Evam III	General Chemistry I (CHEM 101) 11/	/15/12 8:30 am T,R Dr. Hahn	Exam #	
	1	(print) Name		_(sign)
question	now work for partial credit on the Long s have no partial credit. Please write y cannot grade it. (1 pts print and sign	Answers and in some of the Sho anything you want graded legib exam)	ort Answer Questions. Mult oly. I If I cannot read your v	
pts per	MULTIPLE CHOICE. Choose the one question, 28 pts total) Solution ρ I) Give the numbers for m_l for a d orbital ρ A) 1, 2, 3 B) 0, 1, 2	$M_{\ell} = \sum_{i=1}^{\ell} M_{\ell}$	$O_{1} \cdots + \ell$ $O_{2} - 1, 0, 1, 2$	1)
	2) Identify the species that has the smal A) neutral C) anion (A) Gerecal Control Control (B) A control (C) anion (C) The vertical height of a wave is called	D) they are all	the same size	3)
	A) frequency B) median C) wavelength D) area E) amplitude 4) Which of the following have the sam		MI GP I	97° []
Ge.	4) Which of the following have the sam A) Ar, Kr, Br B) As, S (W) Till A) He compound with ionic be B) H ₂ O	I	98.I	5) <u>C</u>
	 6) Which of the following statements in A) Single bonds are shorter than a B A covalent bond has a lower part of electrons involved in D) A covalent bond is formed that E) It is not possible for two atoms 	double bonds. botential energy than the two sep a covalent bond are sometimes bough the transfer of electrons fro	om one atom to another.	o)
	7) A double covalent bond contains	of electrons. C) 3 pairs D)	4 pairs E) 1 pair	7) <u>/ </u>
	8) Describe the shape of a p orbital. A) two connected balls B) eight connected balls C) three connected balls D) four connected balls E) a ball			<i>□.</i> •••

9) Which reaction below represents the first ionization of O? A) $O(g) + e^- \rightarrow O^-(g)$ B) O⁻(g) \rightarrow O(g) + e⁻ (C) $O(g) \rightarrow O^+(g) + e^-$ D) O⁻(g) + e⁻ \rightarrow O²⁻(g) E) $O^+(g) + e^- \rightarrow O(g)$ 10) Which reaction below represents the electron affinity of Li? A) $\text{Li}(g) + e^- \rightarrow \text{Li}^+(g)$ $\begin{array}{c}
B) \text{Li}(g) + e^{-} \rightarrow \text{Li}^{-}(g) \\
C) \text{Li}(g) \rightarrow \text{Li}^{+}(g) + e^{-}
\end{array}$ D) $Li^+(g) \rightarrow Li(g) + e^-$ E) $Li^+(g) + e^- \rightarrow Li(g)$ 11) How many valence shell electrons does an atom of indium have? (In) D) 2 12) Which of the following occur as the energy of a photon of electromagnetic radiation increases? ET, XV, UT A) the frequency decreases. B) the wavelength increases (C) the wavelength gets shorter. D) the speed increases. E) None of the above occur as the energy of a photon increases. 13) Which of the following represent the Lewis structure for N? E) N: (B) ·N: C) \dot{N} : D) N. A):N: 14) Place the following elements in order of <u>increasing</u> electronegativity. (hint: most electronegative 14) ____ element is F) EN | 1855 EN P Cs K A) Cs < P < KB) P < Cs < KC) K < P < Cs

page 2

D) P < K < CsE Cs < K < P

Part II Short Answer: Write the word or phrase or circle the choice that best completes each statement or answer the question. (42 pts)
1. Principal quantum number is abbreviated (a) (2 pts) (a letter) and is correlated
with (b) period (2 pts) numbers in the periodic table.
Principal quantum numbers are also called the (c) (shell) subshell, orbital) (circle one) (2 pts)
The Principal quantum number gives (d) (how far the electron is from the nucleus) (the shape of
the electrons cloud around the nucleus) (circle one) (2 pts) The angular momentum quantum
number is abbreviated (e)(2 pts) is also called the subshell
magnetic quantum number is abbreviated (f)(2 pts) (a letter symbol)
In the p subshell, there are (g) (give # in blank) orbitals. (3 pts)
Maximum number of electrons in the p subshell is (h) (give # in blank) (3 pts
The s block of the periodic table consists of Group (i) 1 to Group (j) 1.
(using the exact group number in the periodic table handed out with this exam) (3 pts each, 6 pt
2. For principal quantum # 5 the possible angular momentum quantum numbers are (3 pts)
l=0,n-1; l=0,1,2,3,4
the possible magnetic quantum numbers are (3 pt
3. For angular momentum quantum number 3, the possible magnetic quantum number $(l=3)$ $(l=3)$ substea
4. For the angular momentum quantum number $\ell = 2$ the symbol is (s, p, (3)) (circle one) (3 pts)
5. Periodic Properties:
a. The bigger atomic size (atomic radius) is the element(circle one) (Mg) or (Ba) (3 pt)
b. The smaller ionization energy is for the element (circle one) (Li) or (Rb) (3 pt)
c. The more reactive element is (circle one) (Na) or (K) (3 pt)
Dr. Hahn Exam III 8:30 page 3

1. a. Give the electron configuration for the element **Br** using the 1s², 2s² nomenclature (7 pts)

 $15^{2}, 25^{2}, 2p^{6}, 35^{2}, 3p^{6}, 45^{2}, 3d^{10}$ $4p^{5}$

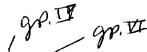
b. Give the <u>valence</u> electron configuration for the same element using the same notation.

