

Name _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 1) Calculate the wavelength (in nm) of a the red light emitted by a neon sign with a frequency of 4.74×10^{14} Hz. 1) _____
A) 704 nm B) 466 nm C) 142 nm D) 158 nm E) 633 nm
- 2) Calculate the energy of the violet light emitted by a hydrogen atom with a wavelength of 410.1 nm. 2) _____
A) 2.06×10^{-19} J
B) 4.85×10^{-19} J
C) 1.23×10^{-19} J
D) 5.27×10^{-19} J
E) 8.13×10^{-19} J
- 3) Which of the following transitions (in a hydrogen atom) represent **emission** of the longest wavelength photon? 3) _____
A) $n = 3$ to $n = 4$
B) $n = 5$ to $n = 4$
C) $n = 3$ to $n = 1$
D) $n = 1$ to $n = 2$
E) $n = 4$ to $n = 2$
- 4) Which of the following visible colors of light have the largest frequency? 4) _____
A) yellow B) orange C) green D) blue E) red
- 5) How many photons are contained in a burst of yellow light (589 nm) from a sodium lamp that contains 609 kJ of energy? 5) _____
A) 1.81×10^{24} photons
B) 4.03×10^{28} photons
C) 2.48×10^{25} photons
D) 3.06×10^{30} photons
E) 3.37×10^{19} photons
- 6) How many different values of m_l are possible in the 4f sublevel? 6) _____
A) 1 B) 7 C) 5 D) 2 E) 3
- 7) Give the ground state electron configuration for Se. 7) _____
A) $[\text{Ar}]4s^23d^{10}$
B) $[\text{Ar}]3d^{10}4p^4$
C) $[\text{Ar}]4s^23d^{10}4p^6$
D) $[\text{Ar}]4s^24d^{10}4p^4$
E) $[\text{Ar}]4s^23d^{10}4p^4$

8) Give the ground state electron configuration for Br^- .

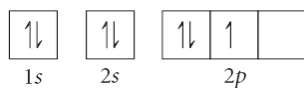
8) _____

- A) $[\text{Ar}]4s^24d^{10}4p^6$
- B) $[\text{Ar}]4s^23d^{10}4p^6$
- C) $[\text{Ar}]4s^23d^{10}4p^4$
- D) $[\text{Ar}]4s^23d^{10}4p^5$
- E) $[\text{Ar}]4s^24p^6$

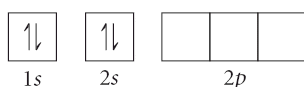
9) Choose the orbital diagram that represents the ground state of N.

9) _____

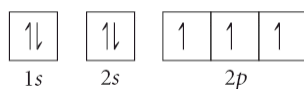
A)



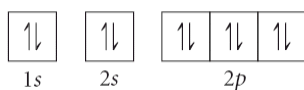
B)



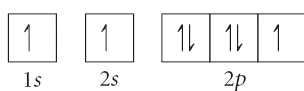
C)



D)



E)



10) Choose the ground state electron configuration for Ti^{2+} .

10) _____

- A) $[\text{Ar}]3d^2$
- B) $[\text{Ar}]3d^4$
- C) $[\text{Ar}]4s^23d^2$
- D) $[\text{Ar}]4s^23d^4$
- E) $[\text{Ar}]4s^2$

11) How many of the following species are paramagnetic?

11) _____



- A) 2
- B) 1
- C) 4
- D) 0
- E) 3

12) Give the set of four quantum numbers that represent the last electron added (using the Aufbau principle) to the Cl atom. 12) _____

A) $n = 3, l = 1, m_l = 0, m_s = -\frac{1}{2}$

B) $n = 3, l = 1, m_l = 0, m_s = +\frac{1}{2}$

C) $n = 3, l = 0, m_l = 0, m_s = -\frac{1}{2}$

D) $n = 2, l = 1, m_l = 0, m_s = -\frac{1}{2}$

E) $n = 3, l = 1, m_l = 1, m_s = +\frac{1}{2}$

13) How many unpaired electrons are present in the ground state P atom? 13) _____
A) 3 B) 0 C) 1 D) 4 E) 2

14) How many valence electrons does an atom of Cu possess? 14) _____
A) 11 B) 3 C) 1 D) 9 E) 2

15) Place the following elements in order of increasing atomic radius. 15) _____

P Ba Cl

- A) Cl < Ba < P
B) P < Cl < Ba
C) Cl < P < Ba
D) Ba < Cl < P
E) Ba < P < Cl

16) Place the following in order of increasing radius. 16) _____

Ca²⁺ S²⁻ Cl⁻

- A) Cl⁻ < Ca²⁺ < S²⁻
B) S²⁻ < Cl⁻ < Ca²⁺
C) Ca²⁺ < S²⁻ < Cl⁻
D) Cl⁻ < S²⁻ < Ca²⁺
E) Ca²⁺ < Cl⁻ < S²⁻

17) Place the following in order of increasing IE_1 . 17) _____

N F As

- A) N < As < F
B) F < N < As
C) As < F < N
D) As < N < F
E) F < N < As

18) Which of the following represent the Lewis structure for Mg? 18) _____

- A) $\overset{\cdot\cdot}{\underset{\cdot\cdot}{\text{Mg}}}$ B) Mg C) $:\overset{\cdot\cdot}{\underset{\cdot\cdot}{\text{Mg}}}:$ D) Mg \cdot E) Mg \cdot

19) Use Lewis theory to determine the chemical formula for the compound formed between Ca and N. 19) _____

- A) Ca₂N B) CaN C) Ca₂N₃ D) Ca₃N₂ E) CaN₂

20) Place the following elements in order of **increasing** electronegativity. 20) _____

K Cs P

- A) Cs < P < K
B) P < K < Cs
C) P < Cs < K
D) K < P < Cs
E) Cs < K < P

21) Choose the bond below that is **most** polar. 21) _____

- A) C-C B) C-N C) F-F D) C-F E) C-O

22) Place the following in order of **increasing** bond length. 22) _____

C-F C-S C-Cl

- A) C-F < C-Cl < C-S
B) C-Cl < C-F < C-S
C) C-S < C-F < C-Cl
D) C-S < C-Cl < C-F
E) C-F < C-S < C-Cl

23) Draw the best Lewis structure for Cl₃⁻. What is the formal charge on the central Cl atom? 23) _____

- A) +1 B) -2 C) 0 D) -1 E) +2

Answer Key

Testname: FALL08PRACTICE3

- 1) E
- 2) B
- 3) B
- 4) D
- 5) A
- 6) B
- 7) E
- 8) B
- 9) C
- 10) A
- 11) B
- 12) A
- 13) A
- 14) A
- 15) C
- 16) E
- 17) D
- 18) E
- 19) D
- 20) E
- 21) D
- 22) A
- 23) D