Chemistry 11

Atomic Theory Practice Test

Name:
Date:
Block:

_____ 1. If two atoms of Ca have a different number of electrons, which property (or properties) would be significantly different?

a) Mass
b) Charge
c) Both A & B
d) Neither A nor B

_____ 2. If two atoms of Na have a different number of neutrons which property (or properties) would be significantly different?

a) Mass
b) Charge
c) Both A & B
d) Neither A nor B

_____ 3. Which of the following ions will NOT have the same electron configuration as Ne?

a) Na^{+}
b) Al^{3+}
c) Ar
d) O^{2-}

_____ 4. Which of the following easily loses one outermost electron?

a) Potassium
b) Beryllium
c) Iron
d) Bromine

_____ 5. Which of the following would have the largest atomic radius?

a) Seaborgium
b) Einsteinium
c) Indium
d) Thallium

_____ 6. Which trend in the halogen family occurs with increasing atomic number?

a) Ionization energies decrease
b) Atomic radii decrease
c) Electronegativities increase
d) Tendency to gain electrons increases

_____ 7. Which of the following species would have 2 valence electrons?

a) Boron
b) Fluorine
c) Oxygen ion
d) Vanadium (III) ion

_____ 8. What sub-shell is especially stable when it is half-filled?

a) s-subshell
b) p-subshell
c) d-subshell
d) f-subshell

_____ 9. A molecule has the VSEPR shape of AX_4E_2. What shape would it have?

a) tetrahedral
b) T-shaped
c) trigonal planar
d) square planar

_____ 10. A molecule is T-shaped. What VSEPR notation would it have?

a) AX_4E
b) AX_5
c) AX_3E_2
d) AX_2E_3

11. The following mixtures of isotopes are found in nature. Calculate the average atomic mass of a sample given that ^{107}Ag = 51.8% and ^{109}Ag = 48.2%. Round your answer to one decimal place. Include units.

12. Complete the following table:

Element Name	Element Symbol	Atomic Number	Atomic Mass	# of protons	# of neutrons	# of electrons
	Ti^{4+}					
		35				36
	Au					

13. Fill in the following table by writing the ***full* electron configuration** for:

Element	*Full Electron Configuration*
N	
Mo	
Ge^{+2}	

14. Show the core notation orbital diagram and determine the number of valence electrons.

Element	*Core Notation Orbital Diagram*	# Valence Electrons
Ru^{3+}		
S		
Ti^{2+}		

15. Identify the **atoms** that has the following electron configuration:

a) $1s^2 2s^2 2p^2$ _____ b) $1s^2 2s^2 2p^4$ _____ c) $1s^2 2s^2 2p^6 3s^2 3p^2$ _____

d) $[Ne] 3s^2 3p^4$ _____ e) $[Ar] 4s^1$ _____ f) $[Ar] 3d^{10}$ _____

16. Consider two neutral atoms: Al and Cl
    a) Which atom has a larger atomic radius?

    b) Which atom has the larger ionization energy?

    c) Which atom has a greater electron affinity?

    d) How many valence electrons does each atom have?

17. Draw the **Lewis structures** (electron dot diagrams) for the following. *Include the VSEPR names as well.*

Boron trifluoride	Oxygen gas (O_2)
VSEPR name:	VSEPR name:

SI_6	BrH_3
VSEPR name:	VSEPR name:

18. Draw the **VSEPR shapes** for the following. *Include the VSEPR names as well.*

CO_2	$BrCl_4^-$
VSEPR name:	VSEPR name:

19. Determine the type of bond that forms between the following atoms:

    a) O and O

    b) P and O

    c) $CaBr_2$

    d) NaF