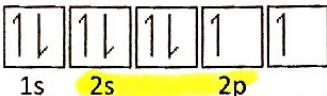
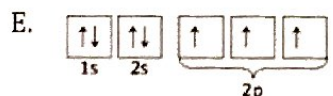
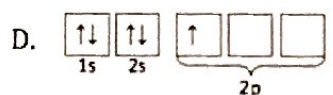
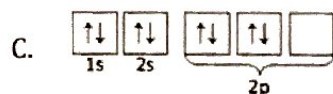
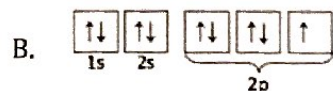
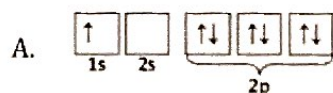


Part II: Identify the atoms by examining their arrangement of electrons.

Orbital Diagram or Electron Configuration	# of Total Electrons	# of Valence Electrons	Element
 1s 2s 2p	8	6	oxygen
[Ne] 3s ² 3p ²	14	4	silicon
1s ² 2s ² 2p ⁶ 3s ² 3p ⁶ 4s ² 3d ⁴	24	2	chromium
[Ar] 4s ² 3d ¹⁰ 4p ⁵	35	7	bronine
1s ² 2s ² 2p ⁶ 3s ² 3p ⁶ 4s ² 3d ¹⁰ 4p ⁶ 5s ² 4d ¹⁰ 5p ⁶ 6s ² 4f ¹⁴ 5d ¹⁰ 6p ³	83	5	bismuth

Part III: Matching!

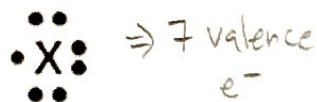


B 1. This orbital notation shows an element with nine total electrons.

D 2. This orbital notation shows an element with three valence electrons.

D 3. This orbital notation shows an element with five total electrons.

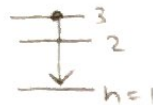
B 4. This orbital notation shows an element with the Lewis dot structure shown below.



Part IV: Multiple Choice

1. When the electron in an atom of hydrogen transitions from $n = 3$ to $n = 1$, which of the following are true?

- I. Energy is emitted.
- II. Energy is absorbed.
- III. The electron is now in its ground state.



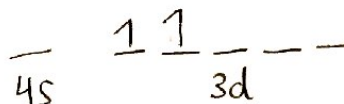
- a. I only b. II only c. I and III only d. II and III only

2. What is the correct noble gas notation for the cation found within the compound AlBr_3 ? $\Rightarrow \text{Al}^{3+}$

- a. [Ne]3s²3p¹
- b. [He]2s²2p⁶
- c. [Ar]4s²4p⁶
- d. [Ar]3s²3p¹

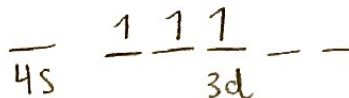
3. Which of the following species has exactly two unpaired electrons in the ground state?

- a. Mg^{2+} **(b.)** Ti^{2+} c. Cr^{2+} d. Zn^{2+}



4. The ground state configuration of the Cr^{3+} ion is characterized by which of the following statements?

- I. Isoelectronic with a noble gas.
 II. An empty 4s orbital.
 III. Partially filled 3d orbitals.
 IV. The presence of unpaired electrons.



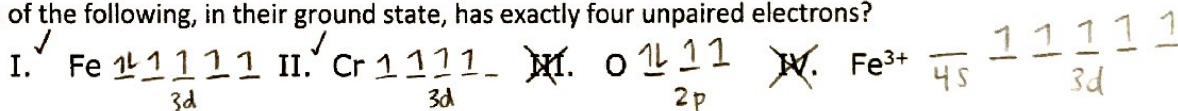
- a. II only b. II and III only c. II and IV only **(d.)** II, III and IV only

5. What is the correct electron configuration for the negatively charged anion found within the compound magnesium oxide?

- a. $1s^2 2s^2 2p^4$ c. $1s^2 2s^2 2p^6 3s^2$
(b.) $1s^2 2s^2 2p^6$ d. $1s^2 2s^2 2p^6 3s^2 3p^4$



6. Which of the following, in their ground state, has exactly four unpaired electrons?



- a. I only b. III only c. II and IV only **(d.)** I and II only

7. Many of the unique properties of tin are due to the electron arrangement within the atom. What is the ground state electron configuration of tin?

- a. $[Kr] 5s^2 5p^2$ c. $[Kr] 5s^2 5d^{10} 5p^2$
(b.) $[Kr] 5s^2 4d^{10} 5p^2$ d. $[Kr] 5s^2 4d^{10} 4f^{14} 5p^2$

8. Which of the following species has exactly three unpaired electrons in the ground state?

- a. Fe^{2+} b. P^{3-} c. Al^{3+} **(d.)** V^{2+}

9. All of the following pairs are isoelectronic EXCEPT:

- a. Cl^- and S^{2-} c. Ar and K^+
(b.) Rb^+ and Xe d. Na^+ and N^{3-}