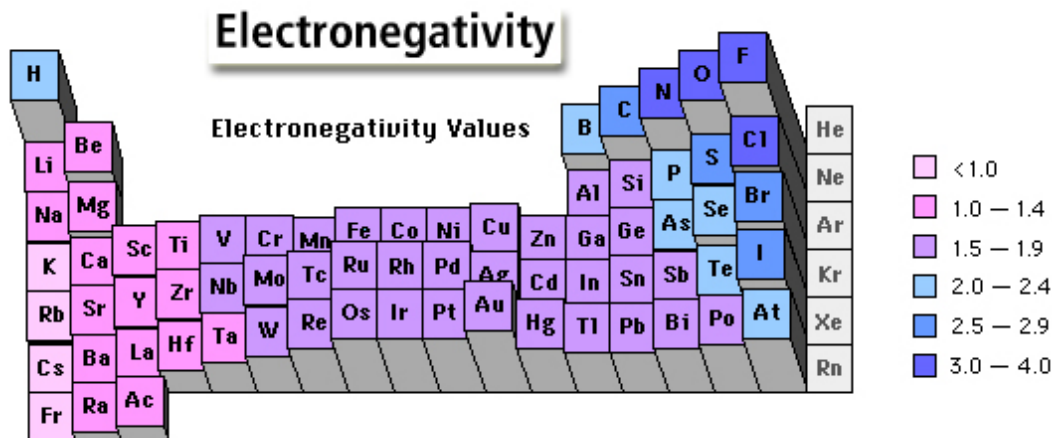


The Periodic Table

											<i>VIIIA</i>						
<i>IA</i>																<i>VIIIA</i>	
H 1 1.01											<i>IIIA</i>	<i>IVA</i>	<i>VA</i>	<i>VIA</i>	<i>VIIA</i>	<i>VIIIA</i>	
Li 3 6.94	Be 4 9.01											B 5 10.81	C 6 12.01	N 7 14.01	O 8 16.00	F 9 19.00	Ne 10 20.18
Na 11 22.99	Mg 12 24.31											Al 13 26.98	Si 14 28.09	P 15 30.97	S 16 32.07	Cl 17 35.45	Ar 18 39.95
		<i>IIIB</i>	<i>IVB</i>	<i>VB</i>	<i>VIB</i>	<i>VIB</i>	<i>VIB</i>	<i>VIB</i>	<i>VIB</i>	<i>IB</i>	<i>IIB</i>						
K 19 39.10	Ca 20 40.08	Sc 21 44.96	Ti 22 47.88	V 23 50.94	Cr 24 52.00	Mn 25 54.94	Fe 26 55.85	Co 27 58.93	Ni 28 58.69	Cu 29 63.55	Zn 30 65.39	Ga 31 69.72	Ge 32 72.61	As 33 74.92	Se 34 78.96	Br 35 79.90	Kr 36 83.80
Rb 37 85.47	Sr 38 87.62	Y 39 88.91	Zr 40 91.22	Nb 41 92.91	Mo 42 95.94	Tc 43 (97.9)	Ru 44 101.07	Rh 45 102.91	Pd 46 106.42	Ag 47 107.87	Cd 48 112.41	In 49 114.82	Sn 50 118.71	Sb 51 121.76	Te 52 127.60	I 53 126.90	Xe 54 131.29
Cs 55 132.91	Ba 56 137.33	La 57 138.91	Hf 72 178.49	Ta 73 180.95	W 74 183.85	Re 75 186.21	Os 76 190.2	Ir 77 192.22	Pt 78 195.08	Au 79 197.97	Hg 80 200.59	Tl 81 204.38	Pb 82 207.2	Bi 83 208.98	Po 84 (209)	At 85 (210)	Rn 86 (222)
Fr 87 223.02	Ra 88 226.03	Ac 89 227.03	Rf 104 (261)	Db 105 (262)	Sg 106 (263)	Bh 107 (262)	Hs 108 (265)	Mt 109 (266)	Ds 110 (271)	Rg 111 (272)	Uub 112 (285)	Uut 113 (284)	Uuq 114 (289)	Uup 115 (288)			

Ce 58 140.12	Pr 59 140.91	Nd 60 144.24	Pm 61 (145)	Sm 62 150.36	Eu 63 152.97	Gd 64 157.25	Tb 65 158.93	Dy 66 162.50	Ho 67 164.93	Er 68 167.26	Tm 69 168.93	Yb 70 173.04	Lu 71 174.97
Th 90 232.04	Pa 91 231.04	U 92 238.03	Np 93 237.05	Pu 94 (240)	Am 95 243.06	Cm 96 (247)	Bk 97 (248)	Cf 98 (251)	Es 99 252.08	Fm 100 257.10	Md 101 (257)	No 102 259.10	Lr 103 262.11



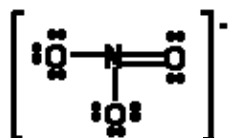
SID

--	--	--	--	--	--	--	--	--	--

Last _____ First _____

Question 1
8 Points

To answer the questions, interpret the following Lewis diagram for NO_3^-



- a) The number of **lone pair** on central atom _____
- b) The number of **single bond(s)** _____
- c) The number of **double bond(s)** _____
- d) The number of **equivalent Lewis structures** _____

Question 2
8 Points

Draw a Lewis structure for each of the following where the central atom obeys the **octet rule**.

HNC (N is the central atom)

CO

PO_4^{3-}

HClCO

Cl=Chlorine

Question 3
6 Points

On the rough work paper provided - draw a Lewis structure for CO_3^{2-} in which the central **C** atom obeys the octet rule, and answer the questions on the right based on your drawing.

