**SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**

**INSTITUTE OF CHEMISTRY**

**COMPREHENSIVE VIVA-VOICE**

**FOR Ph.D**

**SESSION 2016-17**

**Time Allowed: 1 hour Date: 31st May, 2017**

Name in full: ------------------------------------------------------------------------------------

Seat No: ------------------------------------------------------------------------------------------

1. **What type of sample cuvette should be used for measuring the absorbance of a molecule at 220 nm?**

1. KBr or NaC1 b) glass c) plastic d) quartz

2. **Cobalt atom lies in the core of:**

a) Metallo-enzyme b) Vitamin A12

c) Vitamin B12 co-enzyme d) Vitamin E12

3. **A solution has a concentration of 2250μg/L. What is its concentration in ppm?**

a) 225 b) 22.5 c) 2.25 d) 0.225

4. **The correct order of spectral regions with respect to increasing frequency is**

a) UV,VIS, IR, RF b) RF, IR, VIS, UV

c) UV, VIS, RF, IR d) VIS, RF, IR, UV

5. **The compounds absorbing IR frequencies must have:**

a) Covalent bonds b) Ionic Bonds

c) Coordinate covalent bond d) all A, B and C are true

6. **Coordination number of central metal atom in complex [Pt(NH3)2Cl2] is:**

1. 2 b) 4 c) 6 d) 0

**7. All photochemical reactions do not depend upon the concentrations of the reactants, and**

**therefore are called as:**

a) Zero order reactions b) 1st order reactions

c) 2nd order d) 3rd order.

**8. What is the oxidation state of chromium in (NH4)2 Cr2O7?**

1. +7 b) +6 c) +5 d) +3

**9. A salt bridge between two half cells**

1. will carry the electrical current
2. is where reduction takes place
3. allows the passage of ions between half cells
4. prevents the build up of a charge which may stop the electrical current

**10. The unit for molar absorptivity is units of \_\_\_\_\_\_\_\_\_\_\_\_\_\_**

1. L mol-1 cm-1 b) Mol L-1 m-1

c. Mol L-1 cm-1 d) Mol L-1

**11. Gram molecular volume of oxygen at STP is**

a) 11200 cm3 b) 22400 cm3 c) 5600 cm3 d) 3200 cm3

**12. The region of an infra-red spectrum where many absorptions take place is known as the...**

a) thumbprint region b) handprint region

c) footprint region d) fingerprint region

**13. Thermodynamic standard conditions of temperature and pressure are ---------**

1. 00C and 1 atm b) 273 k and 101.3 k Pa
2. 298 k and 1 atm d) 00C and 101.3 k Pa

**14. The state of the hybridization of boron atom in boron trichloride is -----------**

a) Sp b) Sp2 c) Sp3 d) 3d2sp3

**15. A conformation in which two atoms are in the same plane but on the opposite side of**

**the bond from which eliminated is**

[(a)](http://chemistry.boisestate.edu/people/richardbanks/organic/mc/vol10/v10_omc1a.htm) Synperiplanar[(b)](http://chemistry.boisestate.edu/people/richardbanks/organic/mc/vol10/v10_omc1b.htm) Cis-diaxial

[(c)](http://chemistry.boisestate.edu/people/richardbanks/organic/mc/vol10/v10_omc1c.htm) trans-diaxial [(d)](http://chemistry.boisestate.edu/people/richardbanks/organic/mc/vol10/v10_omc1d.htm) antiperiplanar

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| **16. What is the total number of sigma bonds found in the following compound?**  **http://chemistry.boisestate.edu/people/richardbanks/organic/mc/vol1/v1_omc4.gif** | | |
|  | 1. 8 b) 10 c) 11 d) 15 |

**17. When an external magnetic field is applied, what happens to the protons in a sample?**

a) All protons align with the field.

b) All protons align opposite to the field.

c) Some protons align with the field and some align opposite to it.

