Vasquez High School -- Chemistry B -- Test #2 -- Chapter 11 -- 100 points

Write TRUE if the statement is true OR write the word(s) that substitutes for the underlined word(s) that would make it true. Writing false earns partial credit. Three points each.

_____ 1) Bohr theorized that if wave-like things can have particle-like properties, then particles can exhibit wave-like properties.

_____ 2) In general, atomic size decreases as you move left to right across a period.

_____ 3) One common application of microwave electromagnetic energy is aircraft radar.

_____ 4) Schroedinger's wave equation describes the probability one will find an atom at a particular location.

_____ 5) The maximum number of electrons that the 4p orbitals can hold is four.

_____ 6) Hydrogen has quantized energy levels.

_____ 7) Rutherford's gold foil experiment showed that a small, dense, positively-charged nucleus existed within the atom.

_____ 8) No orbital in a particular sublevel can have two electrons before each has one is one description of Einstein's Rule.

_____ 9) The sublevel filled just before the 4d sublevel is the 5s sublevel.

_____ 10) An example of an atom having just four electrons in a p-sublevel is zirconium.

Short Answer/Fill-in. Be neat and complete; no one or two word answers unless asked for. Three points each.

11) At what speed does electromagnetic radiation move thru space? How is this speed related to wavelength and frequency? _____

_____.

12) Define the term "ionization energy." _____

_____.

13) What is meant by the wave-particle duality of light? _____

_____

_____.

14) In the modern theory of the atom, a(n) _____ represents a region of space in which there is a high probability of finding an electron.

15) What is the name given to the lowest energy or rest state energy of an electron? _____

16) Draw a representation of an electromagnetic wave. Then identify and label crest, trough, wavelength, and amplitude. Be accurate, not messy. Easy five points.

17) Draw the electromagnetic spectrum complete with the ten energies in their proper order and six correct labels. Fifteen points.

18) What are the names of the four quantum numbers? Their letter representations are not enough. Five points.

a) _____ c) _____

b) _____ d) _____

19) Write out the complete electron configurations for each of the following. Three points each.

a) $_{24}Cr$ _____

b) $_{54}Xe$ _____

c) $_{83}Bi$ _____

d) For one more: Which element has a $5d^1$ before filling out the 4f sublevel? _____

20) Green light has a wavelength of about 520 nm. What is the frequency of such a green light?

21) An emitted photon from a common appliance has an energy of 1.55×10^{-24} J. What is the wavelength of such an energy? For an extra two points extra credit, what might that appliance be?

22) Short essay. Describe, with a diagram, how certain elements can have certain visible colors when they are burned. Label the diagram and be clear. Ten points.

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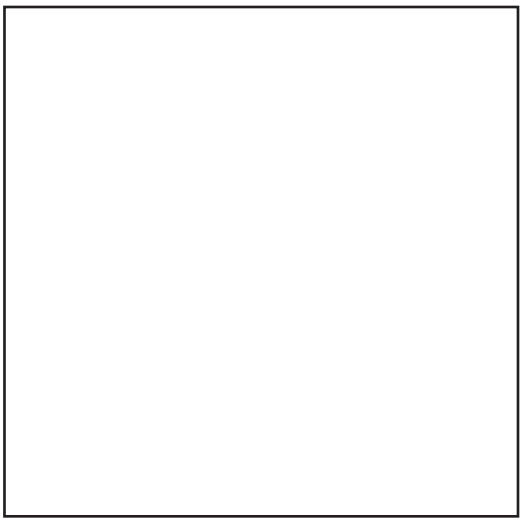

23) Think carefully here. The total number of electrons that the entire fourth energy level can hold is _____.

EXTRA CREDIT SECTION. Two points apiece. Guessing is okay.

24) Scientists at the University of Nijmegan magnetically levitated what kind of animal? _____

25) What is the unusual exception that the element copper exhibits in its electron configuration?

_____

26) What country was the very popular Ernest Rutherford from? _____