Isoelectronic atoms and ions: the "iso" in "isoelectronic" means "same", so isoelectronic atoms and ions have the same number of electrons.

Example:

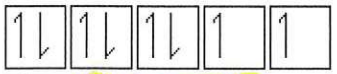
- Write the electron configuration for S^{2-}: $1s^2 2s^2 2p^6 3s^2 3p^6$
- What noble gas is isoelectronic to S^{2-}? Ar
- List other atoms or ions that are isoelectronic to the S^{2-} ion: P^{3-}, Cl^-, K^+, Ca^{2+}

Yum, atoms! Let's practice.

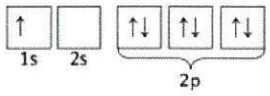
Part I: The counting of electrons.

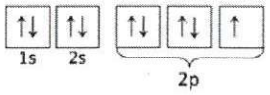
Si	Orbital Notation: ↿⇂ (1s) ↿⇂ (2s) ↿⇂ ↿⇂ ↿⇂ (2p) ↿⇂ (3s) ↿ ↿ _ (3p)	
	Electron Configuration: $1s^2 2s^2 2p^6 3s^2 3p^2$	Noble Gas Configuration: $[Ne]\,3s^2 3p^2$
As	Orbital Notation: ↿⇂ (1s) ↿⇂ (2s) ↿⇂ ↿⇂ ↿⇂ (2p) ↿⇂ (3s) ↿⇂ ↿⇂ ↿⇂ (3p) ↿⇂ (4s) ↿⇂ ↿⇂ ↿⇂ ↿⇂ ↿⇂ (3d) ↿ ↿ ↿ (4p)	
	Electron Configuration: $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^3$	Noble Gas Configuration: $[Ar]\,4s^2 3d^{10} 4p^3$
Cl^-	Orbital Notation: ↿⇂ (1s) ↿⇂ (2s) ↿⇂ ↿⇂ ↿⇂ (2p) ↿⇂ (3s) ↿⇂ ↿⇂ ↿⇂ (3p)	
	Electron Configuration: $1s^2 2s^2 2p^6 3s^2 3p^6$	Noble Gas Configuration: $[Ne]\,3s^2 3p^6$
Fe^{3+}	Orbital Notation: ↿⇂ (1s) ↿⇂ (2s) ↿⇂ ↿⇂ ↿⇂ (2p) ↿⇂ (3s) ↿⇂ ↿⇂ ↿⇂ (3p) _ (4s) ↿ ↿ ↿ ↿ ↿ (3d)	
	Electron Configuration: $1s^2 2s^2 2p^6 3s^2 3p^6 4s^{\emptyset} 3d^5$ (or leave out!)	Noble Gas Configuration: $[Ar]\,3d^5$

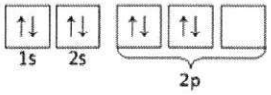
Part II: Identify the atoms by examining their arrangement of electrons.

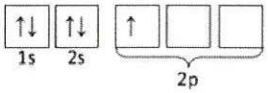
Orbital Diagram or Electron Configuration	# of Total Electrons	# of Valence Electrons	Element
	8	6	oxygen
[Ne] $3s^2 3p^2$	14	4	silicon
$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^4$	24	2	chromium
[Ar] $4s^2 3d^{10} 4p^5$	35	7	bromine
$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^6 6s^2 4f^{14} 5d^{10}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

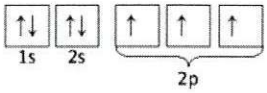
Part III: Matching!

A. 

B. 

C. 

D. 

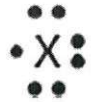
E. 

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.

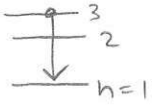
B 4. This orbital notation shows an element with the Lewis dot structure **shown below**.

 ⇒ 7 valence e^-

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 $AlBr_3$? ⇒ Al^{3+}

a. [Ne]$3s^2 3p^1$ c. [Ar]$4s^2 4p^6$
(b.) [He]$2s^2 2p^6$ d. [Ar]$3s^2 3p^1$