Exam

Name_____

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

1) The energy of a photon of light is _____ proportional to its frequency and _____ proportional to its wavelength.
   A) directly, directly
   B) inversely, directly
   C) indirectly, not
   D) inversely, inversely
   E) directly, inversely

   1) _____

2) What is the wavelength of light (nm) that has a frequency of 3.22×10^{14} s^{-1}?
   A) 932
   B) 9.32×10^{-7}
   C) 9.66×10^{22}
   D) 649
   E) 1.07×10^{6}

   2) _____

3) Of the following, _____ radiation has the longest wavelength and _____ radiation has the greatest energy.

   gamma   ultraviolet   visible

   A) visible, ultraviolet
   B) gamma, visible
   C) ultraviolet, gamma
   D) gamma, gamma
   E) visible, gamma

   3) _____

4) The energy (J) required for an electronic transition in a Bohr hydrogen atom from n = 2 to n = 3 is _____ J.
   A) 4.00×10^{-19}
   B) 3.00×10^{-19}
   C) -3.00×10^{-19}
   D) 4.60×10^{14}
   E) -7.90×10^{-19}

   4) _____

5) The 4d subshell in the ground state of atomic xenon contains _____ electrons.
   A) 2   B) 6   C) 8   D) 10   E) 36

   5) _____

6) There are _____ unpaired electrons in a ground state fluorine atom.
   A) 0   B) 1   C) 2   D) 3   E) 4

   6) _____

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7) The principal quantum number for the outermost electrons in a Br atom in the ground state is _____.

7) _____

    A) 4   B) 1   C) 2   D) 5   E) 3

8) The largest principal quantum number in the ground state electron configuration of barium is _____.

8) _____

    A) 1   B) 2   C) 4   D) 5   E) 6

9) What is the correct ground–state electron configuration for molybdenum?

9) _____

    A) $[Kr]5s^14d^5$
    B) $[Kr]5s^14d^{10}$
    C) $[Kr]5s^24d^9$
    D) $[Kr]5s^24d^4$
    E) $[Kr]5s^24d^5$

10) The complete electron configuration of gallium, element 31, is _____.

10) _____

    A) $1s^22s^22p^{10}3s^23p^{10}4s^23d^3$
    B) $1s^42s^42p^83s^43p^84s^3$
    C) $1s^42s^42p^63s^43p^64s^43d^3$
    D) $1s^22s^22p^63s^23p^63d^{10}4s^24p^1$
    E) $1s^42s^42p^{10}3s^43p^9$

11) In a ground–state manganese atoms, the _____ subshell is partially filled.

11) _____

    A) 4s   B) 4p   C) 3s   D) 4d   E) 3d

12) According to the Heisenberg Uncertainty Principle, it is impossible to know precisely both the position and the _____ of an electron.

12) _____

    A) charge
    B) color
    C) momentum
    D) mass
    E) shape

13) Which one of the following is <u>not</u> a valid value for the magnetic quantum number of an electron in a 5d subshell?

13) _____

    A) 1   B) 2   C) 0   D) 3   E) –1

14) An electron cannot have the quantum numbers n = _____, l = _____, m_l = _____.

14) _____

    A) 3, 2, 1   B) 2, 0, 0   C) 3, 1, –1   D) 2, 1, –1   E) 1, 1, 1

15) In a p_x orbital, the subscript x denotes the _____ of the electron.

15) _____

    A) spin of the electrons
    B) probability of the shell
    C) size of the orbital
    D) axis along which the orbital is aligned
    E) energy