d) All protons assume a random orientation

**18. Which of the following compounds has the most deshielded protons?**

a) CH3Cl b) CH3I c) CH3Br d) CH4

**19. II B sub-group of basic radicals consists of**

(a) As, Cd and Hg (b) Zn, Cd and Hg

(c) Cu, Hg and Au (d) As, Sb and Sn

**20. The correct order for the basic features of a mass spectrometer is...**

a) acceleration, deflection, detection, ionization  
b) ionization, acceleration, deflection, detection

c) acceleration, ionization, deflection, detection

d) acceleration, deflection, ionization, detection

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| **21. “Line spectra” are caused primarily by:**  a) The existence of many ground states in an atom  b) The existence of many excited states in an atom  c) The existence of many atoms in a typical sample  d) None of the above  **22. Chromatography is used to:**  a) Separate two or more compounds based on their polarities.  b) Separate two or more compounds based on their masses.  c) Separate two or more compounds based on how strongly they interact with other compounds.  d) More than one of the above.  **23. A --------- group takes a pair of electron with it when it leaves.**   1. Eletrofugal b) Nucleofugal   c. Ambident electriphyl d) None of them  **24. When a non-volatile solute is dissolved in solvent**   1. The vapor pressure of solution become greater than the vapor pressure of pure solvent 2. The vapor pressure of pure solvent become greater than that of solution 3. The vapor pressure of solution becomes lower than that of pure solvent 4. only (b) and (c) are correct 5. **Transition metals are paramagnetic because of----------** 6. Presence of vacant orbitals b) Presence unpaired electron 7. High melting and boiling points d) Malleability and ductility 8. **The π-π\* transition occur in \_\_\_\_\_\_\_\_ region of light.** 9. Radiofrequency b) Infra Red   c. Microwave d) UV/Visible   1. **If a gas remains gas upto -273 0C it means it is an ---------** 2. Real gas b) Noble gas 3. Ideal gas d) Diatomic gas 4. **Ring strain arises because it is not possible for the orbitals of the atoms to overlap at their --------- angles.**   [(a)](http://chemistry.boisestate.edu/people/richardbanks/organic/mc/vol10/v10_omc1a.htm) right[(b)](http://chemistry.boisestate.edu/people/richardbanks/organic/mc/vol10/v10_omc1b.htm) optimum[(c)](http://chemistry.boisestate.edu/people/richardbanks/organic/mc/vol10/v10_omc1c.htm) acute d) obtuse   1. **Alkaloids occurs chiefly in the plants of the ----------- family.**   [(a)](http://chemistry.boisestate.edu/people/richardbanks/organic/mc/vol10/v10_omc1a.htm) monocotyledonous b) dicotyledonous  [(c)](http://chemistry.boisestate.edu/people/richardbanks/organic/mc/vol10/v10_omc1c.htm) tricotyledonous d) polycotyledonous   1. **Which of the following types of pollutants affects the pH levels of water and soil?** 2. acid precipitation b) pesticides   c). thermal pollution d) ozone depletion   1. **How many geometrical isomers are possible for given compound**   C6H5-CH=CH-CH=CH-COOH   1. 3 b) 4 c) 5 d) 6 2. **Which of the following compound will form intramolecular hydrogen bond?