications of chelating agents in therapy of some *disorders* in biological system

**Q. No. 3** Explain that how radioactive elements are disintegrated by emission of nuclear particles? Describe that how radioisotope are used in the diagnosis and therapy of thyroiditis

**Q. No. 4** What are essential elements how they are classified? Discuss toxic effects of the lead and pharmacological action of the sodium ion in maintaining electrolytic balance in the biological system

**THE END**

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF Pharmacy**

**Subject:** Pharmaceutical Inorganic Chemistry **Class**: 1st Professional Pharm. D

(Failure/Improver)

**Semester:** 2nd **Test:** Final

**Session:** 2011 **Date** 07-01-2012

**Maximum Marks** 80 **Time allowed:** 2½hr

**Note: Attempt any three Questions all questions carry equal marks**

Q. No. 1 How elements are classified in groups and periods according to modern periodic table? On the basis of electronic configuration determine position of following elements in the periodic table

(i) Se (Z)= 34, Sr (Z) = 38, Mn (Z) = 25, P (Z) = 15

Q. No. 2 Explain the terms ionization potential and electron affinity how they vary in periodic table describe with diagrammatic representation that why there is not continuous variation in ionization potential in periods of periodic table what are the factors which effect upon these properties

Q. No. 3 What is octet rule how the elements obey this rule by formation of different type of bonds and also describe that why the compound PCl5 do not follow the octet rule

Q. No. 4 What are essential and trace elements how they are classified? Describe role of Fe and Co in biological functions

Q. No. 5 Give the occurrence, properties and manufacture of sodium metal and Pharmacological action of sodium ion in maintaining electrolytic balance

Q. No. 6 Write short note on following

(i) Hund’s rule (ii) Pauli’s Exclusion principle (iii) Chemistry of Sodium bicarbonate

**THE END**

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic chemistry **Class:** B.S. III / M. Sc.(Previous)

**Semester:** 2nd **Test:**  1st Sessional

**Session:** 2011 **Date:** 07- 03 - 2012

**Maximum Marks** 15  **Time allowed:** 1hr

**Note: Attempt any Two Questions**

**Q. No. 1** What are aqueous and noaqueous solutions? Describe some factors which effect upon the solubility of ionic compounds in aqueous solutions

**Q. No. 2** **(a)** Elaborate with examples following acid base concepts

(i) Solvent system

(ii) Lewis acid and base

(b) From following acid base pairs which acid is strong and why

(i) HCl, HI (ii) H2SO4, H2SO3 (ii) NH3, H20

**Q. No. 3** Explain that how pearson classify acid and base as hard and soft acid base? Give pearson’s principle and discuss its applications

**THE END**

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Homogenious catalysis Class: B.S (IV

**Semester:** 2nd Test 1st Sessional

**Session:** 2011 Date: 10- 03- 2012

**Maximum Marks** 15 Time allowed 2hr

**Q. No. 1** What is Ziegler Natta’s catalyst ? Describe the reaction mechanism for polymerization of ethylene using Ziegler Natta’s catalyst

**Q. No. 2** Differentiate between homogenous and hetreogenous catalysis system including their merits and demerits over each other? Describe the carbonyl insertion and decarbonylation reactions with examples

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Organometallic Compounds Class: B.S (IV

**Semester:** 2nd Test 1st Sessional

**Session:** 2011 Date: 10- 03- 2012

**Maximum Marks** 15 Time allowed 2hr

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**Q. No. 1** What is Ziegler Natta’s catalyst ? Describe the reaction mechanism for polymerization of ethylene using Ziegler Natta’s catalyst

**Q. No. 2** Differentiate between homogenous and heterogeneous catalysis system including their merits and demerits over each other? Describe the carbonyl insertion and decarbonylation reactions with examples

**DEPARTMENT OF CHEMISTRY**

**Subject:** Organometallic Compounds Class: B.S (IV

**Semester:** 2nd Test 2nd Sessional

**Session:** 2011 Date: 02- 04- 2012

**Maximum Marks** 15 Time allowed 2hr

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**Describe Reaction Mechanism for Synthesis of following organic Compounds Using Metal Complexes as Catalysts**

1. Polymers of Dienes
2. Hydroformylation of Olefins
3. Synthesis of acetic acid by carbonylation of methanol

**THE END**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Organometallic Compounds Class: B.S (IV

**Semester:** 2nd Test 2nd Sessional

**Session:** 2011 Date: 02- 04- 2012

**Maximum Marks** 15 Time allowed 2hr

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**Describe Reaction Mechanism for Synthesis of following organic Compounds Using Metal Complexes as Catalysts**

1. Polymers of Dienes
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3. Synthesis of acetic acid by carbonylation of methanol

**THE END**

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Class:** B.S. III / M. Sc.(Previous) **Subject:** Inorganic chemistry

**Semester:** 2nd **Test:**  3rd Sessional

**Session:** 2011 **Date:** 25- 04 - 2012

**Maximum Marks** 15  **Time allowed:** 1hr

**Note: Attempt all Questions**

**Q. No. 1** Explain that how solvents are classified< Elaborate with examples the following reactions takes place in liquid SO2 as solvent

**(i)** Acid base Reactions

(ii) Precipitation reaction

1. Complex formation reaction

**Q. No. 2** What are f-block elements how they are classified? Write note on occurrence of lanthanides in their different form of minerals

**Q. No. 3** Give applications of electrochemical series on basis of those applications solve the following problems

(i) Calculate the e.m.f of Cu-Ag cell (E0 Cu2+/Cu = +0.34, E0 Ag1+/Ag = +0.80)

(ii) Predict in following reaction that whether magnesium replace Zn2+ from its salt or not

Zn + MgSO4 -------------------- MgSO4 + Zn ( E0 Mg2+/Mg = -2.34v, E0 Zn2+/Zn= -0.76)

(iii) Predict whether Zn and Ag react with 1N H2SO4 to H2 gas or not

When E0 Ag1+/Ag = 0.80

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic chemistry **Class:** M.S

**Semester 1st**  **Test:**  Final

**Session:** 2011 **Date:** 10- 04 - 2012

**Maximum Marks** 80  **Time allowed:** 1½hr

**Note: Attempt any Five Questions**

Q. No. 1 Define crystal lattice and unit cell? Describe any method with which the internal structure of crystal can be determined. Discuss seven crystal systems

Q. No 2 What is coordination number of an ion? Elaborate the structure of following ionic sompounds

(i) NaCl crystal (6:6 co-ordination crystal)

(ii) Zinc blende (ZnS) crystal

(iii)Fluorite (CaF2) Crystal

Q. No. 3 (a) What is lattice energy? How lattice energy is experimentally determined by Boron-Hyber cycle

1. Calculate lattice energy of NaCl when one mole of crystalline NaCl is prepared from 1gm atom of Na and 0.5 mole of shlorine gas, 410kj of heat is produced. The heat of sublimation of Na metal 108.8KJ, The heat of dissociation of chlorine gas into atoms is 242KJ, the ionization energy of Na is 493.7KJ and the electron affinity of Cl is 368.2KJ

Q. No. 4 Elaborate with examples the conductors, semiconductors, insulators and superconductors? Describe the band theory for conductance of metals

Q. No. 5 What is Symmetry? Elaborate with examples following types of symmetry

(i) Centre of Symmetry (ii) Plane of Symmetry (iii) Axis of symmetry

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Class:** M.S Inorganic Chemistry **Semester 2nd**

**Subject:** Inorganic Environmental Chemistry **Test:**  Final

**Session:** 2011 **Date:** 18- 04 - 2012

**Maximum Marks** 80  **Time allowed:** 2½hr

**Note: Attempt any four Questions**

Q. No. 1 What are pollutants how they are categorized? Give the brief discussion on collection of environmental samples and their analysis by using different instrumental methods

Q. No. 2 (a) Discuss that how Ozone layer protect the atmosphere and also discuss that how it is going to be damaged by human activities

(b) What is greenhouse effect why the temperature of atmosphere is increasing day by day how it can be controlled

Q. No 3 What are heavy metals give their biological role? Give the toxic effects of following heavy metals in biological system

(i) Cadmium (ii) Arsenic (iii) Lead

Q. No 4 How the wastes are categorized and how it pollute the environment? Describe modern methods for disposal of wastes

Q. No 5 Explain that how electricity is produced by atomic power plants? Describe methods for treatment of power plant wastes and what will be the health hazards of nuclear pollutants

**THE END**

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Homogenous Catalysis & Inorganic polymers Class: B.S (IV

**Semester:** 2nd Test 3rd Sessional

**Session:** 2011 Date: 024 - 04- 2012

**Maximum Marks** 15  **Time allowed:** 1hr

**Note: Attempt any two Questions**

Q.No 1 Give the main methods for preparing active species containing a Ờ metal carbon bond? Give the mechanism of Nickel catalyzed cross coupling of Grignard reagents with aryls

Q. No 2 Give the reaction mechanism of hydrosilylation and hydrocyanation of olefins by using transition metal complexes as catalyst

Q. No 3 What are inorganic polymers how they are classified? Give general characteristic properties of inorganic polymer

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**(Section Inorganic Chemistry)**

**Subject:** Practical Written Test Class: B.S (IV M. Sc (Final)

**Semester:** 2nd Test Final

**Session:** 2011 Date: 17-05 2012

**Maximum Marks** 40  **Time allowed:** 1hr

**Q. No. 1** Prepare 250ml of 0.1N solution of H2SO4 and Na2CO3 When the percentage purity of acid is 98 and density is 1.8

**Q. No. 2** Explain the following

(a) Canal water is soft than ground water

(b) BaCl2 is used for analysis of SO42- ions in water and soil

(c) EDTA is used for determination of hardness of water

(d) Solution of NH4Cl and NH3 is used in EDTA titration

**Q. No. 3** Give the basic principle of AES

**Q. No. 4** Define the following terms

(i) Precipitation (ii) Chelating agent (iii) titration (iv) pH

**Q. No. 5** Write theory procedure observation and calculation for given object

**Object:-** Determine hardness of tap water by titrating it with 0.01M solution of EDTA

**THE END**

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Homogenous Catalysis & Inorganic polymers Class: B.S (IV

**Semester:** 2nd Test 3rd Sessional

**Session:** 2011 Date: 024 - 04- 2012

**Maximum Marks** 15  **Time allowed:** 1hr

**Note: Attempt any two Questions**

Q.No 1 Give the main methods for preparing active species containing a Ờ metal carbon bond? Give the mechanism of Nickel catalyzed cross coupling of Grignard reagents with aryls

Q. No 2 Give the reaction mechanism of hydrosilylation and hydrocyanation of olefins by using transition metal complexes as catalyst

Q. No 3 What are inorganic polymers how they are classified? Give general characteristic properties of inorganic polymer

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Homogenous Catalysis & Inorganic polymers **Class:**  B.S (IV)/ M.Sc. )Final

**Semester:** 2nd **Test**  Final

**Session:** 2011 **Date:** o4-05- 2012

**Maximum Marks** 50  **Time allowed:** 2hrs

**Note: Attempt any Three Questions**

**Q. No 1** Differentiate between homogenous and heterogeneous catalysts? Describe reaction mechanism for the polymerization of ethylene and dimerization of butadiene using transition metal complexes as catalysts

**Q. No 2** Discuss that how CO is alternative source of petroleum? Give the reaction mechanism for hydrocarbonylation of propylene by using cobalt carbonyl as catalyst and synthesis of acetic acid by carbonylation of methanol

**Q. No 3** (a) Describe the method for synthesis of ethane by hydrogenation of ethylene by using RhCl(PPh3)3 as catalyst

(b) Explain that how C-C coupling takes place? Give the mechanism of palladium catalyzed ketone synthesis from acyl chloride and alkyl tin compounds

**Q. No 4** What are silicones how they are prepared? Give the preparation, properties and uses of following types of silicones

(i) Silicone Resins (ii) Silicone Rubbers

**THE END**

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Homogenous Catalysis & Inorganic polymers **Class:**  B.S (IV)/ M.Sc. )Final

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**Semester:** 2nd **Test**  Final

**Session:** 2011 **Date:** o4-05- 2012

**Maximum Marks** 50  **Time allowed:** 2hrs

**Note: Attempt any Three Questions**

**Q. No 1** Differentiate between homogenous and heterogeneous catalysts? Describe reaction mechanism for the *polymerization* of ethylene and dimerization of butadiene using transition metal complexes as catalysts

**Q. No. 2** What is Ziegler Natta’s catalyst how it is used for the polymerization and oligomerization of butadiene

**Q. No3** Discuss that how CO is alternative source of petroleum? Give the reaction mechanism for hydrocarbonylation of propylene by using cobalt carbonyl as catalyst and synthesis of acetic acid by carbonylation of methanol

**Q. No 4** (a) Describe the method for synthesis of ethane by hydrogenation of ethylene by using RhCl(PPh3)3 as catalyst

(b) Explain that how C-C coupling takes place? Give the mechanism of palladium catalyzed ketone synthesis from acyl chloride and alkyl tin compounds

**Q. No 5** What are silicones how they are prepared? Give the preparation, properties and uses of following types of silicones

(i) Silicone Resins (ii) Silicone Rubbers

Q. No 6 Describe reaction mechanism for the hydrosilylation and hydrocyanation of alkenes using transition metal complex as catalyst

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Advance Inorganic Chemistry **Class:**  B.S (IV)/ M.Sc. )Final

**Semester:** 2nd **Test**  Final

**Session:** 2011 **Date:** 09-05- 2012

**Maximum Marks** 50  **Time allowed:** 2hrs

**Note: Attempt any Three Questions all questions carry equal marks**

**Q. No 1** Elaborate with examples which type of organic compounds are used as reagent for inorganic analysis? Give the advantages disadvantages and common properties of organic *reagent* for inorganic analysis

**Q. No 2** Explain that why and how metal ions are analyzed by organic reagents? Give the action of following reagents and specification for metal ion analysis

(i) Cupferon (ii) Dimethylglyoxime (iii) Benzidine

**Q. No 3** Describe that why mostly inorganic reagents are not used for spectrophotometric analysis while organic reagents are almost used for same? Give the use of inorganic reagents with chemical reactions for the detection of metal cations of group ii and iii of salt analysis scheme by using particular reagents

**Q. No 4** Write all possible microstates for p2 electronic configuration of C atom. Compute Ms for each and ML for each

**THE END**

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Class:** B.S. III / M. Sc.(Previous) **Subject:** Inorganic chemistry

**Semester:** 2nd **Test:**  Final

**Session:** 2011 **Date:** 15- 05 - 2012

**Maximum Marks** 50  **Time allowed:** 2hr

**Note: Attempt three Questions Q. No. 1 is compulsory**

Q. No. 1 **Do as directed**

(i) Determine oxidation number of atoms in following compounds

(a) Br in Br3O8 (b) Pb in Pb3O4 (c) Fe in Fe3O4 (ii) S in S4O6 -2

(ii) Balance the following equation by ion electron method

MnO4- + C2O42- --------------- Mn2+ + CO2 (Acidic and basic medium)

(iii) Give the conjugate base of following acids

(a) HNO2 (b) CH3COOH (c) HCO3- (d) HOCl

(iv) In the following acid pair which is strong acid and why

1. H2O and H2S (b) HCl and HI (c) HCl and HClO3 (d) CH3-, NH3

(v) Explain the following

1. H2O is leveling solvent and CH3COOH is differentiating solvent
2. AgCl is unstable and AgF is stable
3. MgF2 is more soluble than BaCl2

Q. No. 2 Discuss that how solvents are classified? Elaborate with examples types of chemical reactions which are taking place in liquid ammonia as solvent

Q. No. 3 What is lanthanide contraction give reason of that? Write the electronic configuration of lanthanides and describe colors of M3+ cations of them

Q. No. 4 **(a)** How the standard hydrogen electrode is constructed? Describe with example that how it is used for determination of standard electrode potential of other elements

**(b)** Calculate cell voltage and mention the cell reaction with cell notation of following redox reaction

Als + Fe2+ --------------- Al3+ + Fes ; E0 Al3+/Al = -1.66 and E0 Fe2+/Fe = -0.4

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Class:** B.S. III / M. Sc.(Previous) **Subject:** Inorganic chemistry( Practical)

**Semester:** 2nd **Test:**  Written Test

**Session:** 2011 **Date:** 18- 05 - 2012

**Maximum Marks** 40  **Time allowed:** 1hr

**Note: Attempt all Questions**

Q. No. 1 Determine amount of KMnO4 for the preparation of its 0.1N solution in 100mls

Q. No. 2 You are given 1 molar stock solution of H2SO4 determine volume of that solution for preparation of 100mls of 0.1N and 0.05N solutions

Q. No. 3 Complete the following reactions

(i) HCl + Na2CO3 ---------------------------

(ii) H2C2O4 + KMnO4 + H2SO4 -----------------------

(iii) AgNO3 + KBr -------------------------------

(iv) BaCl2 + H2SO4 ----------------------

Q. No. 4 Give name to following compounds by IUPAC system

(i) HNO2  (ii) C2O5  (iii) Fe2(SO)3.2H2O (iv) Na2S2O4  (v) HClO3

Q. No. 5 Define the following terms

(i) precipitation (ii) Solubility (iii) Saturated solution (iv) Oxidizing agent

(v) Molarity

Q. No. 6 Write theory procedure observation and calculation of given object

**Object** Determine the amount of oxalic acid in given solution by titrating it with 0.1N solution of KMnO4

**DEPARTMENT OF SHEMISTRY SHSH ABDUL LATIF UNIVERSITY KHAORPUR**

**Subject:** Comprehensive Viva voice **Class:**  B.S (IV)/ M.Sc. )Final

**Semester:** 2nd **Test**  Final

**Session:** 2012 **Date:** 04-05- 2013

**Maximum Marks** -  **Time allowed:** 1hr

Name ----------------------------------------------------------- Seat No. ---------------------------------

**Tick the correct answer**

1. The element having valence shell electronic configuration is 3S2, 3p5 that belongs to

(a) Fourth period, VA group (b) 5th period, IIIA group (c) 3rd period, VIIA group

(d) 2nd period VA group

1. Each 8th element has similar properties as of one this classification of elements was given by
2. Newland (b) Mosely (c) Bohor (d) Rutherford
3. Which of following has minimum electron affinity
4. N (b) O (c) Ar (d) P
5. Which of following bonds is most polar
6. N ─ Cl (b) O ─ F (c) C ─ Cl (d) C ─ F
7. By emission of positron the nucleus of element is changed in to other element having
8. One atomic number less than parent atom
9. One atomic number more than parent atom
10. Two mass number less
11. Remains same
12. Covalencies of phosphorus are
13. 3, 4 (b) 5, 2 (c) 4, 5 (d) 3, 5
14. The bond between BF3 ─ F- is
15. Ionic bond (b) Covalent bond (c) Dative bond (d) Sigma bond
16. In SO42- sulfur is bonded with four oxygen atoms with four bonds from these bonds
17. Two are covalent bonds two are coordinate covalent bonds
18. One is coordinate covalent three are covalent bonds
19. Two ionic and two are covalent bonds
20. Three coordinate covalent and one is covalent bond
21. Bond order of NO+ is
22. 2 (b) 3 (c) 1 (d) 4
23. The shape of XeF4 is square planar due to
24. Four bonded pairs (b)Three bonded one loan pair (c) Two loan pairs four bonded pairs (d)One loan pair three bonded pairs
25. In NH3 molecule hybridization is

(dsp2) (b) sp2 (c) sp3 (d) d2sp3

1. The 2nd group reagent for analysis of salt cations is
2. HCl (b) H2S (c) NaCO3 (d) NH4OH
3. Stoichiometric mass of NaCl2 formed by reaction of Na2CO3 and HCl is
4. 58.5 (b) 117 (c) 28.5 (d) 45
5. When un-dissolved substance is formed during chemical reaction that is called
6. Contamination (b) Precipitation (c) Complexation (d) Crystallization
7. Graphite allotropic form of carbon conduct electricity due to presence of
8. Unpaired electrons (b) Free electrons (c) Loan pair of electrons (d) Bonded electrons
9. Standard reduction potential of hydrogen electrode is
10. -1 (b) 0 (c) +1 (d) ±1
11. In the electrochemical cell
12. Electrical energy is changed into chemical energy
13. Chemical energy into potential energy
14. Chemical energy into electrical energy
15. Kinetic energy into thermal energy
16. Oxidation number of Fe in compound Fe2O3 is
17. +3 (b) +5 (c) -2 (d) 4
18. For preparation of 100ml 0.1M solution of Na2C2O4 amount of sodium oxalate is required
19. 13.5g (b) 1.3g (c) 1.50g (d) 67.5g
20. When H+ ion concentration of solution is 1x10-8 pH of that solution will be
21. 13 (b) 8 (c) 10 (d) 5
22. From four halogen acids HI, HCl, HF and HBr which is the strongest acid
23. HF (b) HBr (c) HCl (d) HI
24. Common name of NaHCO3 is
25. Washing Soda (b) Bleaching powder (c) Backing soda (d) Soda ash
26. Dialkyl dichlorosilane gives
27. Long chain polymer (b) Cross linked polymer (c) Cyclic structure polymer (d) Trimeric polymer
28. Colored componds absorb electromagnetic radiation from
29. UV region (b) Visible region (c) IR region (d) Radio wave region
30. Nuclear closed shell structure is reached when number of nucleons are

(a) 2, 18, 32, 56, 82 (b) 8, 18, 2, 36, 120 (c) 2, 8, 20, 50, 85 (d) 85, 32, 120, 18, 85

1. Mechanism for the emission of β-1 particle from nucleus is that in which
2. Proton is changed into neutron (b) electron is emitted from K shell (c) Neutron is changed in to proton (d) Positron is changed in to electron
3. Half life time of radioactive element is 6hrs how much amount of it remained after 12hrs
4. ½ (b) 1/6 (c) ¼ (d) 1/8
5. In high spin octahedral complex compounds hybridization is
6. d2sp3 (b) sp3d2 (c) s2p3d2 (d) dsp3
7. Diethylene triamine is
8. Tridentate ligand (b) Tetradentate ligand (c) Hexadentate ligand (d) monodentate ligand
9. In octahedral high spin complex compounds containing d5 electrons CFSE energy is
10. 12Dq (b) 16Dq (c) 0dq (d) 20Dq
11. In square planar complex compounds splitting of d orbitals occurs when ligands are arranged around central metal atom highly effected d orbital is
12. dz2 (b) dx2-y2 (c) dxy (d) dxz
13. Coordination number of central metal atom in complex [Pt(NH3)2Cl2] is
14. 2 (b) 4 (c) 6 (d) 0
15. The source of electromagnetic radiation which is used in the instrument atomic absorption spectrophotometer is
16. Xenon lamp (b) Hallow cathode lamp (c) Tungsten lamp (d)Deuterium lamp
17. For the preparation of 100mls of 1000ppm solution of Na+ from NaCl amount of NaCl is required

