2 CHAPTER CLASSIFICATION OF ELEMENTS & PERIODICITY IN PROPERTIES

EXERCISE-1

[SINGLE CORRECT CHOICE TYPE]

PERIODIC TABLE

Q.1 If A, B and C are the three element of Dobereiner's Triad and atomic mass of A and B are 7 and 15 respectively then the atomic mass of C is

(A) 1 (B) 11 (C) 23 (D) 25

Q.2 According to the Lother Meyer's curve which of the following statement is incorrect.

(A) The element having similar properties will occupy the same position in the curve.

(B) Alkaline earth metals are at the peaks of the curve.

(C) Halogens are at ascending part of the curve.

(D) The atomic volume of the elements in a period initially decreases and then increases.

Q.3 For which set of elements "diagonal relationship" is not existing.

(A) B, Si (B) Li, Mg (C) B, Mg (D) Be, Al

Q.4 Which of the following element is not a 'p' block element.

(A) Bi (B) Ga (C) Sn (D) Cd

Q.5 Which of following is not correctly matched

(A) d-block element : electronic configuration is $ns^{0-2}\,(n-1)d^{1-10}$.

(B) p-block element : electronic configuration is $ns^{1-2}\,np^{1-6}$

(C) s-block element : electronic configuration is ns^{1-2}

(D) Ce : f-block's first member.

Q.6 Which is not transition element.

(A) Cu (B) Ac (C) Zn (D) Pd

Q.7 Which of the following atomic numbers represent s, p and d-block respectively.

(A) 10, 41, 23 (B) 20, 82,46 (C) 4, 44, 19 (D) 32, 55, 16

Q.8 The "atomic volume" of an element is defined as
(A) the volume occupied by an atom
(B) the volume occupied by one gram of an atom
(C) the volume occupied by the one gram-atom of an element
(D) none of these

Q.9 Find the odd element from the given electronic configuration.
(A) $1s^2\ 2s^2\ 2p^6\ 3s^1$ (B) $1s^2\ 2s^1$
(C) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^1$ (D) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^1$

Q.10 The total number of element present in 4^{th} period in the long form of periodic table.
(A) 18 (B) 2 (C) 8 (D) 32

Q.11 An element having electronic configuration of [Ar] $3d^3\ 4s^2$ belongs to
(A) s-block (B) p-block (C) d-block (D) f-block

Q.12 Which of the following element is/are of d-block element (for which the atomic numbers are given).
(A) 19 (B) 81 (C) 46 (D) 58

Q.13 The elements in which 5f-orbitals are progressively filled are called as
(A) Lanthanides (B) Actinides
(C) Transition elements (D) None of these

Q.14 Which of the following is 'd' block element.
(A) Bi (B) Sn (C) Nb (D) In

Q.15 The elements P, Q and R are one of the Dobereiner's triad of elements in the **increasing order** of their atomic masses. If the atomic masses of P, Q and R are x, y and z respectively, then
(A) $x = 2y + z$ (B) $z = x + y$ (C) $z = 2x - y$ (D) $x + y + z = 3y$

Q.16 Which of the following statement is **incorrect** for Lother Mayer's curve ?
(A) Atomic volumes of elements were taken on y-axis and atomic masses of elements on x-axis.
(B) All the peaks were occupied by alkali metals.
(C) Halogens were present on the descending curve.
(D) Alkaline earth metals were present on the descending curve.

Q.17 Which one of the following statements is not correct?
(A) Li shows similarity in properties with Mg
(B) Li, Na and K forms Doberenier's Triads.
(C) In the Lother Meyer's curve alkaline earth metals occupy the ascending positions of the curve
(D) IUPAC name of the element having atomic number 112 is Uub.

Q.18 The period number, group number, and block of the element having atomic number 39 will be :
(A) 5, 5, d (B) 5, 4, d (C) 5, 3, d (D) 5, 15, p

Q.19 In the Modern long form of periodic table, 4th period contains only 18 elements. It is due to filling of electrons in the :
(A) 4s, 4p and 4d sub-shells (B) 4s, 3d and 4p sub-shells
(C) 4s, 4p, 4d and 4f sub-shells (D) 3s, 3p and 3d sub-shells

Q.20 Which of the following element does not belongs to p-block?
(A) Cl (B) S (C) H (D) Ne

Q.21 If x, y and z are the three elements of Dobereiner's triad and the atomic masses of x and z are 7 and 23 respectively, the atomic mass of y is
(A) 15 (B) 11 (C) 12 (D) 24

