Electron Configurations

Name _____

Date _____ Per _____

PART A – ORBITAL NOTATION

Use the patterns within the periodic table to write the orbital notation for the following atoms.

	Symbol	# e^-	Orbital Notation
1.	Mg		↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ $1s^2$ $2s^2$ $2p^6$ $3s^2$
2.	Ar		↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ $1s^2$ $2s^2$ $2p^6$ $3s^2$ $3p^6$
3.	V		↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑ ↑ ↑ __ __ $1s^2$ $2s^2$ $2p^6$ $3s^2$ $3p^6$ $4s^2$ $3d^3$
4.	Ge		↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑ ↑ __ $1s^2$ $2s^2$ $2p^6$ $3s^2$ $3p^6$ $4s^2$ $3d^{10}$ $4p^2$
5.	Kr		↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ $1s^2$ $2s^2$ $2p^6$ $3s^2$ $3p^6$ $4s^2$ $3d^{10}$ $4p^6$
6.	Ca		↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ $1s^2$ $2s^2$ $2p^6$ $3s^2$ $3p^6$ $4s^2$

PART B – SHORTHAND ELECTRON CONFIGURATION

Use the patterns within the periodic table to write the longhand electron configuration notation for the following elements.

	Symbol	# e^-	Longhand Electron Configuration Notation
7.	S		$1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^4$
8.	Pb		$1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 3d^{10}\ 4p^6\ 5s^2\ 4d^{10}\ 5p^6\ 6s^2\ 4f^{14}\ 5d^{10}\ 6p^2$
9.	F		$1s^2\ 2s^2\ 2p^5$
10	U		$1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 3d^{10}4p^6\ 5s^2\ 4d^{10}\ 5p^6\ 6s^2\ 4f^{14}\ 5d^{10}\ 6p^6 7s^2\ 6d^1 5f^3$
11	Ag		$1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 3d^{10}\ 4p^6\ 5s^1\ 4d^{10}$

PART B – RULES OF ELECTRON CONFIGURATIONS

Which of the following "rules" is being violated in each electron configuration below? Explain your answer for each. ***Hund's Rule, Pauli Exclusion Principle, Aufbau Principle***

12 ↑↓ ↑↓ ↑↓ __ __

1s 2s 2p

Hunds Rule – does not have a maximum number of unpaired electrons

13 ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ___ ↑↓ ↑_ ↑_

1s 2s 2p 3s 3p

Aufbau Principle – electrons skip sublevels (not a ground state configuration)

14 ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑↑ ↑↓ ↑↓ ↑_

1s 2s 2p 3s 3p

Pauli Exclusion Principle – 3s electrons are not paired.

	↑↓	↑↓	↑↓	↑↓	↑↓	↑↓	↑↓	↑↓	↑↓	↑↓	↑↓	↑↓	↑↓	↑↓
15	1s	2s	2p			3s	3p			3d				

Aufbau Principle – electrons skip sublevels (4s) (not a ground state configuration)