**AP CHEMISTRY CHAPTER 6: ELECTRONIC STRUCTURE OF ATOMS (Pgs. 214-223 and 234-255)**

EQ: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Questions:

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| **Electronic Structure-2**Electronic structure is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_What is one way that the properties of extremely small particles are explained? :\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| http://www.grandinetti.org/resources/Teaching/Chem121/Lectures/QuantumTheoryofLight/wave.gif**Waves-3-4**Label the wavelength, crest/peak, trough:The wavelength **(*λ*)** is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.Frequency **(*ν*)**is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.The longer the wavelength, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ the frequency. |
| **Electromagnetic Radiation-5**All \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ travels at the same \_\_\_\_\_\_\_\_\_\_\_\_\_.The speed of light is: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Equation for speed of light: |  |
| **The Nature of Energy—Quanta-6-7**What cannot be explained by the wave nature of light? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ explained it by assuming that energy comes in \_\_\_\_\_\_\_\_\_\_\_\_\_\_ called \_\_\_\_\_\_\_\_\_\_\_ (singular:\_\_\_\_\_\_\_\_\_\_) |
| **The Photoelectric Effect-8**The photoelectric effect was explained by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ using \_\_\_\_\_\_\_\_\_\_\_\_\_\_.Each metal has a different \_\_\_\_\_\_\_\_\_\_\_\_\_ at which it \_\_\_\_\_\_\_\_\_\_\_\_\_ electrons. At a \_\_\_\_\_\_\_\_\_\_\_\_ energy, electrons are not emitted.What did Einstein conclude?E= *h* is \_\_\_\_\_\_\_\_\_\_\_\_\_ constant, and equals \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. |
| **Continuous vs. Line Spectra-10**What is NOT observed for atoms and molecules? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Where does one see this? \_\_\_\_\_\_\_\_\_\_\_\_\_\_Each element has a unique \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Which is made up of \_\_\_\_\_\_\_\_\_\_\_\_ wavelengths. |  Label Each: |
| **The Hydrogen Spectrum-11**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ( ) discovered a formula relating the \_\_\_\_\_\_\_\_\_\_\_\_\_ to integers.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ advanced this formula.Formula: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ explained why this mathematical relationship works. |
| **The Bohr Model-12**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ adopted Planck’s assumption and explained these phenomena: | **The Bohr Model-13**1.
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| **The Bohr Model-14**What is the equation for calculating the energy absorbed or emitted from the process of electron promotion or demotion?:Rh=ni and nf are the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | **Limitations of the Bohr Model-15**What are three limitations of the Bohr model?1.
2.
3.
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| **Important Ideas from the Bohr Model-16**What parts were incorporated into the current atomic model?1.
2.
 | **Energies of Orbitals—Hydrogen-32**For a one-electron \_\_\_\_\_\_\_\_\_\_\_\_\_\_ atom, orbitals on the same energy level have the same \_\_\_\_\_\_\_\_\_\_\_. These are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_ orbitals. |
| **Energies of Orbitals-Many-electron Atoms-33**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ between electrons increases as the number of \_\_\_\_\_\_\_\_\_\_\_\_ increases. All orbitals on the same energy level are degenerate in multi-electron atoms. T or F ?Orbital sets in the same \_\_\_\_\_\_\_\_\_\_\_\_\_\_ are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.What happens to energy levels? | **Spin Quantum Number, *ms*-34**In 1920, what was discovered about two electrons in the same orbital?:The \_\_\_\_\_\_\_\_\_ describes its \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, which affects its \_\_\_\_\_\_\_\_\_\_\_\_\_\_.This led to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.What are the vales of the spin quantum number: |
| **Pauli Exclusion Principle-35**1. No two electrons in the same atom can have \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. No two electrons in the same atom can have identical \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
3. Every electron in an atom must differ by at least \_\_\_\_\_\_\_\_ of the four quantum #’s.
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| **Electron Configurations-36-38**Electron configuration is the way \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The most stable organization is the lowest possible energy, called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.Each component consists of :1. A number denoting \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. A letter denoting the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
3. A superscript denoting \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Draw a line to each corresponding part of the picture from its correct definition. |
| **Orbital Diagrams-39**What does each box in the diagram represent? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Half arrows represent? \_\_\_\_\_\_\_\_\_\_\_\_\_\_The direction of the arrow represents what? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **Hund’s Rule-40**“For degenerate orbitals, the lowest energy is attained when the number of electrons with the same spin is maximized.”What does this mean? |
| **Condensed Electron Configurations-41**Valence electrons:Core electrons:What are the main components of writing shortened electron configurations?Write the example for Sodium:  | **Periodic Table-42**Orbitals are filled \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.Different blocks correspond to different \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .State the location:S orbital:P orbital:D orbital:F orbital: |
| **Some Anomalies-43**When do some irregularities occur? |
| **Chromium as an Anomaly-44**Actual configuration for Chromium:Expected configuration:Why does this occur?Where does this occur? |  |

**SUMMARY**

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