PERIODIC CLASSIFICATION OF ELEMENTS

01. The total elements known up to now are 114 (except 113 th) element.

02. 88 elements are Natural and the remaining are man made.

03. Classification of elements in to different groups which makes the study of physical and chemical properties of the elements and their compounds easier is called periodic classification.

Periodic Laws

04. a) Law of triads was proposed by Dobereiner .

b) When three elements with similar properties are arranged in the increasing order of their atomic weights, the atomic weight of the middle one is the average of the other two elements.

Eg: Li, Na, K ; P, As, Sb
Ca, Sr, Ba S, Se, Te } Triads
Cl, Br, I

05. a) Law of octaves was proposed by Newlands.

b) When the elements are arranged in the increasing order of atomic weights every 8 th element had similar properties.

Eg:	H	Li	Be	B	C	N	O
	F	Na	Mg	Al	Si	P	S
	Cl	K	Ca	–	–	–	–

06. Lother mayer developed atomic volume curve.

a) Lother meyer plotted a graph between atomic weights and atomic volumes.

b) Atomic volume = $\frac{\text{Gram atomic weight}}{\text{Density (solid state)}}$

c) Alkalimetals occupy the peaks of the curve, Hologens, Noble gases occupy the ascending positions.

d) Alaklie earth metals occupy the descending positions.

e) Element with highest atomic volume is Francium, lowest atomic volume Boron.

07. Mendeleef periodic law.

a) Atomic weight is the basis for the "Mendeleef periodic table".

b) Periodic law: The physical and chemical properties of elements are periodic functions of their atomic weights.

c) Increasing order of atomic weights is not followed at

1) Ar, K
2) Co, Ni
3) Te, I

} Anomalour pairs (or) Inverted pairs

d) Mendeleef left 3 gaps for the unknown elements

i) EKa boron (Scandium)

ii) EKa Aluminium (Gallium)

iii) EK silicon (Germanium)

e) Mendeleef could correct atomic weight of certain elements like Be, In etc.,

Long form of periodic table

08. Moseley discovered Atomic Number from X – ray spectra of elements.

09. Atomic number is the fundamental property of elements.

10. Moseley periodic law is based on → Atomic number.

11. Modern periodic law : The physical and chemical properties of elements are the periodic functions of their Electronic configuration (Atomic numbers).

12. **Structure of long form of periodic table**.

a) It is known as Bohr's table.

b) Based on electronic configuration.

c) It is the graphical representation of aufbau principle.

d) The vertical columns are called groups (or) families, while the horizontal rows are called periods (or) series.

e) It contains 7 periods and 18 groups.

f) Every period starts with an alkali metal and ends with an inert gass.

Period	Energy level	No.of elements	Starting element	Last element	Name
1.	1s	2	H ($1s^1$)	He ($1s^2$)	Very short
2.	2s 2p	8	Li(..$2s^1$)	Ne(..$2s^2sp^6$)	short
3.	3s 3p	8	Na(..$3s^1$)	Ar(..$3s^23p^6$)	short
4.	4s 3d 4p	18	K(..$4s^1$)	Kr(..$3d^{10}4s^24p^6$	Long
5.	5s 4d 5p	18	Rb(..$5s^1$)	Xe(..$4d^{10}5s^25p^6$)	Long

6.	6s 4f 5d 6p	32	Cs(..$6s^1$)	Rn(..$4f^{10}5s^25p^6$)	Longest
7.	7s 5f 6d –	27	Fr(–$7s^1$)		Incomplete

g) III period elements are called typical elements because they represent the properties of the elements in that group.

h) II period elements are known as Bridge elements because they show diagonal relationship with the III period elements.

i) The elements in a group will have similar chemical properties due to similar outer electronic configuration.

j) The Lanthanides and actinides are placed in same group (III B) and they are placed below the main body of the periodic table.

13. **Merits** :

a) Rectified the position of inverted pairs by taking atomic number.

b) Shows the relation between the position of an element and its electronic configuration.

c) It provides satisfactory position for Fe, CO, Ni, etc., which were placed in VIII group.

d) Main divisions in this table are Noble gases, active metals, Transition metals, Metalloids, Non metals, Rare earths and radio active metals.