Q.22 In the general electronic configuration
$(n-2)f^{1-14}\,(n-1)d^{0-1}\,ns^2$, if value of n = 7 the configuration will be :
(A) Lanthanides (B) Actinides (C) Transition elements (D) None

Q.23 Find the species **not** having same number of d-electron in last possible filled d-subshell as in Zn.
(A) Ga (B) Pd (C) Cd (D) Pt

Q.24 According to modern periodic law, properties of the elements are the periodic functions of their
(A) Atomic weight (B) Surface area (C) Atomic number (D) Density

Q.25 The element having the lowest atomic number and a ground state electronic configuration of $(n-1)\,d^6\,ns^2$ is placed in
(A) Fifth period (B) Fourth period (C) Sixth period (D) Third period

Q.26 Select the configuration of neutral atom(s), which belongs to s-block?
(A) $[Xe]\,4f^{14}\,5d^{10}\,6s^2$ (B) $[Xe]\,5d^1\,6s^2$ (C) $[Xe]\,4f^7\,3d^0\,6s^2$ (D) $[Xe]\,6s^2$

Q.27 Select the pair of elements which are present in same group but in different sub group in Mendeleev's periodic table.

(A) F, Ar (B) Cl, B (C) K, Cu (D) Be, Mg

Q.28 Select the pair of elements which are present in same period in long form of periodic table.

(A) C, Ar (B) Sc, Y (C) Na, La (D) P, S

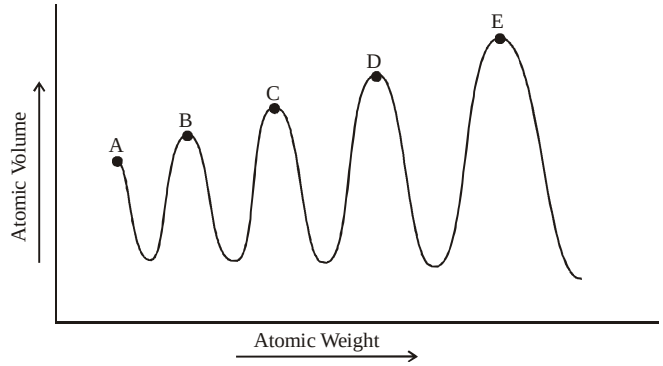
Q.29 If an orbital can have maximum 4 electrons then, how may elements can be present in 8^{th} period?

(A) 100 (B) 75 (C) 128 (D) 64

Q.30 Principle of modern periodic table is given by :

(A) Mosley (B) Mendeleef (C) Doberinier (D) Newland

Q.31 In the Lother - Mayer graph, A,B,C,D & E element are



(A) Halogens (B) Alkaline earth metals

(C) Alkali metals (D) Transition metals

Q.32 Most of the 'd' block elments are known as :

(A) Alkali metals (B) Alkaline earth metals

(C) Innertransition element (D) Transition element

Q.33 If the atomic number of an element is 33, it will be placed in the periodic table in the _____

(A) first group (B) third group (C) fifth group (D) seventh group

Q.34 Match **column I (atomic number)** with **column II (position in the Periodic Table)** and select the correct answer using the codes given below:

	Column I		**Column II**
I.	52	P.	s-block
II.	56	Q.	p-block
III.	57	R.	d-block
IV.	60	S.	*f*-block

(A) I – P, II – Q, III – S, IV – R (B) I – Q, II – P, III – S, IV – R
(C) I – P, II – Q, III – R, IV – S (D) I – Q, II – P, III – R, IV – S

Q.35 In which group of periodic table, the elements of 4th, 5th and 6th period have different ground state electronic configuration for last two shells, from each other?
(A) 8 (B) 9 (C) 10 (D) 18

Q.36 Identify the atom which has ground state configuration [Ar] $3d^{10}$ $4s^2$ $4p^1$
(A) Al (B) Ga (C) In (D) Tl

Q.37 Name of element with atomic number (z) = 110.
(A) Unnilbium (B) Ununnillium (C) Unnilunium (D) Ununtrium

Q.38 Which of the following statement is correct for an element having atomic number (z) = 98?
(A) It is s-block element. (B) It is p-block element.
(C) It is transition element. (D) It is inner transition element.