(a) 2.54g (b) 0.254g (c) 5.85g (d) 2.3g

1. Cyclooctatetraene forms complex with [Fe(CO)3] by
2. Four carbon atoms (b) Eight carbon atoms (c) three carbon atoms (d) Six carbon atoms
3. Allyl group form complex compound with metal atom through
4. Two carbon atoms (b) three carbon atoms (c) one carbon atom (d) Four carbon atoms
5. Cyclopentadiene is linked with transition metals through
6. Four carbon atoms (b) five carbon atoms (c) three carbon atoms (d) one carbon atoms
7. Effective atomic number of cobalt in case of [Co(NH3)6]3+ is
8. 24 (b) 36 (c) 54 (d) 39 , the atomic number of Co= 27
9. The reaction in which one ligand is replaced by another ligand is called
10. Electrophilic subistitution reaction (a) Nuclophillic suistitution reaction
11. Coordination reaction (b) Oxidation reaction
12. For the polymerization of olefins the reagent which is used as catalyst
13. Grignard reagent (b) Ziegler Nattas’s reagent (c) [PdCO3R] (d) [RhCO4
14. When the coordination number is five shape of that complex is
15. Square planar (b) Octahedral (c) Terahedral (d) Trigonalbipyramidal
16. The most nonmetallic in group 15 is:

(a) N (b) P (c) Bi (d) Sb

1. Which of the following is not Lewis base
2. NH3 (b) H2O (c) CO (d) Cu
3. Which of the following factors produces covalent character in ionic bond in molecule
4. Larger charges on ions (b) Large ionic radius

© Small size of anion (c)High degree of polarization

1. When 17Cl35 undergoes (n,p) reaction, the radioactive isotope formed is:
2. 15P35 (b) 16S35 (c) 15P32  (d) 16S 36
3. The moderator used in nuclear reactor is
4. H2O (b) D2O (c) S (d) Boron
5. In the periodic table the element with atomic number 35 belongs to:
6. Period IV and group IIA (a) Period III and group IVA (b) Period V and group IIA
7. Period IV and group VIIA
8. Raw materials used for the manufacture of cement are:
9. CaCO3 and SiO2 (b) CaCO3 and Clay (c) CaO and SiO2 (d) Ca(OH)2 and clay
10. Sodium hexametaphosphate is used;
11. Fertilizer (a) For softening water (b) In fruit ripening (c) None of above
12. Which of following is hypochlorous acid
13. HClO2 (b) HClO (c) HClO3 (d) HClO4

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Comprehensive Viva voice **Class:**  B.S (IV)/ M.Sc. )Final

**Semester:** 2nd **Test**  Final

**Session:** 2011 **Date:** 22-05- 2012

**Maximum Marks** 30  **Time allowed:** 30minutes

Name ----------------------------------------------------------- Seat No. ---------------------------------

**Tick the correct answer**

1. The element having valence shell electronic configuration is 3S2, 3p5 that belongs to

(a) Fourth period, VA group (b) 5th period, IIIA group (c) 3rd period, VIIA group

(d) 2nd period VA group

02. By emission of positron the nucleus of element is changed in to other element having

1. One atomic number less than parent atom
2. One atomic number more than parent atom

03. Covalencies of phosphorus are

(a) 3, 4 (b) 5, 2 (c) 4, 5 (d) 3, 5

**04.** Bond order of NO+ is

(a) 2 (b) 3 (c) 1 (d) 4

05. The shape of XeF4 is square planar due to

1. Four bonded pairs (b)Three bonded one loan pair (c) Two loan pairs four bonded pairs (d)One loan pair three bonded pairs

06. The shape of XeF4 is square planar due to

(a) Four bonded pairs (b) Three bonded one loan pair (c) Two loan pairs four bonded

07. When un-dissolved substance is formed during chemical reaction that is called

1. Contamination (b) Precipitation (c) Complexation (d) Crystallization

08. Standard reduction potential of hydrogen electrode is

1. -1 (b) 0 (c) +1 (d) ±1

09. Oxidation number of Fe in compound Fe2O3 is

1. +3 (b) +5 (c) -2 (d) 4

10. When H+ ion concentration of solution is 1x10-8 pH of that solution will be

1. 13 (b) 8 (c) 10 (d) 5
2. When H+ ion concentration of solution is 1x10-8 pH of that solution will be
3. 13 (b) 8 (c) 10 (d) 5

11. Dialkyl dichlorosilane gives

1. Long chain polymer (b) Cross linked polymer (c) Cyclic structure polymer (d) Trimeric polymer

12. Colored compounds absorb electromagnetic radiation from

1. UV region (b) Visible region (c) IR region (d) Radio wave region

13. Nuclear closed shell structure is reached when number of nucleons are

1. 2, 18, 32, 56, 82 (b) 8, 18, 2, 36, 120 (c) 2, 8, 20, 50, 85 (d) 85, 32, 120, 18, 85

14. Half life time of radioactive element is 6hrs how much amount of it remained after

12hrs

1. ½ (b) 1/6 (c) ¼ (d) 1/8

15. In octahedral high spin complex compounds containing d5 electrons CFSE energy is

(a) 12Dq (b) 16Dq (c) 0dq (d) 20Dq

16. Cyclooctatetraene forms complex with [Fe (CO)3] by

(a) Four carbon atoms (b) Eight carbon atoms (c) three carbon atoms (d) Six carbon atoms

17. In square planar complex compounds splitting of d orbitals occurs when ligands are

arranged around central metal atom highly effected d orbital is

1. dz2 (b) dx2-y2 (c) dxy (d) dxz

18. Effective atomic number of cobalt in case of [Co(NH3)6]3+ is

1. 24 (b) 36 (c) 54 (d) 39 , the atomic number of Co= 27

19. The reaction in which one ligand is replaced by another ligand is called

1. Electrophilic substitution reaction
2. Nucleophilic substitution reaction
3. Coordination reaction
4. Oxidation reaction

20. The source of electromagnetic radiation in uv region is

(a) Tungsten lamp (b) Duterium lamp (c) Hollow cathode lamp (d) Xenon lamp

21. Which of the following is not Lewis base

1. NH3 (b) H2O (c) CO (d) Cu

22. Olefens form complex with transition metals due to presence of

(a) Loan pairs (b) Filled π star orbitals (c) Vacant π star orbitals (d) Vacant sigma star

orbitals

23. Synthetic gas is mixture of

(a) CO2 and H2 (b) CO and H2 (c) H2 and O2 (c) Co andO2

24. RMgX is used for synthesis of OMC as

(a) Oxidizing agent (b) Reducing agent (c) Alkylating agent (d) Halidation reagent

25. Enantiomers are those compounds which possesses

(a) Same molecular formula different geometrical shape

(b) molecule are mirror images of each other

© Same molecular formula different empirical formula

(d) Same atomic number different mass number

25 The hybridization in the NH3 molecule is

1. Sp3  (b) sp2 (c) Sp1 (d) dsp1

26 Labile complex compounds are those in which t ½ for substitution reaction is

1. Less than 1sec (b) more than one sec (c) less than 30sec (d) more than 30 sec

27 In the atomic emission spectrophotometer the source for excitation of electron is

1. Hollow cathode lamp (b) Laser rays (c) Flame (d) X-rays

28. In the periodic table the element with atomic number 35 belongs to:

(a) Period III and group IVA (b) Period IV and group IIA (c) Period V and group IIA

(d) Period IV and group VII

29 When the coordination number is five shape of that complex is

1. Square planar (b) Octahedral (c) Terahedral (d) Trigonalbipyramidal

30. In square planar complex compounds splitting of d orbitals occurs when ligands are

arranged around central metal atom highly effected d orbital is

1. dz2 (b) dx2-y2 (c) dxy (d) dxz

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Class:** M.S Inorganic Chemistry **Semester 2nd**

**Subject Bio-inorganic Chemistry**  **Test:**  Final

**Session:** 2012 **Date:** 15-04 - 2013

**Maximum Marks** 80  **Time allowed:** 2½hr

**Note: Attempt any four Questions**

Q. No. 1 How elements are classified as essential nonessential and trace elements? Give the biological functions and *deficiency* signs of following elements

(i) Zn (ii) Cu (iii) Ca

Q. No. 2 What are chelates discuss some areas of medicine in which these are used? Describe therapeutic uses of platinum and Lithium and their complexes

Q. No 3 How the metals are storage and transported in biological system? Give the mechanism of sodium/ potassium pump in transportation and storage of sodium and potassium in biological system

Q. No 4 Write the structural formula of metalloporphyrin? Give the mechanism of transport of oxygen by hemoglobin and photosynthesis by chlorophyll in plant

Q. No 5 Explain the role of enzymes in catalysis of different biological reactions. Give the absorption, transportation and metabolic functions of vitamin B12

**THE END**

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Class:** M. Sc.(Prev) Failure/Improver **Subject:** Inorganic chemistry

**Semester:** 1st **Session 2011**

**Maximum Marks** 80  **Time a llowed:** 2½hr

**Note: Attempt four Questions**

Q. No. 1 Explain the acid and base on the basis of Lewis and Arrhenius modern concepts of acid and *base*

(a) In following acid pairs give their conjugate bases and which acid is strong and why

(i) HF and HI (ii) H2SO4 and H2SO3 (iii) H2S and H2O (iv) NH3 and H2O

Q. No. 2 How the solvents are classified? Describe some factors which effect upon the solubility of ionic compounds in aqueous solution

Q. No. 3 Discuss on liquid ammonia as solvent? Describe with examples following reactions in liquid ammonia as solvent

(i) Oxidation reduction reaction (ii) Acid base reaction (iii) salvolysis reaction

Q. No. 4 What is oxidation and reduction reaction? Give rules for determining the oxidation number of elements in given compounds? Balance the following redox reaction by ion electron method

K2Cr2O7 + FeSO4 + H2SO4 ------------------ Cr2(SO4)3 + Fe(SO4)3 + K2SO4

Q. No.5 What is standard hydrogen electrode how it is constructed and used for the determination of standard electrode potential of Zn/ Zn2+ electrode

Q. No. 6 What is electrochemical series give some applications of this series? On the basis of reduction potential values solve the following problems

(i) Two half reactions and their standard reduction potential values are given below

Zn2+ --------------------------- Zn E0 = +0.76v

Cu2+ ---------------------------- Cu E0 = -0.34v

In complete reaction which will be oxidized and which is reduced

(ii) Calculate the cell voltage at 250C for the following cell

Mg(S) / Mg 2+ (0.01M) // Sn2+/Sn (0.1) -0.136V

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic Chemistry **Class**: B. S. (i)

**Semester:** 1st **Test:** 3rd Sessional

**Session:** 2011 **Date** 14- 10 - 2011

**Maximum Marks** 15 **Time allowed:** 1hr

**Note: Attempt Two Questions Q. No2. is compulsory**

Q. No. 1 What is periodic table? On what basis Mendleev arranged elements in his periodic table what were its defects

Q. No. 2 (a) What are four quantum number values for electron when they are present in 3d, 4f, 4p and 6s subshells

(b) Show the position of elements in periodic table when their atoms have valence shell electronic configuration as below

(i) 4s2, 4p4 (ii) 6s2, 4f14, 5d10, 6p5 (iii) 5s2, 3d6 (iv) 4s1, 3d10 (v) 6s2, 4f14 3d10 6p1

(c) Write electronic configuration of following elements indicating spin of e

lectrons (According to Hund’s rule)

Sulfur (Z= 16), Copper (Z= 29) , Phosphorus (Z= 15), Tellurium (Z= 52)

(d) In which block elements will found when their electronic configuration is

(i) 1s2, 2s2, 2p6 (ii) 1s2, 2s2, 2p6, 3s2, 3p6, 4s2 (iii) 1s2 2s2, 2p6, 3s2, 4s2, 3d2

Q. No. 3 What is the modern periodic law? How the defects of Mendleev’s periodic table removed when elements were arranged on the basis of modern periodic law

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inprganic Chemistry **Class**: B. S. (i)

**Semester:** 1st **Test:** 2nd Sessional

**Session:** 2011 **Date** 25-09-2011

**Maximum Marks** 15 **Time allowed:** 1hr

**Note: Attempt any Two Questions**

Q. No. 1 How and why atoms are linked with each other and form bond? Describe with examples the polar, nonpolar, double and single covalent bonds

Q. No. 2 Write short note on following

1. Wander walls forces
2. Metallic bonding
3. Chelates

Q. No. 3 Explain the following by giving suitable reason

1. H2O is liquid while H2S is gas
2. AlCl3 is covalent while AlF3 is ionic compound
3. PCl5 is stable while NCl5 can
4. Chlorine has only one unpaired electron in their valence shell even then it shows the covalency of 1,3,5,7
5. AlCl3 is electrophile while NH3 is nucleophile

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Advance Inorganic Chemistry **Class:**  B.S (IV)/ M.Sc. )Final

**Semester:** 2nd **Test**  1st Sessional

**Session:** 2011 **Date:** 26-01-2012

**Maximum Marks** 50  **Time allowed:** 1hr

**Note: Attempt any two Questions all questions carry equal marks**

Q. No.1 Describe anomalous behavior of Li with the other elements of same group? How it

is related with Mg which is in the diagonal position of lithium

O. No.2 According to periodic classification all elements of similar group possesses similar

properties but how and why Aluminum possesses different properties than other

elements

Q. No.3 Give the mechanisum of 8-Hydroxyqunoline for analysis of metal ions copper iron

and nickel

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Advance Inorganic Chemistry **Class:**  B.S (IV)/ M.Sc. )Final

**Semester:** 2nd **Test**  2nd Sessional

**Session:** 2011 **Date:** 26-01-2012

**Maximum Marks** 50  **Time allowed:** 1hr

**Note: Attempt any two Questions all questions carry equal marks**

Q No1 Describe with examples 1,10-phenethroline as a reagent for analysis of different heavy metals

Q. No.2 Describe action of some inorganic reagents for analysis of salts? How salts are classified on basis of analysis

Q. No.3 Elaborate role of diacetyl acetone for analysis of mercury and lead in biological samples

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Advance Inorganic Chemistry **Class:**  B.S (IV)/ M.Sc. )Final

**Semester:** 2nd **Test**  2nd Sessional

**Session:** 2011 **Date:** 26-01-2012

**Maximum Marks** 50  **Time allowed:** 1hr

**Note: Attempt any two Questions all questions carry equal marks**

**Q. No 1** Write all possible microstates for p2 electronic configuration of C atom. Compute Ms for each and ML for each

Q. No2 What is reussel-saunders coupling How the energy levels are spillited in different energy levels when electrons are interacted with each other

Q. No.3 Explain that how spectroscopic terms are used in analysis of inorganic compounds by the help of spectroscopy

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Advance Inorganic Chemistry **Class:**  B.S (IV)/ M.Sc. )Final

**Semester:** 1st **Test**  1st Sessional

**Session:** 2012 **Date:** 25-09-2012

**Maximum Marks** 15  **Time allowed:** 1hr

**Note: Attempt all questions carry equal marks**

Q. |No. 1 (a) What is shielding effect? How the shielding constant can be determined and how shielding effect vary in the period and group

(b) Determine effective nuclear charge of last electron of atom having electronic configuration

1s2, 2s2, 2p6, 3s2, 3p6, 4s1

Q.No. 2 What do you know about diagonal relationship of elements in periodic table. Describe the diagonal relationship of Li with Mg and cause of diagonal relationship

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic chemistry Class: B.S. III / M. Sc. (Previous)

**Semester:** 1st Test: Mid Term

**Session:** 2014 Date 15- 04 - 2014

**Maximum Marks** 30 Time allowed: 1hr

**Note: Attempt any Two Questions**

Q. No. 1 What are complex compounds? Describe that how Werner describe the structure of complex compounds with experimental evidences

Q. No. 2 What are chelating agents, how they are classified? Elaborate with examples how chelating agent form complex with transiton metals

Q. No. 3 (a) Give the IUPAC name to following complex compounds

(i) [ Cr(H2O)6]Cl2 ii [Ni(CO)5Cl]-1 iii K3[Co(C2O4)3] iv [Co(en)3]SO4

(b) Determine the effective atomic number of central metal atom in following complex compounds

(i) K3[Fe(CN)6] (ii) [Ni(CO)4] (iii) [Mn(CN)6] (iv) [CuCl4]

Atomic Number Fe =26, Ni= 28, Mn = 25, Cu = 29

**THE END**

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic chemistry Class: B.S. III

**Semester:** 1st Test: 2nd Sessional

**Session:** 2012 Date 07- 11 - 2012

**Maximum Marks** 15 Time allowed: 1hr

**Note: Attempt any Two Questions**

Q. No. 1 How complex compounds are formed on the basis of valence bond theory? Describe with examples the high spin and low spin octahedral complex compounds on basis of valence bond theory

Q. No. 2 Describe that how d-orbitals are splinted in case of octahedral and tetrahedral complexes in light of CFT? Elaborate with examples factors which effect upon crystal field splitting parameter ∆o

Q. No. 3 Give the main features of crystal field theory? How this theory describe the colored nature of complexes, distorted octahedral complexes and deviation in the heat of hydration of 3rd period metal cations of 2+ charge

**THE END**

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject Organometallic compounds** **Class:**  B.S (IV)/ M.Sc. )Final

**Semester:** 1st **Test**  2nd Sessional

**Session:** 2012 **Date:** 08-11-2012

**Maximum Marks** 15  **Time allowed:** 1hr

**Note: Attempt all questions**

Q. No. 1 Give the synthetic methods for preparation of any two of following organotransition metal complexes

(i) Ƞ2- bonded olefins

(ii) Ƞ5 -Cyclopentadienyl complexes

(iii) Ƞ6 -Arene metal complexes

Q.No. 2 Give the different methods which are used for synthesis of transition metal alkyls and aryls? Describe any two methods with examples for preparation of organotransition metal compounds from following

(i) Alkyl transfer reaction

(ii) Synthesis involving insertion method

1. Synthesis by attack on coordinated ligands

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject Advance Inorganic Chemistry** **Class:**  B.S (IV)/ M.Sc. )Final

**Semester:** 1st **Test**  2nd Sessional

**Session:** 2012 **Date:** 10-11-2012

**Maximum Marks** 15  **Time allowed:** 1hr

**Note: Attempt all questions**

Q. No. 1 Describe some methods by which complex compounds are separated from reaction mixture? Elaborate with some examples following general methods foe synthesis of coordination compounds

(i) Simple addition method

(ii) Substitution reaction

Q.No. 2 What is the stereoisomerism? Give the geometrical and optical isomers of following complex compounds

(i) Fe [Cr (en)2(CN)4]

(ii) [Co (CO)4 (NO2)2]

1. [Pt Cl2 Py2 (NH3)2]
2. [Ni Cl2 (NH­3)2]

**THE END**

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inprganic Chemistry **Class**: B. S. (i)

**Semester:** 1st **Test:** 2nd Sessional

**Session:** 2012 **Date** 15-11-2012

**Maximum Marks** 15 **Time allowed:** 1hr

**Note: Attempt any Two Questions**

Q. No. 1 What is ionization potential, what are the factors which effect upon it? Why 2nd ionization energy is higher than the first and how IP vary periodically in periodic table

Q. No. 2 What is effective nuclear charge how screening effect effects upon the effective nuclear charge and how it vary in periods and groups

(b) Calculate effective nuclear charge of an atom on the last electron of phosphorus having Atomic Number 15

Q. No. 3 Explain that why there is no regular change in the electron affinity of the elements in the periods from left to right in periodic table also explain why formation of uninegative oxygen is exothermic while dinegative oxygen is endothermic process and how electron affinity is differ from electronegativity

**THE END**

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inprganic Chemistry **Class**: B. S. (i)

**Semester:** 1st **Test:** 3rd Sessional

**Session:** 2012 **Date** 03-12-2012

**Maximum Marks** 15 **Time allowed:** 15min

Name ------------------------------------- S/O -------------------------------------------------- Roll No. --------

**Note: Tick the correct answer**

1. Which of the following set of four quantum numbers is possible for electron when it is present in 3p orbital?

(a) n = 1, l =3, m= 0±3, s = -½ (b) n = 3, l =1, m= 0±1, s = +½

(c) n = 2, l =3, m= 0±2, s = +½ (d) n = 3, l =2, m= 0 ±2, s = +½

1. For an atom which has n =3 valence shell it contains number of orbitals

(a) 3 (b) 10 (c) 09 (d) 06

1. The basis of periodic law presented by mosely

(a) Valency (b) Atomic number (c) Atomic weight (d) Atomic properties

1. In the periodic table elements with atomic number 38 belongs to

(a) Period iv and Group ii (b) Period iv and Group iv

© Period iii and Group iv (d) Period v and Group ii

1. The total number of valence shell electrons in the Arsenic element is?

(a) 3 (b) 2 (c) 05 (d) 04

1. In inner transition elements partially filled orbital is

(a) 3d (b) 4p (c) 4f (d) 5d

1. Elements belonging to the same group of periodic table have generally the same

(a) Electronic configuration (b) Number of valence shell electrons

(c) Chemical properties (d) Physical properties

1. For an atom which has n =3 valence shell it contains number of orbitals

(a) 3 (b) 10 (c) 09 (d) 06

1. From following metal ions which ion obeys octet rule

(a) Na (b) K Cl-1  (c) l Mg+1  (d) Fe 2+

1. From following compounds which compound contains double covalent bond

(a) RbCl (b) CaO (c) H2O (d) CO2

1. Among the following configurations the one having the highest ionization potential energy
2. Which of the following elements has the highest electron affinity

(a) Ne (b) K (c) Cl (d) F

(a)[Ne] 3s2, 3p1 (b) [Ne] 3s2, 3p3 (c) [Ar] 3d10, 4s2, 4p3 [Ne] 3s2, 3p3

1. Lewis symbol indicates

(a) Valence shell electrons (b) Total number of electrons

(c) Inner shell electrons (d) Outer shell electrons

1. AlCl3 forms coordinate covalent bond due to

(a) Vacant orbitals in its valence shell (b) Shared electron pair

©Loan pair of electron (d) Unpaired electrons

1. The covalency of nitrogen in NH3 and carbon in CH2Cl2 is

(a) 3, 2 (b) 3, 4 (c) 4, 4 (d) 5, 4

THE END

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic chemistry Class: B.S. III / M. Sc. (Previous)

**Semester:** 1st Test: 3rd Sessional

**Session:** 2012 Date: 05- 12 - 2012

**Maximum Marks** 15 Time allowed: 1hr

**Note: Attempt any Two Questions**

Q. No. 1 Describe with diagrammatical representation molecular orbitals formed in CO and O2 molecule and distribute number of valence shell electrons in them and determine their bond order

Q. No. 2 Describe on basis of molecular orbital theory that why CN1- is strong field ligand and F1- is weak field ligand? Distribute number of valence shell electrons in molecular orbitals formed in d5 octahedral low spin complex compound

Q. No. 3 What is eighteen electron rule how it is different from Octet rule? How eighteen electron rule is satisfied in following metal carbonyls

(i) Co2(CO)8  (ii) Ru3 (CO)12  (iii) Fe(CO)5

Atomic Number of Co = 27, Ru = 44, Fe = 26

**THE END**

**Subject Organometallic compounds** **Class:**  B.S (IV)/ M.Sc. )Final

**Semester:** 1st **Test**  3rd Sessional

**Session:** 2012 **Date 06**- 12-2012

**Maximum Marks** 15  **Time allowed:** 20min

**Tick the correct answer**

1. Which of the following is not organometallic compounds.
2. RMgX (b) R2SiO (b) Fe(C2O4) (c) Ferrocene
3. In dimolecular structure of AlCl3 two alkyls acts as bridging group by formation of
4. 2 e-2centre type bond (b) 2e-4centre type bond

