The Periodic Table	He 2						
	2						
	///A 4.00						
	F Ne						
3 4 5 6 7 8	9 10						
6.94 9.01 10.81 12.01 14.01 16.00 1	9.00 20.18						
Na Mg Al Si P S	CI Ar						
11 12 13 14 15 16	17 18						
22.99 24.31 IIIB IVB VB VIB VIIB VIIIB VIIIB IB IB 26.98 28.09 30.97 32.07 3	5.45 39.95						
K Ca Sc Ti V Cr Mn Fe Co Ni Cu Zn Ga Ge As Se	Br Kr						
<u>19</u> <u>20</u> <u>21</u> <u>22</u> <u>23</u> <u>24</u> <u>25</u> <u>26</u> <u>27</u> <u>28</u> <u>29</u> <u>30</u> <u>31</u> <u>32</u> <u>33</u> <u>34</u>	35 36						
39.10 40.08 44.96 47.88 50.94 52.00 54.94 55.85 58.93 58.69 63.55 65.39 69.72 72.61 74.92 78.96 7	9.90 83.80						
Rb Sr Y Zr Nb Mo Tc Ru Rh Pd Ag Cd In Sn Sb Te	I Xe						
37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52	53 54						
85.47 87.62 86.91 91.22 92.91 95.94 (97.9) 101.07 102.91 106.42 107.87 112.41 114.82 118.71 121.76 127.60 12	26.90 131.29						
CS BA LA HT TA W RE OS IT PT AU HG TI PD BI PO	At Rn						
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Er Da Ac Df Db Sa Bb He Mt De Da Hub Hut Hug Hub	210/ (222)						
87 88 89 104 105 106 107 108 109 110 111 112 113 114 115							
223.02 226.03 227.03 (261) (262) 263) (262) (265) (266) (271) (272) (285) (284) (289) (288)							
Ce Pr Nd Pm Sm Eu Gd Tb Dy Ho Er Tm '	Yb Lu						
58 59 60 61 62 63 64 65 66 67 68 69	70 71						
140.12 140.91 144.24 (145) 150.36 152.97 157.25 158.93 162.50 164.93 167.26 168.93 17	73.04 174.97						
Th Pa U Np Pu Am Cm Bk Cf Es Fm Md J	No Lr						
90 91 92 93 94 95 96 97 98 99 100 101 ⁴	102 103						
232.04 231.04 238.03 237.05 (240) 243.06 (247) (248) (251) 252.08 257.10 (257) 25	59.10 262.11						



Average Single Bond Lengths (Picometers)

	н	С	N	0	F	Si	Р	S	CI	Br	1
н	74	110	98	94	92	145	138	132	127	142	161
С		154	147	143	141	194	187	181	176	191	210
Ν			140	136	134	187	180	174	169	184	203
0				132	130	183	176	170	165	180	199
F	5-8 (2)				128	181	174	168	163	178	197
Si						234	227	221	216	231	250
Ρ							220	214	209	224	243
s								208	203	218	237
С	5.2 011								200	213	232
Br										228	247
Т											266

Average Multiple Bond Lengths (Picometers)

C = C	134	$C \equiv C$	121
C = N	127	C = N	115
C = 0	122	C ≡ O	113
N = 0	115	N≡0	108

 $1 \text{ pm} = 1 \times 10^{-12} \text{ m}$

Average Single Bond Energies (kJ per mole)

	н	С	Ν	0	F	Si	Р	s	CI	Br	T
н	436	414	389	464	569	293	318	339	431	368	297
С		347	293	351	439	289	264	259	330	276	238
Ν			159	201	272		209		201	243	
0				138	184	368	351		205		201
F					159	540	490	285	255	197	
Si						176	213	226	360	289	
Ρ							213	230	331	272	213
s								213	251	213	
CI									243	218	209
Br										192	180
1											151

Average Multiple Bond Energies (kJ per mole)