(6 pts)

452, 4p5

c. Give the <u>orbital diagram</u> for the <u>valence</u> electrons of the element including showing the electrons as up or down arrows. (6 pts)

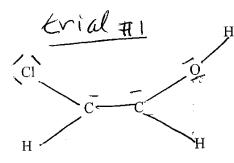
1 1 1 1 1 1 4 P



- le CIC2H3O or which I have provided the Give the Lewis Dot Structure for the molecule formula and frame by:
 - Give the total number of valence electrons for the molecule _ a. (show work for fullcredit)

$$7e+2(4\bar{e})+3(1\bar{e})+6\bar{e}=24\bar{e}$$

Complete the Lewis Dot Structure Hint: Lewis Dot structure has one double bond. b. Elements in period 1 & 2 cannot expand its octet. The formula for the Lewis Dot CIC₂H₃O (6 pts) structure is:



Exam [III Gener	al Chemis	stry I (CI	IEM 101) 11/1	.5/12 8:30 a	m T,R Dr. Hahr	ı	Exam #		
Name_		Ker	γ		(print) N	ame			(sign)	}
questic	show wor	k for part o partial o	o ial credit credit.	on the Long A	Answers and nything you	in some of the Sh	ort Answ	er Questions. M If I cannot read y	Iultiple cho our work,	oice I
	MULTIP			ose the one a	lternative th	at best completes	the state	ment or answers	the questi	on. (2
	A) A B) A C) I D) S	A covalent A covalent t is not po Single bon	t bond is t bond ha ssible for ds are sh	s a lower pote two atoms to orter than dou	gh the transfential energy share more to able bonds.	er of electrons fro than the two sepa than two electron d are sometimes 1	arate aton s.	ns.	1) _	<u> </u>
	A) L B) L C) L D) L	reaction I $i^{+}(g) + e^{-}$ $i^{+}(g) \rightarrow I$ $i(g) \rightarrow L$ $i(g) + e^{-}$ $i(g) + e^{-}$	→ Li(g) Li(g) + e ⁻ .i ⁺ (g) + e ⁻ → Li ⁻ (g)		ectron affini	lty of Li? — Ir	٦		2) -	
	3) How n		nce shell	electrons does	s an atom of	indium have? C) 49		D) 1	3) _	B
	A) F B) C C) C D) F		Cs Cs K P K	ents in order c		(less		most electronega	tive 4) <u>.</u>	
	A) F 6) The ve A) a B) v C) a D) n	Rb, Sb, I Y D ertical heig implitude vavelengt	ght of a w	ave the same of B) Ar, Kr	number of va	llence electrons? C) Ga, Sn, Bi)	DAS, Sb, Bi	5) ₋	DA

7) Describe the shape A) eight connecte B) four connecte O two connecte D) three connecte E) a ball	ed balls d balls ed balls				7)
8) Which of the follow A) the waveleng B) the waveleng C) the frequency D) the speed income	th increases th gets shorter. decreases. reases.	\bigcirc) V1	ation increases?	8)
E) None of the a	bove occur as the er	nergy of a photon r	ncreases.		1
9) Which of the follow	ving represent the L	ewis structure for l	N?		9)
(A)) ·Ņ:	B) ·Ņ:	C) :ÿ:	D) Ņ:	E) N·	
10) Identify the species	s that has the smalle	st radius			10)
A) neutral C cation	, that has the small	B)	anion they are all the same	size	a.
11) A double covalent	bond contains	of electrons			11)
A) 0 pairs	B 2 pairs	C) 3 pairs	D) 4 pairs	E) 1 pair	
12) Give the numbers t	for mį for a d orbital	•			12)
A) 1, 2, 3, 4, 5	B) 0, 1, 2,	3, 4)-2, -1, 0, 1, 2	D) 1, 2, 3	Ω
13) Which reaction bel A) $O^{+}(g) + e^{-} \rightarrow$ B) $O(g) \rightarrow O^{+}(g)$ C) $O^{-}(g) + e^{-} \rightarrow$ D) $O^{-}(g) \rightarrow O(g)$ E) $O(g) + e^{-} \rightarrow$	O(g) y) + e ⁻ O ²⁻ (g) y) + e ⁻	rst ionization of O	?		13) 6
14) Idenţify the compo	ound with ionic bone	ding.			14)
A) NaCl	B) H ₂ O	C) Li	D) He	E) S	

Part II Short Answer: Write the word or phrase or circle the choice that best completes each statement or answer the question. (42 pts)
15) 1. Principal quantum number is abbreviated (a) (2 pts) (a letter) and is correlated with
(b) Periodic table. (2 pts) numbers in the periodic table.
Principal quantum numbers are also called the (c) (shell, subshell, orbital) (circle one) (2 pts)
The Principal quantum number gives (d) (how far the electron is from the nucleus) (t he shape
of the electrons cloud around the nucleus) (circle one) (2 pts) The angular momentum quantum
number is abbreviated (e)(2 pts) is also called the subshell
magnetic quantum number is abbreviated (f)(2 pts) (a letter symbol)
In the d subshell, there are (g) (give # in blank) orbitals. (3 pts)
Maximum number of electrons in the d subshell is (h) $(give # in blank)$ (3 pts)
The p block of the periodic table consists of Group (i) II A to Group (j)
(using the exact group number in the periodic table handed out with this exam) (3 pts each, 6 pts)
2. For principal quantum number 6 the possible angular momentum quantum numbers are
$\begin{array}{cccccccccccccccccccccccccccccccccccc$
3. For angular momentum quantum number 2 the possible magnetic quantum numbers are (3 pts)
(1=2, ml=-2, ml=-2, -1, 0, +1, +2)
4. For the angular momentum quantum number $\ell=3$ the symbol is (s, p, d, f) (circle one) (3 pts)
5. Periodic Properties:
a. The bigger atomic size (atomic radius) is the element(circle one) (Sr) or (Rb) (3 pt)
b. The smaller ionization energy is for the element (circle one) (Mg) or (Ca) (3 pt)
c. The more reactive element is (circle one) (Na) or (Li) 3 pt)
Dr. Hahn Exam III 8:30 page 3

Se using the $1s^2$, $2s^2$ Give the electron configuration for the element 1. nomenclature (7 pts)

152, 251, 2p6, 352, 3p6, 452, 3d10, 4pt

Give the <u>valence</u> electron configuration for the same element using the same notation.

b. Give the <u>valence</u> electron configuration.