© 2e-3centre type bonding (d) 4e-2centre type bonding

1. Bond stretching frequency of alkyls when form organometallic compounds is

(a) Decrease (b) Increase (b) Remains same (c) None of them

1. Olefens form complex with transition metals due to presence of
2. Loan pair of electrons (b) Bonded pair of electrons

© Unpaired electrons (d) bonded pair of electron

1. Cr with atomic number 24 can form complex with
2. 3CO (b) 4CO (c) 2CO (d) 6CO
3. Cyclopentadiene form compound with transition metals through
4. One carbon atom (b) 5 carbon atom (b) 6 carbon atom(c) Four carbon atoms
5. If the ligands are weak field ligands transition metal atoms in complex compounds can accommodate
6. 16 elecrons (b) 18 electrons (c) 20 electrons (d) 22 electrons

8 Cp2ZrClH + CH2 = CHR → Cp2ZrCH2CH2RCl

1. Oxidative addition reaction (b) Reductive Elimination reaction

© Insertion reaction (d) Alkylation reaction

1. Complete the following reactions
2. Fe (CO)5 + C4H6 Heating →
3. Ni(CO)5 + C3H5X →
4. Fe (CO)5 + 2Ph2C2 →
5. (CO)5 M CROR +BX3 →
6. In eighteen electron rule following orbitals are filled
7. Ns , np (b) ns , (n-1)d- np (c) ns (n-1)p (n-1)d, nS (d) nd, ns, nd
8. for synthesis of organometallic compounds the atmosphere which is needed
9. N2 atmosphere (b) inert atmosphere (c) He atmosphere (c) all of them
10. In synthesis of OTMC Grignard reagent is used as
11. Alkylating agent (b) Reducing agent (C) Hyloginating agent (d) Oxidising agent

(13) CN1- acts as π- acceptor ligand due to ------------------------------------------------------

**DEPARTMENT OF CHEMISTRY**

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**Subject:** Advance Inorganic Chemistry **Class:**  B.S (IV)/ M.Sc. )Final

**Semester:** 1st **Test**  2nd Sessional

**Session:** 2012 **Date:** 11-12-2012

**Maximum Marks** 15  **Time allowed:** 1hr

**Note: Attempt all questions carry equal marks**

Q. |No. 1 Elaborate with examples the synthesis of complex compounds using following methods

(i) Oxidation reduction reactions

(ii) Substitution reactions

Q.No. 2 What do you know about trans effect? Explain that why [Pt(NO2)4]2- by substitution reaction with Py forms cis complex and [Pt(Py)4]2+ by substitution with NO21- ion form trans complex

**DEPARTMENT OF CHEMISTRY, SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**Subject:** Advance Inorganic Chemistry **Class:**  B.S (IV)/ M.Sc. )Final

**Semester:** 1st **Test**  2nd Sessional

**Session:** 2012 **Date:** 11-12-2012

**Maximum Marks** 15  **Time allowed:** 1hr

**Note: Attempt all questions carry equal marks**

Q. |No. 1 Elaborate with examples the synthesis of complex compounds using following methods

(i) Oxidation reduction reactions

(ii) Substitution reactions

Q.No. 2 What do you know about trans effect? Explain that why [Pt(NO2)4]2- by substitution reaction with Py forms cis complex and [Pt(Py)4]2+ by substitution with NO21- ion form trans complex

**Subject:** In-organic Chemistry **Class**: B. S. (i)

**Semester:** 1st **Test:** Final

**Session:** 2012 **Date** 19 – 12 - 2012

**Maximum Marks** 50 **Time allowed:** 2½hrs

**Note: Attempt any four questions all questions carry equal marks**

Q. No. 1 Explain that how the position of electrons in an atom is completely described by four quantum numbers? Give the four quantum number values for electron when it is present in 4d orbital

Q. No. 2 (a) What is periodic table? How mendleef classify the elements in tabular form what are its merits and demerits

(b) Write the electronic configuration of following elements with atomic number 20, 35 and 16 and mention their position in periodic table

Q. No. 3 (a) What is an atomic radius how it can be calculated and which are factors effect upon it? Give the trends of variation of atomic radii in periods and groups

(a) Explain the following by giving suitable reason

(i) As we know that IP increases from left to right in period but nitrogen possess lower IP value than oxygen

(ii) Anions are bigger than their parent atoms and cations are smaller than their parent atoms

(iii) 1stA group elements form ionic compounds with 7th A group elements while 3rdA group elements form covalent compounds with 6thA group

(iv) Formation of F- from F atom is Exothermic while O-2ion from oxygen atom is endothermic

Q. No. 4 Illustrate with examples that how elements satisfy octet rule by formation of ionic and covalent bond? Also explain that why NH3 forms coordinate covalent bond with H+ ion while do not form such bond with H atom

Q. No. 5 Elaborate with examples following modern concepts of acid and base

(i) Bronsted acid base concept (ii) Lewis acid base concept

Arrange the following acids in increasing order of their strength by giving suitable reason

1. PH3 and HCl (ii) HI and HF (iii) H2O and H2S

Q. NO. 6 Write short note on following(i) Hund’s rule (ii) Hydrogen bonding (iii) Shielding effect

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** In-organic Chemistry **Class**: B. S. (i) Failure/Improver

**Semester:** 1st **Test:** Final

**Session:** 2012 **Date** 19 – 12 - 2012

**Maximum Marks** 80 **Time allowed:** 2½hrs

**Note: Attempt any four questions all questions carry equal marks**

Q. No. 1 What is modern periodic law? How the defects of Mendleef’s periodic table is removed when elements are arranged on the basis of modern periodic law and also describe that how modern periodic table is divided into different blocks on the basis of their electronic configuration

Q. No. 2 What is ionization potential and electronegativity and how they vary in the periodic table? Illustrate with examples the role of electronegativity in the formation of ionic bond, polar covalent bond and nonpolar covalent

Q. No. 3 What is the chemical bond describe that why atoms do combines with each other? Elaborate with examples following types of chemical bond

(i) Ionic bond (ii) Coordinate covalent bond

Q. No. 4 Describe with examples the Bronsted Lowrry and Arrhenius acid base concepts? What do you know about the strength of acid and base what are the factors which effect upon it

Q. No. 5 Explain that how the position of electrons in an atom is completely described by four quantum numbers? Give the four quantum number values for electron when it is present in 4d and 3p orbitals

Q. NO. 6 Write short note on following

(i) Pauli’s Exclusion princiciple (ii) Atomic Radii (iii) Shielding effect

**THE END**

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject Advance Inorganic Chemistry** **Class:**  B.S (IV)/ M.Sc. )Final

**Semester:** 1st **Test**  Final

**Session:** 2012 **Date:** 21- 12 -2012

**Maximum Marks** 50  **Time allowed:** 2hr

**Note: Attempt any three questions**

Q. No. 1 What do you know about diagonal relationship and anomalous behavior of elements in periodic table? Give the diagonal relationship of boron with silicon and also explain reasons of diagonal relationships of elements with each other

Q. No. 2 What do you know about tran effect how the cis and tras isomers are formed by tras effect? Elaborate with examples following methods for synthesis of coordination compounds

(i) Substitution reaction (ii) Reaction of coordinated ligands

Q. No. 3 What are labile and inert complex compounds? Explain with examples the SN1 and SN2 substitution reaction mechanism including orders of reaction mechanism by considering general reactions or by proper reactions

Q. No. 3 Discuss with examples stereo isomerism? Describe following types of structural isomerism

(i) Ionization isomerism

(ii) Ligand isomerism

1. Coordination isomerism
2. Polymerizations isomerism

Q. No. 1 Describe some methods by which complex compounds are separated from reaction mixture? Elaborate with some examples following general methods foe synthesis of coordination compounds

(i) Simple addition method

(ii) Substitution reaction

Q.No. 2 What do you know about trans effect? Explain that why [Pt(NO2)4]2- by substitution reaction with Py forms cis complex and [Pt(Py)4]2+ by substitution with NO21- ion form trans compl

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Organometallic Compounds (Theory) **Class:**  B.S (IV)/ M.Sc. Final

**Semester:** 1st **Test**  Final

**Session:** 2012 **Date:** 24- 12 -2012

**Maximum Marks** 50  **Time allowed:** 2hr

**Note: Attempt any three questions**

Q. No. 1 Explain that why acetylene and ethylene forms complex compounds with heavier transition elements at their lower oxidation state? Describe the nature of bonding in metal olefin complexes with experimental evidences which reflects the back bonding in metal complexes.

Q. No. 2 Explain that why cyclopentadiene forms complex with Fe(CO)3 through four carbon atoms while Ni(CO)3 through two carbon atoms? Give the logic with diagrammatic representations that how planar complexes do not obey the eighteen electron rule and tetrahedral complexes do not necessary obey this rule while metal carbonyls in octahedral complex compounds mostly obey that rule

Q. No. 3 Elaborate that why and how organotransition metal complexes are synthesized in inert atmosphere? Describe with examples the synthetic methods for preparation of metal alkyls б- bonded organotransition metal compounds

Q. No. 4 Describe that how organometallic compounds are named by IUPAC system? How the π- metal complexes of following organic groups are synthesized

(i) Ƞ5-cyclopentadienyl metal complexes (ii) Ƞ6-Arene metal complexes

**THE END**

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic chemistry Class: B.S. III / M. Sc. (Previous)

**Semester:** 1st Test: Final

**Session:** 2012 Date: 09- 01-2013

**Maximum Marks** 50 Time allowed: 2hr

**Note: Attempt any Three Questions**

Q. No. 1 What are multidentate ligands how they are classified? Differentiate between complex compounds and chelates give some applications of chelation

(b) Give the IUPAC name to following complex compounds

(i) [Cu(en)2Br2]Br (ii) [Co(NH3)5NO2]Cl (iii) [Co(OH)(NH2)Co(en)4] SO4

(iv) K2[Fe(CN)6] (v) K[Pt(NH3) Cl Br I]

Q. No. 2 Elaborate with examples that how valence bond theory describe the structure and magnetic properties of octahedral, tetrahedral and square planar complex compounds on basis of hybridization

(b) Calculate the effective atomic number of following complex compounds

(i) [Fe(CO)5] (ii) [Co(NH3)6]3+ (iii) K3[Cu F6] (iv) [Ni(CO)4]

The atomic number of Fe = 26, Ni = 28, Cu = 29, Co = 27

Q. No. 3 Explain that how crystal field theory describe the color of complex compounds and distorted octahedral complexes? Discuss with diagrammatic representation splitting of d orbitals in case of tetrahedral complex compounds

(b) Distribute the electrons in different energy levels in octahedral complexes and calculate crystal field stabilization energy in case of strong and weak field ligands in d3, d6, d5 and d7 complexes

Q. No. 4 Explain that how ligand field theory elaborate the nature of bonding in complex compounds? Describe bonding in metal carbonyl complexes with experimental evidences which reflects the back bonding in complexes

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

Class: B.S. III / M. Sc. (Previous) Failure Imrover **Subject:** Inorganic chemistry

**Semester:** 1st Test: Final

**Session:** 2012 Date: 04-01-13

**Maximum Marks** 80 Time allowed: 2½hr

**Note: Attempt any Four Questions**

Q. No. 1 (a) What are complex compounds? How the werner theory explain the structure of complex compounds with experimental evidences

(b) Give the IUPAC name to following complex compounds

(i) [Cu(en)2Br2]Br (ii) [Co(NH3)5NO2] Cl (iii) [Co(OH)(NH2)Co(en)4] SO4

(iv) K2[Fe(CN)6] (v) K[Pt(NH3) Cl Br I]

Q. No. 2 What do you know about valence bond theory? Elaborate with examples how this theory explains the inner outer octahedral complex compounds and tetrahedral an square planar complexes

Q. No. 3 Explain the crystal field theory? How the degeneracy of d orbitals is resolved when the ligands are arranged around the central metal atom in case of square planar and tetrahedral complexes

Q. No. 4 Explain that how molecular orbital theory removes the defects of valence bond theory in covalent compounds? Give with diagrammatic representation molecular orbitals formed in the following molecules and determine their bond order and magnetic properties

(i) N2 (ii) C2+1 (iii) NO-1

Q. No. 5 Explain with diagrammatic representations the molecular orbitals formed in complex compounds and distribute number of electrons in molecular orbitals in case of d5? Explain on basis ligand field theory why CO is strong field ligand

Q. No. 6 Write short note on following

(i) Application of chelates (ii) Eighteen electron rule (ii) Crystal field stabilization energy

**THE END**

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Practical **Class:**  B.S (IV)/ M.Sc. Final

**Semester:** 1st **Test**  Final

**Session:** 2012 **Date:** 02- 01 -2013

**Maximum Marks** 50  **Time allowed:** 1½hr

**Note: Attempt all questions**

Q. No. 1 (a) How you will prepare 100mls of 0.05N solution of CaCO3

(b) Determine the normality of solution of H3PO4 when its specific gravity is 1.8 and percentage purity is 83

Q. No. 2 How you will prepare 100mls solution of 100ppm of Na from the NaCl and from 100ppm of NaCl solution prepare 2ppm, 4ppm, 6ppm and 10ppm solutions

Q. No. 3 Describe that why substance absorb electromagnetic radiations? Give basic principle of uv/visible spectrophotometer

Q. No. 4 Define the following terms

(i) Percipitation (ii) wave length and frequency (iii) Electromagnetic spectrum (iv) Molarity

Q. No.5 Write procedure and make absorption spectrum and calibration curve for the spectrophotometric determination of KMnO4 by using spectronic 20 spectrophotometer

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Practical **Class:**  B.S (IV)/ M.Sc. Final

**Semester:** 1st **Test**  Final

**Session:** 2012 **Date:** 02- 01 -2013

**Maximum Marks** 50  **Time allowed:** 1½hr

**Note: Attempt all questions**

Q. No. 1 (a) How you will prepare 100mls of 0.05N solution of CaCO3

(b) Determine the normality of solution of H3PO4 when its specific gravity is 1.8 and percentage purity is 83

Q. No. 2 How you will prepare 100mls solution of 100ppm of Na from the NaCl and from 100ppm of NaCl solution prepare 2ppm, 4ppm, 6ppm and 10ppm solutions

Q. No. 3 Describe that why substance absorb electromagnetic radiations? Give basic principle of uv/visible spectrophotometer

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(i) Percipitation (ii) wave length and frequency (iii) Electromagnetic spectrum (iv) Molarity

Q. No.5 Write procedure and make absorption spectrum and calibration curve for the spectrophotometric determination of KMnO4 by using spectronic 20 spectrophotometer

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic Practical **Class:**  B.S (i)

**Semester:** 1st **Test**  Final

**Session:** 2012 **Date:** 07- 01 -2013

**Maximum Marks** 40  **Time allowed:** 1

Name-------------------------------------- Father’s Name------------------------------------

Seat No -------------

**Note: Attempt all questions**

Q. No. 1 (a) Calculate the amount of given compounds for the preparation of 100mls of 0.05N solution

(i) Na2CO3

1. Ca(OH)20
2. Calculate volume of 2M solution for preparation of its 100ml dilute solution of 0.1M solution

Q. No. 2 Define the following terms

Solution-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Percipitation reaction ---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Molarity-------------------------------------------------------------------------------------------------------------------------------------------------------------

Arrhenius acid and base--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

--------------------------------------------------------------------------------------------------------

Standard solution---------------------------------------------------------------------------------------------------------------------------------------------------

Q. No. 3 Complete the following reactions

Na2CO3 + H2SO4 ------------------------

MgSO4 + H2O ----------------------------

KOH + HNO3 ------------------------------

PbNO3 + HCl ------------------------------

Q. No. 4 Give the name to following inorganic compounds

(i) NH4NO3 (ii) Fe2(SO4)3 (iii) H2O2 (iv) Al2O5 (v) H3PO4

Q. No. 5 Fill in the blanks

(i) Standard solution is that solution whose concentration is ----------------------

(ii) When the pH of the solution is less than 7 that solution is ---------------------

1. In the salt analysis scheme the third group cations are -------------------------
2. The group reagent for iv th group cations is ----------------------------------------
3. Acidic radical in salt Na­2SO4 is -------------------------------------------------------
4. Molecular weight of H2C2O4 ----------------------------------------------------------

Q. No. 6 Write the theory procedure observation calculation and the result for the given object by putting imaginary burete readings

**Object:** Determine the normality and amount of NaOH / 250ml of given solution by titration with 0.1N solution of HCl

Q. No.5 Write procedure and make absorption spectrum and calibration curve for the spectrophotometric determination of KMnO4 by using spectronic 20 spectrophotometer

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic Practical **Class:**  B.S (iii)/M. Sc. Previous

**Semester:** 1st **Test**  Final

**Session:** 2012 **Date:** 08- 01 -2013

**Maximum Marks** 50  **Time allowed:** 1

Name-------------------------------------- Father’s Name------------------------------------

Seat No -------------

**Note: Attempt all questions**

Q. No. 1 (a) Calculate the amount of given compounds for the preparation of 100mls of 0.05N solution

(i) CaSO4 Atomic weight of Ca =40, S= 32, O = 16

1. H2SO4 Specific gravity = 1.8 and Percentage purity is 96
2. Calculate volume of 1M solution of HCl for preparation of its 100ml dilute solution of 0.1M solution

Q. No. 2 Define the following terms

Chelates-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Buffer soolution ---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Gravimetric Analysis-------------------------------------------------------------------------------------------------------------------------------------------------------------

Titration--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Basicity and Acidity------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Molarity---------------------------------------------------------------------------------------------------------------------------------------------------

Q. No. 3 Give the name to following inorganic compounds

(i) H3PO4 (ii) Fe2(SO4)3 (iii) Na2EDTA (iv) XeF6 (v) Na2HPO4 (vi) Na2S2O4

Q. No. 4 Fill in the blanks

(i) Standard solution is that solution whose concentration is ----------------------

(ii) When the pH of the solution is more than 7 that solution is ---------------------

1. Structural formula of EDTA is -------------------------------------------------------------------------------------------------------------------------------------
2. Indicators are those which show the ------------------------------ of chemical reaction
3. Acidic radical in salt Na­2SO4 is -------------------------------------------------------
4. Molecular weight of H2C2O4 ----------------------------------------------------------

Q. No. 5 Write the theory procedure observation calculation and the result for the given object by putting imaginary burete readings

**Object:** Determine the permanent hardness of tape water by titrating with 0.01M solution of EDTA

**THE END**

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Advance Inorganic (Theory) **Class:**  B.S (IV)/ M.Sc. Final

**Semester:** 2nd **Test**  Mid Term Test

**Session:** 2012 **Date:** 25- 03 -2013

**Maximum Marks** 30  **Time allowed: 1 and** 1/2h

**Note: Attempt all questions**

Q. No. 1 What are inorganic polymers how they are classified? Describe the structure and properties of borazine and its derivatives

Q. No. 2 What are silicones describe general steps for the preparation of silicones? Describe preparation properties and uses of following silicones

(i) Silicone fluids or oils

(ii) Silicone Rubbers

Q. No. 3 Give the preparation properties and structure of following polymers of Sulfur

(i) Tetrasulfur tetranitride

(ii) Imides of Sulfur

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic chemistry Class: B.S. III / M. Sc. (Previous) Failure/Improver

**Semester:** 2nd Test: Final Test

**Session:** 2012 Date: 06- 04 - 2013

**Maximum Marks** 80 Time allowed: 2hr

**Note: Attempt any 3 Questions**

Q. No. 1 (a) What is solubility elaborate with examples some factors which effect upon the solubility of the substances in aqueous solution

(b) Explain that how Pearson’s classify lewis acids bases into hard soft acids and bases? Describe with examples some applications of HSAB principle

Q. No. 2 Elaborate with examples redox reaction and mention oxidizing agent and reducing agent in those reactions? Give some rules for determining oxidation number of the elements in their compounds

(b) Balance the following redox equation by ion electron methods

MnO4 -  + Cl - ---------------------------- Mn 2+ + Cl2

Q. No. 3 What is standard electrode potential? How the standard hydrogen electrode is constructed and applied for the determination of standard electrode potential of Cu2+ / Cu

Q. No 4 What are actinides and lanthanides? Give the preparati0ns and properties and uses of lanthanide elements

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Class:** M. Sc. (Final) **Semester 2nd**

**Subject:** Advance Inorganic Chemistry **Test:**  Final

**Session:** 2012 **Date:** 18- 04 - 2013

**Maximum Marks** 80  **Time allowed:** 2½hr

**Note: Attempt any four Questions**

Q. No. 1 What are pollutants how they are categorized? Give the brief discussion on collection of environmental samples and their analysis by using different instrumental methods

Q. No. 2 (a) Discuss that how Ozone layer protect the atmosphere and also discuss that how it is going to be damaged by human activities

(b) What is greenhouse effect why the temperature of atmosphere is increasing day by day how it can be controlled?

Q. No 3 What are heavy metals give their biological role? Give the toxic effects of following heavy metals in biological system

(i) Mercury (ii) Arsenic (iii) Lead

Q. No 4 How the wastes are categorized and how it pollute the environment? Describe modern methods for disposal of wastes

Q. No 5 Explain that how electricity is produced by atomic power plants? Describe methods for treatment of power plant wastes and what will be the health hazards of nuclear pollutants

**THE END**

**DEPARTMENT OF CHEMISTRY**

**Class:** M.S Inorganic Chemistry **Semester 2nd**

**Subject:** Inorganic Environmental Chemistry **Test:**  Final

**Session:** 2013 **Date:** 22- 11 - 2013

**Maximum Marks** 80  **Time allowed:** 2½hr

**Note: Attempt any four Questions**

Q. No. 1 Describe the segments of Environment? Explain that how the concentration of carbon remains constant by carbon cycle in nature

Q. No. 2 Describe the process of creation and destruction of ozone layer

(b) What is greenhouse effect why the temperature of atmosphere is increasing day by day how it can be controlled?