Q.39 Which of the following is not a bridge element of in Mendeleev's table?
(A) Mg (B) Al (C) Si (D) Ar

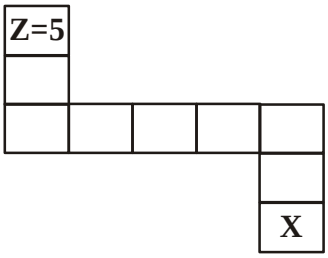
Q.40 What will be the atomic number of yet undiscovered element directly below Fr in periodic table?
(A) 117 (B) 118 (C) 119 (D) 120

Q.41 Which of the following is p-block element.
(A) Zn (B) Rb (C) Pb (D) Nb

Q.42 The outer electronic configuration of an element in ground state is $5s^2$ $4d^{10}$ $5p^3$. The properties of element is likely to be similar to that of
(A) Chlorine (B) Sulphur (C) Phosphorus (D) Aluminium

Q.43 In the sixth period, the orbitals are filled as-
(A) 6s 5f 6d 6p (B) 6s 4f 5d 6p (C) 5s 5p 5d 6p (D) 6s 6p 6d 6f

Q.44



In above figure if 'Z' is the atomic number then identify the period number of element 'X' in periodic table-

(A) 5th (B) 4th (C) 6th (D) 7th

Q.45 Identify the group number of Tl element in periodic table.

(A) Group number = 13 (B) Group number = 4

(C) Group number = 16 (D) Group number = 7

Q.46 Mendleeve left the space for elements in periodic table, the element is not _____.

(A) Ga (B) Sc (C) Ge (D) Te

Q.47 The number of elements in 6^{th} period of the modern periodic table are :

(A) 8 (B) 18 (C) 32 (D) None of these

Q.48 The number of groups in modern periodic table that belong to d-block are :

(A) 18 (B) 10 (C) 6 (D) 2

Q.49 Which of the following is a transition element?

(A) Zn (B) Cd (C) Hg (D) Cu

Q.50 The number of elements present in the group 3 of the modern periodic table is:

(A) 4 (B) 8 (C) 18 (D) 32

Q.51 The elements with given atomic numbers that belong to the group number 16 of the modern periodic table is:

(A) 34, 52 (B) 15, 33 (C) 38, 56 (D) None of these

Q.52 In the modern periodic table the maximum number of elements are present in :

(A) Group I and period number 5 (B) Group III and period number 6

(C) Group V and period number 7 (D) Same for all

EFFECTIVE NUCLEAR CHARGE

Q.53 Choose the correct statement from the following :

(A) Z_{eff} on 'd' electron of Sc^{2+} is 18

(B) Z_{eff} values on an electron present in 4s and 4p orbital of an atom are identical.

(C) Z_{eff} values on an electron present in 3s and 4s orbital of an atom are identical.

(D) the screening constant value on one electron in H^- ion is 0.35.

Q.54 According to Slater rule, which set of elements show incorrect order of $z_{eff.}$

(A) Al > Mg (B) Na > Li (C) K > Na (D) None of these

Q.55 The value of screening constant (σ) for N-atom is 3.10 and that for O-atom is

(A) 3.10 (B) 2.75 (C) 3.45 (D) 3.80

Q.56 In a given shell the order of screening effect is

(A) s > p > f > d (B) s > d > p > f (C) s > p > d > f (D) s < p < d < f

Q.57 Calculate the effective nuclear charge for the outer most electron of oxygen atom.

(A) 3.45 (B) 4.55 (C) 0.85 (D) 6.4

Q.58 What will be the difference of Z_{eff} in N and O for last electron.

(A) 0.35 (B) 0.65 (C) 2.1 (D) 0.85

Q.59 The outermost and penultimate shell of an element contains 2 and 8 electrons, respectively. The effective nuclear charge for the valence electron of this element, according to Slater's Rule, should be :

(A) 2.20 unit (B) 2.50 unit (C) 2.85 unit (D) 7.15 unit

Q.60 Which of the following pair of elements have the same value of shielding constant (σ) for 3s-electron.

(A) Mn & Zn (B) Fe & Na (C) Ar & Cl (D) All of these

Q.61 Which of the following pair has the same value of screening constant for '3s' electron?

(A) Cl & Mg (B) Mg & Ca (C) N & Na (D) K & Ca

Q.62 The value of σ for the 4s and 5s electron of Rb is respectively ?

