Answer Questions 1-20 on your scantron. Each question is worth 2 pt. Remember significant figures for those questions that involve a calculation.

1) (3-1) How many valence electrons does the element sulfur have?
A) 2 B) 4 C) 6 D) 8

2) (3-1) Which of the following elements contains 6 valence electrons?
A) Si B) P C) S D) Cl

3) (3-1) Which of the following elements has a filled valence shell?
A) Ne B) P C) Se D) O

4) (3.2) An ion is:
A) an atom or a group of atoms that carries an electrical charge
B) another term for an atom
C) a molecule such as sucrose
D) a substance formed by the combination of two elements

5) (3.2) Which of the following is one of the main cations in the body that maintains solution concentrations inside and outside the cell?
A) Fe^{2+} B) Ba^{2+} C) K^{+} D) NH_4^{+}

6) (3.2) Which of the following is the main anion in the body?
A) CO_3^{2-} B) SO_4^{2-} C) Cl^{-} D) S^{2-}

7) (3.2) When an atom gains an electron, the resulting particle is called
A) a proton B) an anion C) a cation D) an isotope E) none of the above

8) (3.3) Which of the following ions is <u>not</u> *isoelectronic* with the noble gas neon?
A) O^{2-} B) F^{-} C) Al^{3+} D) S^{2-}

9) (3.3) A positive charge attracts negative charges and repels other positive charges.
A) TRUE B) C) D) E) FALSE

10) (3.3) Which of the following is an ionic compound?
A) carbon dioxide B) Potassium C) sodium carbonate D) I_2 E) Cr

11) (3.4) Which compound contains <u>only</u> covalent bonds?
A) NH_4OH B) $Ca_3(PO_4)_2$ C) $HC_2H_3O_2$ D) NaCl

12) (3.4) A single bond involves the sharing of _____ electron(s) between the atoms.
A) 1 B) 2 C) 4 D) 6

13) (3.4) How many single bonds does an atom of carbon normally make in a covalent molecule if there are no double or triple bonds?
A) 1 B) 2 C) 3 D) 4

14) (3.7) A bond where the electrons are shared unequally is called a(n):
A) polar covalent B) coordinate covalent C) purely (nonpolar) covalent D) ionic

15) Which of the following has the dipole arrow correctly oriented for the following bonds?
A) C-C B) N-H C) Cl-O D) N-O

16) Which of the following is the LEAST polar bond?
A) C-C B) N-H C) Cl-O D) N-O

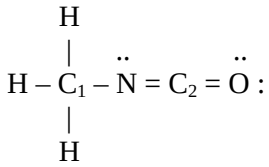
(18 pt) (3.3, 3.4) Fill in the table (side by side) with either the missing name or missing formula.

NAME	Cation	Anion	FORMULA
			NH_4NO_3
	Fe^{2+}	PO_4^{3-}	
Dinitrogen tetroxide	----------	----------	
			$(Fe)_2O_3$
Potassium sulfide			
	----------	----------	SO_3
Calcium hydrogencarbonate			
	Au^{3+}	Cl^-	

(6 pt) (3.6) Draw the Lewis structure for H_2CO.
(2 pt) Total Number of Valence Electrons _____

30 pt

(24 pt) (3.6, 3.7) Fill in the following table concerning the molecular shape of the compound with the following Lewis structure:



	At C_1	At N	At C_2
Bond Angle			
Molecular Shape Name			
Polar / Non-polar BOND	C-H C-N	C-N	C-N C-O
Based on the information above is the molecule Polar or Non-polar?			

17) (3.5) A thimble of water contains 4.0×10^{21} molecules. The number of moles of H_2O is:

A) 2.4×10^{45} B) 6.6×10^{-3} C) 6.6×10^{-23} D) 2.4×10^{23}

18) (3.5) What is the mass in grams of 3.61 moles of Ca?

A) 0.090 g B) 144 g C) 40.0 g D) 150 g

19) (3.5) Which quantity contains the fewest moles?

A) 10 g N_2 B) 10 g CO C) 10 g Si D) 10 g AlH_3

20) (3.5) The molar mass of an element in grams is numerically equal to that element's atomic mass in amu.

A) TRUE B) FALSE

(4 pt) (3.5) Calculate the number of molecules in 2.00 moles of O_2

(6 pt) (3.5) Calculate the number of O *atoms* in 8.00 moles of $C_6H_{12}O_6$

(4 pt) (3.5) Calculate the molar masses of the following compounds $CH_3(CH_2)_3CH_3$

(8 pt) (3.5) Calculate the grams of carbon in 40.0 g of $(CH_3)_3N$ (molar mass = 59.13 g).

