31. (a) → $Ca \rightarrow 1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2$

$Ca^+ \rightarrow [Ar]\ 4s^1$:→ has 1 e^- in valence shell

32. (b) Cl → EN of Cl → 3.0

33:- (c) NO_2^- :

$^{\ominus}O - \ddot{N} = O$

↳ one single bond and one double bond

34. (a) solid PCl_5

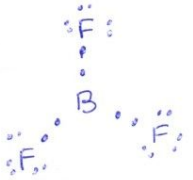
solid PCl_5 exist in ionic form as $PCl_4^{\oplus}$ and $PCl_6^{\ominus}$ and

Hybridization of $PCl_4^{\oplus}$ → sp^3

$PCl_6^{\ominus}$ → sp^3d^2

35:- (c) BF_3

Structure of BF_3



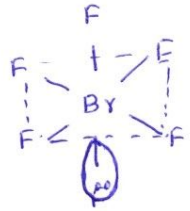
It only has 6e^-. Rest all has 8e^-.

36:→ a) Conceptual

37: (d) C−N → single bond

Single bond has longest wavelength so it can be broken with less amount of energy so its weakest as well.

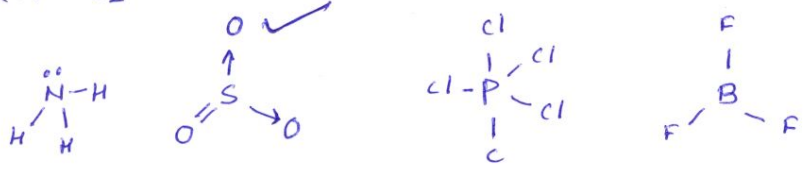
38 (d) 0



Due to LP-BP repulsion no bond will stay at 90°. All ∠FBrF bonds will be < 90°.

39. (c) Hydration energy is greater for the LiCl than NaCl so LiCl will ionize faster than NaCl.

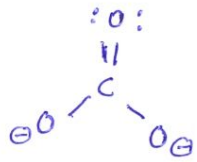
40 (b) SO_2



41 (c)

Thermal stability decreased down the group due to size of ~~an~~ cation ↑ase. but in $BeCO_3$ due to more covalent character, exceptionally it will have least ~~Cova~~ Thermal stability.

42: (b)

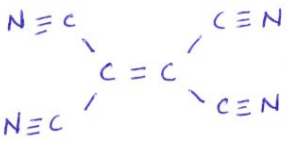


Formal Charge = (No. of valence e^-s) − (Total no. of LP e^-s) − $\frac{1}{2}$ (Total no. of BP e^-s)

$= 6 - 4 - \frac{1}{2}(4)$

$= 0$

43: (c)



Total No. of σ = 9

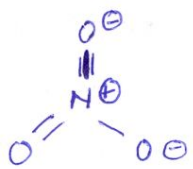
π = 9

44 (d)

$2p_x$ and $2p_y$ will be in different axis so ~~it~~ they can't ~~be~~ ~~form~~ overlap.

45. (c) Due to Resonance bond order will become 1.5 and bond length will be equal.

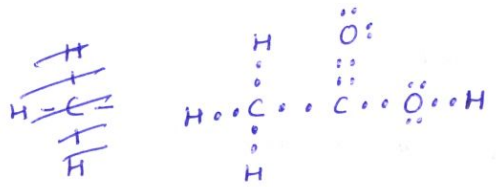
46. (d)



4 - Bond pair

1 - Lone pair.

47 (a)

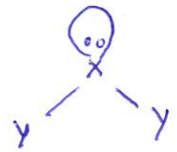


16 shaired e^- and 8 unshared e^-.

48 : (c)

$2\sigma + 1\pi + 1LP$

= Total B.P + L.P = 2 + 1 = 3



geometry → Trigonal planar

49: (d) Solubility decrease from top to bottom in a group for ~~sam~~ small anion$_y$ like $F^\ominus$ and $OH^\ominus$.
salt

50: (b)

	C – H		N – H		O – H		F – H	
	↑	↓	↓	↓	↓	↓	↓	↓
E.N →	2.5	2.1	3.0	2.1	3.5	2.1	4.0	2.1

least EN difference is in between C–H. so it will be least polar.

51, (c) Conceptual :-

52: (c) ~~Xe_2OF~~ XeO_2F_2 ~~2 + 2 BP = 4~~

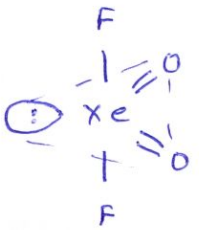
Xe – 8 valence e^-

~~Xe~~ 2O → 4 e^- in two double bond

2F → 2 e^- in two single bond

2 e^- As a lone pair e's

Total BP = 4, LP = 1 5 = sp^3d



$XeO_3 \rightarrow sp^3$

$XeF_6 \rightarrow sp^3d^3$

$XeOF_4 \rightarrow sp^3d^2$

53: (a)

$N \equiv N$, $O = O$, $F - F$, $Cl - Cl$

* B.O of N_2 is 3 so Bond length is minimum.

54. (b) ~~Xe~~ XeF_4

Xe - 8 valence e^-, 4 B.P, 2 L.P

~~6 + 1 = 7 = sp^3~~ $4 + 2 = 6 = sp^3d^2$

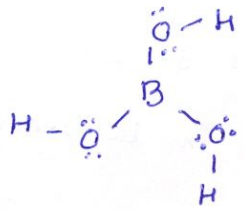
55: (c) ClO_2^-

Cl^- → 8 e^-, 4 e^- in bonding

2 BP + 2 LP = Tetrahedral geometry, V-shape

56. (c) Conceptual

57: (b) sp^2 and sp^3



For B: 3 BP + 0 LP

= sp^2

For O :- 2 BP + 2 LP

= sp^3.

58. (b) $AlCl_3$

Rest all are s-block elements ~~compounds~~ which forms more ionic compounds.

59. (b) Size of anion ↓, ~~MP ↓~~. ionic character ↓.

AgF → more ionic character.

60. (a) Cs-Cl, EN. difference