16. **Stability of complete filled B^+**

The first ionization energy of carbon is greater than the same of boron as predicted from periodic trend. However, for 2^{nd} $\underset{2s^2}{\boxed{\uparrow\downarrow}}$; more stable than $C^+ = 1s^2 2s^2$ $\underset{2p^1}{\boxed{1}\boxed{\ }\boxed{\ }}$ ionization trend is reversed due to stability of completely filled 2s-orbital of B^+ :

17.(B) Elements having half filled valence subshell have high ionisation energy. Also, ionisation energy decreases down the group.

18. $Mg^{2+} < Na^{2+} < F^- < O^{2-} < N^{3-}$

Ionic size

$Mg^{2+} < Na^+ < F^- < O^{2-} < N^{3-}$

19.(D) The d-subshells are not filled monotonically. The regular trend is broken by Cr and Cu.

20. **Higher effective nuclear charge**

Greater the positive charge, smaller is the radius.

21.(F) The basic nature of hydroxides increases down the graph.

22.(F) Cl has maximum electron affinity. Hence the order is : Cl > F > Br

23.(D)

Mg^{2+}	$1s^2 2s^2 2p^2$	no unpaired electron
Ti^{3+}	$1s^2 2s^2 2p^2 3s^2 3p^2 3p^6 3d^1$	one unpaired electron
V^{3+}	$1s^2 2s^2 2p^6 3s^2 3p^6 3d^2$	two unpaired electrons
Fe^{2+}	$1s^2 2s^2 2p^6 3s^2 3p^6 3d^6$	four unpaired electrons

24. **Inert pair effect**

Inert pair effect favours lower oxidation stable among isoelectric species.

25.(B) Mg^+ requires less energy for further ionisation as compared to Na^+ due to the noble gas configuration of Na^+.

26.(C) Statement I is true; Statement II is false.

F atom has slightly lower affinity for the electron than chlorine. It is due to the reason that additional electrons are repelled more effectively by 2p-electrons in F than by 3p-electrons in Cl-atom.

27.(D) For ions of same elements, greater the positive charge, lesser is the radius.

28.(C) Statement-1 is true.

Be $1s^2 2s^2$: Fully filled valence subshell higher IE

B $1s^2 2s^2 2p^1$

Statement-II is false as the energy of 2s is lower than 2p.

29.(B) Ionisation energy decreases drawn the group.

30.(C) Statement-I is correct. Due to inert pair effect. Pb^{4+} is unstable and can be easily reduced to Pb^{2+} is stronger oxidising agent than Sn^{4+}.

Statement-II is false. The higher oxidation states for group 14 elements are less stable for heavier elements of the group due to inert pair effect.