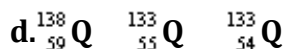
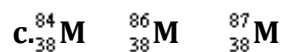
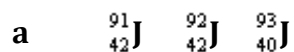


1) What is an isotope?

2) Describe how do you calculate the atomic mass of an element when given the percent abundance of each isotope (see page 117).

3) Sample problems to complete about isotopes

➤ Which of the following sets of symbols represents isotopes of the same element?



➤ What does the number 84 in the name krypton-84 represent?

➤ Which of the following isotopes has the same number of neutrons as phosphorus-31?



➤ Chlorine has two naturally occurring isotopes, Cl-35 and Cl-37. The atomic mass of chlorine is 35.45. Which of these two isotopes of chlorine is more abundant?

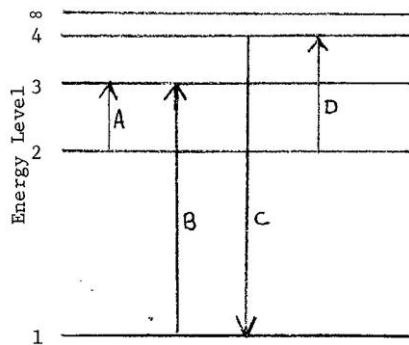
➤ Consider an element Z that has two naturally occurring isotopes with the following percent abundances: the isotope with a mass number of 19.0 is 55 % abundant; the isotope with a mass number 21 of is 45% abundant. What is the average atomic mass for element Z?

4) What radioisotopes are listed in your book that are used in medicine? What characteristics should medical radioisotopes have?(chap 25)

5) How are elements arranged on the periodic table? \_\_\_\_\_ and All atoms of the same element have the same number of \_\_\_\_\_

6) What is a valence electron? Why are they important in chemistry?

7) Review atomic spectra (Chap 5)



a) Which line absorbs the most energy

b) Which line shows an electron returning to ground state and giving off light?

c) Bright line spectra/How do you identify an unknown element/What are excited state, energy transitions and ground state (go to page 140-143)

8) Review electron configuration and how an orbital is filled in. page (go to pages 133-136).

a) Aufbau is defined as .

b) Pauli - is defined as

c) Hund's is defined as

10) Write electron configurations for the following atom and ion of that atom.

a) phosphorus atom

b) phosphide ion,  $P^{-3}$

11) A neutral atom has an electron configuration of  $1s^2 2s^2 2p^1$ . Determine the identity of the atom

12) A neutral atom has excited electron configuration of  $1s^2 2s^2 2p^5 3s^2$ . Determine the identity of the atom

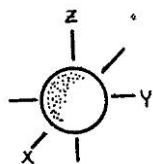
13) What is the electron configuration of potassium (K)?

— — ——— — ——— — ——— —  
1s 2s 2p 3s 3p 4s 3d

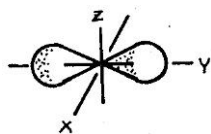
14) Which of the following “rules” is being violated in each electron configuration below? Explain your answer for each. *Hund’s Rule, Pauli Exclusion Principle, Aufbau Principle*

A	$\uparrow\downarrow$	$\uparrow\downarrow$	$\uparrow\downarrow$	—	—										
	1s	2s	2p												
b	$\uparrow\downarrow$	$\uparrow\downarrow$	$\uparrow\downarrow$	$\uparrow\downarrow$	$\uparrow\downarrow$	—	$\uparrow\downarrow$	$\uparrow$	$\uparrow$						
	1s	2s	2p	3s	3p										
c	$\uparrow\downarrow$	$\uparrow\downarrow$	$\uparrow\downarrow$	$\uparrow\downarrow$	$\uparrow\downarrow$	$\uparrow\uparrow$	$\uparrow\downarrow$	$\uparrow\downarrow$	$\uparrow$						
	1s	2s	2p	3s	3p										
d	$\uparrow\downarrow$	$\uparrow\downarrow$	$\uparrow\downarrow$	$\uparrow\downarrow$	$\uparrow\downarrow$	$\uparrow\downarrow$	$\uparrow\downarrow$	$\uparrow\downarrow$	$\uparrow\downarrow$	—	$\uparrow\downarrow$	$\uparrow\downarrow$	$\uparrow\downarrow$	$\uparrow\downarrow$	$\uparrow\downarrow$
	1s	2s	2p	3s	3p	4s	3d								

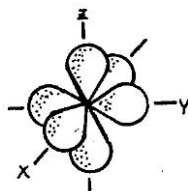
\*15) Also review orbital shapes of both “s” and “p” orbitals



what orbital has this shape?



What orbital has this shape?



How many and what kind of orbitals does this shape have?

**16) What types of orbital are in each of the first four principal energy levels and what is the maximum number of electrons each principal energy level can contain.**

**1st principal energy level- -**

**2 nd principal energy level -**

**3 rd principal energy level .**

**4 th principal energy level -**

**17) What is an alkali metal, alkali earth metal, halogen, noble gas and how many valence electrons does each group have .(go to pages 161-168)**

**18) Why are alkali metals so reactive?**

**19) Define the following periodic trends? (go to pages 170-178) for**

**a) atomic radii,**

**b) ionization energy and**

**c) electronegativity.**

**20) How does and Why does electronegativity decrease within a family as the atomic number increases? .**

**a) What is the most electronegative element?**

**b) What is the least electronegative element?**

**21) Going from Cl to Ar what happens to the atomic size?**

**22) What is the trend showing the increase in ionization energy on the periodic table**

EVEN More Practice

Fill in the blanks (**Chapter 6.1 – 6.3**):

In the periodic table, each row is called a \_\_\_\_\_ .