Q. No 3 What are heavy metals give their biological role? Give the toxic effects of following heavy metals in biological system

(i) Mercury (ii) Arsenic (iii) Lead

Q. No 4 How the wastes are categorized and how it pollute the environment? Describe modern methods for disposal of wastes

Q. No 5 Explain that how electricity is produced by atomic power plants? Describe methods for treatment of power plant wastes and what will be the health hazards of nuclear pollutants

**THE END**

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Advance Inorganic (Theory) **Class:**  B.S (IV)

**Semester:** 2nd **Test**  Final Test

**Session:** 2012 **Date:** 22- 04 -2013

**Maximum Marks** 50  **Time allowed: 2hr**

**Note: Attempt any three questions**

Q. No. 1 Describe the nature of bonding in the cyclicpolyphodphonitrilic chloride? Discuss the preparation properties and uses of following polymers of phosphorus

(i) Vitrous polyphosphate glass (ii) Borophosphate glass

Q. No. 2 What are coordination polymers give the general methods for their preparation.? Give with structure elucidation synthesis and bonding in the polymeric metal complexes with organic ligands

Q. No. 3 Discuss the advantages and disadvantages of organic reagents over inorganic? Give structural formula, mode of action and specification of glyoxime and Benzindine for inorganic analysis

Q. No. 4 How the selected metal ions are extracted from the mixture of metal ions by using particular reagents? Give the structural formula and the procedure for the derivatisation and extraction and copper and Beryllium using dimethyldithiocarbamate and acetylacetone

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**(Section Inorganic Chemistry)**

**Subject:** Practical Written Test Class: B.S (IV) M. Sc (Final)

**Semester:** 2nd Test Final

**Session:** 2012 Date: 02-05 2012

**Maximum Marks** 40  **Time allowed:** 1hr

**Q. No. 1** (a) Prepare 100mls of 0.1N solution of H2SO4 when the % Purity of given solution is 96 and density is 1.8

(b) determine the amount of KCl for the preparation of 100mls 1000ppm o**f** KCl when the atomic weight of K= 39 and Cl= 35.5

**Q. No. 2** Fill in the blanks

(i) Acidic solution is that whose pH is ----------------------------------------------

(ii) Gram equivalent weight of CaCO3 is ------------------------------------ When At. Wt. of Ca =40, O= 16

(iv) Molar mass of 12 grams of NaCl is ------------------------------------------------

(v) The reagent which is used for Gravemetric determination of Cl-1 ions in given solution is ---------------------

(VI) The structural formula of sulfuric acid is --------------------------------------------------------------------------------------------------------------------------------------------

1. Strong electrolytes are those which ----------------------------------------------------------------------------------------------------------
2. High conductivity of water is due to the presence of high concentration of ------------------------------------------------------------------------------------
3. For the determination of Al3+ ions in solution ---------------------------- reagent is used
4. In paper chromatography ------------------------- is used as stationary phase and -------------------- is used ---------------------------is mobile phase

**Q. No. 3** Define the following Terms

(i) Solubility (ii) Masking agent (iii) Chelation (iv) Titration (v) Primary and secondary standards (vi) Calibration curve (vii) Concentration (viii) Solvent extraction (ivx) Analytical reagent (x) Spectroscopy

**Q. No. 5** Write theory procedure observation and calculation for given object

**Object:-** Determine the alkalinity of water sample by titration method and amount of SO4-2 ions by gravimetric method

**THE END**

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**(Section Inorganic Chemistry)**

**Subject:** Practical Written Test Class: B.S (IV) M. Sc (Final)

**Semester:** 2nd Test Final

**Session:** 2012 Date: 02-05 2012

**Maximum Marks** 40  **Time allowed:** 1hr

**Tick the correct answer**

1. The element having valence shell electronic configuration is 3S2, 3p5 that belongs to

(a) Fourth period, VA group (b) 5th period, IIIA group (c) 3rd period, VIIA group

(d) 2nd period VA group

1. Each 8th element has similar properties as of one this classification of elements was given by
2. Newland (b) Mosely (c) Bohor (d) Rutherford
3. Which of following has minimum electron affinity
4. N (b) O (c) Ar (d) P
5. Which of following bonds is most polar
6. N ─ Cl (b) O ─ F (c) C ─ Cl (d) C ─ F
7. By emission of positron the nucleus of element is changed in to other element having
8. One atomic number less than parent atom
9. One atomic number more than parent atom
10. Two mass number less
11. Remains same
12. Covalencies of phosphorus are
13. 3, 4 (b) 5, 2 (c) 4, 5 (d) 3, 5
14. The bond between BF3 ─ F- is
15. Ionic bond (b) Covalent bond (c) Dative bond (d) Sigma bond
16. In SO42- sulfur is bonded with four oxygen atoms with four bonds from these bonds
17. Two are covalent bonds two are coordinate covalent bonds
18. One is coordinate covalent three are covalent bonds
19. Two ionic and two are covalent bonds
20. Three coordinate covalent and one is covalent bond
21. Bond order of NO+ is
22. 2 (b) 3 (c) 1 (d) 4
23. The shape of XeF4 is square planar due to
24. Four bonded pairs (b)Three bonded one loan pair (c) Two loan pairs four bonded pairs (d)One loan pair three bonded pairs
25. In NH3 molecule hybridization is

(dsp2) (b) sp2 (c) sp3 (d) d2sp3

1. The 2nd group reagent for analysis of salt cations is
2. HCl (b) H2S (c) NaCO3 (d) NH4OH
3. Stoichiometric mass of NaCl2 formed by reaction of Na2CO3 and HCl is
4. 58.5 (b) 117 (c) 28.5 (d) 45
5. When un-dissolved substance is formed during chemical reaction that is called
6. Contamination (b) Precipitation (c) Complexation (d) Crystallization
7. Graphite allotropic form of carbon conduct electricity due to presence of
8. Unpaired electrons (b) Free electrons (c) Loan pair of electrons (d) Bonded electrons
9. Standard reduction potential of hydrogen electrode is
10. -1 (b) 0 (c) +1 (d) ±1
11. In the electrochemical cell
12. Electrical energy is changed into chemical energy
13. Chemical energy into potential energy
14. Chemical energy into electrical energy
15. Kinetic energy into thermal energy
16. Oxidation number of Fe in compound Fe2O3 is
17. +3 (b) +5 (c) -2 (d) 4
18. For preparation of 100ml 0.1M solution of Na2C2O4 amount of sodium oxalate is required
19. 13.5g (b) 1.3g (c) 1.50g (d) 67.5g
20. When H+ ion concentration of solution is 1x10-8 pH of that solution will be
21. 13 (b) 8 (c) 10 (d) 5
22. From four halogen acids HI, HCl, HF and HBr which is the strongest acid
23. HF (b) HBr (c) HCl (d) HI
24. Common name of NaHCO3 is
25. Washing Soda (b) Bleaching powder (c) Backing soda (d) Soda ash
26. Dialkyl dichlorosilane gives
27. Long chain polymer (b) Cross linked polymer (c) Cyclic structure polymer (d) Trimeric polymer
28. Colored componds absorb electromagnetic radiation from
29. UV region (b) Visible region (c) IR region (d) Radio wave region
30. Nuclear closed shell structure is reached when number of nucleons are
31. 2, 18, 32, 56, 82
32. 8, 18, 2, 36, 120
33. 2, 8, 20, 50, 85
34. 85, 32, 120, 18, 85
35. Mechanism for the emission of β-1 particle from nucleus is that in which
36. Proton is changed into neutron (b) electron is emitted from K shell (c) Neutron is changed in to proton (d) Positron is changed in to electron
37. Half life time of radioactive element is 6hrs how much amount of it remained after 12hrs
38. ½ (b) 1/6 (c) ¼ (d) 1/8
39. In high spin octahedral complex compounds hybridization is
40. d2sp3 (b) sp3d2 (c) s2p3d2 (d) dsp3
41. Diethylene triamine is
42. Tridentate ligand (b) Tetradentate ligand (c) Hexadentate ligand (d) monodentate ligand
43. In octahedral high spin complex compounds containing d5 electrons CFSE energy is
44. 12Dq (b) 16Dq (c) 0dq (d) 20Dq
45. In square planar complex compounds splitting of d orbitals occurs when ligands are arranged around central metal atom highly effected d orbital is
46. dz2 (b) dx2-y2 (c) dxy (d) dxz
47. Coordination number of central metal atom in complex [Pt(NH3)2Cl2] is
48. 2 (b) 4 (c) 6 (d) 0
49. The source of electromagnetic radiation which is used in the instrument atomic absorption spectrophotometer is
50. Xenon lamp (b) Hallow cathode lamp (c) Tungsten lamp (d)Deuterium lamp
51. For the preparation of 100mls of 1000ppm solution of Na+ from NaCl amount of NaCl is required

(a) 2.54g (b) 0.254g (c) 5.85g (d) 2.3g

1. Cyclooctatetraene forms complex with [Fe(CO)3] by
2. Four carbon atoms (b) Eight carbon atoms (c) three carbon atoms (d) Six carbon atoms
3. Allyl group form complex compound with metal atom through
4. Two carbon atoms (b) three carbon atoms (c) one carbon atom (d) Four carbon atoms
5. Cyclopentadiene is linked with transition metals through
6. Four carbon atoms (b) five carbon atoms (c) three carbon atoms (d) one carbon atoms
7. Effective atomic number of cobalt in case of [Co(NH3)6]3+ is
8. 24 (b) 36 (c) 54 (d) 39 , the atomic number of Co= 27
9. The reaction in which one ligand is replaced by another ligand is called
10. Electrophilic subistitution reaction
11. Nuclophillic suistitution reaction
12. Coordination reaction
13. Oxidation reaction

40 For the polymerization of olefins the reagent which is used as catalyst

1. Grignard reagent (b) Ziegler Nattas’s reagent (c) [PdCO3R] (d) [RhCO4

41 When the coordination number is five shape of that complex is

1. Square planar (b) Octahedral (c) Terahedral (d) Trigonalbipyramidal

42 The most nonmetallic in group 15 is:

(a) N (b) P (c) Bi (d) Sb

1. Which of the following is not Lewis base
2. NH3 (b) H2O (c) CO (d) Cu
3. Which of the following factors produces covalent character in ionic bond in molecule
4. Larger charges on ions
5. Large ionic radius

© Small size of anion

1. High degree of polarization
2. When 17Cl35 undergoes (n,p) reaction, the radioactive isotope formed is:
3. 15P35 (b) 16S35 (c) 15P32  (d) 16S 36
4. The moderator used in nuclear reactor is

(a) H2O (b) D2O (c) S (d) Boron

1. In the periodic table the element with atomic number 35 belongs to:
2. Period IV and group IIA
3. Period III and group IVA
4. Period V and group IIA
5. Period IV and group VIIA
6. Raw materials used for the manufacture of cement are:
7. CaCO3 and SiO2 (b) CaCO3 and Clay (c) CaO and SiO2 (d) Ca(OH)2
8. Octahedral complex C.N. =6 shows cis-trans isomerism if they are of the type
9. Ma4B2 (b) (Ma3b3) (c) Ma5b2 (d) Ma2B2
10. Which of following is hypochlorous acid
11. HClO2 (b) HClO (c) HClO3 (d) HClO4

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Comprehensive Viva voice **Class:**  B.S (IV)/ M.Sc. )Final

**Semester:** 2nd **Test**  Final

**Session:** 2012 **Date:** 04-05- 2013

**Maximum Marks** 30  **Time allowed:** 30minutes

Name ----------------------------------------------------------- Seat No. ---------------------------------

**Tick the correct answer**

01 The element having valence shell electronic configuration is 3S2, 3p5 that belongs to

(a) Fourth period, VA group (b) 5th period, IIIA group (c) 3rd period, VIIA group

(d) 2nd period VA group

By emission of positron the nucleus of element is changed in to other element having

1. One atomic number less than parent atom
2. One atomic number more than parent atom

02. Covalencies of phosphorus are

(a) 3, 4 (b) 5, 2 (c) 4, 5 (d) 3, 5

**03.** Bond order of NO+ is

(a) 2 (b) 3 (c) 1 (d) 4

04. The shape of XeF4 is square planar due to

1. Four bonded pairs (b)Three bonded one loan pair (c) Two loan pairs four bonded pairs (d)One loan pair three bonded pairs

05. When un-dissolved substance is formed during chemical reaction that is called

1. Contamination (b) Precipitation (c) Complexation (d) Crystallization

06. Standard reduction potential of hydrogen electrode is

1. -1 (b) 0 (c) +1 (d) ±1

07 . Oxidation number of Fe in compound Fe2O3 is

1. +3 (b) +5 (c) -2 (d) 4

10. When H+ ion concentration of solution is 1x10-8 pH of that solution will be

1. 13 (b) 8 (c) 10 (d) 5
2. When H+ ion concentration of solution is 1x10-8 pH of that solution will be
3. 13 (b) 8 (c) 10 (d) 5

11. Dialkyl dichlorosilane gives

1. Long chain polymer (b) Cross linked polymer (c) Cyclic structure polymer (d) Trimeric polymer

12. Colored compounds absorb electromagnetic radiation from

1. UV region (b) Visible region (c) IR region (d) Radio wave region

13. Nuclear closed shell structure is reached when number of nucleons are

1. 2, 18, 32, 56, 82 (b) 8, 18, 2, 36, 120 (c) 2, 8, 20, 50, 85 (d) 85, 32, 120, 18, 85

14. Half life time of radioactive element is 6hrs how much amount of it remained after

12hrs

1. ½ (b) 1/6 (c) ¼ (d) 1/8

15. In octahedral high spin complex compounds containing d5 electrons CFSE energy is

(a) 12Dq (b) 16Dq (c) 0dq (d) 20Dq

16. Cyclooctatetraene forms complex with [Fe (CO)3] by

(a) Four carbon atoms (b) Eight carbon atoms (c) three carbon atoms (d) Six carbon atoms

17. In square planar complex compounds splitting of d orbitals occurs when ligands are

arranged around central metal atom highly effected d orbital is

1. dz2 (b) dx2-y2 (c) dxy (d) dxz

18. Effective atomic number of cobalt in case of [Co(NH3)6]3+ is

1. 24 (b) 36 (c) 54 (d) 39 , the atomic number of Co= 27

19. The reaction in which one ligand is replaced by another ligand is called

1. Electrophilic substitution reaction
2. Nucleophilic substitution reaction
3. Coordination reaction
4. Oxidation reaction

20. The source of electromagnetic radiation in uv region is

(a) Tungsten lamp (b) Duterium lamp (c) Hollow cathode lamp (d) Xenon lamp

21. Which of the following is not Lewis base

1. NH3 (b) H2O (c) CO (d) Cu

22. Olefens form complex with transition metals due to presence of

(a) Loan pairs (b) Filled π star orbitals (c) Vacant π star orbitals (d) Vacant sigma star

orbitals

23. Synthetic gas is mixture of

(a) CO2 and H2 (b) CO and H2 (c) H2 and O2 (c) Co andO2

24. RMgX is used for synthesis of OMC as

(a) Oxidizing agent (b) Reducing agent (c) Alkylating agent (d) Halidation reagent

25. Enantiomers are those compounds which possesses

(a) Same molecular formula different geometrical shape

(b) molecule are mirror images of each other

© Same molecular formula different empirical formula

(d) Same atomic number different mass number

25 The hybridization in the NH3 molecule is

1. Sp3  (b) sp2 (c) Sp1 (d) dsp1

26 Labile complex compounds are those in which t ½ for substitution reaction is

1. Less than 1sec (b) more than one sec (c) less than 30sec (d) more than 30 sec

27 In the atomic emission spectrophotometer the source for excitation of electron is

1. Hollow cathode lamp (b) Laser rays (c) Flame (d) X-rays

28. In the periodic table the element with atomic number 35 belongs to:

(a) Period III and group IVA (b) Period IV and group IIA (c) Period V and group IIA

(d) Period IV and group VII

29 When the coordination number is five shape of that complex is

1. Square planar (b) Octahedral (c) Terahedral (d) Trigonalbipyramidal

30. In square planar complex compounds splitting of d orbitals occurs when ligands are

arranged around central metal atom highly effected d orbital is

1. dz2 (b) dx2-y2 (c) dxy (d) dxz

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic chemistry Class: M. Sc. (Previous)

**Semester:** 2nd Test: Final

**Session:** 2012 Date: 06- 05-2013

**Maximum Marks** 50 Time allowed: 2hr

**Note: Attempt Three Questions Q. No. 1 is compulsory**

Q. No. 1 **Do as directed**

(i) Give the conjugated acid and base of following reaction

(a) HClO4 +H2O ----------------------

(b) CH3COOH +NH3 ------------------

© H2SO4 + H2O ----------------------

(d) HNO3 + H2O ------------------------

(ii) Balance the following equation by ion electron method in acidic medium

Cr2O72-  + H2O2 --------------- Cr3+ +O2

(iii) Explain the following

1. Why water is weak acid as compared to HF
2. NaCl is highly soluble while AgCl is sparingly soluble
3. Why alkali metal ions form stable complex with F - not with I-
4. Why AlCl3 is Lewis acid but not is Arrhenius acid

(iv) Give the oxidation number to the elements of following compounds

1. SO4 2- (b) H2C2O4 (c) ClO4-1 (d) Na2AsO3

(v) Write the cell reaction and calculate the cell e.m.f from following half cell

Reactions.

Ag + e‑ ---------------- Ag; E0 = + 0.799v

Ni2+ + e- -------------- Ni ; E0 = - 0250v

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic chemistry Class: B.S. III

**Semester:** 2nd Test: Final

**Session:** 2012 Date: 06- 05-2013

**Maximum Marks** 50 Time allowed: 2hr

**Note: Attempt Three Questions Q. No. 1 is compulsory**

Q. No. 1 Describe the segments of Environment? Explain that how the concentration of carbon remains constant by carbon cycle in nature

Q. No. 2 Describe the role of water as solvent? Elaborate with examples factors which effect upon the solubility of ionic compounds in aqueous solution

Q. No. 3 Discuss liquid sulfur dioxide as a solvent? Elaborate with examples following reactions which are taking place in liquid sulfur

(i) Acid Base reactions

(ii) Precipitation reactions

Q. No. 4 How the standard reduction potential values in electrochemical series are measured? Describe at least three applications of electrochemical series

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic chemistry(Practical) Class: B.S. III / M. Sc. (Previous)

**Semester:** 2nd Test: Final

**Session:** 2012 Date: 06- 05-2013

**Maximum Marks** -- Time allowed: 1hr

Name --------------------------------------------- S/O, D/O-------------------------------------------

Seat No.----------------.

Q. No. 1 (i) Determine the amount of H2C2O4 for the preparation of 100mls of 0.2M solution

(ii) Prepare 10% solution of BaCl2

(iii)Prepare 100mls of 0.1 solution of HCl when the % purity of the acid is 85 and density is 1.5

Q. No. 2 Write IUPAC name of following compounds

(i) H2SO3 (ii) HClO4 (iii) NH4NO2  (iii) (iv) Hg2O (v) FeNH4SO4

Q. No. 3 Explain the following

(i) Why indicator is not used in KMnO4 titration

(ii) Why BaCl2 is used in SO4 ion determination

(iii)Why PPt is ignited in gravemetric analysis

(iv)

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic chemistry (Theory Class: B.S. III / M. Sc. (Previous)

Failure/ Improver

**Semester:** 2nd Test: Final

**Session:** 2014 Date: 28- 11-2014

**Maximum Marks** 80 Time allowed: 2½hr

**Note: Attempt any Four Questions**

Q. No. 1 What is acid and base? Explain with examples following modern concepts of acid and base

(i) Bronsted and Lowerry concept (ii) Solvent system (iii)Lewis acid and base

Q. No. 2 What is solubility? Explain that why ionic compounds are soluble in aqueous solution and discuss some factors which effect upon the solubility of ionic compounds in aqueous solution

Q. No. 3. Explan the redox reaction including oxidizing and reducing agent by giving examples? Balance the following equation by ion electron method

Cr2O71- + Fe2+ H+ --------------------- Cr3+ + Fe3+ + H2O

Q. No. 4 What is oxidation and reduction electrode potential? What are the factors which effect upon it?

(b) Write the cell reaction and calculate the cell e.m.f from following half cell

Reactions.

Ag1+ + e‑ ---------------- Ag; E0 = + 0.799v

Ni2+ + 2e- -------------- Ni ; E0 = - 0250v

Q. No. 5 How the solvents are classified? Discus liquid ammonia as solvent and explain following reactions which are taking place in liquid ammonia

(i) Acid base reaction (ii) Amonolysis reaction (iii)

Q. No. 6. Write short note on following

(i) HSAB concept (ii) Strength of acids (iii) Standard Hydrogen electrode

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic Practical **Class M.S**

**Semester:** 2nd **Test**  Final

**Session:** 2012 **Date:** 23- 05 -2013

**Maximum Marks** 70  **Time allowed:** 1

Name------------------------------------- Father’s Name-------------------------------Seat No -------------

**Note: Attempt all questions**

Q. No. 1 (a) Calculate the amount of given compounds for the preparation of 100mls of 0.05N solution

(i) CaSO4 Atomic weight of Ca =40, S= 32, O = 16

1. H2SO4 Specific gravity = 1.8 and Percentage purity is 96
2. Determine volume of 1M solution of HCl for preparation of its 100ml dilute solution of 0.1M solution

Q. No. 2 Define the following terms

Chelates-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Buffer soolution ---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Gravimetric Analysis-------------------------------------------------------------------------------------------------------------------------------------------------------------

Titration--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Basicity and Acidity------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Hard and soft water---------------------------------------------------------------------------------------------------------------------------------------------------

Q. No. 3 Give the name to following inorganic compounds

(i) H3PO4 (ii) Fe2(SO4)3 (iii) Na2EDTA (iv) XeF6 (v) Na2HPO4 (vi) Na2S2O4

Q. No. 4 Fill in the blanks

(i) Standard solution is that solution whose concentration is ------------------

(ii) When the pH of the solution is more than 7 that solution is --------------

1. Structural formula of EDTA is -------------------------------------------------------------------------------------------------------------------------------------
2. The natural water is alkaline due to presence of ---------------------------ions
3. Conductivity of water is increased by increase of -------------------------------------------------------
4. Gram equivalent weight of H2C2O4 is ------------------------------------------------------

Q. No. 5 Write the theory procedure observation calculation and the result for the given object by putting imaginary beurate readings

**Object:** Determine the hardness of tape water by titrating with 0.01M solution of EDTA solution

**THE END**

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR, DEPARTMENT OF CHEMISTRY**

**Subject:** Practical Written Test Class: M.S (section Inorganic)

**Semester:** 1st Test Final

**Session:** 2014 Date: 05-06- 2014

**Maximum Marks** 60  **Time allowed:** 1½hr

**Q. No. 1** (i) Determine amount of FeSO4.2H2O for the preparation of 100mls of 0.05N solution

**(ii)** Prepare 100mls of 10ppm solution of K ion from KCl salt

(iii) Determine volume of chloroform (CHCl3) for the preparation of its 250mls of 0.1M solution

**Q. No. 2** Write the IUPAC name of following compounds

(i) K2[Ni(CN)4] (ii) I2O4 (iii) K2S2O4 (iv) NH4NO2  (v) HCLO

**Q. No. 3** Explain The following

(i) Why substances absorb electromagnetic radiations

(ii) Why instruments are used for chemical analysis of samples although classical methods are available

(iii) Why photomultiplier tube is used in spectrophotometer

(iv) Why pH is less when [H+] is high

(v) Why double beam spectrophotometer is better than single beam spectrophtometer

**Q. No. 4** The analysis of sample for Na+ ion contents gave following % values

28.1, 28.08, 28.03, 28.4, 28.1 and 28.06

Calculate the mean, standard deviation and coefficient of variation for the values

**Q. No. 5** Define the following terms

(i) Frequency (ii) Electromagnetic spectrum (iii) Masking agent (iv) Precipitation reaction (v) Strong and weak electrolyte (vi) Spectroscopy (vii) Accuracy and precision

**Q. No. 6** You are given analysis data draw the calibration curve and determine the concentration of unknown solution

1 2ppm 0.06, 4ppm 0.13, 6ppm 0.17, 8ppm 0.25 10ppm 0.3

**Q. No. 7** Write theory and procedure for given object

**Object:** Determine λ-max and unknown concentrationof given solution of KMnO4 by spectrophotometer

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic chemistry Class: B.S. III / M. Sc. (Previous)

**Semester:** 1st Test: 3rd Sessional

**Session:** 2012 Date: 06- 12 - 2012

**Maximum Marks** 50 Time allowed: 1hr

**Note: Attempt any Two Questions**

Q. No. 1 (a) What is solubility elaborate with examples some factors which effect upon the solubility of the substances in aqueous solution

(b) Explain that how Pearson’s classify lewis acids bases into hard soft acids and bases? Describe with examples some applications of HSAB principle

Q. No. 2 Elaborate with examples redox reaction and mention oxidizing agent and reducing agent in those reactions? Give some rules for determining oxidation number of the elements in their compounds

(b) Balance the following redox equation by ion electron methods

MnO4 -  + Cl - ---------------------------- Mn 2+ + Cl2

Q. No. 3 What is standard electrode potential? How the standard hydrogen electrode is constructed and applied for the determination of standard electrode potential of Cu2+ / Cu

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Class:** M.S Inorganic Chemistry **Semester 2nd**

**Subject Bio-inorganic Chemistry**  **Test:**  Final

**Session:** 2012 **Date:** 10-04 - 2012

**Maximum Marks** 80  **Time allowed:** 2½hr

**Note: Attempt any four Questions**

Q. No. 1 How elements are classified as essential nonessential and trace elements? Give the biological functions and *deficiency* signs of following elements

(i) Zn (ii) Cu (iii) Ca

Q. No. 2 What are chelates discuss some areas of medicine in which these are used? Describe therapeutic uses of platinum and Lithium and their complexes

Q. No 3 How the metals are storage and transported in biological system? Give the mechanism of sodium/ potassium pump in transportation and storage of sodium and potassium in biological system

Q. No 4 Write the structural formula of metalloporphyrin? Give the mechanism of transport of oxygen by hemoglobin and photosynthesis by chlorophyll in plant

Q. No 5 Explain the role of enzymes in catalysis of different biological reactions. Give the absorption, transportation and metabolic functions of vitamin B12

**THE END**

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic chemistry (Theory) Class: B.S. III / M. Sc. (Previous)

**Semester:** 1st Test: Mid Term

**Session:** 2013 Date: 06- 09-2013

**Maximum Marks** 30 Time allowed: 1hr

**Note: Attempt all Questions**

Q. No. 1 Elaborate with examples multidentate ligands and how they form chelates with metals? Explain that how Werner successfully describe the structure of complex compounds on the basis of their properties

Q. No. 2 Differentiate between coordination number and oxidation number of central metal atom? Give the IUPAC name to any five of following complex compounds

(I) [ (NH3)5Cr-OH-Cr(NH3)4]Cl5 (ii) [CrCl2(H2O)4]NO3 (iii) K3[Mn(CN)6]

(iv) Pt(en)4SCN]Cl (v) Na3[Co(C2O4)3] (vi) [Pt(NH3)Cl.Br.I.]