(A) 27.75 and 34.80 (B) 28.95 and 34.80

(C) 27.75 and 28.10 (D) 28.10 and 28.95

Q.63 Effective nuclear charge on last electron of Fe^{2+} (Using Slater's Rule)

(A) 7.5 (B) 7.45 (C) 6.25 (D) 19.75

Q.64 Z_{eff} for the valence electron of Al (Z = 13) is :

(A) 9.50 unit (B) 3.50 unit (C) 3.85 unit (D) 3.15 unit

Q.65 Find Z_{eff} (using Slater's Rule) on 3d electron of Cu(29)

(A) 8.3 (B) 6.85 (C) 7.85 (D) None of these

Q.66 Choose the following atom which has maximum value of Z_{eff} ?

(A) Na (B) Li (C) S (D) O

Q.67 Calculate the value of Z_{eff} for 3d electron of $_{21}Sc$.

(A) 18.69 (B) 21.69 (C) 3.69 (D) 3.00

Q.68 Which of the following transition element has minimum value of effective nuclear charge (according to Slater'a rule).

(A) Zn (B) Cu (C) Ni (D) Mg

SIZE

Q.69 In Which of the following case the size ratio is maximum :

(A) Cl^- / Cl (B) I^- / I (C) H^- / H (D) F^- / F

Q.70 Among the following species the highest radius is of

(A) Al^{3+} (B) F^- (C) Na^+ (D) N^{3-}

Q.71 Select the correct sequence of increasing radius (left to right)

(A) Se^{2-}, O^{2-}, F^- (B) Ca^{2+}, Ar, K^+ (C) Se, As, Ge (D) Fe, Fe^{2+}, Fe^{3+}

Q.72 Atomic radii of fluorine and neon in Angstrom units are respectively given by

(A) 0.72, 1.60 (B) 1.60,1.60 (C) 0.72, 0.72 (D) 1.60, 0.72

Q.73 Choose the correct ionic radius order:

(A) $N^{3-} < N^{2-}$ (B) $N^{3-} < P^{3-}$ (C) $K^+ < Ca^{2+}$ (D) $O^{2-} < Mg^{2+}$

Q.74 In which of the following compound size of cation to anion ratio is minimum :

(A) CsF (B) LiI (C) LiF (D) CsI

Q.75 The Lanthanide contraction is caused by

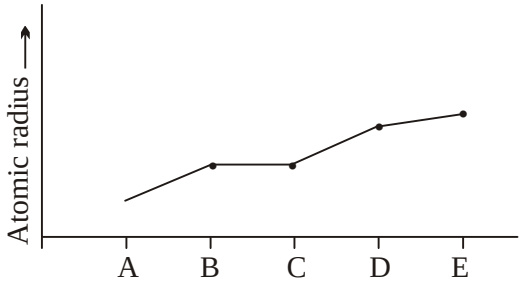
(A) sudden increase of number of proton inside the nucleus of an atom.

(B) sudden decrease of number of valence shell electrons.

(C) presence of large number of d and f-electrons having poor shielding effect.

(D) the repulsion of inner shell electrons.

Q.76 Atomic radius variation of an unknown group in the periodic table is as below



The element B & C respectively are :

(A) Cl & Br (B) Be & Mg (C) Si & Ge (D) Al & Ga

Q.77 Choose the incorrect ionic radius order.

(A) $Al^{3+} < Li^{+}$ (B) $O^{2-} > C^{4-}$ (C) $Cl^{-} < S^{2-}$ (D) $Na^{+} > Li^{+} > H^{+}$

Q.78 The smallest size cation and anion available are respectively.

(A) H^{+} and H^{-} (B) H^{+} and F^{-} (C) Li^{+} and F^{-} (D) Li^{+} and H^{-}

Q.79 Select the correct order of ionic radii.

(A) $O^{2-} > S^{2-} > Se^{2-} > Te^{2-}$ (B) $S^{2-} > O^{2-} > Se^{2-} > Te^{2-}$

(C) $Te^{2-} > Se^{2-} > S^{2-} > O^{2-}$ (D) $Se^{2-} > Te^{2-} > O^{2-} > S^{2-}$

Q.80 Which of the following is smallest anion.

(A) $F^{\ominus}$ (B) $H^{\ominus}$ (C) $Cl^{\ominus}$ (D) O^{2-}

Q.81 Which of the following is the correct increasing size?

(A) $Cl^{-} < Ca^{2+} < S^{2-} < Al^{3+}$ (B) $Mg^{2+} < K^{+} < Li^{+} < Al^{3+}$

(C) $Mg^{2+} < Na^{+} < F^{-} < O^{2-} < N^{3-}$ (D) $F^{-} < Na^{+} < Mg^{2+} < O^{2-}$

Q.82 Which of the following elements have smaller size than carbon?

