

- 3) True or False? Green light has lower energy than orange light. _____
- 4) True or False? If an electron falls a relatively short distance, light of relatively low energy would be emitted. _____
- 5) What does it mean for electron energy levels to be *quantized*?

- 6) Why does an excited electron naturally fall towards the nucleus?

- 7) When electricity is sent through an emission tube filled with hydrogen gas, distinct energies of light are emitted. Thus, a bright line or emission spectrum is obtained. Explain how this emission spectrum gives experimental evidence for the concept that the electron in hydrogen can exist in only distinct energy levels.

- 8) Fluorescent substances only fluoresce (emit visible light) when _____ light shines on the object.
- 9) When you see an object as red, it is because ...
a) all colors are being absorbed b) only red is absorbed c) all colors except red are absorbed
- 10) Explain why a black shirt gets hotter in the sun than a white shirt. (What is absorbed? What is emitted? What happens to e^- 's?)

- 11) What does an orbital (or electron cloud) represent? How is an orbital different from an orbit?

- 12) Draw a representation of a typical "s" orbital, "p" orbital and a "d" orbital. How many orientations are there of each type?

- 13) Describe the photoelectric effect. How does it support the conclusion that light can have properties of particles?

14) What does the Heisenberg uncertainty principle state? How do electrons in atoms satisfy the uncertainty principle?

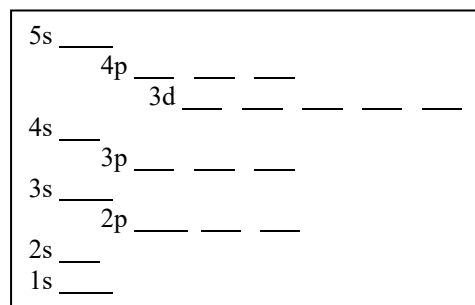
15) How many electrons can fit in the third main energy level? _____ What is another name for a row? _____

16) What sublevel should become filled after the 5s sublevel is filled? _____

17) What is the maximum number of electrons that can fit in any one orbital? _____

18) Questions about Germanium:

- Fill out the arrow diagram for Ge to the right
- How many unpaired electrons does Ge have? _____
- How many valence electrons does Ge have? _____
- Why do the electrons remain unpaired in the 4p sublevel?



19) Write the electron configurations for these elements. (Use noble gas notation.)

- Te _____
- W _____

20) What is the name of the family of elements in Group 1/IA? _____ Group 2/IIA? _____
_____ Group 17/VIIA? _____ Group 18/VIIIA? _____

21) Answer these questions concerning the element whose electrons configuration ends with $4p^4$.

- The element is _____. Write out its electron configuration _____
- How many valence electrons does it have? _____
- How many unpaired electrons does it have? _____
- When in compounds, what is its most common ion? _____
- What is the electron configuration of this most common ion? _____
- Is this ion smaller or larger than its neutral atom? _____
- If a particular isotope of this element had 40 neutrons, what would be its mass number? _____
- What type of element is this-- metal, nonmetal or metalloid? _____
- What would be the mass of a 0.650 mole sample of this element?