14. **Limitations**:

a) The position of hydrogen still remains unsolved.

b) Lanthanides and Actinides do not find a place, in the main body of the periodic table.

c) 14 Lanthanides were placed in same group but their electronic configuration is not uniform.

15. **Classification of elements into Blocks**:

The elements are classified into s, p, d, f blocks based on the sub shell into which the differentiating electron enters.

16. **'S' Block Elements**:

01. The differentiating electron enters into s – subshell.
02. IA and IIA group elements (two groups) are present.
03. They are active metals, Electropositive and act as reducing agents.
04. Except hydrogen all the S – block elements are metals.

05. The general electronic configuration is ns $^{1-2}$.

06. They form only ionic compounds except Beryllium.

07. Fr and Ra are radioactive elements.

08. Cs , Fr, Liquids at room temperature.

17. **'P' Block elements**:

01. The differentiating electron entres into 'p' sub shell.

02. IIA to VII A and 'O' group elements (6 groups) are present.

03. The general electronic configuration is ns^2 np^{1-6}.

04. It includes metals, Metalloids, non metals and inert gases.

05. The only 'p' block element in which the differentiating electron does not enter into 'p' orbital is He.

18. **'d' Block elements**:

01. The differentiating electrons enters into the 'd' orbital of penultimate shell (n – 1)

02. All 'B' sub group IB to VII B and VIII group elements present between 's' and 'p' block elements are called 'd' block elements.

03. 'd' Block contains 10 elements in each period.

04. The general electronic configuration is (n – 1) d^{1-10} ns^{1-2}.

19. **'f' Block elements**:

01. The differentiating electron entres into the 'f' orbital of Antipenultimate shell (n – 2) f.

02. The Lanthanides Ce_{58} to Lu_{71} and Actinides Th_{90} – Lr_{103} belongs to this block.

03. The Lanthanides belong to III B group and 6^{th} period.

04. The Actinides belongs to III B group and 7th period.

05. In Lanthanides and Actinides the differentiating electron enters into '4f' and '5f' orbitals respectively.

06. 'f' block contains 14 elements in each series. (Total 28).

07. The general electronic configuration is (n – 2) f^{1-14} (n – 1) d^o (or) ns^2.

08. The Actinides are radioactive and Majority of them are synthetic elements.

20. **Types of elements**:

The elements are classified into 4 types based on Electronic configuration of outer shells and chemical properties.

a) **Inert gases : Rare gases (or) Noble gases**.

01. These are 'O' group elements.

02. There are six elements He, Ne, Ar, Kr, Xe, Rn.
03. Except He ($1s^2$) all the other elements have $ns^2\ np^6$ configuration.
04. All are chemically inert gases due to octet configuration ($ns^2\ np^6$).
05. All are Mono atomic.
06. The Heavier elements Kr, Xe form true compounds and undergo chemical reactions with oxygen and Fluorine.
07. Outer most shell is completely filled with electrons ($ns^2\ np^6$).
08. Radon is a radio active.
09. Inert gases isolated from air and so called Aerogens.
10. Also called Noble gases because of their least reactivity.

b) **Representative elements**: Normal elements.

01. Outermost shell is incompletely filled.
02. Except 'O' group all the remaining 's' and 'p' block elements of the periodic table are called representative elements.
03. The general electronic configuration is ns^1 to $ns^2\ np^5$.
04. Metals, non metal and metalloids are present.
05. All are chemically reactive and involve in the chemical reactions by loosing, gaining (or) mutual sharing of electrons.

c) **Transition elements**:

01. In these elements outer most and penultimate shells [n, (n – 1)], are Incompletely filled.
02. Differentiating electrons enters into penultimate shell (n – 1) d.
03. These elements properties are intermediate of those of 's' and 'p' block elements.
04. The general electronic configuration is $(n-1)\ d^{1-9}\ ns^{1\ or\ 2}$.
05. There are four transitional series transitional corresponding to 3d, 4d, 5d and 6d series in incomplete remaining are complete containing 10 elements each.
06. Due to small size, High effective nuclear charge and unpaired 'd' electrons they exhibit characteristic properties.
    01. They are Hard and heavy metals.
    02. They exhibit High m.p., B.p.
    03. Exhibit variable valency due to participation to 'd' electrons in bond formation Eg : Fe^{+2}, Fe^{+3}, Cu^{+1}, Cu^{+2}, Sn^{+2}, Sn^{+4}.

