Al al-Bayt University

Chem 101; 2nd Exam

Name: _____   S. No.: _____

Exam consists of 16 questions (25 points total)
Answer all questions
Time allowed is one hour only

Answer Form

Question No.	Answer
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Total Score	**/25**

1. The number of dots in the Lewis dot structure for nitrogen (N) is

a. three   b. two   c. six   d. four   e. five

2. The number of valence electrons in SO_3 is

a. 23   b. 26   c. 28   d. 24   e. 30

3. Which of the following are predicted by the molecular orbital model to be unstable (does not exist) diatomic species?

a. Ne_2^{2+} b. C_2 c. Li_2 d. Li_2^{2+} e. F_2^+

4. What is the best description of the shape (geometry) of the KrF_4

a. T-shaped   b. see-saw   c. trigonal bipyramide d. tetrahedral   e. square planar

5. According to the VSEPR theory, which of the following should not be linear?

a) BeH_2 b) SO_2 c) CS_2 d) NNO   e) ICl

6. Which of the following molecules is non-polar

a. NH_3 b. ICl_2^- c. HCN   d. a + b   e. a + c

7. Calculate the concentration (M) of Al^{3+} ion in 4.0×10^{-2} M $Al_2(SO_4)_3$

a. 4.0×10^{-2} b. 0.012   c. 8.0×10^{-2} d. 7.5×10^{-3} e. 0.020

8. Electronegativity decreases along the periodic table

a. from bottom to top and from right to left
b. from bottom to top and from left to right
c. from top to bottom and from right to left
d. from top to bottom and from left to right.
e. cannot be predicted

9. Which of the following should not have a dipole moment?

a) NNO   b) SF_4 c) BrF_3 d) XeF_2 e) all should have

10. Which of the following is not isoelectronic with Ar?

a) S^- b) Cl^- c) K^+ d) Ca^{2+} e) K^+ and Ca^{2+}

11. Equal numbers of electrons in bonding and antibonding molecular orbitals yield a bond order of:

a) 0   b) 1/2   c) 1   d) 3/2   e) 3/5

12. The hybridization of the oxygen atom in water is closest to:

a) sp b) sp^2 c) sp^3 d) sp^3d e) sp^3d^2

13. Which of the following molecules is not planar

a. BCl_3 b. NH_3 c. CO_3^{2-} d. NO_3^- e. SO_3

14. Using the molecular orbital model, the molecule (O_2^+, O_2, O_2^-, O_2^{2-}) with the smallest bond length is:

a. O_2^+ b. O_2 c. O_2^- d. O_2^{2-}

15. Predict the formula of the ionic compound formed by magnesium (Mg) and fluoride (F)

a. Mg_2F_3 b. MgF c. MgF_2 d. Mg_2F e. MgF_3

16. The expected hybridization of the central atom (I) for the ICl_4^- is

a. sp^3 b. sp^2 c. sp^3d^2 d. sp^3d e. sp

Periodic Table of the Elements