PERIODIC TABLE:

① An element has atomic no X, find its group and period if X is a) 18 b) 16 c) 12 d) 11

Ans: a) 18 = 2, 8, 8 Group = valence + 10 = 18
Period = no of shells = 3

b) 16 = 2, 8, 6 Group = 10 + 6 = 16
period = 3

c) 12 = 2, 8, 2 Group = valence e (if valence e is 1 or 2)
= 2
period = 3

d) 11 = 2, 8, 1 Group = valence e^- = 1
Period = 3

② What is the unit for measuring Atomic radius?

Ans: Angstrong $1A^\circ = 10^{-10} m$

③ How does Atomic Radius varies a) Down a group b) Across a period

Ans: a) It increases down a group due to increase in no. of shells
b) It decreases on moving left to right in a period due to increase in effective Nuclear charge.

④ What is Ionisation potential? On what factors does it depend? How does it vary a) Down to group a) Across a period.

Ans: It is defined as amt of energy required to remove the valence shell e^- of an isolated, gaseous neutral atom.
It is measured in ev/atom. S.I. unit is J/mole

It depends a) I.P. $\propto$ Nuclear charge

b) $I.P. \propto \frac{1}{\text{Atomic Radius}}$

a) Down a group → I.P. decreases b) Left to Right in Period It increases.

Which element has highest and lowest I.P.?

Highest → Helium Lowest → Francium

(6) Why Ionisation potential increases along a period? (Left to Right)

Ans Due to decrease in Atomic radius
Due to increase in Nuclear charge.

(7) Why noble gases have very high I.P.?

Ans: As they have complete outermost shell.

(8) What is Electron Affinity? On what factors does it depend? How does it vary a) Down a group b) Along a Period

Ans: It is the amount of energy released when an e^- is added to the valence shell of an isolated, neutral, gaseous atom. It's SI unit is J/mole. It is also measured in eV/atom. It's value is generally negative

a) Down a group: E.A. decreases
b) Across a period (left to Right) → E.A Increases

It depends on a) E.A. $\propto$ Nuclear charge
b) E.A $\propto \frac{1}{\text{Atomic Radius}}$

(9) Why Electron Affinity of Cl > F even when Cl is below F?

Ans Cl has large size, so it has more tendency to accept e^- than F.

(10) What is Electronegativity? On what factors does it depend? How does it vary a) Down a group b) Along a period

Ans: It is the tendency to attract shared pair of e^- towards itself by an atom in a molecule.

It depends on i) E.N. $\propto$ Nuclear charge
ii) E.N. $\propto \frac{1}{\text{Atomic Radius}}$

Down a group: EN decreases

b) Along a period (left to Right) EN increases

(11) Among the elements Be, Mg, Ca, Sr, Ba which will form ions most readily? Why?

Ans Be
Mg
Ca
Sr
Ba

I.P. decreases
Ba looses e most easily
so it forms ions most easily

(12) With refrence to periodic table, state whether an element is metallic or non metallic if it is in

a) Group I b) Group II c) Group 16 d) Group 17

Ans a) Metal b) Metal c) Non-metal d) Non-metal

(13) Which element has highest E.A.

Ans Chlorine

(14) Which Element has highest E.N.?

Ans: Fluorine

(15) Metals have _____ (high / small) Ionisation Potentia

Ans: Metals have low (small) I.P., Low I.P. ⇒ less energy to remove electrons → more metallic

(16) The no of valence e⁻ varies a) Down a group

b) Along a Period —:

Ans a) Down a group → Same

b) Along a period → Increases from 1, 2, 3, 4, 5, 6, 7, 8

How does metallic character varies:—

a) Down a group → Increases

b) Along a Period (left to Right) → Decreases

(18) An element has Atomic NO

a) 16 b) 13 b) 18 classify them as metal-non metal

Ans: a) 16 = 2,8,6 6 $\bar{e}$ in valence shell → non metal

b) B = 2,8,3 3 $\bar{e}$ in valence " → metal

Note: 1,2,3 $\bar{e}$ in last shell → metal

4,5,6,7 e " " " → non-metal

C) 18 = 2,8,8 → 8 $\bar{e}$ in valence shell → non-metal (noble gas)

(19) An element has 4 shells and 2 $\bar{e}$ in valence shell. Give its group & period.

Ans Group no = no of $\bar{e}$ in valence shell (if 1 or 2)

= 2

period no = no of shell = 4

(20) State modern periodic Law.

Ans The properties of an element are periodic function of its "atomic number."

(21) An element Y belongs to period 3 and group 16 it will have ___ shells and ___ valence e.

Ans Group no = no of valence $\bar{e}$ + 10 (if valence e is 3,4,5,6,7)

16 = x + 10

x = 6 valence $\bar{e}$

period no = no of shells = 3