04. They are good conductors of heat and electricity due to presence of delocalised (or) mobile electrons.
05. They form coloured compounds, the colour is due to presence of unpaired electrons and d – d electron transition.
06. They are paramagnetic due to presence of unpaired 'd' electrons.
07. They forms alloys like Brass, Bronze and German silver because of their similar size and crystal structure.
08. Transition elements and their oxides are good catalysts due to their variable valencies.

Eg : i) In hydrogenation of oils $\rightarrow$ Nickel catalyst

ii) Manufacture of Ammonia by Haber's process $\rightarrow$ Finely divided Iron as catalyst and Molybdinum as promoter.

iii) Manufacture of H_2SO_4 by $\rightarrow V_2O_5$ by contact process.

09. They form complex compounds.
11. Zn, Cd, Hg are not true Transition metals.
12. Cu, Ag, Au are called typical transition metals (coinage metals), though they have $(n-1)\,d^{10}\,ns^1$ configuration they exhibit transitional properties.

21. **Inner Transition elements**:

01. Elements in which the ultimate, penultimate and Antipenultimate shells [n, (n – 1), (n – 2)] are incompletely filled are called inner transition elements.
02. These are 'f' block elements.
03. Differentiating electron enters into Antipenultimate shell (n – 2).
04. The general electronic configuration is $(n-2)\,f^{1-14}\,(n-1)\,d^{o}$ (or) $^{1}\,ns^{2}$.
05. The Lanthanides and Actinides belong to inner transition series.
06. Lanthanides are also called rare earths because of their rare occurance.
07. The common oxidation state of lanthanide is +3.
08. The elements after uranium in Actinides are called transuranic elements, all man made, synthetic and radioactive.

22. **Periodic properties**:

01. The re occurance of elements with similar properties at regular intervals (2, 8, 8, 18, 18, 32) in the periodic table is called periodicity and the properties are called periodic properties.
02. Its due to similar valence electronic configuration.
03. 2, 8, 8, 18, 18, 32 are the Magic numbers of periodic table.
04. Some important periodic properties are

i) Atomic radius ii) Ionisation potential
iii) Electron Affinity iv) Electronegativity
v) Valence vi) Oxidation state
vii) Electropositivity viii) Metallic and non metallic nature
ix) Acidic and Basic nature of oxides

Non periodic properties are

i) Colour ii) Atomic number iii) Atomic weight.

23. **Atomic Radius (or) Atomic size**:

01. The distance from the nucleus to the outer most orbit is called as atomic radius.
02. It can't be determined directly because electron cloud is diffused.
03. Atomic radius of an atom depends on

a) The type of bonding b) its oxidation state
c) its coordination number d) number of bonds between the two atoms.

04. Atomic radius is expressed in three ways

a) covalent radius b) Vanderwaal radius
c) crystal radius (or) metallic radius.

05. ***Isoelectronic species***:

1. The species having the same number of electrons are known as Isoelectronic species. They differ by nuclear charge.

   Eg : C^{-4}, N^{-3}, O^{-2}, F^{-}, Na^{+}, Mg^{+2}, Al^{+3}, contains 10 electrons each.
2. In isoelectronic species the size decreases with increase in charge (or) atomic number $C^{-14} > N^{-3} > O^{-2} > F^{-} > Ne > Na^{+} > Mg^{+2} > Al^{+3} > Si^{+4}$.
3. Along the period in a transitional elements the atomic radii remains almost constant due to effective shielding of (n – 1) d electrons.
4. In transition elements the atomic radius decreases slowly in the beginning, remains constant in the middle and then increases a little at the end.