**   [(a)](http://chemistry.boisestate.edu/people/richardbanks/organic/mc/vol5/v5_omc1a.htm) Acetone [(b)](http://chemistry.boisestate.edu/people/richardbanks/organic/mc/vol5/v5_omc1b.htm) Nitroethane  [(c)](http://chemistry.boisestate.edu/people/richardbanks/organic/mc/vol5/v5_omc1c.htm) 1-3 pentanedione [(d)](http://chemistry.boisestate.edu/people/richardbanks/organic/mc/vol5/v5_omc1d.htm) Benzaldehyde   1. **The presence of unsaturated groups which make the compound coloured are**   [(a)](http://chemistry.boisestate.edu/people/richardbanks/organic/mc/vol5/v5_omc1a.htm) Auxochrome, [(b)](http://chemistry.boisestate.edu/people/richardbanks/organic/mc/vol5/v5_omc1b.htm) Hyposochrome  [(c)](http://chemistry.boisestate.edu/people/richardbanks/organic/mc/vol5/v5_omc1c.htm) Anthrone [(d)](http://chemistry.boisestate.edu/people/richardbanks/organic/mc/vol5/v5_omc1d.htm) Chromophore   1. **For preparation of 100ml 0.1M solution of Na2C2O4 amount of sodium oxalate is required**   a)13.5g b) 1.3g c) 1.50g d) 67.5g   1. **Half life time of radioactive element is 6hrs how much amount of it remained after 12hrs** 2. ½ b) 1/6 c) ¼ d) 1/8 3. **Which of the following pairs has the highest difference in their first ionization energy? (a)** Xe, Cs (b) Kr, Rb(c) Ar, K (d) Ne, Na 4. **In** **metal-olefin interaction, the extent of increase in metal ® olefin p-back-donation would**   (a) lead to a decrease in C = C bond length(b) change the formal oxidation state of the metal(c) change the hybridization of the olefin carbon from sp2to sp3.(d) increase with the presence of electron donating substituent on the olefin.   1. **Electron change in reduction of Ce(SO4)2, KMnO4, HNO2 and I2 with hydrazine in acidic medium, respectively is** (a) 1e, 1e, 2e and 4e (b) 1e, 3e, 2e and 4e(c) 2e, 3e, 1e and 4e(d) 2e, 4e, 1e and 3e. 2. **Correct combination for π and π\* orbital’s in B2 molecules is**   (a) Gerade Ungerade(b) Ungerade    Gerade (c) Gerade Gerade (d) Ungerade  Ungerade   1. **According to VSEPR theory, the molecule/ion having ideal tetrahedral shape is:**   (a) SF4(b) SO3-2(c) S2Cl2 (d) SO2Cl2.   1. **The number of antibonding electrons in NO and CO according to MO theory are respectively.** (a) 1, 0(b) 2, 2(c) 3, 2(d) 2. 2. **The molecule C3O2 has a linear structure. This compound has**   (a) 4σ and 4π bonds(b)  3σ and 2π bonds(c)  2σ and 3π bonds bonds(d)  3σ and 4π bond.   1. **The number of lone pair(s) of electrons on the central atom in [BrF4]–, XeF6and [SbCl6]3-are, respectively,** (a) 2, 0 and 1(b) 1, 0 and 0(c) 2, 1 and 1(d) 2, 1 and 0. Ans (c) 2. **The correct order of the retention of cations on a sulfonated cation exchange resin column is**(a) Ag+> K+> Na+> Li+(b) K+> Na+> Ag+> Li+(c) Li+> Na+> K+> Ag+(d) Li+> Na+> Ag+>  K+ 3. **Flame proof fabrices contain**   (a) H2NC(O)NH2 .Na2SO4(b) H2NC(S)NH2 .Na2SO4(c) H2NC (O) NH2 .H3PO4(d) H2NC(S) NH2 .H3PO4   1. **The number of lone-pairs are identical in the pairs** 2. XeF4, ClF3(b) XeO4, ICl4–(c) XeO2F2, ICl4–(d) XeO4, ClF3 3. **The number of 3c-2e bonds present in Al(BH4)3 is**   (a) four(b) three(c) six(d) zero   1. **The correct order of stability of difluorides is**:   (a) GeF2> SiF2 > CF2(b) CF2 > SiF2 >GeF2(c) SiF2 >GeF2 >CF2(d) CF2 >GeF2 >SiF2   1. **The reaction between NH4Br and Na metal in liquid ammonia (solvent) results in the products**   (a) NaBr,HBr(b) NaBr, H2(c) H2 ,HBr(d) HBr, H2 .   1. **The number of microstates for d5 electron configuration is:**   (a) 21×63(b) 14×63(c) 7×62(d) 28×63  **SHAH ABDUL LATIF UNIVERSITY KHAIRPUR**  **INSTITUTE OF CHEMISTRY**  **SUBJECT GRE TEST FOR Ph.D**  **SESSION 2012-13, 2013-14**  **Time Allowed: 1 hour SDate: 7th Feb: 2017**  **KEY** |
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| 1. | C | 26 | D |
| 2. | C | 27 | B |
| 3 | B | 28 | B |
| 4 | B | 29 | B |
| 5 | A | 30 | B |
| 6 | B | 31 | B |
| 7 | A | 32 | C |
| 8 | D | 33 | D |
| 9 | C | 34 | B |
| 10 | A | 35 | C |
| 11 | B | 36 | D |
| 12 | D | 37 | C |
| 13 | C | 38 | A |
| 14 | B | 39 | B |
| 15 | D | 40 | B |
| 16 | C | 41 | A |
| 17 | C | 42 | A |
| 18 | A | 43 | C |
| 19 | D | 44 | A |
| 20 | A | 45 | C |
| 21 | B | 46 | A |
| 22 | D | 47 | C |
| 23 | B | 48 | A |
| 24 | D | 49 | B |
| 25 | B | 50 | C |