Chem 110, Exam. (2)
Time : 90 min
2010 – 2011 1nd term

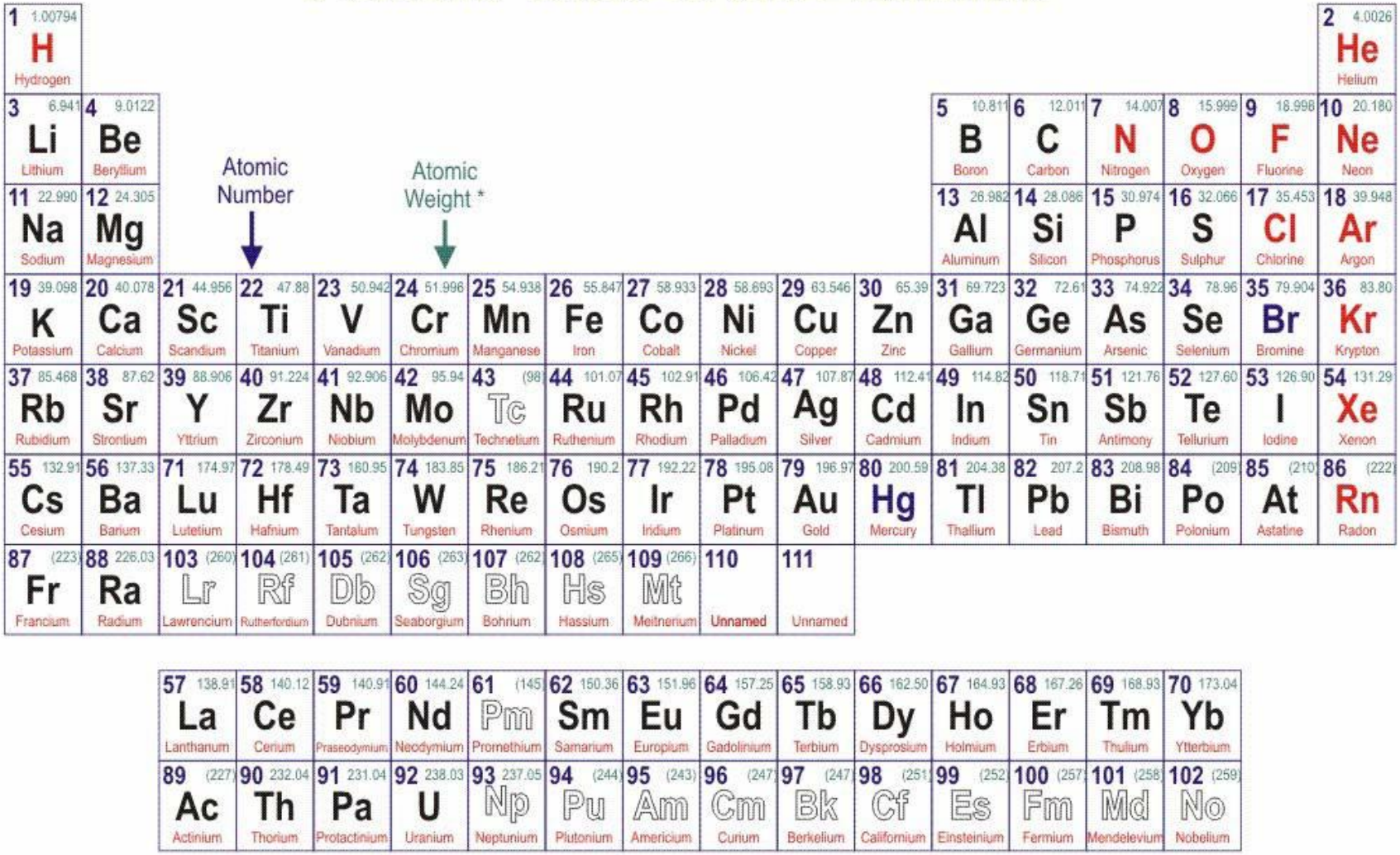
Model (C)

Name:	Useful information
Number:	Speed of light, $c = 3.0\times10^{8}$ m/s Gas constant, R= 0.082 L atm K^{-1} mol^{-1} = 8.314 $JK^{-1}mol^{-1}$
Section:	

With the best wishes

General Chemistry Team work

Periodic Table of the Elements



Directions: For each of the following questions, choose the letter that **best** answers the question and place it on your answer sheet.