5. The initial decrease in atomic radii of transition elements is due to the increase in effective nuclear charge.

Ionisation potential (or) Ionisation energy:

01. The energy required to remove an electron from the outer most orbit of an isolated gaseous atom is called ionisation energy ($1p_1$).

$$M(g) + I.P_1 \rightarrow M^{+}_{(g)} + e^{-}.$$

02. The minimum energy required to remove another electron from the unpositive ion in gaseous state is called second ionisation energy.

$$M^{+}(g) + I.P_2 \rightarrow M^{+2}(g) + e^{-}$$

$$I.P_1 < I.P_2 < I.P_3 < .....$$

03. Ionisation energy is generally expressed in Kj / Mole (or) K.Cal / mole.

04. Ionisation potential is generally expressed in e.v. / atom.

05. It's the property of an isolated gaseous atom.

06. 1 e.v. / atom = 23.06 K.Cal / mole = 1.602×10^{-19} Joule / atom = 96.45 KJ/mole.

07. The I.P of Hydrogen is 13.6 ev / mole; its ionisation energy is 313.6 K.cal /mole

$I.P_1 = 13.6 \times Z^2$ ev / atom. (Z = atomic Number).

Ex : I.P of He^{+} and Li^{+2} are 54.5 and 124.4 ev / atom.

Electron Affinity:

01. The amount of energy released when an electron is added to neutral gaseous atom is called electron affinity.

$$X_{(g)} + e^{-} \rightarrow X^{-}_{(g)} + EA_1 \text{ (Exothermic).}$$

02. The second electron affinity of an element is expressed in positive sign (Energy absorbed)

$$X^{-}_{(g)} + e^{-} \rightarrow X^{2-}_{(g)} - EA_2 \text{ (Endothermic).}$$

03. Electron affinity is the property of Isolated gaseous atom expressed in E.v / atom, K.J / mole , K. Cal / Mole Etc.,

04. EA_1 is exotherm is but EA_2 is endothermic this is due to repulsions between added electron and the unnegative ion.

05. Electron affinity values are determined indirectly by Boron – Haber cycle.

06. For an atom EA_1 , $EA_2 > EA_3$.

07. Factors that influence the electron affinity values are

1. Size of atom 2. Screening effect.

3. Electronic configuration 4. Atomic number (nuclear charge)

08. In a group from top to bottom, the E.a values increase because the size of the atom decrease.

09. In a group from top to bottom, the E.a values decrease because the atomic size increase.

10. VII A group elements (Halogens) show highest electron affinity values. The order is Cl > F > Br > I.

11. The greater the magnitude of electron affinity value, greater will be its oxidising power.

12. Oxidising power of fluorine is greater than the chlorine because fluorine has low bond dissociation energy then chlorine.

13. The low (or) zero (or) negative electron affinity values of Alkaline earth metals VA zero group elements can be explained by Hunds rule. (They have stable half filled (or) fulfilled orbitals. Eg: Be, N, Ne, are having zero E.a values.

14. In each group the third period element has higher E.A value then second period. Element because in third period elements due to its small size greater repulsion occur. E.A of Cl > F, E.A of S > O, E.A of P > N

15. In metals gold has maximum E.a.

16. The electron affinity of a Neutral atom (x) is equal to the Ionisation of its negative ion (x^-)

17. The ionisation potential of a neutral atom (m) is equal to the electron affinity of its cation (m^+)

18. Electron affinity is the measure of oxidation power of an element.

19. In periodic table chlorine has the highest electron affinity.

Electro negativity:

01. The tendency of an atom to attract the shared electron pair to wards itself in a molecule is called electro negativity.

02. It is the property of a bonded atom it is relative property and has no unit.

03. Through both electron affinity and electro negativity refers to the measure of electron attracting power, the electron affinity refers to an isolated gaseous atom while electro negativity refers to an atom in a molecule.

