**Name: Period: Seat#:**

**S-37, 38, 39, 40, 41, 42**

**Directions:** Try these problems. If you can DO them, check the box (🗹).
If you CANNOT do them, write some notes TO YOURSELF about what you need to study to succeed at these problems.

|  |
| --- |
| Formulas and Constants |
| c = υ | E = hυ | E =  | En =  |  =  |  |
| c = 2.998 x 108 m/s h = 6.626 x 10-34 J·s Rhc = 2.18 x 10-18 J R = 1.0974 x 107 m-1 |

**S37 – Quick Check #1**

🞎 **Electromagnetic Spectrum**

 List all electromagnetic radiations from low energy to high.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | **R O Y G B V*****Visible range*** |  |  |  |

 We can see electromagnetic radiation with wavelengths between 400 nm and 700 nm.

 Is 400 nm red light or violet light? \_\_\_\_\_\_\_\_\_\_\_\_\_\_ Justify your answer.

 Consider this graphic from the **Online Tutorial: Electromagnetic Radiation**. The scale is in nm.



 What is the wavelength (λ) of this wave? \_\_\_\_\_\_\_nm

 Would you be able to see this wave? \_\_\_\_\_\_\_\_

 What is this wavelength in meters? \_\_\_\_\_\_\_\_\_\_\_m

🞎 **Calculations**

Yellow light from a sodium vapor light has a wavelength of 589 nm.
Calculate the frequency of this color of yellow light in Hz.

 A radio station (KPCC) has a frequency of 89.3 MHz (megahertz).

 How many Hz are in a MHz? \_\_\_\_\_\_\_\_\_

 What is the frequency of this radio wave in s-1? \_\_\_\_\_\_\_\_

 What is the energy of the radio waves being emitted (in Joules)?

**S38 – Quick Check #2**

🞎 **Calculations**

Calculate the energy of level n=3 of the hydrogen atom.

 Calculate the energy and wavelength of light emitted when an electron drops from level n=5 to n=2.
What color will this light be? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 A runner with a mass of 50.0 kg moves at a velocity of 2.00 m/s.
Calculate her deBroglie wavelength as she moves?

**S39 – Quick Check #3**

* **Orbital Diagrams**

How many electrons does neutral Vanadium have? \_\_\_\_\_ Correctly fill in the orbital diagram below.



How many valence electrons does Vanadium have? \_\_\_\_\_\_

Put a box around them.

 Which electrons above are *furthest away* from the nucleus? \_\_\_\_\_\_\_\_

 Write the Long Form electron configuration for Vanadium.

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Write the Short Form (noble gas) electron configuration for Vanadium.

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Which electrons in Vanadium have the *greatest amount of energy*? \_\_\_\_\_\_\_\_

 Would Vanadium be considered to be an s-block, p-block, d-block or f-block element? \_\_\_\_\_\_\_

 Correctly fill in one of the diagrams below for Manganese ion (Mn2+), which has \_\_\_\_\_ electrons.

 Correctly fill in one of the diagrams below for Molybdenum, Mo, which has \_\_\_\_\_ electrons.





* **Periodicity**

Looking at the periodic table, shade in a “period” red. Shade in a “group” blue.
 

What is the difference between a “group” and a “family”? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**S40 – Quick Check #4**

* **Paramagnatism**

 These elements are in Period \_\_\_. List them from least to most paramagnetic: \_\_\_\_<\_\_\_\_<\_\_\_

|  |  |  |
| --- | --- | --- |
| **Be** | **C** | **F** |
|  |  |  |

**S41 – Quick Check #5**

* **Periodic Trends (Periodicity)**

Write the equation for the first ionization energy of Be. What is the phase of Be? \_\_\_\_ (g)/(l)/(s)

 Write the equation for the first ionization energy of F.

|  |  |
| --- | --- |
| 14Si28.09 | 15P30.97 |
| 32Ge72.59 | 33As74.92 |

Looking at the four elements to the right, which of these elements.

Which would have the ***largest*** atomic size?

What is your ***explanation*** for your answer above? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 If beryllium turned into an ion, would the size of that ion be bigger or smaller than neutral Be? Explain. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**S42 – Quick Check #6**

* **Mixed Problems**

 Write the ground state electron configuration (short form or long form) for an arsenic atom.

 Is an isolated arsenic atom in the ground state paramagnetic or diamagnetic?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Justify your answer.

 What **ion charge** would As be expected to form? \_\_\_\_\_\_

 The ion would be named \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Write the electron configuration for the ion.