(b)Determine the effective atomic number of metal atom in following complex compounds

K3[Fe(CN)6] (ii) [Pd(NH3)6]4+ (iii) [Mn(H20)6]SO4 (iv) [Cr(CO)6]

Atomic number of Fe=26, Pd= 46, Mn= 25, Cr= 24

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic chemistry (Theory) Class: B.S. (i)

**Semester:** 1st Test: Mid Term

**Session:** 2013 Date: 09- 09-2013

**Maximum Marks** 30 Time allowed: 1hr

**Note: Attempt any two Questions**

Q. No. 1 Describe Mendleef’s periodic table what are it’s defects? What is modern periodic law discuss that how it removes the defects of Mendleef’s periodic table

Q. No. 2 (a) What is shielding effect describe some factors which effect upon it and how it vary in groups and periods

(b) Calculate effective nuclear charge for last electron in oxygen atom

Q. No. 3 Describe ionization energy and electron affinity? Discuss some factors which effect upon I.P and how it vary in periods and groups and also discus that why N possess higher I.P than O and alkaline earth metals possess 0 electron affinity

THE END

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Practical **Class:**  B.S (IV)/ M.Sc. Final

**Semester:** 1st **Test**  Final

**Session:** 2013 **Date:** 18- 11 -2013

**Maximum Marks** 60  **Time allowed:** 1½hr

**Note: Attempt all questions**

Q. No. 1 (a) How you will prepare 100mls of 0.05N solution of Na2SO4

(b) Determine the normality of solution of H3PO4 when its specific gravity is 1.8 and percentage purity is 98

Atomic weight Na = 23, P = 31, S = 32, O = 16, Cl = 35.5, K = 39

Q. No. 2 How you will prepare 100mls of 2ppm, 4ppm, 6ppm and 10ppm solutions of KCl

Q. No. 3 Explain the following

(i) Why complex compounds are colored

(ii) Why some substances absorb electromagnetic radiations in visible region

(iii) Why organic compounds are mostly analysed in IR region not in visible region

1. Why pH is less when [ H+] is higher
2. Why monochromator is used in spectrophotometer

Q. No. 4 Define the following terms

(i) Buffer solution (ii) wave length and frequency (iii) Electromagnetic spectrum (iv) Molar mass (v) Chelates

Q. No. 5 Give the basic principle of spectrophotometer

Q. No.6 Write theory and procedure

**Object** Determine Unknown concentration of given solution of KMnO4 by using spectronic 20 spectrophotometer

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Class:** M.S (Inorganic Chemistry) **Semester 2nd**

**Subject:** Inorganic Environmental Chemistry **Test:**  Final

**Session:** 2013 **Date:** 22- 11 - 2013

**Maximum Marks** 80  **Time allowed:** 2½hr

**Note: Attempt any four Questions**

Q. No. 1 Describe the segments of environment? Explain that how the carbon in the environment remained constant by carbon cycle

Q. No. 2 Describe the process of creation and destruction of ozone layer in the atmosphere? Give the mechanism of ozone depletion in the atmosphere what are its causes and consequences

Q. No 3 What is the smog give the mechanism of its synthesis how it can be controlled and what are its effects on the health of human

Q. No 4 What do you know about greenhouse effect how it is affected by environmental pollutants and what are the consequences of enhancement of greenhouse effect

Q. No 5 Write short note on followings

(i) Acid rain (ii) Particulates

**THE END**

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** In-organic Chemistry **Class**: B. S. (i)

**Semester:** 1st **Test:** Final

**Session:** 2013 **Date** 26 – 11 - 2013

**Maximum Marks** 50 **Time allowed:** 2hrs

**Note: Attempt Three Questions, Q.No.1 is Compulsory**

Q. No. 1 (a) Write the electronic configuration of following elements and tell their position in the periodic table

As (Z= 33), Ge (Z= 31), Se (Z= 34)

(b) Give the lewis diagram of following molecules

(i) HCl (ii) H2O (iii) PCl3  (iv) SiCl4 (v) IF6

© Explain the following

(i) Cations are smaller than their parent atoms and anions are larger than their parent atoms

(ii) HI is stronger acid than HF

(iii) CH4 is tetrahedral and NH4 is trigonal pyramidal

(iv) Na forms positively charge ion while chlorine forms negatively charged ion

(v) Sulfur is placed in p-block and iron is placed in d-block

(d) Determine type of hybridization and shape of following molecules

(i) PF5 (ii) NH3 (iii) H2S (iv) BCl3 (v) CCl3

Q. No. 2 What is octet rule how it is satisfied when atoms of elements form chemical bond explain with examples in all types of chemical bonding

Q. No. 3 What is basic difference between molecular orbital theory and valence bond theory? Draw the molecular orbital diagram for following molecules and distribute the electrons and determine their bond order and magnetic properties

(i) NO (ii) C2  (iii) Cl2

Q. No. 4 (a) Describe following modern concepts of acid and base

(i) Bronsted Lowry acid base (ii) Lewis acid base

(b) Some lemon juice has a hydronium ion concentration of 1x10-4M. What will be the pH of the lemon juice?

THE END

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** In-organic Chemistry **Class**: B. S. (i) Failure/Improver

**Semester:** 1st **Test:** Final

**Session:** 2013 **Date** 26 – 11 - 2013

**Maximum Marks** 80 **Time allowed:** 2½hrs

**Note: Attempt any four questions all questions carry equal marks**

Q. No. 1 How the elements are arranged in groups and periods according to modern periodic table? Give the merits and demerits of modern periodic table

(b) Write the electronic configuration of following elements and tell their position in the periodic table

As (Z= 33), Ge (Z= 31), Se (Z= 34)

Q. No. 2 Describe ionization energy and electron affinity? Discuss some factors which effect upon I.P and how it vary in periods and groups and also discus that why N possess higher I.P than O and alkaline earth metals possess 0 electron affinity

Q. No. 3 Describe the ionic and covalent bond give characteristic properties of covalent and ionic compounds? Elaborate with examples the hydrogen bonding give some applications of it

Q. No. 4 What do you know about word acid and base? Elaborate with examples modern concepts of acid and base. Give the conjugate bases of following acids

(i) HCL (ii) H2CO3 (iii) CH3COOH (iv) ( H2SO4

Q. No. 5 Describe the four quantum numbers which describe position of electrons in an atom? Give in tabular form energy levels sub energy levels number of orbitals and number of electrons in each energy level

Q. NO. 6 Write short note on following

(i) Electronegativity (ii) Hund’s rule (iii) Effective nuclear charge

**THE END**

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic (Practical) **Class:**  B.S (i)

**Semester:** 1st **Test**  Final

**Session:** 2013 **Date:** 26- 11 -2013

**Maximum Marks** 60  **Time allowed:** 1

Name-------------------------------------- Father’s Name--------------------------------

Seat No -------------

**Note: Attempt all questions**

Q. No. 1 (a) Calculate amount of following compounds for the preparation of 250mls their 0.1M solution

(i) CaCl2

1. NaOH

Determine Gram equivalent weight of following compounds

1. H2SO4 (ii) Ca(OH)2 (iii) MgCl2 (iv) HCl

The atomic weight of S= 32, O= 16, Mg= 24, Cl=35.5

Q. No. 2 Define the following terms

Titration -----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Acidic salts ---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

pH -------------------------------------------------------------------------------------------------------------------------------------------------------------

Precipitation ---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Gravimetric analysis ---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Neutralization reaction---------------------------------------------------------------------------------------------------------------------------------------------------

Buffer--------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Arrhenius acid-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Q. No. 3 Complete the following reactions

Na2CO3 + H2SO4 ------------------------

MgSO4 + BaCl2 ----------------------------

KOH + HNO3 ------------------------------

MgCl2 + H2O ------------------------------

Q. No. 4 Give the name to following inorganic compounds

(i) HClO4 (ii) Fe2(SO4)3 (iii) N2O5 (iv) NaNO2 (v) H3PO4  (vi) H2S2O4  (vii) Hg2S

Q. No. 5 Fill in the blanks

(i) Standard solution is that solution whose concentration is ------------------

(ii) When the pH of the solution is less than 7 that solution is ------------------ (iii) Formula for determination of alkalinity of tap water is ----------------------------------------------------------------------------

1. One mole of water is equal to ----------------------- grams of water
2. Acidic radical in salt Na­2SO4 is ----------------------------------------------------
3. Molecular weight of H2C2O4 ------------------------- At. Wt. C=12, O = 16

Q. No. 6 Write the theory procedure observation calculation and the result for the given object by putting imaginary buret readings

**Object:** Determine the normality and amount of NaOH / 250ml in given solution by titration with 0.1N solution of HCl

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic chemistry Class: B.S. III / M. Sc. (Previous)

**Semester:** 1st Test: Final

**Session:** 2013 Date: 27- 11-2013

**Maximum Marks** 50 Time allowed: 2hr

**Note: Attempt Three Questions Q. No. 1 is Compulsory**

Q. No. 1 (a) Give the IUPAC name to following complex compounds

(i) K[Ag(CN)] (ii) [Cr(H2O)4]NO3 (iii) [(en)4 Cr – OH- Cr (NH)3]Cl4

(iv) Na2 [Fe (NO)(CN)5] (v) [Co(OH)(NH2)Co(en)4] SO4

(b) Calculate the CFSE in following complex compounds in case of strong field ligands

(i) d4 (ii) d8  (iii) d7

© Explain the following by giving suitable reason

(i) Why complex compounds of different metals form different colored compounds

(ii) Why [Ni(CN)4]-2 is diamagnetic and square planar and [Ni(F)4]-2 is paramagnetic and tetrahedral complex

(iii) Why complex compounds containing d4 electrons in weak field ligand is distorted octahedral shape and in strong field is regular octahedral shape

(iv) Chelates are more stable than nonchelating complexes

(v) [Co(NH3)6]3+ is inner orbital complex and [Co(F)6]3+ is outer orbital complex

(d) Count the valence shell electrons in the following complexes and tell that either they obey the eighteen electron rule or not

(i) [Fe(CO)5) (ii) [Co(NH3)6]3+  (iii) [Ni(CN)4]2+

Q. No. 2 Describe that how the d orbitals are spilt in different energy levels in different geometrical shapes according to crystal field theory? Explain some factors which effect upon the magnitude of ∆o

Q. No. 3 Explain with diagrammatical representation that how ligands form complex with central metal atom in octahedral complexes according to ligand field theory and how this theory removes the defects of CFT

Q. No. 4 Explain the nature of bonding in metal carbonyl and metal cyanide complexes with experimental evidences which reflect the back bonding in metal carbonyls

**The EN**

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

Class: M. Sc. (Previous) Failure Imrover **Subject:** Inorganic chemistry

**Semester:** 2nd Test: Final

**Session:** 2013 Date: 06-05-2013

**Maximum Marks** 80 Time allowed: 2½hr

**Note: Attempt any Four Questions**

Q. No. 1 Explain with experimental evidences the Jorgenson chain theory and werener’s theory for explaining structure of complex compounds

Q. No. 2 What are chelating agents and how they are classified? Elaborate with examples that how chelates are formed give some applications of chelates

Q. No. 3 (a) Give IUPAC name to following complex compounds

(i) K[Ag(CN)] (ii) [Cr(H2O)4]NO3 (iii) [(en)4 Cr – OH- Cr (NH)3]Cl4

(iv) Na2 [Fe (NO)(CN)5] (v) [Co(OH)(NH2)(en)4] SO4

(b) Write formula of following complex compounds

(i) Sodium bis (dioxilato) diaquo mangnate(ii)

(ii) Cis-dichlorodiamine platinium(ii)

(iii) Octaquo- -dihydroxo diron (ii) chloride

(iv) Dinitropentacarbonyl cobalt(iii) chloride

(v) Dicynotetrakiss(ethylenediamine) cobalt (ii) sulphate

Q. No. 4 What is the valence bond theory how it explain the bonding in metal complexes? In the light of valence bond theory explain that why [Co(NH3)6]3+ is inner orbital complex and [Co(F)6]3- is inner orbital complex compound

Q. No. 5 Give the central idea of crystal field theory how the d orbitals are spilted in different energy level in case of octahedral complex compounds? Distribute electrons in different in energy levels in octahedral complexes in case of strong field ligand and weak field ligand from d1 to d10

Q. No. 6 Discuss that how molecular orbital theory describe the nature of bonding in metal complexes and remove the defects of CFT? Explain with experimental evidences that CO ligand is π-acceptor ligand

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic Practical **Class:**  B.S (iii)/M. Sc. Previous

**Semester:** 1st **Test**  Final

**Session:** 2013 **Date:** 27- 11 -2013

**Maximum Marks** 60  **Time allowed:** 1

Name-------------------------------------- Father’s Name--------------------------------

**Note: Attempt all questions**

Q. No. 1 (a) How you will prepare 500mls of 0.01N solution of CaCO3 (At Wt Ca=40, C= 30

(b)Determine the molarity of concentrated H2SO4 when its % purity is 98 and

Specific gravity is 1.5

©You are given 12 molar solution of HCl Calculate volume of that solution for

preparation of its 100ml dilute solution of 0.1M solution

Q. No. 2 Explain the following

(i) Why EDTA is used for determination of Ca2+ ions in tap water

(ii) Ammonia / Ammonium chloride solution is used in EDTA titration

(iii) EDTA is linked with central metal atom through six atoms

1. Temporary hardness is removed by heating
2. Complex comp+ounds are colored in nature

Q. No. 3 Give the IUPAC name to following inorganic compounds

(i) Na2C2O4  (ii) Hg2S (iii) HClO3 (iv) P4H10 (v) ZnHPO4

Q. No. 4 Define the following terms

(i) Chelates (ii) Titration (ii) Precipitation (iii) Buffer solution (iv) Volumetric analysis (v) Equivalent weight (vi) Hydration and hydrolysis (vii) Saturated solution (viii) Molar solution

Q. No. 5 Write theory procedure observation and calculation of following object

**Object:** Determine temporary and permanent hardness of tap water by using 0.01N solution of EDTA

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**(Section Inorganic Chemistry)**

**Subject:** Practical Written Test Class: B.S (IV) M. Sc (Final)

**Semester:** 2nd Test Final

**Session:** 2013 Date: 27-02 2014

**Maximum Marks**  **Time allowed:** 1½hr

**Q. No. 1** (a) Prepare 100mls of 0.1N solution of H2SO4 when the % Purity of given solution is 96 and density is 1.8

(b) determine the amount of KCl for the preparation of 100mls 1000ppm o**f** KCl when the atomic weight of K= 39 and Cl= 35.5

**Q. No. 2** How you will prepare 100mls of 1M solution of CaCl2 and from that solution 500mls of 0.1N solution of that solution. The atomic weights are Fe = 56, S = 32, O = 16,

**Q. No. 3** Fill in the blanks

(i) Basic solution is that whose pH is ----------------------------------------------

(ii) Gram equivalent weight of CaCO3 is ------------------------------------ When At. Wt. of Ca =40, O= 16

(iii) Molar mass of 5 grams of NaCl is ------------------------------------------------

(iv) Reagent which is used for Gravimetric determination of Cl-1 ions in given solution is ---------------------

(v) The structural formula for EDTA is --------------------------------------------------------------------------------------------------------------------------------------------

(vi) Strong electrolytes are those which ---------------------------------------------------------------------------------------------------------------------------------------

1. For determination of hardness of water samples --------------------------------- --------------------------------------------------------------Equation is used
2. When the [H+] concentration is 0.001N the pH of that solution will be ----------------------------------------------------------------
3. Hardness of water is due to presence of cations --------------------------------------
4. For determination of SO4-2 ions in water samples gravimetrically ----------------------------------------reagent is used

**Q. No. 4** Define the following Terms

(i) Mole (ii) Solubility(iii) Chelation (iv) Titration (v) Primary and secondary standards (vi) Masking agents (vii) Supersaturated solution (viii) Perciptation (ivx) Recrystallization (x) Distilation

**Q. No. 5** Write theory procedure observation and calculation for given object

**Object** Prepare 0.01M solution of EDTA and determine the hardness of tape water by using that solution

**THE END**

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic chemistry Class: B.S. III / M. Sc. (Previous)

**Semester:** 2nd Test: Final

**Session:** 2013 Date: 06- 03-2014

**Maximum Marks** 50 Time allowed: 2hr

**Note: Attempt any Three Questions**

Q. No. 1 What is the oxidation number? Describe some rules for giving oxidation number to elements in compounds

(b) Balance following chemical equations by ion electron method

(i) Cr2O72- + Cl1- -------------------- Cr3+ + Cl2 (Acidic medium)

(ii) Mn2+ + ClO31- --------------------MnO2 ClO2 (Basic medium)

Q. No. 2 (a) What is electrochemical series? How the values of reduction potential has been obtained from electrochemical cell

(b) Discuss following applications of electrochemical series by giving suitable examples

(i) To predict whether a given metal will displace another metal from aqueous solution of its salt

(ii) To compare oxidizing and reducing power of metals or nonmetals

(iii) To calculate e.m.f of cell

Q. No. 3 Discuss liquid ammonia as a solvent? Elaborate with examples the following chemical reactions which takes place when liquid ammonia as a solvent

(i) Acid base reactions

(ii) Salvolysis reaction

(iii)Complex formation reaction

Q. No. 4 Describe that how solvents are classified? Explain that how metals are dissolved in liquid ammonia and reactions of metals in liquid ammonia as solvent

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** In-organic Chemistry **Class**: B. S. (iii) Failure/Improver

**Semester:** 2nd **Test:** Final

**Session:** 2012 **Date** 07 – 05 - 2013

**Maximum Marks** 80 **Time allowed:** 2½hrs

**Note: Attempt any four questions all questions carry equal marks**

Q. No. 1 How the elements are arranged in groups and periods according to modern periodic table? Give the merits and demerits of modern periodic table

(b) Write the electronic configuration of following elements and tell their position in the periodic table

As (Z= 33), Ge (Z= 31), Se (Z= 34)

Q. No. 2 Describe ionization energy and electron affinity? Discuss some factors which effect upon I.P and how it vary in periods and groups and also discus that why N possess higher I.P than O and alkaline earth metals possess 0 electron affinity

Q. No. 3 Describe the ionic and covalent bond give characteristic properties of covalent and ionic compounds? Elaborate with examples the hydrogen bonding give some applications of it

Q. No. 4 What do you know about word acid and base? Elaborate with examples modern concepts of acid and base. Give the conjugate bases of following acids

(i) HCL (ii) H2CO3 (iii) CH3COOH (iv) ( H2SO4

Q. No. 5 Describe the four quantum numbers which describe position of electrons in an atom? Give in tabular form energy levels sub energy levels number of orbitals and number of electrons in each energy level

Q. NO. 6 Write short note on following

(i) Electronegativity (ii) Hund’s rule (iii) Effective nuclear charge

**THE END**

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Comprehensive Viva voice **Class:**  B.S (IV)/ M.Sc. )Final

**Semester:** 2nd **Test**  Final

**Session:** 2013 **Date:** 11-003- 2014

**Maximum Marks** 50  **Time allowed:** 30minutes

Name ----------------------------------------------------------- Seat No. ---------------------------------

**Tick the correct answer**

01 Microwave spectra result from

1. Change of Spin (b) Change of Orientation (c) Change of electron configuration (d) Change of nuclear configuration

02 what would be the transmittance reading (on spectrophotometer) at 0.25 absorbance?