22 pt

PERIODIC CHART OF THE ELEMENTS

1 H 1.00797																1 H 1.00797	2 He 4.0026
3 Li 6.939	4 Be 9.0122											5 B 10.811	6 C 12.0112	7 N 14.0067	8 O 15.9994	9 F 18.9984	10 Ne 20.183
11 Na 22.9898	12 Mg 24.312											13 Al 26.9815	14 Si 28.086	15 P 30.9738	16 S 32.064	17 Cl 35.453	18 Ar 39.948
19 K 39.102	20 Ca 40.08	21 Sc 44.956	22 Ti 47.90	23 V 50.942	24 Cr 51.996	25 Mn 54.9380	26 Fe 55.847	27 Co 58.9332	28 Ni 58.71	29 Cu 63.54	30 Zn 65.37	31 Ga 69.72	32 Ge 72.59	33 As 74.9216	34 Se 78.96	35 Br 79.909	36 Kr 83.80
37 Rb 85.47	38 Sr 87.62	39 Y 88.905	40 Zr 91.22	41 Nb 92.906	42 Mo 95.94	43 Tc (99)	44 Ru 101.07	45 Rh 102.905	46 Pd 106.4	47 Ag 107.870	48 Cd 112.40	49 In 114.82	50 Sn 118.69	51 Sb 121.75	52 Te 127.60	53 I 126.904	54 Xe 131.30
55 Cs 132.905	56 Ba 137.34	*57 La 138.91	72 Hf 178.49	73 Ta 180.948	74 W 183.85	75 Re 186.2	76 Os 190.2	77 Ir 192.2	78 Pt 195.09	79 Au 196.967	80 Hg 200.59	81 Tl 204.37	82 Pb 207.19	83 Bi 208.980	84 Po (210)	85 At (210)	86 Rn (222)
87 Fr (223)	88 Ra (226)	‡89 Ac (227)	104 Rf (261)	105 Db (262)	106 Sg (266)	107 Bh (262)	108 Hs (265)	109 Mt (266)	110 ? (271)	111 ? (272)	112 ? (277)						

Periodic Table with Electronegativities:

1A	2A	3B	4B	5B	6B	7B	8B			1B	2B	3A	4A	5A	6A	7A	8A
1 H *2.1* **1.01**						at. no. Symbol *e.n.* **amu**											2 He **4.00**
3 Li *1.0* **6.94**	4 Be *1.5* **9.01**											5 B *2.0* **10.81**	6 C *2.5* **12.01**	7 N *3.0* **14.00**	8 O *3.5* **16.00**	9 F *4.0* **19.00**	10 Ne **20.18**
11 Na *0.9* **23.00**	12 Mg *1.2* **24.31**											13 Al *1.5* **26.98**	14 Si *1.8* **28.09**	15 P *2.1* **30.97**	16 S *2.5* **32.06**	17 Cl *3.0* **35.45**	18 Ar **39.95**
19 K *0.8* **39.10**	20 Ca *1.0* **40.08**	21 Sc *1.3* **44.96**	22 Ti *1.5* **47.90**	23 V *1.6* **50.94**	24 Cr *1.6* **52.00**	25 Mn *1.5* **54.94**	26 Fe *1.8* **55.85**	27 Co *1.9* **58.93**	28 Ni *1.9* **58.71**	29 Cu *1.9* **63.54**	30 Zn *1.6* **65.37**	31 Ga *1.6* **69.72**	32 Ge *1.8* **72.59**	33 As *2.0* **74.92**	34 Se *2.4* **78.96**	35 Br *2.8* **79.91**	36 Kr *3.0* **83.80**
37 Rb *0.8* **85.47**	38 Sr *1.0* **87.62**	39 Y *1.2* **88.90**	40 Zr *1.4* **91.22**	41 Nb *1.6* **92.91**	42 Mo *1.8* **95.94**	43 Tc *1.9* **(99)**	44 Ru *2.2* **101.1**	45 Rh *2.2* **102.9**	46 Pd *2.2* **106.4**	47 Ag *1.9* **107.9**	48 Cd *1.7* **112.4**	49 In *1.7* **114.8**	50 Sn *1.8* **118.7**	51 Sb *1.9* **121.8**	52 Te *2.1* **127.6**	53 I *2.5* **126.9**	54 Xe *2.6* **131.3**
55 Cs *0.7* **132.9**	56 Ba *0.9* **137.3**	57 La *1.1* **138.9**	72 Hf *1.3* **178.5**	73 Ta *1.5* **180.9**	74 W *1.7* **183.8**	75 Re *1.9* **186.2**	76 Os *2.2* **190.2**	77 Ir *2.2* **192.2**	78 Pt *2.2* **195.1**	79 Au *2.4* **197.0**	80 Hg *1.9* **200.6**	81 Tl *1.8* **204.4**	82 Pb *1.9* **207.2**	83 Bi *1.9* **209.0**	84 Po *2.0* **(210)**	85 At *2.2* **(210)**	86 Rn *2.4* **(222)**
87 Fr *0.7* **(223)**	88 Ra *0.9* **(226)**	89 Ac *1.1* **(227)**	104 Rf **(261)**	105 Ha Db **(262)**	106 Sg **(266)**	107 Ns Bh **(262)**	108 Hs **(265)**	109 Mt **(266)**	110 Uun **(271)**	111 Uuu **(272)**	112 Uub **(277)**						

58 Ce *1.1* **140.1**	59 Pr *1.1* **140.9**	60 Nd *1.1* **144.2**	61 Pm *1.2* **(147)**	62 Sm *1.2* **150.4**	63 Eu *1.1* **152.0**	64 Gd *1.2* **157.2**	65 Tb *1.2* **158.9**	66 Dy *1.2* **162.5**	67 Ho *1.2* **164.9**	68 Er *1.2* **167.3**	69 Tm *1.2* **168.9**	70 Yb *1.2* **173.0**	71 Lu *1.3* **175.0**
90 Th *1.3* **232.0**	91 Pa *1.5* **(231)**	92 U *1.7* **238.0**	93 Np *1.3* **(237)**	94 Pu *1.3* **(242)**	95 Am *1.3* **(243)**	96 Cm *1.3* **(247)**	97 Bk *1.3* **(247)**	98 Cf *1.3* **(249)**	99 Es *1.3* **(254)**	100 Fm *1.3* **(253)**	101 Md *1.3* **(256)**	102 No *1.5* **(256)**	103 Lr **(257)**