05. Electro negativity is measured by a) Mullican scale b) Pauling scale.

11. In periods E.N values increases due to decrease in size of atoms.
12. In groups E.N values decreases due to increase in size of atoms.
14. Elements with high electro negativity are non metals (VI_A , VII_A) and low electro negativity are metal (I_A , II_A).
15. Halogens are having highest E.N. values.
16. The element with highest E.N value is Fluorine (F > O > N = Cl).
17. Alkali metals shows lowest electro negativity values periodic table Cs (or) Fr.
18. Electro negativity of inert gas is zero.

Oxidation number or oxidation state :

01. The possible charge which an atom appears to have acquired in a given substance is called oxidation state or oxidation number.
02. Oxidation state could be positive or negative or zero or fractional number.
03. In s – block elements, oxidation state is equal to group number.
04. Oxidation number alkali metals is +1.
05. Oxidation state of alkaline earth metals is +2.
06. p-block elements show multivalency, their oxidation states change by two numbers.
07. Common oxidation state of group III–A elements ($ns^2\ np^1$) is +3.
08. +1 oxidation state of 'Tl' is more stable than +3 O.S., it is due to inert electron pair effect.
09. The reluctance of the electron pair present in the outer shell (ns^2) to unpair and non-participation in bonding is called inert pair effect.
10. The inert pair effect is observed in group III–A, IV–A and V–A elements.
11. General solution states of group IV–A elements are +4 and +2.
12. Group V–A elements ($ns^2\ np^3$) show +5 and +3 oxidation states.
13. Common oxidation state of group VI–A elements ($ns^2\ np^4$) is –2.
14. Common oxidation state of halogens (VII–A group) is –1.
15. Fluorine shows always –1 O.S, it is due to highest electro negativity value of fluorine (4.0).
16. Elements of 1 – IV group show the oxidation states equal to their group numbers.
17. Common oxidation states of elements of IV – VII groups are equal to (8–group number).
18. The common oxidation state of d–block elements (transition elements) is +2.
19. Ruthenium (Ru) and Osmium (Os) show maximum oxidation state of +8.

20. f–block elements (inner transition elements) show a common oxidation state of +3.
21. No element exceeds its group number in the oxidation state.
22. The oxidation state of metal in carbonyl is zero.

Trends in Periodic properties.

Periodic Property	Period (From left to right)	Group (from top to bottom)
Atomic radius	Decreases	Increases
Ionisation potential	Increases	Decreases
Electron affinity (non metallic character)	Increases	Decreases
Oxidising character	Increases	Decreases
Reducing power	Decreases	Increases
Basic nature of the oxides	Decreases	Increases
Acidic nature of the oxides	Increases	Decreases
Valency w.r.to Hydrogen	Increases from 1 to 4 & then decreases to 1	Remains same
Valency w.r.to oxygen	Increases from 1 to 7	Remains same

General points

01. Most abundant metal in earth's crust is Aluminium.
02. Most abundant element in the sun or in the universe in hydrogen.
03. The only non – metal of s-block is hydrogen.
04. Most active metal is Francium. (Caesium).
04. Most active non metal is Fluorine.
05. Lightest non – metal is hydrogen.
06. Elements of Zn group (II – B) are called volatile metals (Zn, Cd, Hg have low boiling points)
07. Coinage metals are copper, silver and gold (I – B).
08. Ag, Au, Pt are called noble metals because of their very low reactivity.
09. Zr and Hf are chemically similar because of almost same atomic size – Lanthanide contraction.
10. Amphoteric metals are Beryllium, Tin, Aluminium, Zinc and Lead.