(a) 0.5t (b) 0.56T (c) 0.65T (d) 0.85T

03 A mass spectrometer measures which of the following characteristics of the

Molecule

(a) Mass (b) Mass to charge ratio (c) Charge (d) Weight

**03.** A device in which incident radiation is converted to electric current is called

(a) A phototube (b) A voltic cell (c) An amplifier (d) An ammeter

04. Carbonyl compounds absorbs in IR region at

(a) 2950 (b) 1725 (c) 1480 (d) 1250

05 The excitation of the outer electrons in atoms and molecules is associated with

which of the following bands of radiation

1. Infrared (b) X-rays (c) Gama rays (d) Ultraviolet

06. Standard reduction potential of hydrogen electrode is

1. -1 (b) 0 (c) +1 (d) ±1

07. Oxidation number of Fe in compound Fe2O3 is

1. +3 (b) +5 (c) -2 (d) 4

08. Nuclear closed shell structure is reached when number of nucleons are

1. 2, 18, 32, 56, 82 (b) 8, 18, 2, 36, 120 (c) 2, 8, 20, 50, 85 (d) 85, 32, 120, 18, 85

09. In square planar complex compounds splitting of d orbitals occurs when ligands are

arranged around central metal atom highly effected d orbital is

1. dz2 (b) dx2-y2 (c) dxy (d) dxz

10. Effective atomic number of cobalt in case of [Co(NH3)6]3+ is

1. 24 (b) 36 (c) 54 (d) 39 , the atomic number of Co= 27

11. The hybridization in H2O molecule is

(a) Sp3  (b) sp2 (c) Sp1 (d) dsp1

12. Half life time of radioactive element is 6hrs how much amount of it remained after

12hrs

1. ½ (b) 1/6 (c) ¼ (d) 1/8

13. In octahedral high spin complex compounds containing d5 electrons CFSE energy is

(a) 12Dq (b) 16Dq (c) 0dq (d) 20Dq

14. In the periodic table the element with atomic number 35 belongs to:

(a) Period III and group IVA (b) Period IV and group IIA (c) Period V and group IIA

(d) Period IV and group VII

17. Amount required for preparation of 100mls of 0.01M solution of H2C2O4 is

(a) 0.3gm (b) 0.09gm (c) 0.2gm (d) 0.05gm

18. Effective atomic number of cobalt in case of [Co(NH3)6]3+ is

1. 24 (b) 36 (c) 54 (d) 39 , the atomic number of Co= 27

19. Which of the following is not Lewis base

(a) NH3 (b) H2O (c) CO (d) Cu

20. When the coordination number is five shape of that complex is

1. Square planar (b) Octahedral (c) Terahedral (d) Trigonalbipyramidal

21. If the mass defect of the Helium nuccli is 0.03037amu then the binding energy per

nucleon will be

(a) 28.27Mev (b) 26.100Mev (c) 7.075Mev (d) 14.13Mev

22. The two nuclides having same proton number and neutron number but differing in

energy states are termed as

(a) Isotopes (b) Isotones (c) Isomers (d) Mirror nuclei

23. In complex compound Co(NH3)3Cl3 chlorides which are ionized in solutions are

(a) 3 (b) 0 (c) 2 (d) 1

24. Molar mass of 5gms of NaCl is

(a) 58.5 (b) 0.085 (c) 0.58 (d)

25. When the orbital having four quantum number values are n= 4, l= 3, that orbital is

(a) 3s (b) 4p (c) 4d (d) 4f

THE END, WISH YOU GOOD LUCK

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic chemistry **Class:**  B.S. III/M. Sc.(Previous) Failure/Improv.

**Semester:** 2nd **Test** Final

**Session:** 2013 **Date**  14-03-2014

**Maximum Marks** 80 **Time allowed**: 2½hr

**Note: Attempt any four questions**

**Q. No. 1** Describe that how solvents are classified? Discuss following factors which effects upon the solubility of ionic compounds in aqueous solution

**(i**) Effect of size and charge ofion

(ii) Effect of polarization of ions

(iii) Effect of long chain alcohols

**Q. No. 2** What do you mean by word acid and base? Illustrate with examples following modern concepts of acid and base

(i) Lewis acid base concept

(ii) Bronsted acid base concept

(iii) Solvent system

**Q. No. 3** What is oxidation number how it can be determined? Determine the oxidation number of elements in following compounds

(i) N-atom in HNO3  (ii) S-atom in H2S2O7 (iii) Cr-atom in Cr2O7-2 (iv) Fe-atom in Fe3O4 (v) Cl-atom in ClO3-1

(B) Balance the following equation by ion electron method

Cu + NO3-1 -------------------------------- Cu2+ + NO

**Q. No. 4** What is standard electrode potential how it can be determined? Construct the electrochemical cell and determine the standard electrode potential of Zinc electrode

**Q. No. 5** What is electrochemical series? Describe following applications of electrochemical series

(i) Determining the e.m.f of cell

(ii) Predict whether a given metal will displace another metal from aqueous solution of its salt

(iii) Determining oxidizing and reducing power of metals and nonmetals

**Q. No. 6** Describe sulfur dioxide as solvent? Illustrate with examples following chemical reactions when sulfur dioxide as solvent

(i) Acid base reaction

(ii) Precipitation reaction

(iii)Complex formation reaction

**THE END**

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Class:** M. Sc.(Prev) Failure/Improver **Subject:** Inorganic chemistry

**Semester:** 2nd **Session 2013**

**Maximum Marks** 80  **Time a llowed:** 2½hr

**Note: Attempt four Questions**

Q. No. 1 Explain the acid and base on the basis of Lewis and Arrhenius modern concepts of acid and *base*

(a) In following acid pairs give their conjugate bases and which acid is strong and why

(i) HF and HI (ii) H2SO4 and H2SO3 (iii) H2S and H2O (iv) NH3 and H2O

Q. No. 2 How the solvents are classified? Describe some factors which effect upon the solubility of ionic compounds in aqueous solution

Q. No. 3 Discuss on liquid ammonia as solvent? Describe with examples following reactions in liquid ammonia as solvent

(i) Oxidation reduction reaction (ii) Acid base reaction (iii) salvolysis reaction

Q. No. 4 What is oxidation and reduction reaction? Give rules for determining the oxidation number of elements in given compounds? Balance the following redox reaction by ion electron method

K2Cr2O7 + FeSO4 + H2SO4 ------------------ Cr2(SO4)3 + Fe(SO4)3 + K2SO4

Q. No.5 What is standard hydrogen electrode how it is constructed and used for the determination of standard electrode potential of Zn/ Zn2+ electrode

Q. No. 6 What is electrochemical series give some applications of this series? On the basis of reduction potential values solve the following problems

(i) Two half reactions and their standard reduction potential values are given below

Zn2+ --------------------------- Zn E0 = +0.76v

Cu2+ ---------------------------- Cu E0 = -0.34v

In complete reaction which will be oxidized and which is reduced

(ii) Calculate the cell voltage at 250C for the following cell

Mg(S) / Mg 2+ (0.01M) // Sn2+/Sn (0.1) -0.136V

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Advance Inorganic Chemistry **Class:**  B.S (IV)/ M.Sc. )Final

**Semester:** 1st **Test**  Mid term

**Session:** 2014 **Date:** 08-04- 2014

**Maximum Marks** 30  **Time allowed:** 1hr

**Note: Attempt all questions**

Q. No. 1 (a) Describe with suitable examples that how VSEPR theory explains structure of complex compounds

(b) What is isomerism? Describe with examples following types of structural isomerism

(i) Polymerization isomerism

(ii) Ionization isomerism

(iii)Coordination isomerism

**Q. No. 2** What do you know about optical active compounds? Illustrate with examples optical active isomers in square planar and octahedral complex compounds

THE END

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic chemistry Class: B.S. (i)

**Semester:** 1st Test: Mid Term

**Session:** 2014 Date: 10- 04-2014

**Maximum Marks** 30 Time allowed: 1hr

**Note: Attempt any two Questions**

Q. No. 1 Discuss that how four quantum number values describe completely position

of electron in an atom? Show in tabular form shells subshells, number

of orbitals in each subshell on basis of their increasing energy levels and

also mention total number of electrons in each shell

Q. No. 2 Discuss Mendleev’s periodic table what are its merits and demerits? Describe

that how most of the demerits of Mendleevs periodic table removed when

elements were arranged on basis of modern periodic law

Q. No. 3 (a) What do you know about periodicity in properties of elements? Describe

Shielding effect and how it vary in the periodic table

1. Determine the effective nuclear charge for the last electron of phosphorus atom which have atomic number 15

THE END

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic chemistry Class: B.S. III / M. Sc.(Previous)

**Semester:** 1st Test: 1st Sessional

**Session:** 2011 Date 04- 10 - 2011

**Maximum Marks** 15 Time allowed: 1hr

**Note: Attempt any Two Questions**

Q. No. 1 What are complex compounds? Explain with experimental evidences how wener describe the structure of complex compounds

Q. No. 2 What are chelating agents, how they are classified, why they form stable complex compounds and what are their applications?

Q. No. 3 (a) Give the IUPAC name to following complex compounds

(i) K3[Fe(CN)6] ii [Ni(CO)5Cl]-1 iii [Co(Py)Cl2] iv [Cr(NO2)2(en)2]

(b) Give the hybridization shape and number of unpaired electrons in following complex compounds

(i) K3[Fe(CN)6] (ii) [Ni(CO)4] (iii) [Mn(CN)6] (iv) [CuCl4]

Atomic Number Fe =26, Ni= 28, Mn = 25, Cu = 29

**THE END**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic chemistry Class: B.S. III / M. Sc.(Previous)

**Semester:** 1st Test: Mid Term Test

**Session:** 2014 Date 15- 04 – 2014

**Maximum Marks** 30 Time allowed: 1hr

**Note: Attempt any Two Questions**

Q. No. 1 (a) What are ligands how they are classified? Explain with structural formula how following multidentate ligands form chelates with metal atoms

(i) EDTA (ii) Diacetate ion (iii) diethylenetriamine

(b) Give the IUPAC name to following metal complexes

(i) K3[Fe(CN)6] ii [Ni(CO)5Cl]-1 iii [Co(Py)Cl2] iv [Cr(NO2)2(en)2]Cl

NH2

[(en)2Co Co (en)2Br4]

NH2

Q. No. 2 Describe with experimental evidences that how werner describe the structure of complex compounds and chain theory was failed for doing so

Q. No. 3 What is valence bond theory how this theory explains the structure and magnetic properties of octahedral inner and outer metal complexes, tetrahedral and square planar complexes?

**THE END**

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** In-organic Chemistry **Class**: B. S. (i)

**Semester:** 1st **Test:** Final

**Session:** 2014 **Date** 12 – 05 - 2014

**Maximum Marks** 50 **Time allowed:** 2hrs

**Note: Attempt Three Questions**

Q. No. 1 What is modern periodic law? How elements are arranged in groups and periods in the modern periodic table and explain that on what basis periodic table is divided in different blocks

Q. No. 2 What do you know about the periodicity in the properties of elements in the periodic table what are its causes? Describe electron affinity how it vary in the periodic table and why there is not a regular trend in the variation of electron affinity in the period of the periodic table

Q. No. 3 Explain that why chemical bond is formed? Explain that how covalent bond is formed what are its characteristic properties and why some elements possess fixed covalency and some possess variable covalency

Q. No. 4 Write short note of following

(i) Electronegativity (ii) Shielding effect (iii) Pauli’s Exclusion principle

THE EN

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** In-organic Chemistry **Class**: B. S. (i) Filure/ Improver

**Semester:** 1st **Test:** Final

**Session:** 2014 **Date** 12 – 05 - 2014

**Maximum Marks** 50 **Time allowed:** 2hrs

**Note: Attempt four Questions**

Q. No. 1 What is modern periodic law? How elements are arranged in groups and periods in the modern periodic table and explain that on what basis periodic table is divided in different blocks

Q. No. 2 What do you know about the periodicity in the properties of elements in the periodic table what are its causes? Describe electron affinity how it vary in the periodic table and why there is not a regular trend in the variation of electron affinity in the period of the periodic table

Q. No. 3 Explain that why chemical bond is formed? Describe that how covalent bond is formed what are its characteristic properties and also discuss that why some elements possess fixed covalency and some possess variable covalency

Q. No. 4 Illustrate with examples following modern concepts of acid and base and also give their merits and demerits

(i) Lewis acid base (ii) Hard acid base (ii) Arrhenius

Q. No. 5 (a) What is hybridization? Describe with examples the types of hybrid orbitals formed in different molecules

(b) Give with diagrammatic representations filling of molecular orbitals by valence shell electrons and determine their bond order of following molecules

(i) O2 (ii) CO (iii) NO1+

Q. No. 5 Write short note of following

(i) Electronegativity (ii) Shielding effect (iii) Pauli’s Exclusion principle

THE End

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic (Practical) **Class:**  B.S (i)

**Semester:** 1st **Test**  Final

**Session:** 2014 **Date:** 14- 05 -2014

**Maximum Marks** 80  **Time allowed:** 1

Name-------------------------------------- Father’s Name--------------------------------

Seat No -------------

**Note: Attempt all questions**

Q. No. 1 (a) Calculate amount of following compounds for the preparation of 250mls of their 0.1M solution

(i) CaCl2

1. NaOH

When atomic weight of Ca= 40, Na=23, Cl=35.5

(b) Determine Gram equivalent weight of following compounds

(i) H2SO4

(ii) Ca(OH)2

(iii) MgCl2

(iv) HCl

The atomic weight of S= 32, O= 16, Mg= 24, Cl=35.5

Q. No. 2 Define the following terms

Standard solution -----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Bronsted Base ---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

pH -------------------------------------------------------------------------------------------------------------------------------------------------------------

Indicator ---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Molarity ---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Neutralization reaction---------------------------------------------------------------------------------------------------------------------------------------------------

Buffer--------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Arrhenius acid-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Qulitative analysis-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Q. No. 3 Write the lewis structure of following molecules

(i) CH4 (ii) BCl3

(iii) NH3 (iv) PCl3

When atomic number of C=6, B= 5, N= 7, P= 15, Cl= 17

Q. No. 4 Give the name to following inorganic compounds

(i) H2O2 (ii) Fe(SO4) (iii) N2O5

(iv) NaNO (v) H3PO4  (vi) KSCN

(vii) Hg2S

Q. No. 5 Write the electronic configuration of following elements mentioning spin of electrons in box diagram

(i) Ni Z=28

(ii) Mo Z=43

(iii) Sn Z= 50

(iv) Se Z= 34

Q. No. 6 Write the theory procedure observation calculation and the result for the given object by putting imaginary burette readings

**Object:** Determine the normality and amount of KOH / 250ml in given solution by titration with 0.1N solution of H2SO4

**THE END**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic chemistry Class: B.S. III / M. Sc.(Previous)

**Semester:** 1st Test: Final

**Session:** 2014 Date 16- 05 – 2014

**Maximum Marks** 50 Time allowed: 2hr

**Note: Attempt any questions**

**Q. No. 1** What is valence bond theory? Explain that how this theory explain the magnetic properties and geometrical shapes of complex compounds by giving suitable reasons and also give reasons of failure of this theory

**Q. No. 2** Give the basic idea of crystal field theory what are its applications? Describe that how d-orbitals are splited in different energy levels in square planar complexes

**(**b) Distribute d electrons in T2g and eg orbitals in case of strong field ligands in octahedral complexes and determine its CFSE in Dq units in complexes having d5, d8 and d7 electrons

**Q. No. 3** What are π- acceptor ligands? Explain that how the ligands containing multiple bonds are in range of strong field ligands also describe effect of π-bonding on the bond length and bond stretching frequency of π- acceptor ligands

Q. No. 4 Write short note on following

(i) Eighteen electron rule (ii) Chelates (iii) Jahn-Teller effect

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Advance Inorganic Chemistry **Class:**  B.S (IV)/ M.Sc. )Final

**Semester:** 1st **Test**  Final

**Session:** 2014 **Date:** 23-05- 2014

**Maximum Marks** 50  **Time allowed:** 2hr

**Note: Attempt any three Questions**

Q. No. 1 Differentiate between enantiomers and racemers? Elaborate with examples geometrical and optical isomers including multidentate ligands and unidentate ligands of square planar and octahedral complexes

Q. No. 2 Explain some methods for separation of product from reaction mixture? Elaborate with examples general methods for synthesis of complex compounds

Q. No. 3 What are inert and labile complexes? Elaborate with examples the reaction mechanism of substitution reactions including the dissociation and displacement mechanism

Q. No. 4 What is the trans effect and discuss the factors responsible for trans effect? Describe with examples the synthesis of cis-trans isomers on the basis of trans effect

THE END

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Practical **Class:**  B.S (IV)/ M.Sc. Final

**Semester:** 1st **Test**  Final

**Session:** 2014 **Date:** 03- 06 -2014

**Maximum Marks** 60  **Time allowed:** 1½hr

**Note: Attempt all questions**

Q. No. 1 (a) How you will prepare 100mls of 0.05N solution of KCN

(b) Determine the normality of solution of H3PO4 when its specific gravity is 1.6 and percentage purity is 96

Atomic weight Na = 23, P = 31, S = 32, O = 16, Cl = 35.5, K = 39

Q. No. 2 How you will prepare 100mls of 2ppm, 4ppm, 6ppm and 10ppm solutions of KMnO4 solution

Q. No. 3 Explain the following

(i) Why complex compounds absorb electromagnetic radiation from uv/visible region

(ii) Why instrumental methods for analysis are better than classical methods

(iii)Why calibration curve is necessary for quantitative analysis

(iv)Why chelating agents are used for analysis of spectrophotometric determination of metal ions

(v) Why organic compounds are mostly analysed in IR region not in visible region

(vi)Why photomultiplier tube is used in spectrophotometer

Q. No. 4 Define the following terms

(i) Gravimetric analysis (ii) wave length and frequency (iii) spectrum (iv) Chromophors (v) Chelates

Q. No. 5 Give the basic principle of spectrophotometer

Q. No.6 Write theory and procedure

**Object:** Determine unknown concentration of given solution of KMnO4 by using spectronic 20 spectrophotometer

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Class**: B. S. (iii)/M. Sc.(Previous) Failure/Improver **Subject:** In-organic Chemistry **Semester:** 1st **Test:** Final

**Session:** 2014 **Date** 05 – 06 - 2014

**Maximum Marks** 80 **Time allowed:** 2½hrs

**Note: Attempt any four questions all questions carry equal marks**

Q. No. 1 (a) What are complex compounds? Describe with examples the nature of bonding in metal complexes by lewis bonding theory

(a) Give IUPAC name to following complex compounds

(i) K[Pt (en)2Cl4] (ii) [Pt(NH3)2NO2]SO4 (iii) Na2[Fe(CN)5]

(iv) [(en)2 Cu Cu (en)2]Cl3 (v) [Mn (H2O)6]Cl3

Q. No. 2 What is hybridization describe different types of hybridization? How the valence bond theory describe the shape and magnetic properties of metal complexes on basis of hybridization

Q. No. 3 Describe that how d orbitals of central metal atoms are affected by the ligands according to CFT in metal complexes? Distribute number of electrons in different energy levels of octahedral complexes in weak field ligands of d4, d6 and d3 metal complexes and determine CFSE in ∆o unit

Q. No. 4 Describe with diagrammatic representations molecular orbitals formed in metal complexes of octahedral shape and distribute number of electrons in d4 and d6 complexes in molecular orbitals? Explain that how this theory is superior to other theories

Q. No. 5 What are π-acceptor ligands explain that why unsaturated molecules are π-acceptor ligands? Describe with experimental evidences the nature of bonding in metal carbonyls

Q. NO. 6 Write short note on following

(i) EAN rule (ii) Chelates (iii) Jorgenson chain theory

**THE END**

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR, DEPARTMENT OF CHEMISTRY**

**Subject:** Practical Written Test Class: M.S (section Inorganic)

**Semester:** 1st Test Final

**Session:** 2014 Date: 05-06- 2014

**Maximum Marks** 60  **Time allowed:** 1½hr

**Q. No. 1** (i) Determine amount of FeSO4.2H2O for the preparation of 100mls of 0.05N solution

**(ii)** Prepare 100mls of 10ppm solution of K ion from KCl salt

(iii) Determine volume of chloroform (CHCl3) for the preparation of its 250mls of 0.1M solution

**Q. No. 2** Write the IUPAC name of following compounds

(i) K2[Ni(CN)4] (ii) I2O4 (iii) K2S2O4 (iv) NH4NO2  (v) HCLO

**Q. No. 3** Explain The following

(i) Why substances absorb electromagnetic radiations

(ii) Why instruments are used for chemical analysis of samples although classical methods are available

(iii) Why photomultiplier tube is used in spectrophotometer

(iv) Why pH is less when [H+] is high

(v) Why double beam spectrophotometer is better than single beam spectrophtometer

**Q. No. 4** The analysis of sample for Na+ ion contents gave following % values

28.1, 28.08, 28.03, 28.4, 28.1 and 28.06

Calculate the mean, standard deviation and coefficient of variation for the values

**Q. No. 5** Define the following terms

(i) Frequency (ii) Electromagnetic spectrum (iii) Masking agent (iv) Crystalisation (v) Strong and weak electrolyte (vi) Spectroscopy (vii) Accuracy and precision

**Q. No. 6** You are given analysis data draw the calibration curve and determine the concentration of unknown solution

1 2ppm 0.06, 4ppm 0.13, 6ppm 0.17, 8ppm 0.25 10ppm 0.3

**Q. No. 7** Write theory and procedure for given object

**Object:** Determine λ-max and unknown concentrationof given solution of KMnO4 by spectrophotometer

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Advance Inorganic Chemistry **Class:**  B.S (IV)/ M.Sc.

**Semester:** 2nd **Test**  Mid Term

**Session:** 2014 **Date:** 26-09- 2014

**Maximum Marks** 30  **Time allowed:** 2hr

**Note: Attempt any Two Questions**

**Q. No. 1** What is borazine how it can be prepared? Describe the structure of borazine and explain with examples the synthesis of polymers of boranzine give their applications

**Q. No. 2** Differentiate between organic and inorganic polymers? Describe general methods for synthesis of silicones, particular method for silicone oils and give its applications

**Q. No. 3** Describe the role of organic reagents in inorganic analysis? Give the structural formula and applications of following reagents in inorganic analysis

(i) 8-hydroxyquinoline

(ii) 1-nitroso-2-napthol

**THE END**

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Advance Inorganic Chemistry **Class:**  B.S (IV)/ M.Sc.

**Semester:** 2nd **Test**  Mid Term

**Session:** 2014 **Date:** 26-09- 2014

**Maximum Marks** 30  **Time allowed:** 2hr

**Note: Attempt any Two Questions**

**Q. No. 1** What is borazine how it can be prepared? Describe the structure of borazine and explain with examples the synthesis of polymers of boranzine give their applications

**Q. No. 2** Differentiate between organic and inorganic polymers? Describe general methods for synthesis of silicones, particular method for silicone oils and give its applications

**Q. No. 3** Describe the role of organic reagents in inorganic analysis? Give the structural formula and applications of following reagents in inorganic analysis

(i) 8-hydroxyquinoline

(ii) 1-nitroso-2-napthol

**THE END**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic chemistry Class: B.S. III / M. Sc.(Previous)

**Semester:** 2nd Test: Mid Term

**Session:** 2014 Date 14- 10 – 2014

**Maximum Marks** 30 Time allowed: 1:15hr

**Note: Attempt any Two questions**

**Q. No. 1** What are Lewis acid and bases how they are classified? Describe with examples applications of pearson’s HSAB rule

Q. No. 2 (a) Illustrate with examples the oxidation reduction reactions including oxidizing and reducing agents

(b) Balance following redox equation by ion electron method in basic medium

(i) MnO41- + SO3- ---------------------- MnO2 + SO42- (Basic medium)

(ii) NO31- + Cu ---------------------- NO + Cu2+

Q. No. 3 (a) What is standard Hydrogen electrode how it is constructed and used for determination of standard electrode potential of Zn/Zn2+ electrode?