[1] If 2.52 moles of hydrogen gas(H_2) is introduced into12.2 L flask at 0^0 C .What is the pressure of this gas ?

A. **46.3 atm.**
B. 14.3 atm.
C. 43.8 atm.
D. 64.6 atm.

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[2] A polar covalent bond would form in which one of these pairs of atoms?

A. **P—Cl**
B. **Si—Si**
C. **Cr—Br**
D. **Cl—Cl**

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[3] The element **[Ne]$3s^2 3p^6$** is in ____ group of the periodic table .

A. 1A
B. 5A
C. **8A**
D. 8B

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[4] What are the standere temperature and pressure(STP)?

A. **273K,1atm**
B. 250 K,1 torr
C. 25^0 C ,1atm
D. 0^0 C,1 torr

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[5] A mixture of gases contains 4.46 moles of Ne and 0.74 mole of Ar.Calculate the partial pressure of the Ne gas if the total pressure is 1.51 atm?

A. 0.247 atm
B. **1.295 atm**
C. 2.314 atm
D. 0.765atm

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[6] Which of these elements has the greatest electron affinity (largest positive value)?

A. P
B. Al
C. Si
D. Mg

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[7] A ground –state atom of Mn^{+2} has ---------unpaired electrons and is -----.

A. 2,paramagnetic
B. 4,diamagnetic
C. **5, paramagnetic**
D. 0,diamagnetic

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[8] Which of these compounds does not follow the octet rule?

A. **PF_4^-**

B. NF_3

C. CO_2

D. Br_2

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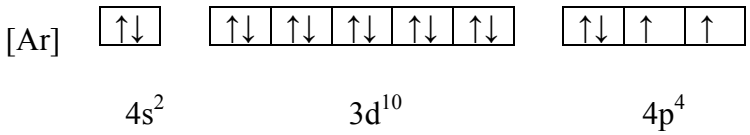
[9] Which ground - state atom has an electron configuration described by the following orbital diagram:



A. Phosphorus(P)
B. Germanium(Ge)
C. **Selenium(Se)**
D. Arsenic(As)

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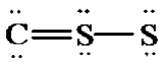
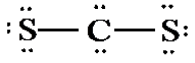
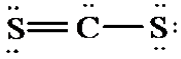
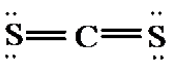
[10] TheLewisistructure for CS_2 is:

A. 

B. 

C. 

D. 

[11] Which of the following is/ are characteristic(s) of gases?

A. Relatively small distances between molecules
B. Formation of heterogeneous mixtures regardless of the nature of gases
C. uncompressibility and relatively small distances between molecules
D. **High compressibility, relatively large distances between molecules and formation of homogeneous mixtures regardless of the nature of gases**

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[12] Which of these pairs consists of *isoelectronic* species?

A. Mn^{2+} and Ar
B. K^+ and Cl^-
C. Zn^{2+} and Cu^{2+}
D. Na^+ and K^+

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[13] The representative elements are those with unfilled energy levels in which the "last electron" was added to

A. **an *s* or *p* orbital.**.
B. an *s* orbital.
C. a *p* or *d* orbital.
D. an *f* orbital.

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[14] Choose the incorrect quantum numbers for electron in an atom?

A. (3 , 0 , 0 , +1/2)
B. **(3 , 5 , 0 , +1/2)**
C. (1 , 0 , 0 , +1/2)
D. (4 , 3 , -2 , -1/2)

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[15] The number of orbital in a p subshell is?

A. 1
B. 7
C. 5
D. **3**

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[16] What is the wavelength of radiation that has a frequency of $7.5\times10^{14}s^{-1}$?