(A) Lithium (B) Nitrogen (C) Neon (D) Sodium

Q.83 For an element, the covalent radius is xÅ, metallic radius is yÅ and the Vanderwaal's radius is zÅ. Which of the following order is correct?

(A) $x < y < z$ (B) $y < x < z$ (C) $z < y < x$ (D) $x < z < y$

Q.84 Which of the following is incorrect order of ionic radii?

(A) $N^- < N^{2-} < C^{4-}$ (B) $O^- < N^{3-}$ (C) $Mg^+ < Al^{3+}$ (D) $Si^{4+} < Al^{2+} < Al^+$

Q.85 Choose the **correct** order of size.

(I) $Fe^{2+} > Fe^{3+}$ (II) $Cu < Zn$ (III) $Cu^{2+} > Cu^+$ (IV) $Hg_2^{2+} > Hg^{2+}$

(A) I, II & IV (B) I, II & III (C) I, III & IV (D) II & IV

Q.86 Among the following species the highest radius is of

(A) Na^+ (B) Mg^{2+} (C) Al^{3+} (D) Si^{4+}

Q.87 The correct order of atomic radii is

(A) $K^+ < Ca^{2+} < Cl^- < S^{2-}$ (B) $Cl^- < K^+ < Ca^{2+} < S^{2-}$

(C) $Cl^- < S^{2-} < K^+ < Ca^{2+}$ (D) $Ca^{2+} < K^+ < Cl^- < S^{2-}$

Q.88 The correct order of ionic radii is

(A) $N^{3-} > Na^+ > O^{2-} > F^-$ (B) $Na^+ > O^{2-} > N^{3-} > F^-$

(C) $O^{2-} > F^- > Na^+ > N^{3-}$ (D) $N^{3-} > O^{2-} > F^- > Na^+$

Q.89 The correct order of ionic radii is :

(A) $Te^{2-} > I^- > Cl^- > Ar^+$ (B) $I^- > Te^{2-} > Cl^- > Ar^+$

(C) $I^- > Te^{2-} > Ar^+ > Cl^-$ (D) $I^- > Cl^- > Te^{2-} > Ar^+$

Q.90 The Lanthanide contraction is responsible for the fact that :

(A) Zr and Y have almost the same radius.

(B) Zr and Nb have similar oxidation state.

(C) Zr and Hf have almost the same radius.

(D) Zr and Zn have the same oxidation state.

Q.91 Select the **correct** order of ionic radii :

(A) $Te^{2-} > Se^{2-} > S^{2-} > O^{2-}$ (B) $Te^{2-} < Se^{2-} < S^{2-} < O^{2-}$

(C) $Te^{2-} = Se^{2-} > S^{2-} = O^{2-}$ (D) None

Q.92 Which one is correct order of the size of the Nitrogen species?

(A) $N^+ < N < N^-$ (B) $N > N^- > N^+$

(C) $N^+ > N^- > N$ (D) $N > N^+ > N^-$

Q.93 Which one is correct order of the size of the iodine species?

(A) $I^- > I > I^+$ (B) $I > I^- > I^+$ (C) $I^+ > I^- > I$ (D) $I > I^+ > I^-$

Q.94 Correct order of radius among the following
F^-, Al^{3+}, Na^+ are
(A) $Al^{3+} = Na^+ = F^-$ (B) $Al^{3+} > Na^+ > F^-$
(C) $Al^{3+} = Na^+ > F^-$ (D) $Al^{3+} < Na^+ < F^-$

Q.95 The ionic radii of Fe^{2+} and Fe^{3+} are x and y respectively the correct relationship between x and y is :
(A) x > y (B) x < y (C) x = y (D) can't be predicted

Q.96 The ions O^{2-}, F^-, Na^+, Mg^{2+} and Al^{3+} are isoelectronic. Their ionic radii show:
(A) an increase from O^{2-} to F^- and then decrease from Na^+ to Al^{3+}
(B) a decrease from O^{2-} to F^- and then increase from Na^+ to Al^{3+}
(C) a significant increase from O^{2-} to Al^{3+}
(D) a significant decrease from O^{2-} to Al^{3+}

Q.97 The correct order of ionic radii is :
(A) $O^- > F^- > Li^+ > B^{3+}$ (B) $F^- > O^- > Li^+ > B^{3+}$
(C) $F^- > B^{3+} > O^- > Li^+$ (D) $O^- > F^- > B^{3+} > Li^+$

