**CHE1031 Lecture 6 Quiz**

Please use any and all resources available to you for this take-home quiz. However, remember that you will be working alone on the exam to follow.

Please show ALL work needed to answer the question.

**6.1: Atomic properties from electron configuration**

1. The valence shell of element X contains 2 electrons in a 5s subshell. Below that shell, element X has a partially filled 4d subshell. What type of element is X?

1. main group element
2. chalcogen
3. halogen
4. transition metal
5. alkalai metal

2. All of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ have a valence electron configuration of ns2.

1. noble gases
2. halogens
3. chalcogens
4. alkalai metals
5. alkaline earth metals

**6.2: The true nature of the atom**

3. In Einstein explanation of the photoelectric effect, both light and matter are quantized. What is the quantized unit of light called? The quantized unit of matter? How are these two quantized units related?

**6.3: Developing a new physics for atoms**

4. As the wavelength of light increases the frequency of light \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**6.4: Bohr’s planetary model**

5. Bohr’s model of the atom is explained in three postulates. Of those three postulates, which are still valid in light of the quantum mechanical model that includes the findings of de Broglie, Heisenberg and Schrödinger? *[Write them out, don’t use numbers to identify the postulates.]*

**6.5: Applying quantum mechanics to the atom**

6. According to the Heisenberg Uncertainty Principle, it is impossible to know precisely both the position and the \_\_\_\_\_\_\_\_\_ of an electron.

a. mass

b. color

c. momentum

d. shape

e. charge

7. Why do orbitals have nodes, areas with zero probability of containing electrons?

**6.6: Orbital filling & electron configuration**

8. The \_\_\_\_\_\_\_\_\_\_ subshell contains only one orbital.

a. 5d

b. 6f

c. 4s

d. 3d

e. 1 p

9. Which carbon atom is “excited”?

a. 1s22s22p13s1

b. 1s22s22p3

c. 1s22s22p1

d. 1s22s23s2

e. 1s22s22p2

10. Which two atoms have the same ground-state electron configuration?

a. Pd and Pt

b. Cu and Ag

c. Fe and Cu

d. Cl and Ar

e. No two elements can have the same ground-state electron configuration.