**Homework #2: Chemistry 1013 Fall 2017**

 **Due Friday 15 September in class 25 pts**

**Your name:\_\_\_\_\_\_\_\_\_\_answers\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 1 pt**

**2.1. Problem 2.2 p. 68 of text (1 pt)**

 **Energy is proportional to frequency**

**2.2. Put the following wavelengths in order from lowest to highest energy: (1 pt)**

 **670 nm 450 nm 540 nm 300 nm**

**\_\_\_\_\_\_\_670\_nm\_\_\_\_\_\_<\_\_\_\_540\_\_nm\_\_\_\_\_< \_\_\_450\_\_\_nm\_\_\_\_\_\_< \_\_\_\_300\_\_nm\_\_\_\_\_\_\_**

**Energy increasing-------------------------🡪**

**2.3. Problem 2.8 pg. 68 of text ( 1 pt)**

 **\_\_\_550 nm\_\_\_\_\_<\_\_450 nm\_\_\_\_\_\_\_<\_\_350 nm\_\_\_\_\_\_**

**Frequency increasing ---🡪**

**2.4. Use the diagram on page 39 of your text to decide whether the following transitions in H**

 **produce visible light emission lines. Assume the visible spectrum lies between the red line at**

 **the top and purple line at the bottom of the emission spectrum shown. (circle choices below)**

 **transition U-circle your pick**

1. **n=6🡪 n=1 visible not visible**
2. **n=5🡪 n=4 visible not visible 3 pts**
3. **n=6🡪 n=3 visible not visible**

 **2.5 For each choice in 2.4. for which you circled `not visible’, predict whether the observed**

 **emission line is in the infrared (IR) or in the uv ranges, beyond the visible. (put an x or check**

 **mark beside the `not visible’ transition(s) under IR or UV. (2 pts)**

 **n🡪n’ Transition IR UV**

**n=6🡪 n=1 X**

**n=5🡪 n=4 X**

**2.6. Problem 2.50 pg. 70 of text (4 pts)**

1. **s 2 c) d 10**
2. **p 6 d) f 14**

**2.7 Write the complete and abbreviated ground electronic state configuration for: (2 pt each)**

*Complete, ground state electronic configuration Abbreviated ground state configuration*

1. **S 1s22s22p63s23p4 [Ne] 3s23p4**
2. **Li 1s22s1 [He]2s1**
3. **Ca 1s22s22p63s23p64s2 [Ar]4s2**

**2.8 Draw the Lewis dot structures for: (3 pts)**

 **..**

1. **O :O:**
2. **Ca Ca:**

 **.**

1. **P :P:**

**2.9 Electron counting (3 pts)**

1. **How many valence electrons does Cl have ? \_\_7\_\_\_\_\_\_**
2. **How many valence electrons are in the element with the following complete, ground state**

**electronic configuration ? 1s22s22p63s23p4 \_\_\_\_\_\_6\_\_\_\_\_ valence count**

1. **How many valence electrons does Ga have ? \_\_\_3\_\_\_\_**