Practice Test Questions
Ch. 7 - 9
Answer Key!

1.) A.) O, S, Se

2.) ← Increasing ↓

3.) D.) principal quantum # of valence e^- obitals increases

4.) O^{2-}, F^-, Ne, Na^+

5.) ↑ increasing, → Chlorine

6.) L → R atomic radius decrease; L → R (F) electron affinity increasing; L → R First ionization energy increasing — D.)

7.) longest → single bond; shortest → triple bond
weakest – single bond.
strongest – triple bond
σ – singma bond
π – pi bond

8.) NO_2^-
5 6(2) +1 = 18 valence e^-

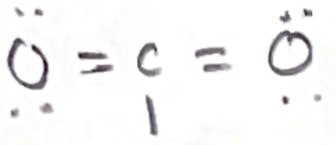
9.) E placement of e^- only

10.) Co^{2+} ion $[Ar]\ 3d^7$
4+

Co
$[Ar]\ 4s^2\ 3d^7$
$[Ar]\ 4s\ 3d^5$

11.) C – Cl 2.5 3.0 = .5; C – Br 2.5 2.8 = .3; C – I 2.5 – 2.7 = .2; C – F 2.5 – 4.0 = 1.5

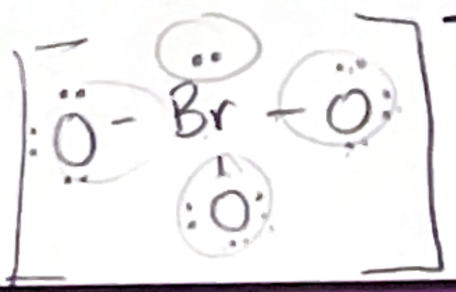
12.) F.C = V.e – (# of bond + free e^-)
$\frac{1}{2}$(bonding e^-)



4 – (4 + 0) = 0

13.) P F5
+5 -1(5) = 0
-5

14.) BrO_3^-
7 6(3) +1 = 26 = 20



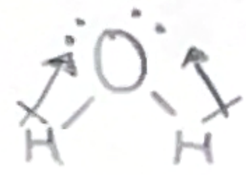
domains = 4
trigonal pyramidal

14.) An electron domain consist of ____? D.) a, b, and C

15.) What is the molecular shape of H_2O

1 1(2) 6 = 8 valence $e^{(-)}$

$\frac{-4}{4}$



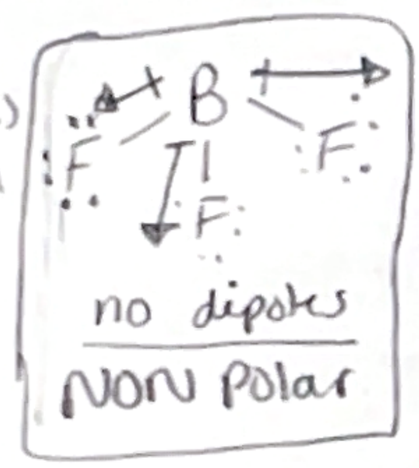
Domain = Tetrahedral

2 lone pairs, 2 bond

Bent molecular shape ~105°

16.) Of the molecules below, only ____ is nonpolar (symmetrical) (dipoles will cancel out)

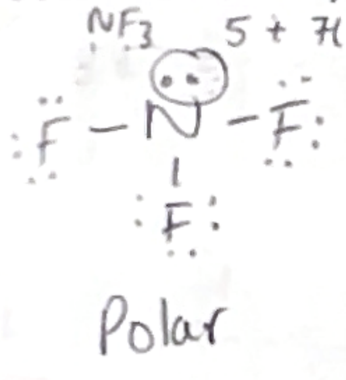
BF_3 1 1 3 7(3) = 24



no dipoles

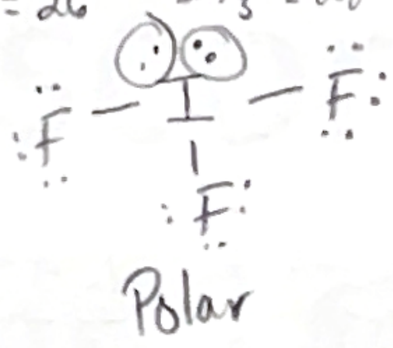
NON Polar

NF_3 5 + 7(3) = 26



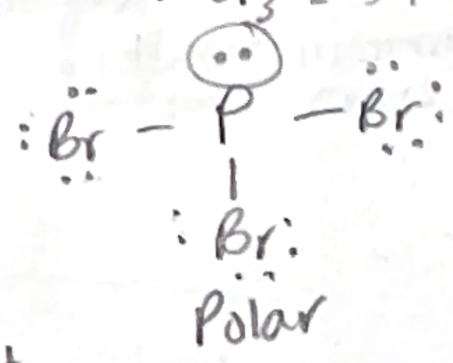
Polar

IF_3 = 28



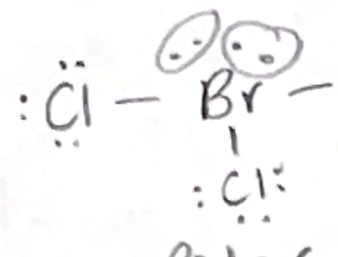
Polar

PBr_3 = 5 + 7(3) = 26



Polar

$BrCl_3$ = 28



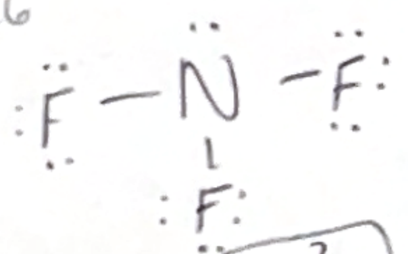
Polar

*Anytime the central element has lone pair the molecule will be Polar!

17.) The hybridization of nitrogen in NF_3 and NH_3 are ___ & ___ respectively

*Draw your Lewis structures first!

NF_3 = 26



Polar

Nitrogen = sp^3

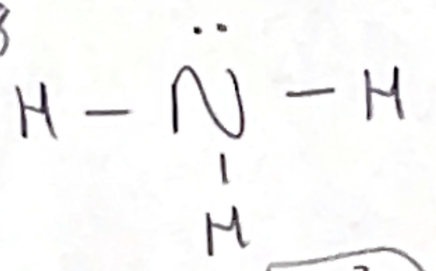
$e^{(-)}$ domain = tetrahedral

Molecular geometry = trigonal pyramidal

angle = ~107°

Hybridization = sp^3

NH_3 = 8



Polar

Nitrogen = sp^3

$e^{(-)}$ domain = tetrahedral

Molecular geometry = trig. pyramidal

angle = ~107°

Hybridization = sp^3

18.) An antibonding MO ____ the corresponding bonding MO

D.) is always higher in energy than

- Bonding MOs have $e^{(-)}$ density between nuclei creating stable bond

* Antibonding MOs have a node between nuclei destabilizing bond.

19.) The F-N-F bond angle in the NF_3 molecule is slightly less than ____.

B. 109.5°

↳ ~107°