Each column in the periodic table is called a \_\_\_\_\_ .

The elements in each period have the same number of \_\_\_\_\_ .

Each of the elements in the same group has the same number of \_\_\_\_\_ in their outer shells. The electrons in the outer shell are called \_\_\_\_\_ electrons.

The group number equals the number of \_\_\_\_\_ electrons.

Word Bank: cations, borrow, lend, ion, sign, anions, anions, oxidation, positive, negative, inert (non-reactive), atom, shell, 8, plus, minus, gain, lose, positive, cations, negative, anions.

Fill in the blanks (**Chapter 7.1 – 7.3**):

When an atom lends or borrows electrons it becomes an \_\_\_\_\_ .

An ionic bond forms between a \_\_\_\_\_ ion with a positive charge and a \_\_\_\_\_ with a negative charge. An atom with a plus sign \_\_\_\_\_ electrons. An atom with a minus sign \_\_\_\_\_ electrons.

The number of electrons an atom can lend or borrow is called its \_\_\_\_\_ (or valence). An oxidation is a number with a \_\_\_\_\_ or \_\_\_\_\_ in front of it.

Na 1+ : A plus sign meant that the atom \_\_\_\_\_ 1 electron and is called \_\_\_\_\_

O 2-: A minus sign means that the atom \_\_\_\_\_ 2 electrons and is called \_\_\_\_\_

A \_\_\_\_\_ will borrow enough electrons to complete its \_\_\_\_\_. A complete outer shell usually has \_\_\_\_\_ electrons.

Metals lend their valence electrons and become \_\_\_\_\_ ions or \_\_\_\_\_

Nonmetals borrow valence electrons and become \_\_\_\_\_ ions or \_\_\_\_\_

Noble gases \_\_\_\_\_ and do not have an oxidation number.

Complete the following table(Chapter 6.1 – 6.3):

Group #	Family Name	#Valence Electrons	Charge on the ion
1			
2			
3			
4			
5			
6			
7			
8			

What are elements on the left side of the periodic table called (**Periodic Table**)?

What are elements on the right side of the periodic table called (**Periodic Table**)?

Label the following as a metal, nonmetals or a metalloid: Silicon (Si), Argon (Ar), Calcium (Ca), Copper (Cu)

**(page 161 – 178 in your book)**

Elements in the SAME GROUP have (circle correct) similar properties/different properties because of (circle correct) valence electrons/inner electrons.

Describe the trends in the atomic size of elements within groups? (Increase/Decrease down a group?)

Describe the trends in the atomic size of elements across periods in the periodic table? (Increase/Decrease across the period?)

Which element has the largest radius? Lithium, Sodium, Rubidium, Cesium

Which of the following elements is the least reactive metal? Lithium, Sodium, Potassium, Rubidium

Describe the trends in the electronegativity of elements within groups? (Increase/Decrease down a group?)

Explain how size of an atom affects electronegativity? Which element has the greatest electronegativity?

Describe the trends in the electronegativity of elements across periods in the periodic table? (Increase/Decrease across the period?)

Describe the trends in reactivity of metals within groups?

Describe the trends in ionization of elements within groups? (Increase/Decrease down a group?)

Describe the trends in ionization of elements across periods in the periodic table? (Increase/Decrease across the period?)



Rank the following elements accordingly to increasing ionization energy

Sodium (Na) Aluminum (Al) Calcium (Ca) Fluorine (F)

Which of the following metals is the LEAST reactive? Lithium (Li), Potassium (K), Rubidium (Rb)

In which group in the periodic table are the most reactive metals?

In which group in the periodic table are the most reactive nonmetals?

Describe the trends in reactivity of nonmetals within groups ((Increase/Decrease down a group?))

Is Bromine is more/less reactive than Chlorine?

List three properties of metals:

List three properties of nonmetals:

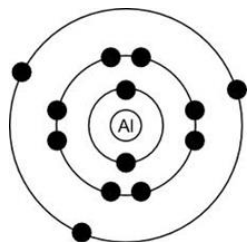
Name an element with similar properties to Sodium (Na)

Name an element in the same period with Nitrogen (N)

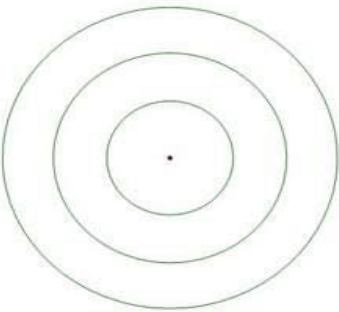
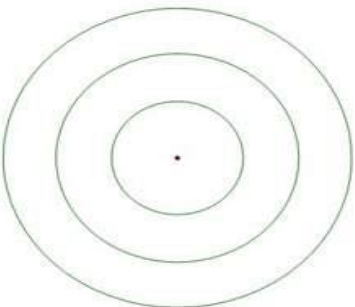
pages 187 – 203 in your book

How many total electrons in the BOHR diagram? \_\_\_\_\_

How many valence electrons in the BOHR diagram? \_\_\_\_\_



Use the information provided for each element to draw Bohr Model diagrams:

<p>Sulfur – atomic #: 16, # of n: 16</p> 	<p>Sodium – atomic #: 11, # of n: 12</p> 
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Complete the data table below:

Element	Lewis Dot Structure	Total # electrons	# valence electrons	Metal or nonmetal	Lends or borrow	# electrons (lend/borrow)	Ion Symbol & charge
Sodium			one	metal	lends	one	Na <sup>+1</sup>
Chlorine							Cl <sup>-1</sup>
Magnesium							
Oxygen							
Aluminum							
Neon							
Bromine							
Calcium							