N = N	418	C = C	611	
N ≡ N	946	C ≡ C	837	
N = 0	590	C = 0	803	In CO ₂ Only
C ≡ N	891	C = 0	745	
0 = 0	498	C ≡ O	1075	

SID	Last First							
Question 1 10 Points	Solution of the Schrödinger wave equation results in a set of functions (orbitals) that describe the behavior of the electron. Each function is characterized by 3 quantum numbers : n , I , and mI .							
	The value of n= 3:							
	a) then the i quantum number can have values from to							
	c) If n=3 and l = 2, then the obital is designated as a orbital							
	d) With I = 2 the ml quantum number can have a total of values							
Question 2	Label the following orbital's as either: s, p, d, f, g?							
Question 3 4 Points	a) The orbital depicted on the left is what type of orbital? b) Based on its Radial Distribution depicted on the right you can label this orbital as?							
Question 4	a) Write the complete electron configuration for Na :							
101000	b) Write the noble gas configuration for Zn :							
	c) The element with an electron configuration 1s²2s²2p⁶3s²3p⁶4s²3d⁷							
	d) The element with the noble gas configuration [Ar]4s ¹ 3d ¹⁰							
	 e) Write the noble gas configuration for Cr: (a) Write the noble gas configuration for Es²⁺. 							
	a) The element with the configuration [Ar]4s ² 3d ¹⁰ 4n ³ has valence electrons							
	h) Period 6 has dimagnetic elements.							
Question 5 6 Points	a) Using only the periodic table arrange the following elements in order of increasing atomic size: Ga, Ca, S, Si							
	smallest largest							
	b) Which one has the greatest Electron Affinity :							
	c) Which one has the smallest first ionization energy :							

Question 6	Draw the <u>best</u> Lewis Dot structure for the following				
	N2:		HFCO:		
	ClO 2 ⁻ : (Cl = Chlorine)		I ₃ -		
Question 7	Draw the <u>best</u> Lewis Dot str	ucture for the fol	lowing organic molecul	es	
	CH₃CH₂COOH:		C₂H₄:		
Question 8 4 Points	Draw the <u>best</u> Lewis Dot structure for the following molecules on the rough work paper provided and then classify each as either a free radical (yes) or not (no)				
	a) 0 2 ⁻ :	b) C	Cl2: (Cl = Chlorine)	_	
Question 9 8 Points (6 Points)	Draw all <u>reasonable</u> resonanc	ce structure for N	lO₂F∶		
(2 Points)	Circle the best answer: <i>Average bond length table is on the front page of this exam.</i> The N to O bond length in pm is expected to be:				
	a) = 136 k) > 136	c) = 115	d) > 115	

Question 10 6 Points	Using the Average bond energy table on the front page of this exam, estimate the enthalpy change associated with the following reaction. CH4(g) + Oxygen(g)> Carbon dioxide(g) + Water(g)			
	kJ			
Question 11 6 Points	The questions asked on the right refer to the partial Lewis Structure depicted on the left.			
	a) What is the Formal Charge on N :			
	b) What is the Formal Charge on O:			
	c) What is the overall charge on the molecule :			
Question 12 6 Points	The questions asked on the right refer to the partial Lewis Structure depicted on the left.			
	a) Give the electron pair geometry about C :			
	H—Ċ—H b) Give the molecular geometry about C :			
	H c) Give the bond angle about C :			
Question 13	The questions asked on the right refer to the partial Lewis Structure depicted on the left.			
, romis	:F:			
	a) Give the electron pair geometry about Br:			
	b) Give the molecular geometry about Br :			
Question 14 6 Points	The questions asked on the right refer to the Lewis diagram for acetamide depicted on the left			
	H :0: I II a) The molecular aeometry about 1 is:			
	H-C-C-N-H b) The molecular acometry about 3 is:			
	1 2 3 c) The bond angle about 2 is:			

Do Not Write Below This

Exam II Score				