1. Justify that following species are isoelectronic. Compare the size of these species with appropriate reasoning and write them in the order of increasing size.
O^{-2}, F^-, Na^+, Mg^{+2}, Al^{+3}

2. You have two reactions associated with the elements X and Y :
$X(g) + e \longrightarrow X^-(g)$
$Y(g) + e \longrightarrow Y^-(g)$
A certain amount of energy is released in both reactions. If addition of an electron to the valence shell of Y(g) was easier than to the valence shell of X(g), then which reaction, reaction (i) or reaction (ii), would have more negative number for energy change? Why? What is this energy change called?

3. Arrange the following elements in the order of their increasing metallic character. Justify answers.
a. K, Rb, Li b. Na, Mg, Al c. K, Ca, Rb

4. Define ionization energy of an element. How does it vary in the periodic table? What are the factors affecting ionization energy of an element?

5. How do you account for the following facts?
a. IE_1 of magnesium is more than that of aluminium.
b. IE_1 of phosphorous is more than that of sulphur.

6. Define electronegativity of an element. How does it vary in the periodic table? Name the most electronegative and the least electronegative element.

7. Explain
a. A cation is smaller than its parent atom.
b. An anion is larger than its parent atom.
c. Noble gas has zero electron affinity.
d. Halogen has the highest electron affinity in the period.
e. IE_2 of sodium is very high than its IE_1.

8. Arrange the following ions in their increasing order of size, with explanations:
a. Na^+, Mg^{++}, Al^{+++}, Si^{+++}
b. P^{---}, S^{--}, Cl^-, Ar
c. Na^+, K^+, Rb^+, Cs^+
d. Cl^-, Br^-, I^-
e. I, I^-, I^+

9. Compare the sizes (with explanations) of
a. Li and C b. F and Cl c. K^+ and Ca^{++} d. F^- and F e. S^{--} and Cl