(6 pts)

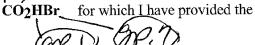
Valence = E in Owthmost shell (n=4) for main

gray 452, 4p4

c. Give the orbital diagram for the valence electrons of the element including showing the electrons as up or down arrows. (6 pts)



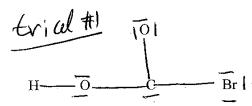
Give the Lewis Dot Structure for the molecule formula and frame by:



(4 pts) Give the total number of valence electrons for the molecule a. (show work for fullcredit)

$$4e + 2(6e) + 1e + 9e = 24e$$

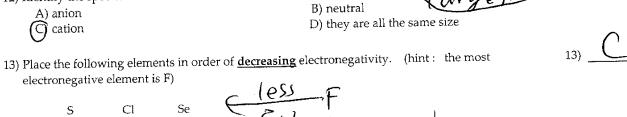
Complete the Lewis Dot Structure Hint: Lewis Dot structure has one double bond. b. Elements in period 1 & 2 cannot expand its octet. The formula for the Lewis Dot CO₂HBr structure is: (6 pts)

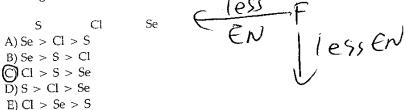


$$\frac{\overline{B}}{\overline{B}} = \frac{12 \times 2}{24}$$

Evam III	General Chemistry I (CH	EM 101) 11/15/12	955 am T,R Dr.	Hahn	Exam #	
Name		, (p.				_(sign)
Please sh questions obviously	ow work for partial credit s have no partial credit. y cannot grade it. (1 pts pr	on the Long Answe Please write anythi int and sign exam)	ers and in some of ng you want grad	the Short Answer ed legibly. I I	· Questions. Mult f I cannot read you	
Part I N	MULTIPLE CHOICE. Choustion, 28 pts total)	ose the one alterna	ntive that best com	pletes the statem	ent or answers the	e question. (2
) Which reaction below re A) $\text{Li}^+(g) + e^- \rightarrow \text{Li}(g)$ B) $\text{Li}(g) \rightarrow \text{Li}^+(g) + e^-$ C) $\text{Li}(g) + e^- \rightarrow \text{Li}(g)$ D) $\text{Li}^+(g) \rightarrow \text{Li}(g) + e^-$)	n affinity of Li?			1)
	$E Li(g) + e^{-} \rightarrow Li^{-}(g)$)				\mathcal{C}
2	2) Which of the following s A) It is not possible fo B) A pair of electrons C)A covalent bond h D) Single bonds are sl	r two atoms to shar involved in a coval as a lower potential	re more than two e ent bond are some , energy than the to	wo separate atom:		2)
(E) A covalent bond is E) A covalent bond is What are the possible va (A) 0, 1, 2, 3, 4, or 5 C) -5, -4, -3, -2, -1, 0	formed through the formed throu	Le transfer of electric $\mathcal{L} = 0 \dots (n)$	ons from one ator -() -3, -2, -1, 0, +1, +2		3) <u>A</u>
	4) Which of the following A) Ar, Kr, Br	have the same num B) Rb, Sb, I	ber of valence elec	strons? Sb, Bi	D) Ga, Sn, Bi	4) <u> </u>
	(9 '	B) 4 pairs	of electrons. C) 2 pairs	D) 1 pair	E) 0 pairs	5) <u>(</u>
	6) How many valence elec A) 4	trons does a neutra B) 52	I tellerium atom h	ave? [6 —]	D) 2	0) <u></u>
	7) Which of the following	represent the Lewi	s structure for Cl? C) ·Ċl:	D) Cl-	_{E)} :Ċi:	7)
	8) Describe the shape of a A) two connected ba B) four connected ba C) eight connected b D a ball E) three connected b	lls dls alls				8)

9) Which reaction below represents the first ionization of O? C) $O^+(g) + e^- \rightarrow O(g)$ D) $O^{-}(g) + e^{-} \rightarrow O^{2-}(g)$ E) $O(g) + e^- \rightarrow O^-(g)$ 10) Which of the following occur as the wavelength of a photon of electromagnetic radiation increases? A) the energy increases B) the frequency decreases C) Planck's constant decreases D) the speed decreases E) None of the above occur as the wavelength of a photon increases. 11) The number of cycles that pass through a stationary point is called (A))frequency B) area C) amplitude D) median E) wavelength





12) Identify the species that has the smallest radius.

14) Identify the compound with covalent bonding.

A) He

(B) H₂O

(C) S

(D) Li

(E) NaCl

Part II Short Answer: Write the word question. (42 pts)	l or phrase or circle the choice that best completes each statement or answer the
1. Principal quantum	m number is abbreviated (a) (2 pts) (a letter) and is correlated with
(b) peribl	(2 pts) numbers in the periodic table.
	nbers are also called the (c) (shell, subshell, orbital) (circle one) (2 pts)
	number gives (d) (how far the electron is from the nucleus) (the shape o
the electrons cloud arc	ound the nucleus) (circle one) (2 pts) The angular momentum quantum
number is abbreviated	(e)(2 pts) is also called the subshell
magnetic quantum numbe	r is abbreviated (f)(2 pts) (a letter symbol)
	are (g) (give # in blank) orbitals. (3 pts)
	etrons in the f subshell is (h) 14 (give # in blank) (3 pts)
	iodic table consists of Group (i) 3B to Group (j) 2B.
	mber in the periodic table handed out with this quiz) (3 pts each, 6 pts)
	m number 4 the possible angular momentum quantum numbers are (3
	(n-1) $Q=0,1,2,3$
3. For angular momentu (3 pts)	the possible magnetic quantum numbers are
Q=2, m	l=-l.,+l)-2,-1,0,+1,+2
4. For the angular mome	entum quantum number = 1 the symbol is (sp d, f) (circle one) (3 pts
5. Periodic Properties:	0 1 2 33
a. The bigger atomic siz	te (atomic radius) is the element(circle one) (O) or (Se) (3 pt)
b. The smaller ionization	n energy is for the element (circle one) (C) or (Ge) (3 pt)
c. The more reactive ele	
	Dr. Hahn Exam III 9:55 page 3

1. a. Give the electron configuration for the element As using the 1s², 2s² nomenclature (7 pts)

15², 25², 2p⁶, 35², 4p⁶, 45², 3d¹⁰, 4p³

b. Give the valence electron configuration for the same element using the same notation.