Q.98 Which of the following pair of species having nearly same atomic size
(A) Zr & Hf (B) Pd & Pt (C) Fe & Co (D) All of these

Q.99 Select the pair of almost same size.
(A) Al, Ga (B) Zr, Hf (C) Fe, Co (D) All of these

Q.100 Choose the correct order of atomic / ionic radii.
(A) Sc < Y < La (B) Fe < Co < Ni
(C) $Be^{2+} < Mg^{2+} < Al^{3+}$ (D) $Tl^+ < Pb^{2+} < Bi^{3+}$

Q.101 Arrange in the increasing order of atomic radii of the following elements O, C, F, Cl, Br
(A) F < O < C < Cl < Br (B) F < C < O < Cl < Br
(C) F < Cl < Br < O < C (D) C < O < F < Cl < Br

Q.102 The ionic radius of Na^+, Mg^{2+} and Al^{3+} ions are in order.
(A) $Na^+ < Mg^{2+} < Al^{3+}$ (B) $Na^+ > Mg^{2+} > Al^{3+}$
(C) $Na^+ = Mg^{2+} = Al^{3+}$ (D) $Na^+ < Al^{3+} < Mg^{2+}$

Q.103 In following compound which has minimum ionic radius of maganese is :
(A) $Mn_2(SO_4)_3$ (B) MnO (C) $KMnO_4$ (D) MnO_2

Q.104 Choose the compound in which 'Cr' atom has minimum atomic radii:

(A) Cr_2O_3 (B) CrO

(C) $K_2Cr_2O_7$ (D) All molecule has same atomic radii of Cr

Q.105 Which of the following pair of element has incorrect order of atomic radii?

(A) Fe $\simeq$ Co (B) La $\simeq$ Y (C) Pt $\simeq$ Pd (D) Zr $\simeq$ Hf

Q.106 Atom which has largest atomic radii in following -

(A) Se (B) Br (C) Te (D) I

Q.107 Which options are correct for atomic radii ?

(A) Ne > F (B) F > Cl (C) F > Ne (D) Cl > Ar

Q.108 Which of the following has the largest size?

(A) K^+ (B) Ca^{+2} (C) Ar (D) S^{2-}

Q.109 Among the following species the highest radius is of

(A) Al^{3+} (B) Mg^{2+} (C) Li^+ (D) Na^+

IONISATION ENERGY

Q.110 Find the highest ratio of IP values of given pair of elements :

(A) He : Ne (B) Ne : Ar (C) He : Xe (D) Kr : Xe

Q.111 Which one of the following electronic configuration of an atom has the lowest ionisation energy

(A) $1s^2 2s^2 2p^3$ (B) $1s^2 2s^2 2p^6 3s^1$ (C) $1s^2 2s^2 2p^6$ (D) $1s^2 2s^2 2p^5$

Q.112 The first five ionization energies of an element are 9.1, 16.2, 24.5, 35 and 205.7 eV respectively. Then number of valence electron in the atom is

(A) 2 (B) 3 (C) 4 (D) 5

Q.113 Which one of the following electronic configuration of an atom has the highest ionisation energy

(A) $1s^2 2s^2 2p^3$ (B) $1s^2 2s^2 2p^6 3s^1$ (C) $1s^2 2s^2 2p^6$ (D) $1s^2 2s^2 2p^5$

Q.114 Which of the following magnetic moment values will correspond to highest ionisation energy for cobalt specie.

(A) $2\sqrt{2}$ (B) $\sqrt{15}$ (C) $\sqrt{35}$ (D) $\sqrt{24}$

Q.115 Which of the following has 2^{nd} I.P. < I^{st} I.P.

(A) Mg (B) Ne (C) C (D) None of these

Q.116 Highest difference between I^{st} & II^{nd} ionisation energies will be observed in:

(A) Li (B) B (C) O (D) F

Q.117 Ionisation energies of element X are given below (in kJ/mol)

IE_1	IE_2	IE_3
520	7,340	11,000

If 'X' reacts with different elements which compounds are possible

(A) XF (B) X_2O (C) X_3N (D) All of above

Q.118 The correct order of ionisation energy of Al, K, Fe, Mg is

(A) K < Al < Mg < Fe (B) K < Mg < Al < Fe

(C) Mg < K < Al < Fe (D) Mg < