



- 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) Why does an excited electron naturally fall towards the nucleus?
- 6) Fluorescent substances only fluoresce (emit visible light) when \_\_\_\_\_ light shines on the object.
- 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) 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
- 9) Why is the sky blue?
- 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 experimental evidence gives support for the concept that electrons have properties of waves?
- 15) What are the differences between a particle, wave and wave-packet? (Discuss knowledge of location and energy of each.)
- Particle:
  - Wave:
  - Wave packet:
- 16) What does the Heisenberg uncertainty principle state? How do electrons in atoms satisfy the uncertainty principle?

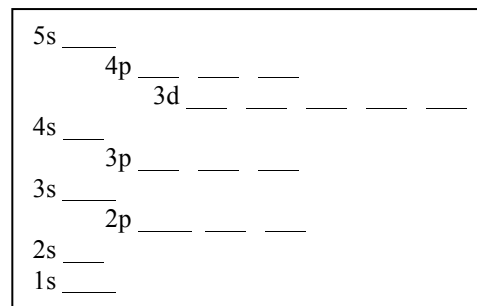
17) How many electrons can fit in the third main energy level? \_\_\_\_\_ What is another name for a row? \_\_\_\_\_

18) What sublevel should become filled after the 5s sublevel is filled? \_\_\_\_\_

19) What is the maximum number of electrons that can fit in any one orbital? \_\_\_\_\_

20) 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 prefer to be unpaired in the 4p sublevel?



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

- Se \_\_\_\_\_
- W \_\_\_\_\_

22) What is the name of the family of elements in Group II? \_\_\_\_\_ Group VII? \_\_\_\_\_ Group VIII? \_\_\_\_\_

23) Answer these questions concerning the element whose electrons configuration ends with  $3p^4$ .

- 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 18 neutrons, what would be its mass number? \_\_\_\_\_
- What type of element is this-- metal, nonmetal or metalloid? \_\_\_\_\_
- What would be the mass of a 0.65 mole sample of this element?