(b) Determine standard reduction potential of Ni2+ electrode when the needle of voltmeter is deflected towards nickel electrode and the cell voltage is 0.24volts

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject: Advance Inorganic Chemistry Class: B.S (IV)/ M.Sc. (Final)**

**Semester: 2nd Test Final Test**

**Session: 2014 Date: 25-11- 2014**

**Maximum Marks 50 Time allowed: 2hr**

**Note: Attempt any Three Questions**

**Q. No. 1 What are inorganic polymers how they are classified? Describe the synthesis, properties and uses of following inorganic polymers**

**(i) Silicone resins**

**(ii) Silicone Rubbers**

**Q. No. 2 What are phosphazines how they are synthesized by different methods? Describe the nature of bonding and polymerization mechanism of polyphosphazines (NPCl2)**

**Q. No. 3 What do you know about the polymeric metal complexes give general methods for their preparation? Describe the various methods for synthesis of organic and inorganic ligands polymeric metal complexes**

**Q. No. 4 Describe merits and demerits of organic reagents over inorganic reagents in in-organic analysis? Give the structural formula, mode of action and aanalytical applications of following organic reagents**

**(i) Dimethyl glyoxime**

**(ii) Cupron**

**(iii) Rubeanic acid**

**THE END**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic Chemistry (Theory) Class: B.S. III / M. Sc.(Previous)

**Semester:** 2nd Test: Final Test

**Session:** 2014 Date 01- 11 – 2014

**Maximum Marks** 50 Time allowed: 2:15hr

**Note: Attempt Three Questions Q.No.1 is Compulsory and contains 20 marks**

**Q. No. 1 Do as directed**

**(i)** Explain the followings

(a) Strong acid gives weak conjugated base and weak acid gives strong

conjugated base

(b) AgF is soluble and AgCl is insoluble in water

© Water is leveling solvent and acetic acid is differentiating solvent

(d) HF is the weakest acid and HI is the strongest acid

(e) Pm3+ compound is colored and Gd3+ is colourless

**(ii)** Give The oxidation number to following species

(a) KClO3 (b) N2O3 (c) SO42- (d) N2H4 (e) Fe2O3

**(iii)** Balance The following equation by ion electron method

Cr2O71- + H2O2 ---------------------------- Cr3+ + O2 ( Acidic medium)

**(iv)** Calculate emf of the following cell at 250c

Cr(s)|Cr3+ (0.001M) || Ni2+ | Ni(s) E0 Cr3+ =-0.76 , Ni2+ = -0.23

**Q. No. 2** What is solubility how inorganic ionic compounds are soluble in water? Describe liquid SO2 as solvent and following inorganic reactions which are taking place in liquid sulfur dioxide

(i) Redox reaction (ii) Acid base reaction

**Q. No. 3** Explain that how the standard reduction potential values are determined? Elaborate with examples following applications of electrochemical

series

(i) To predict whether a given nonmetal will displace another nonmetal from its aqueous solution

(ii) To predict whether a given metal can liberate H2 gas from water

(iii) To compare the oxidizing and reducing power of metals and nonmetals

**Q. No. 4** What are Lanthanides how they are classified on the basis of their occurrence? Give the extraction of Lanthanides by flow chart diagram the extraction of Lanthanides from monazite send

THE END

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Synthetic Inorganic Chemistry Class: Ph. D

**Semester:** 2nd Test: Final Test

**Session:** 2014 Date 09- 12 – 2014

**Maximum Marks** 100 Time allowed: 2:30hr

**Note: Attempt Three Questions Q.No.1 is Compulsory and contains 20 marks**

Q. No. 1 What is borazine how it can be prepared? Describe the structure of borazine and explain with examples the synthesis of polymers of boranzine give their applications

Q. No. 2 What are inert and labile complexes? Elaborate with examples the reaction mechanism of substitution reactions including the dissociation and displacement mechanism of metal complexes

Q. No. 3 What are silalkanes how they are synthesized? Give the reaction mechanism of polymerization of silalkanes. Give the synthesis and applications as catalyst for the synthesis of organic compounds of Grignard reagent

Q. No. 4 Describe the occurrence, extraction methods, synthesis of their compounds and their applications of following elements

(i) Platinum (ii) Uranium

THE END

Honorarium

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**(Section Inorganic Chemistry)**

**Subject:** Practical Written Test Class: B.S (IV) M. Sc (Final)

**Semester:** 2nd Test Final

**Session:** 2014 Date: 10-12- 2014

**Maximum Marks**  **Time allowed:** 1½hr

**Q. No. 1** (a) Prepare 100mls of 0.1N solution of H3PO4 when the % Purity of given acid is 80 and density is 1.8

(b) Determine the amount of NaCl for the preparation of 100mls 1000ppm solution when the atomic weight of Na= 23 and Cl= 35.5

**Q. No. 3** Fill in the blanks

(i) In Chromatography stationary phase is used for ----------------------------------------------------------------------------------------------------------------------

(ii) In atomic absorption spectrophotometer the flame is used for ---------------------------------------------------------------------

(iii In thermogravimetric analysis thermogram (Curve) is temperature VS---------------------------------------

(iv) Total electrolytes are determined by using instrument----------------------------------------------------------------------------------------------

(v) The structural formula for EDTA is --------------------------------------------------------------------------------------------------------------------------------------------

(vi) Strong electrolytes are those which ---------------------------------------------------------------------------------------------------------------------------------------

(vii) In gas chromatography the mobile phase is ---------------------------------------------------------------------------------------------------

(viii) When the [H+] concentration is 0.001N the pH of that solution will be ----------------------------------------------------------------

(ix) pH meter is based on ------------------------------------------------ Reaction

(x) For determination of SO4-2 ions in water samples gravimetrically ----------------------------------------reagent is used

**Q. No. 4** Define the following Terms

(i) Density (ii) Solubility(iii) Chelation (iv) Titration (v) Primary and secondary standards (vi) Masking agents (vii) Supersaturated solution (viii) Buffer solution(ix) Solvent extraction (x) Distillation

**Q. No. 5** Write theory procedure observation and calculation for given object

**Object** Prepare 0.01N solution of AgNO3 standardized it and then determine the amount of total chlorides in given sample of water

**THE END**

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Comprehensive Viva voice **Class:**  B.S (IV)/ M.Sc. )Final

**Semester:** 2nd **Test**  Final

**Session:** 2014 **Date:** 16-12- 2014

**Maximum Marks** 50  **Time allowed:** 30minutes

Full Name --------------------------------------------------------------------------------------- Seat No. ---------

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**Tick the correct answer**

01 Microwave spectra result from

1. Change of Spin (b) Change of Orientation (c) Change of electron configuration (d) Change of nuclear configuration

02 what would be the transmittance reading (on spectrophotometer) at 0.25 absorbance?

(a) 0.5t (b) 0.56T (c) 0.65T (d) 0.85T

03 When one complex is mirror image of another complex is called

(i)Recemers (ii) Enatiomers (iii) Isomers (iv) Dimers

**04** A device in which incident radiation is converted to electric current is called

(a) A phototube (b) A voltic cell (c) An amplifier (d) An ammeter

05. Carbonyl compounds absorbs in IR region at

(a) 2950 (b) 1725 (c) 1480 (d) 1250

06 The excitation of the outer electrons in atoms and molecules is associated with

which of the following bands of radiation

1. Infrared (b) X-rays (c) Gama rays (d) Ultraviolet

07. Standard reduction potential of hydrogen electrode is

1. -1 (b) 0 (c) +1 (d) ±1

08. Oxidation number of Fe in compound Fe2O3 is

1. +3 (b) +5 (c) -2 (d) 4

09. Nuclear closed shell structure is reached when number of nucleons are

1. 2, 18, 32, 56, 82 (b) 8, 18, 2, 36, 120 (c) 2, 8, 20, 50, 85 (d) 85, 32, 120, 18, 85

10. In square planar complex compounds splitting of d orbitals occurs when ligands are

arranged around central metal atom highly effected d orbital is

1. dz2 (b) dx2-y2 (c) dxy (d) dxz

11. Effective atomic number of cobalt in case of [Co(NH3)6]3+ is

1. 24 (b) 36 (c) 54 (d) 39 , the atomic number of Co= 27

12. The hybridization in H2O molecule is

(a) Sp3  (b) sp2 (c) Sp1 (d) dsp1

13. Half life time of radioactive element is 6hrs how much amount of it remained after

12hrs

1. ½ (b) 1/6 (c) ¼ (d) 1/8

14. In octahedral high spin complex compounds containing d5 electrons CFSE energy is

(a) 12Dq (b) 16Dq (c) 0dq (d) 20Dq

15. In the periodic table the element with atomic number 35 belongs to:

(a) Period III and group IVA (b) Period IV and group IIA (c) Period V and group IIA

(d) Period IV and group VII

16. The reaction in which one ligand is replaced by another ligand that reaction is called

(i) Electrophilic substitution reaction (ii) Oxidation reaction (iii) Reduction reaction (iv) Nucleophilic substitution reaction

17. Reagents which are used for spectrophotometric analysis of metal ions are

(i) Precipitating agent (ii) Oxidizing agent (iii) Chelating agent (iv) complexing agent

18. Which of the following is not Lewis base

(a) NH3 (b) H2O (c) CO (d) Cu

19. When the coordination number is five shape of that complex is

1. Square planar (b) Octahedral (c) Terahedral (d) Trigonalbipyramidal

20. If the mass defect of the Helium nuccli is 0.03037amu then the binding energy per

nucleon will be

(a) 28.27Mev (b) 26.100Mev (c) 7.075Mev (d) 14.13Mev

21. The reaction in which product is formed in seconds are called

(i) Labile complexes (ii) Soft complexes (iii) Inert complexes (iv) Hard complexes

22. In boranzine which is trimeric compound of BN the hybridization in nitrogen is

(i) sp2  (ii) sp3 (iii) dsp2 (iv) sp4

23. Molar mass of 5gms of NaCl is

(a) 58.5 (b) 0.085 (c) 0.58 (d)

24. When the orbital having four quantum number values are n= 4, l= 3, that orbital is

(a) 3s (b) 4p (c) 4d (d) 4f

25. The source of electromagnetic radiation in uv region is

(i) Tungsten lamp (ii) Deuterium lamp (iii) Cathode lamp (Xenon lamp

THE END, WISH YOU GOOD LUCK

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Class:** M.S (Inorganic Chemistry) **Semester 2nd**

**Subject:** Inorganic Environmental Chemistry **Test:**  Final

**Session:** 2014 **Date:** 16- 12 - 2014

**Maximum Marks** 80  **Time allowed:** 2½hr

**Note: Attempt all Questions**

Q. No. 1 What is atmosphere how it is divided in different regions? Explain that how the oxygen in the environment remained constant by oxygen cycle

Q. No. 2 Describe the champion cycle for the ozone formation and depletion? Describe the catalytic process of ozone depletion and what the consequences of ozone depletion are

Q. No 3 What are particulates how they are categories and formed by human activities and describe that how they are mortal for human being?

Q. No 4 Describe that why temperature of troposphere is increasing day by day what are their causes remedies and effects upon the atmosphere

**THE END**

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic chemistry Class: B.S. III / M. Sc. (Previous) Failure/Improver

**Semester:** 2nd Test: Final Test

**Session:** 2012 Date: 06- 04 - 2013

**Maximum Marks** 80 Time allowed: 2hr

**Note: Attempt any 3 Questions**

Q. No. 1 (a) What is solubility elaborate with examples some factors which effect upon the solubility of the substances in aqueous solution

(b) Explain that how Pearson’s classify lewis acids bases into hard soft acids and bases? Describe with examples some applications of HSAB principle

Q. No. 2 Elaborate with examples redox reaction and mention oxidizing agent and reducing agent in those reactions? Give some rules for determining oxidation number of the elements in their compounds

(b) Balance the following redox equation by ion electron methods

MnO4 -  + Cl - ---------------------------- Mn 2+ + Cl2

Q. No. 3 What is standard electrode potential? How the standard hydrogen electrode is constructed and applied for the determination of standard electrode potential of Cu2+ / Cu

Q. No 4 What are actinides and lanthanides? Give the preparati0ns and properties and uses of lanthanide elements

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic chemistry **Class:**  B.S. III/M. Sc.(Previous) Failure/Improv.

**Semester:** 2nd **Test** Final

**Session:** 2013 **Date**  14-03-2014

**Maximum Marks** 80 **Time allowed**: 2½hr

**Note: Attempt any four questions**

**Q. No. 1** Describe that how solvents are classified? Discuss following factors which effects upon the solubility of ionic compounds in aqueous solution

**(i**) Effect of size and charge ofion

(ii) Effect of polarization of ions

(iii) Effect of long chain alcohols

**Q. No. 2** What do you mean by word acid and base? Illustrate with examples following modern concepts of acid and base

(i) Lewis acid base concept

(ii) Bronsted acid base concept

(iii) Solvent system

**Q. No. 3** What is oxidation number how it can be determined? Determine the oxidation number of elements in following compounds

(i) N-atom in HNO3  (ii) S-atom in H2S2O7 (iii) Cr-atom in Cr2O7-2 (iv) Fe-atom in Fe3O4 (v) Cl-atom in ClO3-1

(B) Balance the following equation by ion electron method

Cu + NO3-1 -------------------------------- Cu2+ + NO

**Q. No. 4** What is standard electrode potential how it can be determined? Construct the electrochemical cell and determine the standard electrode potential of Zinc electrode

**Q. No. 5** What is electrochemical series? Describe following applications of electrochemical series

(i) Determining the e.m.f of cell

(ii) Predict whether a given metal will displace another metal from aqueous solution of its salt

(iii) Determining oxidizing and reducing power of metals and nonmetals

**Q. No. 6** Describe sulfur dioxide as solvent? Illustrate with examples following chemical reactions when sulfur dioxide as solvent

(i) Acid base reaction

(ii) Precipitation reaction

(iii)Complex formation reaction

**THE END**

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Class:**  B.S. III/M. Sc.(Previous) Failure/Improv. Test Final

**Subject:** Inorganic chemistry **Semester:** 2nd

**Session:** 2014 **Date**  19-12-2014

**Maximum Marks** 80 **Time allowed**: 2½hr

**Note: Attempt any four questions**

**Q. No. 1 What is difference between saturated, unsaturated and supersaturated solution? Describe that how ionic compounds dissolve in ionizing solvents and describe that how chemical structure affects upon solubility**

**Q. No. 2 Describe the strength of acids on the basis of Bronsted acid base concept? Explain with examples following modern concepts of acid and base**

**(i) Solvent System (ii) Bronsted acid base concept (iii) Lewis acid and base**

**Q. No. 3 Describe liquid ammonia as solvent? Elaborate with some examples following chemical reactions which are taking place in liquid ammonia as a solvent**

**(i) Precipitation reaction (ii) Complex formation reaction (iii) Redox reaction**

**Q. No. 4 (a) Differentiate between oxidation number and valency with examples? Describe some rules for giving oxidation number to the compounds and by applying these rules give the oxidation number to the atoms in H2SO4 and H2C2O4**

**(b) Balance the following equation by ion electron method**

**FeCl3 + SnCl2 ---------------------------- FeCl2 + SnCl4**

**Q. No. 5 Elaborate with examples electrode potential, types of electrode potential and standard electrode potential? Determine standard electrode potential of Cu (s)/Cu2+ (aq.) electrode**

**Q. No. 6 Write short note on following**

**(i) Liquid SO2 as solvent (ii) Hard soft acid base concept (iii) Levelling and differentiating solvents**

**WISH YOU GOOD LUCK**

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject: Advance Inorganic Chemistry Class: B.S (IV)/ M.Sc. )Final**

**Semester: 1st Test Mid term**

**Session: 2015 Date: 09-03- 2015**

**Maximum Marks 30 Time allowed: 1hr**

**Note: Attempt all questions**

**Q. No. 1 Discuss the geometry of complex compounds? What is stereoisomerism describe with examples the geometrical isomers in square planar and octahedral metal complexes**

**Q. No. 2 Describe with examples the following methods for the synthesis of metal complexes and how they are separated from reaction mixture**

**(i) Simple addition reaction**

**(ii) Substitution reaction**

**THE END**

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** **Inorganic chemistry Class: B.S. III / M. Sc.(Previous)**

**Semester: 1st Test: Mid Term Test**

**Session: 2015 Date 11- 03 – 2015**

**Maximum Marks 30 Time allowed: 1hr**

**Note: Attempt any two Questions all Questions carry equal marks**

**Q. No. 1 (a) Describe with experimental evidences that how Werner describe structure of metal complexes**

**(b) Give the IUPAC name to following metal complexes**

**(i) [Pt(NH3)5NO2]Cl2 ii [Ni(CO)5Cl]-1 iii K2[Fe(F)2CN2]**

**iv [Cr(C2O4)2(en)2]Cl (v)**

**OH**

**[(en)2Mn Mn (en)2]SO4**

**NH2**

**Q. No. 2 (a) What is EAN rule how it can be determined elaborate with suitable examples**

**(b) Give the main features of valence bond theory? How it describe the bonding in square planar and inner octahedral metal complexes**

**Q. No. 3 What is difference between chelates and metal complexes? Give some applications of metal complexes**

**(b) Give the orientation of different five d orbitals? Describe with examples that how Lewis with Lewis dot formula explain the nature of bonding in metal complexes**

**THE END**

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject: Advance Inorganic Chemistry Class: B.S (IV)/ M.Sc. )Final**

**Semester: 1st Test Mid term**

**Session: 2015 Date: 09-03- 2015**

**Maximum Marks 30 Time allowed: 1hr**

**Note: Attempt all questions**

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject: Organometallic Compounds Class: B.S (IV)/ M.Sc. )Final**

**Semester: 1st Test Mid term**

**Session: 2015 Date: 13 – 03 - 2015**

**Maximum Marks 30 Time allowed: 1hr**

**Note: Attempt all questions**

**Q. No. 1 What are π-acceptor ligands? Explain with experimental evidences the nature of bonding between olefins and acetylenes with metal in organotransition metal complexes**

**Q. No. 2 What are organometallic compounds and how they are named according to IUPAC system? Explain the nature of bonding in covalent and multicenter organometallic compounds**

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Class:** M.S (Inorganic Chemistry) **Semester 1st**

**Subject:** Solid State Chemistry **Test:**  Mid Term

**Session:** 2015 **Date:** 04- 05 -215

**Maximum Marks** 30 **Time allowed:** 1.20hr

**Note: Attempt all Questions**

Q. No. 1 Describe that how crystalline solids are classified? Explain structure of diamond and graphite and also give comparison between different types of crystals

Q. No. 2 What are crystalline and amorphous solids describe that how they are different in their properties? Discuss the various types of symmetry found in crystals

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic (Practical) **Class:**  B.S (i)

**Semester:** 1st **Test**  Final

**Session:** 2015 **Date:** 13- 05 -2015

**Maximum Marks** 50  **Time allowed:** 40

Name-------------------------------------- Father’s Name--------------------------------

Seat No ------------- Regular/Failure/Improver

**Note: Attempt all questions**

**Q. No. 1 (a) Calculate amount of following compounds for the preparation of 250mls their 0.1M solution**

**(i) Na2CO3**

**(ii) MgSO4**

**The atomic weight of S= 32, O= 16, Mg= 24, Na= 23, C = 12**

**Q. No. 2 Define the following terms**

**Molarity-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------**

**Reducing agent ---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------**

**Bronsted Acid -------------------------------------------------------------------------------------------------------------------------------------------------------------**

**Indicator---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------**

**Gravimetric analysis ---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------**

**Neutralization reaction---------------------------------------------------------------------------------------------------------------------------------------------------**

**Oxidation reduction reaction------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------**

**Q. No. 3 Give the name to following inorganic compounds**

**(i) NaClO3  (ii) Fe2(SO4)3**

**(iii) As2O3 (iv) NaNO2**

**(v) H3PO4  (vi) H2O2**

**Q. No. 4 Fill in the blanks**

**(i) Standard solution is that solution whose concentration is ------------------**

**(ii) When the pH of the solution is more than 7 that solution is ------------------**

**(iii) Formula for determination of alkalinity of tap water is -------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------**

**(iv) One mole of NaCl is equal to ----------------------- grams of NaCl**

**(v) Acidic radical in salt Na­2SO4 is ----------------------------------------------------**

**(vi) Molecular weight of H2C2O4 ------------------------- At. Wt. C=12, O = 16**

**(vii) Normality of given solution can be determined from volumes of reacting**

**substance can be determined by formula---------------------------------------------------**

**-----------------------------------------------------------------------------------------------------------**

**(viii)Gram equivalent weight of Na3PO4 is ---------------- At. Wt. Na = 23, P = 31**

**Q. No. 5 Write theory procedure observation calculation and the result for the given object by putting imaginary burette readings**

**Object: Determine the normality and amount of Na2CO3 / 250ml in given solution by titration with 0.1N solution of HCl**

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Organometallic Compounds Class: B.S (IV) M.Sc. (Final)

**Semester:** 1st Test: Final

**Session:** 2015 Date: 14-05-2015

**Maximum Marks** 50 Time allowed 2hr

**Note: Attempt Three Questions Q. No. 1 is compulsory**

**Q. No. 1** Explain any five of following by giving suitable reason

**(i)** Why olefens acts as ligand although it does not possesses loan pair of electrons

**(ii)** Why bond stretching frequency of carbonyl is decreases when it forms bond with metal complexes

1. Why bridging –CH3 forms two electron three centre type bond while –CH2 forms two electron two centre type bond
2. Why Ni(CO3) form Ƞ2 with olefens while Fe(CO)3 forms Ƞ4comlex with olefens
3. Why N2 is π acceptor ligand while F2 is not
4. Why benzene is Ƞ6 and cyclohexane is Ƞ1 organometallic compound

**. No. 2** Discuss logical approach for obeying and not obeying eighteen electron rule in different geometrical shapes of organotransition metal complexes

**Q. No. 3** Elaborate with examples that how organotransition metal complexes are classified? Describe nature of bonding in following organometallic compounds

(i) Metal allyls

(ii) Ferrocene (iii) Metal carbenes

**Q. No. 4** Describe synthetic methods for preparation of following metal complexes

(i) Ƞ6-Arene complexes

(ii) Transition metal Hydrides

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Organometallic Compounds Class: B.S (IV) M.Sc. (Final)

**Semester:** 1st Test: Final

**Session:** 2015 Date: 14-05-2015

**Maximum Marks** 50 Time allowed 2hr

**Note: Attempt Three Questions is compulsory**

**Q. No. 1** What are organometallic compounds? Describe types of organometallic compounds

**. No. 2** Discuss logical approach for obeying and not obeying eighteen electron rule in different geometrical shapes of organotransition metal complexes

**Q. No. 3** Elaborate with examples that how organotransition metal complexes are classified? Describe nature of bonding in following organometallic compounds