11. The artificial element present in Lanthanides is prometheum.
12. Heaviest element existing in earth's crust is uranium.
13. The most malleable metal is Au.
14. Metal with highest electrical conductance is silver.
15. The element with highest melting point is carbon (Diamond 3750°C).
16. The metal with lowest melting point is Hg (–38°C).
17. The metal with widest liquid rage (30° – 2070°C) is Gallium.
18. Gallium is used as a thermometric liquid.
19. The element with lowest melting point and boiling point is Helium.
20. The element with highest catenation property is carbon.
21. The element which is commonly known as 'liquid silver' is mercury.
22. The metal obtained by heating its ore is mercury.
23. An alloy of mercury is called as amalgam.
24. The metals which do not form amalgam are Iron and Platinum.
25. The element present in chlorophyll is Mg.
26. The element present in haemoglobin is Iron.
27. The metals used in photoelectric cells are Cs, K.
28. The element use das nuclear fuel is U^{235}.
29. Ge, Ga, B and si are semi – conductors.
30. Cobalt is present in vitamin B_{12}.
31. Antimony is use din the treatment of 'Kalaazar'.
32. Non-metallic conductor is graphite.
33. Most abundant element of human body is oxygen.
34. Lightest radioactive element is hydrogen (Tritium).
35. Element use din cancer therapy Cobalt – 60.
36. Metals that get passivated with HNO_3 are Fe, Co, Ni, Al, Cr.
37. The lightest element in hydrogen ($_1H^1$) and heaviest element is $_{92}U^{238}$.
38. Densest element is Osmium.
39. The lighest metal is lithium.
40. The liquid metals are mercury, Cesium and francium, Galium.
41. The liquid non – metal is bromine.
42. Highest Ionisation potentials is associated with Helium.

43. Lowest I.P. value is associated with cesium.

44. Chlorine has highest electron affinity.

45. Fluorine has highest electro negativity.

46. Elements after uranium (Z = 93 to 105) are called trasnuranic elements (man made). Then were synthesised by G.T seaborg.

47. Transuranic elements are indicated with a three lettered symbol.

Z	=	104	–	Unnil quadum (Unq)
Z	=	105	–	Unnil pentum (Unp)
Z	=	106	–	Unnil hexum (Unh)
Z	=	107	–	Unnil septrium (Uns)
Z	=	108	–	Unnil Octrium (Uno)
Z	=	109	–	Unnil enndrium (Une)

48. Up to Uranium (z = 92) 4 elements are missing on earth (Tc, Pm, At and Ff) a called misscenious elements.

49. First synthetic element is Technitium.

50. Synthetic P – block element is A, S – block element is Fr. Most of f – block of elements synthetic.

51. The elements lanthanum and actinium belongs to d – block. But lanthanides and actinides belongs to f – block.

52. Elements of copper group (IB) are called coinage metals or currency metals.

53. 2nd period elements are known as bridge elements.

54. 3rd period elements are known as typical elements.

55. Element with highest melting point a carbon (diamond).

56. Element with highest boiling point is rhenium.

57. The most abundant elements on the earth are O > Si > Al.

58. The most abundant elements in air are $N_2 > O_2$.

59. The 14 lanthanons are called rare earths.

60. The elements rhenium, rhodium, palladium, osmium, iridium and platinum together called platinum metals because of the close resemblance with platinum.

61. The 14 elements after lanthanum (z=57) are called lanthanides (z = 58 to 71)

62. The 14 elements after actinium (z=89) are called actinides (z = 90 to 103)

* * *

E X E R C I S E

01. The electronic configuration of $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^3$ corresponds to
1) S 2) P 3) Na 4) Ar

02. Which pair of elements with the given atomic number have same chemical properties
1) 13, 22 2) 3, 11 3) 4, 24 4) 2, 4

03. In the long form of the periodic table, all the non – metals are placed under
1) s – block 2) p – block 3) d – block 4) f – block

04. Which pair of atomic numbers represents elements which are both 'S' block elements
1) 7, 15 2) 6, 12 3) 9, 17 4) 3, 12

05. Which of the following electronic configurations corresponds to an inert gas
1) $1s^2 2s^2 2p^5$ 2) $1s^2 2s^2 2p^6$ 3) $1s^2 2s^1$ 4) $1s^2 2s^2 2p^6 3s^1$

06. The rare gas that is more abundant in the atmosphere is
1) He 2) Ne 3) Ar 4) Kr

07. In lanthanides the differentiating electron enters
1) d sub – level 2) f sub – level 3) s sub – level 4) p sub – level