(6 pts) Soutmost shell(n) for main gp. elenat

452, 483

c. Give the <u>orbital diagram</u> for the <u>valence</u> electrons of the element including showing the electrons as up or down arrows. (6 pts)

1 1 1 1 45 4p

4 5 6 1 7 CN2O2H2Br2

2. Give the Lewis Dot Structure for the molecule provided the formula and frame by:

for which I have

a. Give the total number of valence electrons for the molecule (4 pts) (show work for fullcredit)

 $4\bar{e} + 2(5e) + 2(6\bar{e}) + 2(1\bar{e}) + 2(7\bar{e}) = 42$

b. Complete the Lewis Dot Structure Hint: Lewis Dot structure has one double bond.

Elements in period 1 & 2 cannot expand its octet.

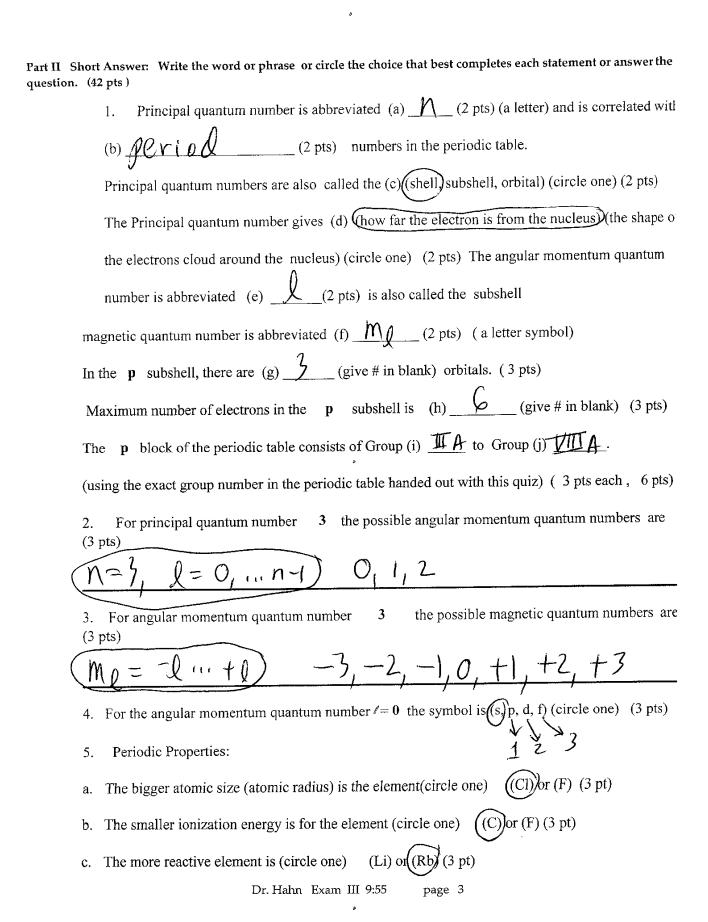
Structure is: CN2O2H2Br2 (6 pts)

Or Br H

10 N-C-N-B-1 10, 18-1 4

Exam I	II General Chemistry I (CHEM 101)	11/15/12 955 am T,	R Dr. Hahn	Exam #	
Name_	Key	(print) Name			(sign)
questic	show work for partial credit on the Lor	ng Answers and in so ite anything you wan	ome of the Short An		ltiple choice ur work, I
	MULTIPLE CHOICE. Choose the or question, 28 pts total)	ne alternative that be	st completes the st	atement or answers tl	ne question. (2
	1) Which reaction below represents the A) $O^{-}(g) \rightarrow O(g) + e^{-}$ B) $O^{-}(g) + e^{-} \rightarrow O^{2-}(g)$ C) $O^{+}(g) + e^{-} \rightarrow O(g)$ D) $O(g) \rightarrow O^{+}(g) + e^{-}$ E) $O(g) + e^{-} \rightarrow O^{-}(g)$	ue first ionization of C)?		1) <u>D</u>
	2) Which of the following have the sa (A) As, Sb, Bi (B) Rb,		e electrons?) Ga, Sn, Bi	D) Ar, Kr, Br	2) <u>H</u>
	3) Which of the following represent the A) Cl. B:Cl:	he Lewis structure for C) :Cl:	r Cl? D) ˙Ċֵl:	E) ·¢l:	3)
	4) How many valence electrons does A) 4	a neutral tellerium at C	om have? Te	D) 2	4)
	5) Place the following elements in ord electronegative element is F)	ler of <u>decreasing</u> elec	tronegativity. (hir	nt: the most	5)
	S CI Se A) S > CI > Se B) CI > S > Se C) CI > Se > S D) Se > CI > S E) Se > S > CI 6) The number of cycles that pass thr A) median B) amplitude C) area D) wavelength E) frequency	rough a stationary po	le SS EN int is called		6)

7) Which of the following occur as the wavelength of a photon of electromagnetic radiation	7)
increases? A) the speed decreases B) the energy increases C) Planck's constant decreases D) the frequency decreases E) None of the above occur as the wavelength of a photon increases.	n
8) Which reaction below represents the <u>electron affinity</u> of Li? A) Li(g) + e ⁻ → Li ⁻ (g) B) Li(g) → Li ⁺ (g) + e ⁻ C) Li ⁺ (g) → Li(g) + e ⁻ D) Li ⁺ (g) + e ⁻ → Li(g) E) Li(g) + e ⁻ → Li ⁺ (g)	8) <u>F</u>
9) Identify the compound with covalent bonding. A) Li B H ₂ O C) NaCl D) S E) He	9)
10) Describe the shape of a s orbital. A) two connected balls B) four connected balls C) a ball D) eight connected balls E) three connected balls	10)
(A) A covalent bond has a lower potential energy than the two separate atoms. B) Single bonds are shorter than double bonds. C) It is not possible for two atoms to share more than two electrons. D) A covalent bond is formed through the transfer of electrons from one atom to another. E) A pair of electrons involved in a covalent bond are sometimes referred to as "lone pairs."	11)
12) What are the possible values of l if $n = 6$? $Q = O(1)$ B) 6 B) 6 D) -4, -3, -2, -1, 0, +1, +2, +3, +4, or +5 D) -4, -3, -2, -1, 0, +1, +2, +3, or +4	12) /+
(13) Identify the species that has the smallest radius. (A) cation (B) anion (C) neutral (D) they are all the same size	13)
14) A triple covalent bond contains of electrons. (All 3 pairs B) 4 pairs C) 0 pairs D) 1 pair E) 2 pairs	14)



1. a. Give the electron configuration for the element Ge using the 1s², 2s² nomenclature (7 pts)

15², 25², 2p⁶, 35², 3p⁶, 45², 3d¹⁰, 4p²

b. Give the <u>valence</u> electron configuration for the same element using the same notation.