(i) Metal allyls

(ii) Ferrocene (iii) Metal carbenes

**Q. No. 4** Describe synthetic methods for preparation of following metal complexes

(i) Ƞ6-Arene complexes

(ii) Transition metal Hydrides

Q. No. 5 Describe with experimental evidences the nature of bonding in metal carbonyls

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic chemistry Class: B.S. III / M. Sc.(Previous)

**Semester:** 1st Test: Final

**Session:** 2015 Date 15- 05 – 2015

**Maximum Marks** 50 Time allowed: 2hr

**Note: Attempt three Questions Q. No. 1 is compulsory**

**Q. No. 1 Do as directed**

**(i) Explain the followings**

(a) Why chelates are more stable than non-chelate complexes

(b) Why complexes absorb electromagnetic radiation from uv/vis region

© Why bond stretching frequency of CN is decreased when it forms complex with transition metals

(d) Why aqueous solution of CoCl3.(NH3)6 conduct electricity while CoCl3.(NH3)3 conduct electricity

(e)Why O2 possess unpaired electrons and paramagnetic while N2 posses paired electrons and is diamagnetic

**(ii) Give IUPAC name to following metal complexes**

(a) K3[Fe(CN)6] (b) [Ni(CO)5Cl]-1 (c) [Co(Py)Cl2] (d) [Cr(NO2)2(en)2]

**(iii)** Determine crystal field stabilization energy in complexes having following number of d electrons in case of strong field ligand

1. 3 (b) 6 (c) 8

Q. No. 2 Give the basic idea of crystal field theory how this theory was able to explain the distorted octahedral complexes, colored nature of complexes, irregular trend in variation in the heat of hydration and lattice energy of 1st transition metal series

Q. No. 3 Draw the ligand field diagram in octahedral complexes and distribute electrons in molecular orbitals and explain that how this theory was able to explain the spectro chemical series on the basis of back bonding

Q. No.4 What do you know about π-Acceptor ligand illustrate with examples? Describe with experimental evidences the nature of bonding in transition metal carbonyl complexes

**Q. No. 2** Give the basic idea of cry stal field theory what are its applications? Describe that how d-orbitals are splited in different energy levels in square planar complexes

**(**b) Distribute d electrons in T2g and eg orbitals in case of strong field ligands in octahedral complexes and determine its CFSE in Dq units in complexes having d5, d8 and d7 electrons

**Q. No. 3** What are π- acceptor ligands? Explain that how the ligands containing multiple bonds are in range of strong field ligands also describe effect of π-bonding on the bond length and bond stretching frequency of π- acceptor ligands

Q. No. 4 Write short note on following

(i) Eighteen electron rule (ii) Chelates (iii) Jahn-Teller effect

**DEPARTMENT OF CHEMISTRY**

**Class:**  B.S. III / M. Sc. (Previous) Failure Improver **Subject:** Inorganic chemistry

**Semester:** 1st **Test:**  Final

**Session:** 2015 Date: 14-05-15

**Maximum Marks** 80 **Time allowed:**  2½hr

**Note: Attempt any Four Questions**

Q. No. 1 (a) What are complex compounds? How the werner theory explain the structure of complex compounds with experimental evidences

(b) Give the IUPAC name to following complex compounds

(i) [Cu(en)2Br2]Br (ii) [Co(NH3)5NO2] Cl (iii) [Co(OH)(NH2)Co(en)4] SO4

(iv) K2[Fe(CN)6] (v) K[Pt(NH3) Cl Br I]

Q. No. 2 Give the basic idea of valance bond theory? Elaborate with examples how this theory explains the inner outer octahedral complex compounds and tetrahedral, square planar complexes on the basis of magnetic properties

Q. No. 3 Explain the crystal field theory? How the degeneracy of d orbitals is resolved when the ligands are arranged around the central metal atom in case of square planar and tetrahedral complexes

(b)Determine crystal field stabilization energy in complexes having following number of d electrons in case of strong field ligand

1. 3 (b) 6 (c) 8

Q. No. 4 Draw the ligand field diagram in octahedral complexes and distribute electrons in molecular orbitals in d5 complexes and explain electron pair donor and acceptor ligands

Q. No. 5 Write short note on following

(i)Chelates (ii) EAN rule (ii) Factors effecting on ∆o

**THE END**

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Inorganic Practical **Class:**  B.S (iii)/M. Sc. Previous

**Semester:** 1st **Test**  Final

**Session:** 2015 **Date:** 18- 05 -2015

**Maximum Marks** 55  **Time allowed:** 50min

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**Name-**------------------------------------- **Father’s Name**--------------------------------

**Seat No**-----------------------------------

**Class**---------------------------------------B.S (iii)/M. Sc (Prev) Regular/Failure Improver

**Note: Attempt all questions**

**Q. No. 1** **(a)** Determine amount for preparation 100mls of 0.1N solution of Ca SO4 (At Wt Ca=40, S= 32, O = 16

1. You are given 12 molar solution of HCl Calculate volume of that solution for

preparation of its 100ml dilute solution of 0.1M solution

**Q. No. 2** **inorganic Give the IUPAC name to following compounds**

**(i)** Na2S2O4  **(ii)** Hg2S

**(iii)** HClO4 (**iv)** P4H10

**(v)** ZnHPO4

**Q. No. 3** **Define the following terms**

**(i)** Chelates---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

**(ii)** Molarity--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

**(iii)** Buffer solution-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

**(iv)**Titration--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

**(v)**Gravimetric analysis------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Q. No. 4 **Fill in the blanks**

**(i)** Formula for determination of normality from volumes of reacting substances can be determined by formula------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

**(ii)**Formula for determination pH of the solution from H+ ion concentration is-------------------------------------------------------------------------------------------------------------------------------------------------------------------

**(iii)**Buffer solution which is used in complexometric titration is---------------------------------------------------------------------------------------------------------------------------------------------------------------

**(iv)**The structural formula of EDTA is -------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

**(v)**Gram equivalent weight of CaCO3 is ------------------------------------------------------------------------------------------------------------ when at. Wt. of Mg = 24, C = 12 , O = 16

**(vi)**The permissible limit of hardness of drinking water according to WHO standards is --------------------------------------------

**Q. No. 5** Write theory procedure observation and calculation of following object

**Object:** Determine temporary and permanent hardness of tap water by using 0.01N solution of EDTA by titration method

**WISH YOU GOOD LUCK**

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Advance Inorganic Chemistry Class: B.S (IV) M.Sc. (Final)

**Semester:** 1st Test: Final

**Session:** 2015 Date: 19-05-2015

**Maximum Marks** 50 Time allowed 2hr

**Note: Attempt any Three Questions**

**Q. No. 1 What do you know about the trans effect and trans effect series, how it is used for synthesis of cis trans isomers illustrate with examples**

**Q. No 2 (a) You know that absorption spectra is basic tool for analysis of complex compounds discuss**

**(b) How complex compounds are analyzed by gouy method? Which information you can get by the magnetic properties of complexes**

**Q. No. 3 Which terms and microstates are possible for the energy levels P2 and d2? Explain that how these energy levels are spillited in further energy levels in octahedral shape in case of strong and weak field ligands and what is effect of it on absorption spectra**

**Q. No. 4 What are labile and inert complexes which factors are responsible for labiality and inertness of the complexes? Describe with examples dissociative and displacement substitution reaction mechanism of complexes**

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject: Advance Inorganic Chemistry Class: B.S (IV)/ M.Sc. )Final**

**Semester: 1st Test Mid term**

**Session: 2015 Date: 09-03- 2015**

**Maximum Marks 30 Time allowed: 1hr**

**Note: Attempt all questions**

**Q. No. 1 Discuss the geometry of complex compounds? What is stereoisomerism describe with examples the geometrical isomers in square planar and octahedral metal complexes**

**Q. No. 2 Describe with examples the following methods for the synthesis of metal complexes and how they are separated from reaction mixture**

**(i) Simple addition reaction**

**(ii) Substitution reaction**

**THE END**

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Advance Inorganic Chemistry

Class: B.S (IV) M.Sc. (Final) Failure/Improver

**Semester:** 1st Test: Final

**Session:** 2015 Date: 19-05-2015

**Maximum Marks** 50 Time allowed 2hr

**Note: Attempt any Three Questions**

Q. No. 1 Discuss the geometry of complex compounds? What is stereoisomerism describe with examples the geometrical isomers in square planar and octahedral metal complexes

Q. No. 2 Describe with examples the following methods for the synthesis of metal complexes and how they are separated from reaction mixture

(i) Simple addition reaction

(ii) Substitution reaction

Q. No. 3 What do you know about the trans effect and trans effect series, how it is used for synthesis of cis trans isomers illustrate with examples

Q. No 4 (a) You know that absorption spectra is basic tool for analysis of complex compounds discuss

(b) How complex compounds are analyzed by gouy method? Which informati on you can get by the magnetic properties of complexes

Q. No. 5 What are labile and inert complexes which factors are responsible for labiality and inertness of the complexes? Describe with examples dissociative and displacement substitution reaction mechanism of complex

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Practical **Class:**  B.S (IV)/ M.Sc. Final

**Semester:** 1st **Test**  Final

**Session:** 2015 **Date:** 22- 05 -2015

**Maximum Marks** 60  **Time allowed:** 1hr

**Note: Attempt all questions**

Q. No. 1 Prepare stock solution 100mls 1000ppm of CaCl2 from that solution prepare 100mls of 10ppm solution of it

Q. No. 2 Calculate amount of KMnO4 for preparation of its 0.1N solution when it acts as oxidizing agent gains 5 electrons. The atomic weight of Mn = 55, K = 39

Q. No. 3 Explain the following

(i) Why complex compounds absorb electromagnetic radiation from uv/visible region

(ii) why metal ions are analyzed in atomic absorption spectrophotometer not with spectrophotometer

(iii)Why double beam spectrophotometer is more convenient than single beam spectrophotometer

(iv)Why flame is used in flame photometer for analysis of metal ions

(v) Why Xenon lamp is used as a source of electromagnetic radiation in IR region

Q. No. 4 Define the following terms

(i) Lambert Beer’s law (ii) Wave length and frequency (iii) Electromagnetic spectrum (iv) Photomultiplier tube (v) Detection limit

Q. No. 5 Give the basic principle of spectrophotometer

Q. No.6 Write theory and procedure

**Object:** Determine λmax andunknown concentration of given solution of KMnO4 by using spectronic 20 spectrophotometer

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Class:** M.S (Inorganic Chemistry) **Semester 1st**

**Subject:** Solid State Chemistry **Test:**  Final Test

**Session:** 2015 **Date:** 26- 05 -215

**Maximum Marks** 50 **Time allowed:** 2hr

**Note: Attempt all Questions**

Q. No. 1 (a) What is symmetry? Describe various types of symmetry found in crystals

(b) What do you know about Isomorphism and isopolymorphism? Give the properties of isomorphus substances

Q. No. 2 Describe various types symmetry found in crystals and give the characteristic of hccp, ccp and bcc structure and how these structures are related with malleability and ductility of metals

Q. No. 3 (a) What is radius ratio rule and how it effect on the shape of ionic crystals

(b) Discuss coordination number of an ion? Give the coordination number in case of three Bravais lattices of cubic system

THE END

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Practical **Class:**  B.S (IV)/ M.Sc. Final

**Semester:** 1st **Test**  Final

**Session:** 2015 **Date:** 22- 05 -2015

**Maximum Marks** 60  **Time allowed:** 1hr

**Note: Attempt all questions**

Q. No. 1 Prepare stock solution 100mls 1000ppm of CaCl2 from that solution prepare 100mls of 10ppm solution of it

Q. No. 2 Calculate amount of KMnO4 for preparation of its 0.1N solution when it acts as oxidizing agent gains 5 electrons. The atomic weight of Mn = 55, K = 39

Q. No. 3 Explain the following

(i) Why complex compounds absorb electromagnetic radiation from uv/visible region

(ii) why metal ions are analyzed in atomic absorption spectrophotometer not with spectrophotometer

(iii)Why double beam spectrophotometer is more convenient than single beam spectrophotometer

(iv)Why flame is used in flame photometer for analysis of metal ions

(v) Why Xenon lamp is used as a source of electromagnetic radiation in IR region

Q. No. 4 Define the following terms

(i) Lambert Beer’s law (ii) Wave length and frequency (iii) Electromagnetic spectrum (iv) Photomultiplier tube (v) Detection limit

Q. No. 5 Give the basic principle of spectrophotometer

Q. No.6 Write theory and procedure

**Object:** Determine λmax andunknown concentration of given solution of KMnO4 by using spectronic 20 spectrophotometer

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Practical **Class:**  M.S/M.Phill

**Semester:** 1st **Test**  Final

**Session:** 2015 **Date:** 04- 06 -2015

**Maximum Marks** 60  **Time allowed:** 1.15hr

**Note: Attempt all questions**

Q. No. 1 Prepare stock solution 100mls 1000ppm of CaCl2 from that solution prepare 100mls of 10ppm solution of it

Q. No. 2 Calculate amount of KMnO4 for preparation of its 0.1N solution when it acts as oxidizing agent gains 5 electrons. The atomic weight of Mn = 55, K = 39

Q. No. 3 Explain the following

(i) Why complex compounds absorb electromagnetic radiation from 0uv/visible region

(ii) Why instrumental analysis is more suitable than classical methods

(iii)Why double beam spectrophotometer is more convenient than single beam spectrophotometer

(iv)Why flame is used in flame photometer for analysis of metal ions

(v) Why Xenon lamp is used as a source of electromagnetic radiation in IR region

(vi)Why pH is decrease when H+ concentration is increased

Q. No. 4 Define the following terms

(i) Lambert Beer’s law (ii) Wave length and frequency (iii) Electromagnetic spectrum (iv) Photomultiplier tube (v) Detection limit (vi) Titrimetric analysis (vii) Basic salts (viii) Oxidizing and reducing agent

Q. No. 5 Give the basic principle of spectrophotometer

Q. No.6 Write theory and procedure

**Object:** How you will determine λmax andunknown concentration of given solution of complex compounds by using spectrophotometer

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject: Homogenous Catalysis Class: B.S (IV)/ M.Sc. )Final**

**Semester: 2nd Test Mid term**

**Session: 2015 Date: 05-10- 2015**

**Maximum Marks 30 Time allowed: 1hr**

**Note: Attempt all questions**

Q. No. 1 Explain with examples any two reactions of following organotransition metal complex compounds

(i) Oxidative addition and reductive elimination reaction

(ii) Reactions of coordinated ligands

(iii) Insertion and deinsertion reaction of olefins

Q. No. 2 Give the advantages and disadvantages of homogeneous catalysis over heterogenous catalysis? Explain reaction mechanism of synthesis of following organic compounds by using metal complex as catalyst

(i) polymerization of dienes

(ii) Polymerization alkynes

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** **Inorganic chemistry Class: B.S. III / M. Sc.(Previous)**

**Semester: 2nd Test: Mid Term Test**

**Session: 2015 Date 06- 10 – 2015**

**Maximum Marks 30 Time allowed: 1.15hr**

**Note: Attempt all Questions**

Q. No. 1 (a) Do you know that water is universal solvent elaborate? Explain that why some substances are highly soluble in water some are less soluble and others are not soluble

(b) Oxidation and reduction takes place simultaneously explain? You are given redox reaction give the oxidation number to the elements of compounds or ions mention the oxidizing agent and reducing agents and balance the redox reaction by ion electron method in acidic medium

Cr2O7- + C2O42- ---------------- Cr3+ + CO2

Q. No. 2 (a) What is electrode potential how it can be measured describe some factors which effect upon it

(b) Determine the standard reduction electrode potential of Mg/Mg2+ electrode, construct the voltic cell andwrite the cell reactionwhen cell voltage is 2.38 and needle is deflected towards magnesium electrode

**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**INSTITUTE OF CHEMISTRY**

**Class: M.S (Inorganic Chemistry) Semester 2nd**

**Subject: Environmental Chemistry Test: Mid Term**

**Session: 2015 Date: 06- 11 -215**

**Maximum Marks 30 Time allowed: 1.15hr**

**Note: Attempt all Questions**

**Q. No. 1 Oxygen and carbon dioxide naturally are in dynamic equilibrium in the atmosphere explain**

**(b) What do you know about eco-system, describe segments of environment?**

**Q. No. 2 As we know that there is continuous destruction and construction of ozone in the atmosphere explain its noncatalytic mechanism and also comments on that why world is worried about ozone layer**

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** **Inorganic chemistry Class: B.S. III / M. Sc.(Previous)**

**Semester: 1st Test: Mid Term Test**

**Session: 2015 Date 11- 03 – 2015**

**Maximum Marks 30 Time allowed: 1hr**

**Note: Attempt any two Questions all Questions carry equal marks**

**Q. No. 1 (a) Describe with experimental evidences that how Werner describe structure of metal complexes**

**(b) Give the IUPAC name to following metal complexes**

**(i) [Pt(NH3)5NO2]Cl2 ii [Ni(CO)5Cl]-1 iii K2[Fe(F)2CN2]**

**iv [Cr(C2O4)2(en)2]Cl (v)**

**OH**

**[(en)2Mn Mn (en)2]SO4**

**NH2**

**Q. No. 2 (a) What is EAN rule how it can be determined elaborate with suitable examples**

**(b) Give the main features of valence bond theory? How it describe the bonding in square planar and inner octahedral metal complexes**

**Q. No. 3 What is difference between chelates and metal complexes? Give some applications of metal complexes**

**(b) Give the orientation of different five d orbitals? Describe with examples that how Lewis with Lewis dot formula explain the nature of bonding in metal complexes**

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Advance Inorganic Chemistry

**Class:**  B.S (IV)/ M.Sc. Final (Failure/Improver

**Semester:** 1st **Test**  Final

**Session:** 2014 **Date:** 22- 05 -2015

**Maximum Marks** 80  **Time allowed:** 1hr

**Note: Attempt all questions**

Q. No. 1 Prepare stock solution 100mls 1000ppm of CaCl2 from that solution prepare 100mls of 10ppm solution of it

Q. No. 2 Calculate amount of KMnO4 for preparation of its 0.1N solution when it acts as oxidizing agent gains 5 electrons. The atomic weight of Mn = 55, K = 39

Q. No. 3 Explain the following

(i) Why complex compounds absorb electromagnetic radiation from uv/visible region

(ii) why metal ions are analyzed in atomic absorption spectrophotometer not with spectrophotometer

(iii)Why double beam spectrophotometer is more convenient than single beam spectrophotometer

(iv)Why flame is used in flame photometer for analysis of metal ions

(v) Why Xenon lamp is used as a source of electromagnetic radiation in IR region

Q. No. 4 Define the following terms

(i) Lambert Beer’s law (ii) Wave length and frequency (iii) Electromagnetic spectrum (iv) Photomultiplier tube (v) Detection limit

Q. No. 5 Give the basic principle of spectrophotometer

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Homogenous Catalysis **Class:**  B.S (IV)/ M.Sc. Final

**Semester:** 2nd **Test:**  Final

**Session:** 2015 **Date:** 01-12-2015

**Maximum Marks** 80  **Time allowed: 2.15hrs**

**Note: Attempt all questions**

Q. No. 1 Ziegler Natta’s catalysts are mixture of compounds explain? Describe reaction mechanism for polymerization of any two of following compounds by using Ziegler Natta’s catalysts

(i) Polymerization of ethylene (ii) Polymerization of cyclic olefins

(iii) Polymerization of dines

Q. No. 2 Discuss that how CO is alternate source of petroleum in petroleum industries? Describe the reaction mechanism for formation of any two compounds of following from CO by using metal complexes as catalysts

(i) Propyl aldehyde from propylene (ii) Acetic acid from methanol

(iii) Ethylene glycol, Alcohols and Vinyl acetate from syngas

Q. No. 3 How and why ligands are coordinated and dissociated in reactions of metal complexes? Give the reaction mechanism of formation of any two compounds of followings by oxidation of hydrocarbons

(i) Synthesis of acrylates by wacker and reppe process (ii) Olefin epoxidation (iii) Acetaldehyde by oxidation of ethylene

THE END

Q. No. 4 Define the following terms

(i) Lambert Beer’s law (ii) Wave length and frequency (iii) Electromagnetic spectrum (iv) Photomultiplier tube (v) Detection limit

Q. No. 5 Give the basic principle of spectrophotometer

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Homogenous Catalysis & Inorganic polymers **Class:**  B.S (IV)/ M.Sc. )Final

Failure/Improver

**Semester:** 2nd **Test**  Final

**Session:** 2015 **Date:** 01-12-2015

**Maximum Marks** 80  **Time allowed:** 2½hrs

**Note: Attempt any Four Questions**

**Q. No 1** Differentiate between homogenous and heterogeneous catalysts? Describe reaction mechanism for the *polymerization* of ethylene and dimerization of butadiene using transition metal complexes as catalysts

**Q. No. 2** What is Ziegler Natta’s catalyst how it is used for the polymerization and oligomerization of butadiene

**Q. No3** Discuss that how CO is alternative source of petroleum? Give the reaction mechanism for hydrocarbonylation of propylene by using cobalt carbonyl as catalyst and synthesis of acetic acid by carbonylation of methanol

**Q. No 4** (a) Describe the method for synthesis of ethane by hydrogenation of ethylene by using RhCl(PPh3)3 as catalyst

(b) Explain that how C-C coupling takes place? Give the mechanism of palladium catalyzed ketone synthesis from acyl chloride and alkyl tin compounds

**Q. No 05** Describe reaction mechanisms for the hydrosilylation and hydrocyanation of *alkenes* using transition metal complex as catalyst

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject: Advance Inorganic Chemistry Class: B.S (IV)/ M.Sc. (Final)**

**Semester: 2nd Test Final**

**Session: 2015 Date: 08-12- 2015**

**Maximum Marks 25 Time allowed: 1hr**

**Note: Attempt any Three Questions**

**Q. No. 1** Inorganic polymers are different from organic polymers explain?Write the general method for synthesis of siliconesand particular description for synthesis properties and applications of silicone oils

**Q. No. 2** What are polyphosphazines how they are synthesized by different methods? Describe the nature of bonding of trimmers of dichlorophosphazine its polymerization mechanism and applications of polyphosphazines (NPCl2)

**SHAH ABDUL LATIF UNIVERSTY KHAIRPUR**

**DEPARTMENT OF CHEMISTRY**

**Subject:** Advance Inorganic (Theory) Section inorganic polymers **Class:**  B.S (IV)/ M.Sc. Final

**Semester:** 2nd **Test**  Mid Term Test

**Session:** 2015 **Date:** 08- 12 -2015

**Maximum Marks** 25  **Time allowed: 1hr**

**Note: Attempt all questions**

Q. No. 1 Inorganic polymers are different from organic polymers explain? Describe the structure and properties of borazine and its derivatives

Q. No. 2 What are silicones describe general steps for the preparation of silicones? Describe preparation properties and uses of following silicones

(i) Silicone fluids or oils

(ii) Silicone Rubbers

Q. No. 3 Give the preparation properties and structure of following polymers of Sulfur

(i) Tetrasulfur tetranitride

(ii) Imides of Sulfur