Electron Arrangement and Mole Review KEY **Name:_____**

Match the letter with the correct answer. Please mark all answers to the left of the question number.

- **a.** It is impossible to pinpoint both the speed and location of an electron at any given time
- **b.** It is impossible for any two electrons to end in the same four quantum numbers
- **c.** We can't pinpoint the EXACT location of an electron, but we can identify a GENERAL location by using quantum numbers
- **d.** Identifies the size of the electron cloud
- **e.** Identifies the orientation of the sublevel; sometimes called orbital
- **f.** Identifies the direction of the spin of the electron
- **g.** Identifies the shape of the electron cloud

_____ 1. C Schrodinger

_____ 2. D Principle Quantum Number

_____ 3. F Spin Quantum Number

_____ 4. A Heisenberg Uncertainty Principle

_____ 5. E Magnetic Quantum Number (orbitals)

_____ 6. G Subsidiary Quantum Number (sublevel)

_____ 7. B Pauli Exclusion Principle

Fill in the blank with the correct answer.

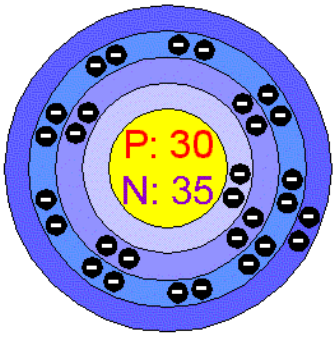
1. Only _2_____ electrons can fit in an orbital.
2. The d sublevel is capable of holding __10___ electrons.
3. The p sublevel is shaped like a _dumbbell – 2 lobes_____.
4. There are __4_____ sublevels in the fourth energy level.
5. Electrons can spin either _____up_____ or ____down_____
6. _____Valence_____ electrons are the electrons on the outermost energy level.

7. The p sublevel contains _3_____ orbital(s).

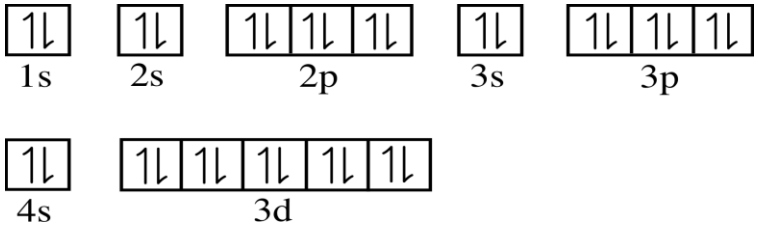
Complete the following questions for the element zinc.

8. Write the complete/full electron configuration.____$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10}$___

9. Draw the Bohr Diagram.



10. Draw the orbital diagram.



11. Draw the noble gas notation

[Ar] $4s^2 3d^{10}$

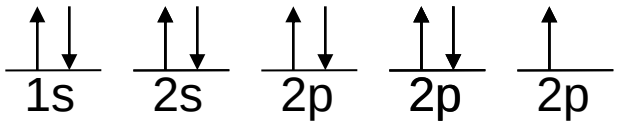
12. Write the electron dot diagram._____

.
Zn ·

Identify the element from the following electron configurations

13. $1s^2 2s^2 2p^6 3s^2 3p^4$ __Sulfur_____

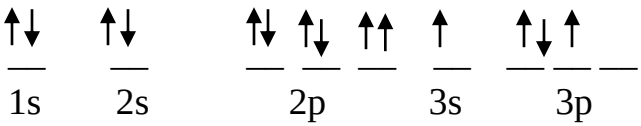
14. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^1$ ____Rubidium_____

15. 

Flourine

Determine how each of the following electron configurations is incorrect and draw/write the correct configuration

16. Circle the three errors in the orbital filling diagram below. (Assume the number of electrons is correct). Draw the corrected diagram.



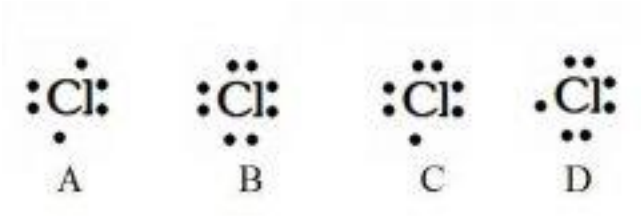
Correct diagram:

Errors: 2p – last 2 electrons should be up/down
3s – is not full and moved on to 3p
3p – placed one down in the first orbital before placing one in the 3rd orbital

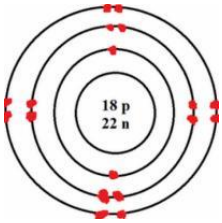
17. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 4d^{10} 4p^5$ ___4d is not after 4s, 3d is_____

18. $1s^2 2s^2 2p^6 3s^3 3d^5$ ___3 electrons can't go into 3s, and 3d is not after 3s, 3p is after it___

19. Identify the correct Dot notation C



20. Identify which element is represented by the picture: Argon



Mole Problems

21. How many moles are 12.04×10^{23} atoms of phosphorous?

$$\frac{12.04 \times 10^{23} \text{ atoms P}}{1} \times \frac{1 \text{ mole P}}{6.02 \times 10^{23} \text{ atoms P}} = 2.000 \text{ mole P}$$

22. How many atoms are in 0.50 moles of zinc?

$$\frac{0.50 \text{ moles Zn}}{1} \times \frac{6.02 \times 10^{23} \text{ atoms Zn}}{1 \text{ mole Zn}} = 3.0 \times 10^{23} \text{ atoms Zn}$$

23. How many atoms are in 3 moles of helium?

$$\frac{3 \text{ moles He}}{1} \times \frac{6.02 \times 10^{23} \text{ atoms He}}{1 \text{ mole He}} = 18.1 \times 10^{23} \text{ atoms He}$$

24. Find the number of moles of nitrogen in 28 g of nitrogen.

$$\frac{28 \text{ g N}}{1} \times \frac{1 \text{ mole N}}{14 \text{ g N}} = 2.0 \text{ mole N}$$

25. Find the grams in 3 moles of hydrogen.

$$\frac{3.0 \text{ mole H}}{1} \times \frac{1 \text{ g H}}{1 \text{ mole H}} = 3.0 \text{ g H}$$

26. Find the mass in 2.0 moles of lithium.

$$\frac{2.0 \text{ mole Li}}{1} \times \frac{7 \text{ g Li}}{1 \text{ mole Li}} = 14 \text{ g Li}$$

27. Find the mass of 18.06×10^{23} atoms of helium.

$$\frac{18.06 \times 10^{23} \text{ atoms He}}{1} \times \frac{1 \text{ mole He}}{6.02 \times 10^{23} \text{ atoms He}} \times \frac{4 \text{ g He}}{1 \text{ mole He}} = 12.00 \text{ g He}$$

28. Find the mass of 1.5 moles of carbon dioxide.

$$\frac{1.5 \text{ moles } CO_2}{1} \times \frac{44 \text{ g } CO_2}{1 \text{ mole } CO_2} = 66 \text{ g } CO_2$$