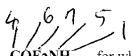
(6 pts)

Soutermost shell (largest n) for main group element

452 482

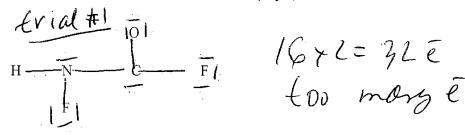
c. Give the <u>orbital diagram</u> for the <u>valence</u> electrons of the element including showing the electrons as up or down arrows. (6 pts)

1 1 1 - 48



- Give the Lewis Dot Structure for the molecule COF2NH for which I have provided the formula and frame by:
 - Give the total number of valence electrons for the molecule $30\overline{e}$ (show work for fullcredit)

Complete the Lewis Dot Structure Hint: Lewis Dot structure has one double bond. b. Elements in period 1 & 2 cannot expand its octet. The formula for the Lewis Dot structure is: COF₂NH (6 pts)



ne		(print) Name			(sign)
stions have no part iously cannot grad	partial credit on the Long tial credit. Please write e it. (1 pts print and sign o	anything you want g exam)	raded legible. I	If I cannot read your	work, I
I MULTIPLE CI per question, 28 pt	HOICE. Choose the one a ts total)	alternative that best	completes the stat	ement or answers the	e question.
1) Give the nu	mbers for m _l for a d orbita	1.			1)
A) 1, 2, 3	B) 0, 1, 2,	3, 4 C) 1	, 2, 3, 4, 5	D) -2, -1, 0, 1, 2	
2) Identify the	species that has the smalle	est radius.			2)
A) neutra	1	•	ation		
C) anion		D) t	hey are all the sam	e size	
3) The vertical	height of a wave is called				3)
A) freque	-				
B) media					
C) wavele	ength				
D) area	•				
E) amplit	ude				
4) Which of the	e following have the same	number of valence e	electrons?		4)
A) Ar, Kr,			Ga, Sn, Bi	D) Rb, Sb, I	
5) Identify the	compound with ionic bon	ding.			5)
A) He	B) H ₂ O	C) NaCl	D) S	E) Li	
6) Which of the	e following statements is T	RUE?			6)
	bonds are shorter than do				
	llent bond has a lower pot				
	of electrons involved in a				
·	lent bond is formed throu	_		om to another.	
E) It is no	t possible for two atoms to	o snare more than tw	o electrons.		
7) A double co	valent bond contains	of electrons.			7)
A) 2 pairs		C) 3 pairs	D) 4 pairs	E) 1 pair	
8) Describe the	shape of a p orbital.				8)
	onnected balls				-,
	onnected balls				
C) three c	onnected balls				
·	onnected balls				
E) a ball					

9) Which reaction be A) O(g) + e ⁻ → B) O ⁻ (g) → O(C) O(g) → O ⁺ (D) O ⁻ (g) + e ⁻ → E) O ⁺ (g) + e ⁻ →	g) + e (g) + e ⁻ > O ²⁻ (g)	rst ionization of O	,		9)	
10) Which reaction be A) Li(g) + e ⁻ → B) Li(g) + e ⁻ → C) Li(g) → Li ⁺ D) Li ⁺ (g) → Li E) Li ⁺ (g) + e ⁻ →	· Li ⁺ (g) · Li ⁻ (g) · (g) + e ⁻ (g) + e ⁻	<u>lectron affinity</u> of	Li?		10)	
11) How many valend A) 3	ce shell electrons doe B) 49	es an atom of indiu C)		D) 2	11)	
D) the speed in	y decreases. gth increases gth gets shorter.		_	diation increases?	12)	
13) Which of the follo	wing represent the I	Lewis structure for	N?		13)	
A) :Ņ:	в) ·Ņ:	c) ÿ:	D) N·	E) ·Ņ:		
14) Place the followir element is F) K	g elements in order Cs P	of <u>increasing</u> electi	onegativity. (hint	: most electronegative	14)	

Part II Short Answer: Write the word or phrase or circle the choice that best completes each statement or answer the question. (42 pts)
1. Principal quantum number is abbreviated (a) (2 pts) (a letter) and is correlated
with (b) (2 pts) numbers in the periodic table.
Principal quantum numbers are also called the (c) (shell, subshell, orbital) (circle one) (2 pts)
The Principal quantum number gives (d) (how far the electron is from the nucleus) (the shape of
the electrons cloud around the nucleus) (circle one) (2 pts) The angular momentum quantum
number is abbreviated (e)(2 pts) is also called the subshell
magnetic quantum number is abbreviated (f) (2 pts) (a letter symbol)
In the p subshell, there are (g) (give # in blank) orbitals. (3 pts)
Maximum number of electrons in the p subshell is (h) (give # in blank) (3 pts
The s block of the periodic table consists of Group (i) to Group (j)
(using the exact group number in the periodic table handed out with this exam) (3 pts each, 6 pt
2. For principal quantum # 5 the possible angular momentum quantum numbers are (3 pts)
3. For angular momentum quantum number 3 the possible magnetic quantum numbers are (3 pt
4. For the angular momentum quantum number ℓ= 2 the symbol is (s, p, d, f) (circle one) (3 pts)
5. Periodic Properties:
a. The bigger atomic size (atomic radius) is the element(circle one) (Mg) or (Ba) (3 pt)
b. The smaller ionization energy is for the element (circle one) (Li) or (Rb) (3 pt)
c. The more reactive element is (circle one) (Na) or (K) (3 pt)