- a) The number of **unshared pairs (lone pairs)** on the central **C** atom is: _____
- b) The central **C** atom forms _____ **single bonds**.
- c) The central **C** atom forms _____ **double bonds**.

Question 4
8 Points

Draw a Lewis structure for each of the following **organic molecules**.

C_2H_2

HCOOCH_3

CH_3COH

$\text{CH}_3\text{CH}_2\text{OH}$

Question 5 SO_3 has resonance structures - draw them.
6 Points

Question 6 8 Points	What is the name of the compound with the formula:	What is the formula for:
	a) CF_4 _____	a) Boron trichloride _____
	b) SCl_6 _____	b) Carbon monoxide _____

Question 7
6 Points



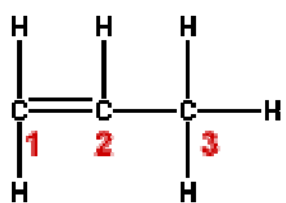
What is the **molecular geometry** about:

a) **Atom 1:** _____

b) **Atom 2:** _____

c) **Atom 3:** _____

Question 8
6 Points



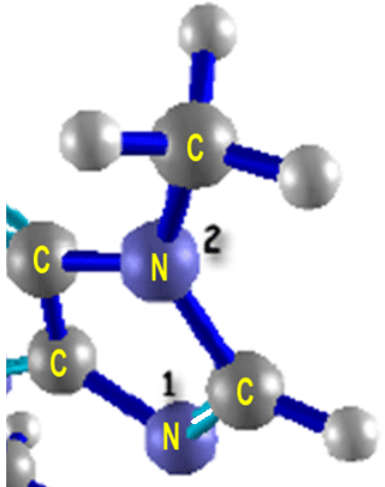
What is the **predicted bond angle** about:

a) **Atom 1:** _____

b) **Atom 2:** _____

c) **Atom 3:** _____

Question 9
6 Points



What is the **predicted bond angle** about the following atoms?

a) **Atom 1** _____

b) **Atom 2** _____

Question 10
8 Points

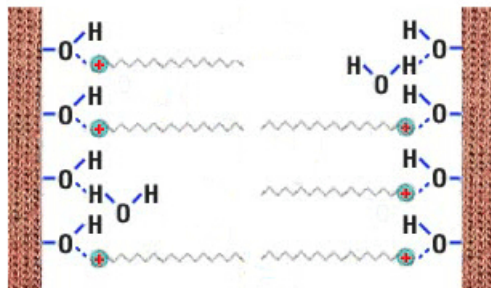
The **electron-pair geometry** around the **Xe** atom in XeO_3 ? _____ -

There is/are _____ **lone pair(s)** around the central atom, so the **molecular geometry** of the XeO_3 molecule is predicted to be _____.

XeO_3 is _____. (Polar/Nonpolar)

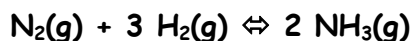
Question 11
4 Points

In our discussion on the **consequences of molecular polarity**, the depiction below was used to discuss:



- a) Membranes
- b) Micelle actions
- c) Fabric softeners
- d) The dissolution process
- e) Chelating therapy.
- f) Detergents

Question 12
4 Points



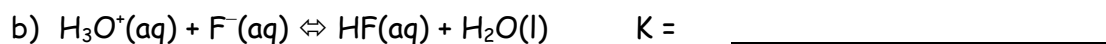
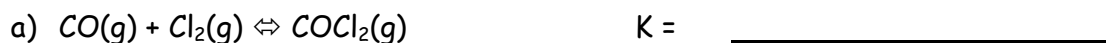
$$K = 3.5 \times 10^8 \text{ at } 298\text{K.}$$

Assuming you start with N_2 and H_2 and no NH_3 , **circle** those of the following that **best** describes the **equilibrium system**?

- a) The **reverse** reaction is favored at equilibrium.
- b) **Appreciable** quantities of **all species** are present at equilibrium.
- c) The **forward** reaction is favored at equilibrium.
- d) **Very little** N_2 will be present at equilibrium.

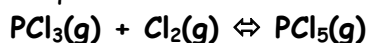
Question 13
4 Points

Write the **equilibrium constant expression**, K , for the following reactions:



Question 14
6 Points

Consider the following system at equilibrium at 500 K:



If the **volume** of the equilibrium system is suddenly **increased** at constant temperature::

The reaction must:

- a) Run in the **forward** direction.
- b) Run in the **reverse** direction.
- c) Remain the **same**.

The concentration of Cl_2 will:

- a) **Increase**
- b) Remain the **same**
- c) **Decrease**

Question 15
6 Points

Consider the following system at equilibrium at 298 K:



When some OH^- is **added** to the equilibrium system at constant temperature:

The reaction must:

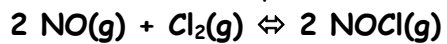
- a) Run in the **forward** direction.
- b) Run in the **reverse** direction.
- c) Remain the **same**.

The concentration of HNO_2 will:

- a) **Increase**
- b) Remain the **same**
- c) **Decrease**

Question 16
6 Points

Consider the following **exothermic** reaction at equilibrium at 573 K:



If the **temperature** of the equilibrium system is suddenly **increased**:

The reaction must:

- a) Run in the **forward** direction.
- b) Run in the **reverse** direction.
- c) Remain the **same**.

The concentration of **Cl₂** will:

- a) **Increase**
- b) Remain the **same**
- c) **Decrease**

Exam II Score