Daily Tutorial Sheet-13	Level-3

145.(AC) **(A)** Same size due to presence of 4f subshell (poor shielding)

(B) Incorrect → As we go across the period size decreases

(C) Same size due to poor shielding effect by d orbital

(D) Incorrect → size of Ne > size of Na [Ne → noble gas]

146.(ABCD)

(A) $C(IE_1) > B(IE_1)$

Boron becomes stable due to fully filled 2s orbital after removing $1e^-$

$\therefore$ e^- can be easily removed

$C(IE_2) < B(IE_2)$

In case of B, 2^{nd} e^- goes from fully filled 2s making it unstable thereby requiring more I.E.

(B) $P(IE_1) > S(IE_1)$

In case of p, 1^{st} e^- goes from half filled 3p orbital (stable) whereas in S, 1^{st} e^- goes from $3p^4$ making it half filled $(3p^3)$ $S(IE_2) > P(IE_2) \rightarrow 2^{nd}e^-$ goes from half filled 3p in case of S thereby requiring more energy, making it unstable.

(C) $Be(IE_1) > B(IE_1)$

In case of Be, $1^{st}e^-$ goes from fully filled 2s whereas in B it goes from partially filled 2p.

$Be(I.E_2) < B(I.E_2)$.e^- goes from fully filled 2s orbital in case of B making it unstable thereby requiring more energy than Be.

(D) $Mg(IE_1) > Na(IE_1)$

In case of Mg, $1^{st}e^-$ goes from fully filled 3s orbital whereas in Na, $1^{st}e^-$ goes from half filled s orbital. $Na(IE_2) > Mg(IE_2)$ e^- goes from fully filled 2p orbital in case of Na making it unstable thereby requiring more I.E than Mg.

147.(AC) **(A)** $\underset{\left[\begin{smallmatrix}\text{energy}\\ \text{required}\end{smallmatrix}\right]}{\text{I.E}} = \underset{\left[\begin{smallmatrix}\text{energy}\\ \text{released}\end{smallmatrix}\right]}{-\text{E.G.E}}$ E.G.E → exothermic process, I.E → endothermic

(B) Incorrect → I.E. ≠ E.A **(C)** True by definition

(D) Incorrect → Valid only in case of cation

148.(BCD)

(A) $\frac{p}{e} = \frac{\overset{Fe^{2+}}{26}}{24}, \frac{\overset{Fe^{3+}}{26}}{23}$, due to high p/e ratio, (high $Z_{eff.}$) in Fe^{3+}, ionic radii of $Fe^{2+} > Fe^{3+}$

(B) In case of second I.E. for 'O' e^- removal in stable configuration $(1s^2.2s^2 3p^3)$ so $N(IE_2) < O(IE_2)$.

(C) Due to high shielding effect, atomic radius of $Zn > Cu$.

(D) Due to high $Z_{eff.}$ I.E. of Tl > In (due to poor shielding effect of 4f subshell)

149.(AD) **(A)** Sum of IE_1 and IE_2 is lower for element P

(B) Sum of first four IE is lower for element Q

150.(ABCD)

According to the values of I.E. given, it can be concluded that

- $IE_1 < IE_2 < IE_3 <<< IE_4 < IE_5$
- This shows that it achieved stable noble gas configuration after removing three e^-.
- It belongs to 13th group of periodic table
- It could be metal or non-metal or metalloid
- It forms stable trivalent cation