A. 2.3×10^{6} nm
B. 4.3×10^{-7} nm
C. 2.0×10^{23} nm
D. **4.0×10^{2} nm**

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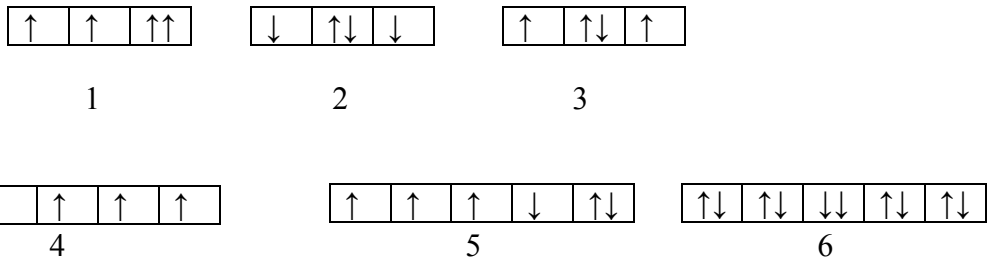
[17] Which of the orbital diagrams is not follow Hand's rule?



A. **(1) and(4)**
B. (1) and(5)
C. (2) and(3)
D. (2) ,(4)and(6)

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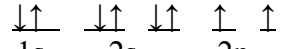
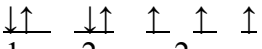
[18] The orbital diagram for a ground state O^{2-} atom is:

A. 

B. 

C. 

D. 

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[19] Element that form diatomic gases among the following ,are:

A. N,Cl,Br,He
B. **O,N,F,H**
C. Ar,N,Cl,F
D. O,Cl,S,Kr

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[20] The electron dot structure for $AsCl_3$ shows

A. two single bonds, one double bond, and 9 lone pairs.
B. **three single bonds and 10 lone pairs**
C. one single bond, two double bonds, and 8 lone pairs.
D. three single bonds and one lone pair.

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[21] The correct order of ionic radius of the following is _____.

A. $K^+ < S^{2-} < Cl^- < P^{3-}$
B. $Cl^- < S^{2-} < K^+ < P^{3-}$
C. **$K^+ < Cl^- < S^{2-} < P^{3-}$**
D. $K^+ < P^{3-} < S^{2-} < Cl^-$

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[22] How man resonance structures for the molecule NO_2 (ONO)

A. 3
B. 1
C. 2
D. 4

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[23] Which of these elements has the *greatest* electronegativity?

A. N
B. **F**
C. N
D. I
E. Cs

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[24] If 500 mL of a gas at -73^0C are heated to 27^0C, what is the new volume?

A. 737 ml.
B. 850 ml.
C. 805 ml.
D. **750 ml.**.

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[25] What is the formal charge on the oxygen atom in N_2O (the atomic order is N-N-O)?

A. +1
B. 0
C. -1
D. -2

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[26] What is the electron configuration of the Cr_{24}?

A. ($1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^5\ 4s^2\ 3d^5$)
B. ($1s^2\ 2s^2\ 2p^6\ 3s^3\ 3p^6\ 4s^2\ 3d^3$)
C. **($1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^1\ 3d^5$)**
D. ($1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 3d^4$)

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[27] The second ionization energy of **Mg** is _____ than its first ionization energy, and is _____ than the second ionization energy of **Na**.

A. lower, lower
B. lower, higher
C. higher, higher
D. **higher, lower**

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[28] A sample of oxygen gas was collected over water at 26°C and 785 mmHg. The volume of the container was 6.33L. Calculate the mass of $O_2(g)$ collected. (Vapor pressure of water = 20.3 mmHg at 26°C.)

A. 7.14 g
B. **8.30 g**
C. 3.80 g
D. 6.29 g

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[29] The maximum number of electrons that can occupy an energy level described by the principal quantum number,n,is?

A. n^{+1}
B. 2n
C. n^2
D. **$2n^2$**

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[30] Ionization energy is the energy need when an atom forms a _____.

A. free radiation
B. molecule
C. Anion
D. **cation**