1. a. Give the electron configuration for the element **Br** using the 1s², 2s² nomenclature (7 pts)

- b. Give the <u>valence</u> electron configuration for the same element using the same notation. (6 pts)
- c. Give the <u>orbital diagram</u> for the <u>valence</u> electrons of the element including showing the electrons as up or down arrows. (6 pts)

	live the Lewis Dot Structure for the molecule ClC ₂ H ₃ O or which I have provided the la and frame by:
a.	Give the total number of valence electrons for the molecule (4 pts) (show work for fullcredit)
b.	Complete the Lewis Dot Structure Hint: Lewis Dot structure has one double bond Elements in period 1 & 2 cannot expand its octet. The formula for the Lewis Dot structure is: ClC ₂ H ₃ O (6 pts)
	Н
Cl	O
	C C
Н	Н

Exam I	II General Chemistry	y I (CHEM 10	1) 11/15/12 8:30	am T/R Dr. Hahn	Exam #	
Name_			(print) I	Vame		_(sign)
questio	show work for partial ns have no partial cre sly cannot grade it. (1	dit. Please	write anything yo	d in some of the Sho u want graded legib	ort Answer Questions. Multip dy II If I cannot read your	ole choice work, I
	MULTIPLE CHOICI question, 28 pts total		one alternative t	hat best completes	the statement or answers the	question. (2
	B) A covalent be C) It is not possi D) Single bonds	ond is formed ond has a low ible for two at are shorter th	through the trans er potential energ oms to share more an double bonds.	y than the two sepa: e than two electrons		1)
	2) Which reaction below A) Li ⁺ (g) + e ⁻ → B) Li ⁺ (g) → Li(C) Li(g) → Li ⁺ (D) Li(g) + e ⁻ → E) Li(g) + e ⁻ →	low represent Li(g) (g) + e ⁻ (g) + e ⁻ Li ⁻ (g)				2)
	3) How many valence A) 2	e shell electro B) 3		f indium have? C) 49	D) 1	3)
	4) Place the following element is F)	g elements in	order of <u>increasin</u>	g electronegativity.	(hint : most electronegative	4)
	K A) P < K < Cs B) Cs < P < K C) Cs < K < P D) P < Cs < K E) K < P < Cs					
	5) Which of the follow A) Rb, Sb, I		same number of Ar, Kr, Br	valence electrons? C) Ga, Sn, Bi	D) As, Sb, Bi	5)
	6) The vertical height A) amplitude B) wavelength C) area D) median E) frequency	t of a wave is	called			6)

7) D	escribe the shape of	a p orbital.					7)	
,	A) eight connected	balls						
	B) four connected b							
	C) two connected by three connected							
	E) a ball	build						
8) W		g occur as the energ	y of a phot	ton of elect	romagnetic rac	liation increases?	8)	_
	A) the wavelength B) the wavelength							
	C) the frequency de	~						
	D) the speed increa							
	E) None of the abo	ve occur as the energ	gy of a pho	oton increa	ses.			
9) 14	Thich of the followin	g represent the Lewi	is structure	e for N?			9)	
<i>)</i> (A) ·N:	B) ·N:		C 101 11.	D) Ņ:	E) N-		_
	A)	B) 1	C) ****		D) 🕶	E) 1N-		
10) Ic	dentify the species th	at has the smallest r	adius.				10)	
,	A) neutral			B) anior				
	C) cation			D) they	are all the same	e size		
11) A	double covalent bo	nd contains	of elec	trons.			11)	
11,2	A) 0 pairs	B) 2 pairs	C) 3 pair	rs	D) 4 pairs	E) 1 pair	, <u> </u>	
12) G	live the numbers for	=				_, , , _	12)	_
	A) 1, 2, 3, 4, 5	B) 0, 1, 2, 3, 4		C) -2, -1	1, 0, 1, 2	D) 1, 2, 3		
12) 14	Thich reaction below	represents the first i	ionization	of O2			13)	
13) 1	A) O ⁺ (g) + e ⁻ \rightarrow O		oruzation	010.			10,	_
	B) $O(g) \rightarrow O^+(g) +$							
	C) $O^-(g) + e^- \rightarrow O$							
	D) $O^-(g) \rightarrow O(g) +$	e e -						
	E) $O(g) + e^- \rightarrow O^-$	(g)						
14) Id	lentify the compoun	d with ionic bonding	ς.				14)	
-,	A) NaCl	B) H ₂ O	C) Li		D) He	E) S	·	

Part II Short Answer: Write the word or phrase or circle the choice that best completes each statement or answer the question. (42 pts)
1. Principal quantum number is abbreviated (a) (2 pts) (a letter) and is correlated with
(b)(2 pts) numbers in the periodic table.
Principal quantum numbers are also called the (c) (shell, subshell, orbital) (circle one) (2 pts)
The Principal quantum number gives (d) (how far the electron is from the nucleus) (t he shape
of the electrons cloud around the nucleus) (circle one) (2 pts) The angular momentum quantu
number is abbreviated (e)(2 pts) is also called the subshell
magnetic quantum number is abbreviated (f) (2 pts) (a letter symbol)
In the d subshell, there are (g) (give # in blank) orbitals. (3 pts)
Maximum number of electrons in the d subshell is (h) (give # in blank) (3 pts)
The p block of the periodic table consists of Group (i) to Group (j)
(using the exact group number in the periodic table handed out with this exam) (3 pts each, 6 pts
2. For principal quantum number 6 the possible angular momentum quantum numbers are (3 pts)
3. For angular momentum quantum number 2 the possible magnetic quantum numbers are (3 pts)
4. For the angular momentum quantum number ℓ= 3 the symbol is (s, p, d, f) (circle one) (3 pts)
5. Periodic Properties:
a. The bigger atomic size (atomic radius) is the element(circle one) (Sr) or (Rb) (3 pt)
b. The smaller ionization energy is for the element (circle one) (Mg) or (Ca) (3 pt)
c. The more reactive element is (circle one) (Na) or (Li) 3 pt)

Dr. Hahn Exam III 8:30 page 3

1. a. Give the electron configuration for the element Se using the 1s², 2s² nomenclature (7 pts)

b. Give the <u>valence</u> electron configuration for the same element using the same notation. (6 pts)

c. Give the <u>orbital diagram</u> for the <u>valence</u> electrons of the element including showing the electrons as up or down arrows. (6 pts)

2.	Gi	ve the	e Lewis Dot S	tructure for the	molecule	CO ₂ HBr	for which I have	e provided the
for	nula	and	frame by:					
	a.		live the total n		ce electrons	for the mole	ecule	(4 pts)
	b.	<u>E</u>					structure has one e formula for the	
			O					
Н		О	C	Br				

Exam II	I General Chemistry	/ I (CHEM 101) 11/1	15/12 (955 am T , F	R Dr. Hahn	Exam #	
Name_			(print) Name_			(sign)
questio	show work for partial ns have no partial cre sly cannot grade it. (1	dit. Please write a	nything you want	me of the Short Ans t graded legibly. I	wer Questions. Mul	ttiple choice ur work, I
	MULTIPLE CHOICI question, 28 pts total		lternative that be	st completes the sta	tement or answers th	ne question. (2
	1) Which reaction bel A) Li ⁺ (g) + e ⁻ → B) Li(g) → Li ⁺ (C) Li(g) + e ⁻ → D) Li ⁺ (g) → Li(E) Li(g) + e ⁻ →	· Li(g) g) + e ⁻ Li ⁺ (g) g) + e ⁻	lectron affinity of	Li?		1)
	B) A pair of election C) A covalent be D) Single bonds	ible for two atoms to etrons involved in a ond has a lower poto are shorter than do	o share more than covalent bond are ential energy than uble bonds.	two electrons. sometimes referred the two separate ato electrons from one a	oms.	2)
	3) What are the possis A) 0, 1, 2, 3, 4, o C) -5, -4, -3, -2		B)) -4, -3, -2, -1, 0, +1,) 6	+2, +3, or +4	3)
	4) Which of the follow A) Ar, Kr, Br	wing have the same B) Rb, Sb,		e electrons?) As, Sb, Bi	D) Ga, Sn, Bi	4)
	5) A triple covalent b A) 3 pairs	ond contains B) 4 pairs	of electrons. C) 2 pairs	D) 1 pair	E) 0 pairs	5)
	6) How many valence A) 4	e electrons does a no B) 52	eutral tellerium atc	om have?) 6	D) 2	6)
	7) Which of the follo	wing represent the I	ewis structure for	· C1?		7)
	A) ·Ċl:	_{B)} :Ċ:	C) ·Çl:	D) Cl·	E) :Ċİ:	
	8) Describe the shape A) two connecte B) four connect C) eight connec D) a ball E) three connec	ed balls ed balls ted balls				8)

9) Which reaction below represents the first ionization	of O?	9)
A) $O(g) \rightarrow O^+(g) + e^-$		
B) $O^-(g) \rightarrow O(g) + e^-$		
C) $O^+(g) + e^- \rightarrow O(g)$		
D) $O^{-}(g) + e^{-} \rightarrow O^{2-}(g)$		
E) $O(g) + e^- \rightarrow O^-(g)$		
10) Which of the following occur as the wavelength of a	photon of electromagnetic radiation	10)
increases?		
A) the energy increases		
B) the frequency decreases		
C) Planck's constant decreases		
D) the speed decreases E) None of the above occur as the wavelength of a	a photon increases	
E) None of the above occur as the wavelength of	a photost mercases.	
11) The number of cycles that pass through a stationary	point is called	11)
A) frequency		
B) area		
C) amplitude		
D) median		
E) wavelength		
12) Identify the species that has the smallest radius.		12)
A) anion	B) neutral	
C) cation	D) they are all the same size	
13) Place the following elements in order of decreasing	electronegativity. (hint: the most	13)
electronegative element is F)		, <u></u>
S Cl Se		
A) Se > Cl > S		
$\stackrel{\frown}{B}$ Se $>$ S $>$ Cl		
C) Cl > S > Se		
D) S > Cl > Se		
E) $Cl > Se > S$		
14) Identify the compound with covalent bonding.		14)
14) Identity the compound with covalent boliding.	D) Li E) NaCl	,

Part II Short Answer: Write the word or phrase or circle the choice that best completes each statement or answer the
Principal quantum number is abbreviated (a) (2 pts) (a letter) and is correlated with the corre
(b)(2 pts) numbers in the periodic table.
Principal quantum numbers are also called the (c) (shell, subshell, orbital) (circle one) (2 pts)
The Principal quantum number gives (d) (how far the electron is from the nucleus) (the shape
the electrons cloud around the nucleus) (circle one) (2 pts) The angular momentum quantum
number is abbreviated (e)(2 pts) is also called the subshell
magnetic quantum number is abbreviated (f)(2 pts) (a letter symbol)
In the f subshell, there are (g) (give # in blank) orbitals. (3 pts)
Maximum number of electrons in the f subshell is (h) (give # in blank) (3 pts)
The d block of the periodic table consists of Group (i) to Group (j)
(using the exact group number in the periodic table handed out with this quiz) (3 pts each, 6 pts
2. For principal quantum number 4 the possible angular momentum quantum numbers are (2 pts)
3. For angular momentum quantum number 2 the possible magnetic quantum numbers a (3 pts)
4. For the angular momentum quantum number ℓ= 1 the symbol is (s, p, d, f) (circle one) (3 p
5. Periodic Properties:
a. The bigger atomic size (atomic radius) is the element(circle one) (O) or (Se) (3 pt)
b. The smaller ionization energy is for the element (circle one) (C) or (Ge) (3 pt)
c. The more reactive element is (circle one) (Cs) or (Na) (3 pt)

Dr. Hahn Exam III 9:55 page 3

1. a. Give the electron configuration for the element As using the $1s^2$, $2s^2$ nomenclature (7 pts)

- b. Give the <u>valence</u> electron configuration for the same element using the same notation. (6 pts)
- c. Give the <u>orbital diagram</u> for the <u>valence</u> electrons of the element including showing the electrons as up or down arrows. (6 pts)

2.		the Lewis Dot		or the mol	lecule	CN ₂ O ₂	H ₂ Br ₂	for which	I have
pro	vided t	he formula and	frame by:						
	a.	Give the total (show work f			lectrons	for the n	nolecule	- 13 ⁻⁰ 2 ⁻	(4 pts)
	b.	Complete the Elements in perstructure is:	eriod 1 & 2		xpand it	s octet.			
	(0	Н						
		N	C	N	Br				
	О		Br	Н					

xam III General Chemi	stry I (CHEM 101) 11	/15/12 955 am TR	Dr. Hahn	Exam #	
lame		(print) Name			(sign)
lease show work for par uestions have no partial bviously cannot grade it	credit. Please write	anything you want g			
art I MULTIPLE CHO		alternative that best	completes the st	atement or answers t	he question.(
1) Which reaction A) O ⁻ (g) → B) O ⁻ (g) + e ⁻ C) O ⁺ (g) + e ⁻ D) O(g) → 0 E) O(g) + e ⁻	$ \rightarrow O^{2^{-}}(g) \rightarrow O(g) O^{+}(g) + e^{-} $	first ionization of O?			1)
2) Which of the fo A) As, Sb, Bi	llowing have the same B) Rb, Sk		lectrons? a, Sn, Bi	D) Ar, Kr, Br	2)
3) Which of the fo	llowing represent the			. .	3)
A) Cl·	B) :Cl:	c) :ä:	D) .Ċj:	E) ∙Çl:	
4) How many val A) 4	ence electrons does a r B) 6	neutral tellerium atom C) 52		D) 2	4)
5) Place the follow electronegative	ving elements in order element is F)	of <u>decreasing</u> electro	negativity. (hir	nt: the most	5)
S A) S > Cl > B) Cl > S > C) Cl > Se : D) Se > Cl : E) Se > S >	Se > S > S				
6) The number of A) median B) amplitude C) area D) waveleng E) frequency	th	gh a stationary point	is called		6)

7) Which of the follo	owing occur as the w	avelength of a photo	n of electromagnet	ic radiation	7)	
increases?						
A) the speed de						
B) the energy is						
C) Planck's con						
D) the frequence	•	wavalangth of a phot	on increases			
E) None of the	above occur as the v	vavelength of a phot	on increases.			
8) Which reaction be	elow represents the a	electron affinity of L	i?		8)	
A) Li(g) + e ⁻ →		or E	••		-/	-
B) $Li(g) \rightarrow Li^{+}$						
C) $Li^+(g) \rightarrow Li$	-					
D) $Li^{+}(g) + e^{-}$						
E) $Li(g) + e^- \rightarrow$	→ Li ⁺ (g)					
0.11	1 11 1 1 .	1 1.			0)	
9) Identify the comp		-	D) 6	E) He	9)	-
A) Li	B) H ₂ O	C) NaCl	D) S	E) He		
10) Describe the shap	o of a c orbital				10)	
A) two connect						-
B) four connec						
C) a ball						
D) eight connec	cted balls					
E) three connec						
44\ X1\YI + 1		EDI JEO			41\	
11) Which of the follo				m.a.	11)	_
	-	tential energy than th	ie two separate atol	115.		
	s are shorter than do	ouble bonds. o share more than tw	zo electrons			
		igh the transfer of ele		om to another		
		covalent bond are so				
, 1				•		
12) What are the poss	sible values of l if $n =$	6?			12)	_
A) 0, 1, 2, 3, 4, 6		B) 6				
C) - 5, -4, -3, -2	2, -1, 0, +1, +2, +3, +4	or +5 D) -	4, -3, -2, -1, 0, +1, +	-2, +3, or +4		
13) Identify the specie	es that has the small	oet radiue			13)	
A) cation	es triat has the sman		nion			-
C) neutral			hey are all the same	size		
-, 1.000m		ے, د		-		
14) A triple covalent l	bond contains	of electrons.			14)	
A) 3 pairs		C) 0 pairs	D) 1 pair	E) 2 pairs		_

Part II Short Answer: Write the word or phrase or circle the choice that best completes each statement or answer the question. (42 pts)
1. Principal quantum number is abbreviated (a) (2 pts) (a letter) and is correlated with
(b) (2 pts) numbers in the periodic table.
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The Principal quantum number gives (d) (how far the electron is from the nucleus) (the shape of
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In the p subshell, there are (g) (give # in blank) orbitals. (3 pts)
Maximum number of electrons in the p subshell is (h) (give # in blank) (3 pts)
The p block of the periodic table consists of Group (i) to Group (j)
(using the exact group number in the periodic table handed out with this quiz) (3 pts each, 6 pts)
2. For principal quantum number 3 the possible angular momentum quantum numbers are (3 pts)
3. For angular momentum quantum number 3 the possible magnetic quantum numbers are (3 pts)
4. For the angular momentum quantum number $\ell = 0$ the symbol is (s, p, d, f) (circle one) (3 pts)
5. Periodic Properties:
a. The bigger atomic size (atomic radius) is the element(circle one) (Cl) or (F) (3 pt)
b. The smaller ionization energy is for the element (circle one) (C) or (F) (3 pt)
c. The more reactive element is (circle one) (Li) or (Rb) (3 pt)

page 3

Dr. Hahn Exam III 9:55

1. a. Give the electron configuration for the element \mathbf{Ge} using the $1s^2$, $2s^2$ nomenclature (7 pts)

b. Give the <u>valence</u> electron configuration for the same element using the same notation. (6 pts)

c. Give the <u>orbital diagram</u> for the <u>valence</u> electrons of the element including showing the electrons as up or down arrows. (6 pts)

2.	Give the Lewis Dot Structure for the molecule					COF ₂ NH	for which I have provided the		
for	mula	a an	d frame by:						
	a.		Give the total number of valence electrons for the molecule(show work for fullcredit)						(4 pts)
	b.		Complete the 3	Lewis Dot Str	ucture Hint:	Lewis Do	t structure h	as one doub	le bond.
			Elements in perstructure is:	criod 1 & 2 car COF ₂ NH		ts octet. T	he formula f	or the Lewis	Dot
			O						
Н		N	C	F					
		F							