

Name: _____

8. (15 pts) Indicate whether or not the following quantum numbers or orbitals can exist using Y for yes and N for no. For those that **cannot exist, explain why.**

	<u>Circle</u>	<u>If no, then explain why.</u>
a. 3d	Y or N	_____
b. $n = 3, l=2, m_l = 2, m_s = \frac{1}{2}$	Y or N	_____
c. $n = 2, l=2, m_l = 0, m_s = \frac{1}{2}$	Y or N	_____
d. 1p	Y or N	_____
e. 9f	Y or N	_____

9. (15 pts) Write the **NOBLE GAS** electron configuration for the following atoms and ions, indicate the number of valence electrons (VE) and determine if they are paramagnetic (P) or diamagnetic (D).

	<u>Noble Gas Electron Configuration</u>	<u>VE</u>	<u>Circle</u>
a. Br^{1-}	_____	___	P or D
b. Cr	_____	___	P or D
c. Ni	_____	___	P or D
d. Sr^{2+}	_____	___	P or D
e. P	_____	___	P or D

10. (40 pts) For each of the following molecules or ions: **(i)** Draw the correct Lewis Dot Structure, **(ii)** Give the AXE notation, **(iii)** Determine the molecular geometry, **(iv)** Give hybridization of the central atom, and **(v)** Indicate if each molecule is polar or nonpolar.

a. SO_2	c. XeF_2
b. ICl_4^{-1}	d. PCl_3

III. (10pts) Essay Question: Explain the trend of ionization energy in relation to the periodic table and describe how the trend is caused by effective nuclear charge.