13. Which of the elements is metalloid
1) C 2) As 3) Pb 4) Mg

16. As per the modern periodic law the physical and chemical properties of elements are periodic function of their
1) atomic number 2) electron configuration 3) both 1 & 2 4) atomic size

17. Which of the following represents the electronic configuration of d – block elements
1) $(n-1)\ d^{1-10}\ ns^2$ 2) $(n-1)\ s^2\ nd^{1-10}$ 3) $(n-1)\ d^{1-10}\ ns^2\ np^2$ 4) $(n-1)\ p^4\ ns^2$

18. An element with atomic number 20 will be placed in which period of the periodic table
1) 4 2) 3 3) 2 4) 1

22. Elements of III period are called as
1) Bridge elements 2) Typical elements
3) Transition elements 4) Representative elements

24. All the lanthanides and actinides belong to group in the periodic table
1) III B 2) IV B 3) II B 4) I B

25. Metalloids are present in the -------- block of elements
1) s 2) d 3) f 4) p

32. Amongest the ions Cl^- , S^{2-} Na^+ and Mg^{2+} the largest ion is

1) Cl^- 2) S^{2-} 3) Na^+ 4) Mg^{2+}

39. Be^{2+} isoelectronic with

1) Mg^{2+} 2) Na^+ 3) Li^- 4) H^-

47. The vander waal's radius is -------- than covalent radius

1) smaller 2) equal 3) larger 4) any

51. The I.P. value of an element on going from left to right in a period

1) increase 2) decrease 3) unchanged 4) gets doubled

52. The first ionisation potential of nitrogen as compared to oxygen is

1) greater 2) smaller 3) same 4) Half

56. In the long form of periodic table the elements having lowest ionisation potentials are present in

1) I group 2) IV group 3) VII group 4) zero group

68. Units of ionisation energy are

1) K.cals / mole 2) eV/ atom 3) KJ/ mole 4) all

69. The first ionisation potential of phosphorous is ------- than that of sulphur

1) less 2) greater 3) equal 4) none

72. The element which has maximum electron affinity is

1) Chlorine 2) Sodium 3) Nitrogen 4) Oxygen

73. The energy released when an electron is added to neutral gaseous atom is maximum in which group

1) IA group 2) O group 3) VIA group 4) VII A group

75. The decreasing order of electron affinity of halogens is

1) I > Br > Cl > F 2) F > Cl > Br > I 3) Cl > F > Br > I 4) Cl > Br > F > I

76. Arrange O, S and Se in the increasing order of their electron affinity

1) Se < S < O 2) Se < O < S 3) S < O < Se 4) S < Se < O

78. Electron affinity values are obtained indirectly by

1) Hund's rule 2) Born – haber cycle 3) Pauli's principle 4) none

79. The elements with very low electron affinity in the following is

1) Halogens 2) Alkaline earth metals 3) Alkali metals 4) Chalcogens

81. On Mulliken scale the average of ionisation potential and electron affinity is reffered so as

1) electro positivity 2) electronegativity 3) electroneutratity 4) none

83. Which of the following is more electronegative

1) Be 2) S 3) P 4) Ti

85. Electronegativity of elements in a period

1) Increases 2) Decreases 3) decrease and increase 4) increase and decrease

86. Which has no units

1) I.P 2) electron affinity 3) electronegativity 4) none

89. Which of a the following halogens does not exhibit positive oxidation state in its and pounds.

1) F 2) Cl 3) Br 4) I

92. In the periodic table on moving from left to right the metallic character of an element

1) increases 2) decreases 3) from 1 and 2 4) remains constant

EET

01. 2	02. 2	03. 2	04. 4	05. 2	06. 3	07. 2	13. 2	14. 4	15.4
16. 3	17. 1	18. 1	22. 2	24. 1	25. 4	32. 2	39. 4	47. 3	51.1
52. 1	56. 1	68. 4	69. 2	72. 1	73. 4	75. 3	76. 2	78. 2	79.2
81. 2	83.	85. 1	86. 3	89. 1	92. 2				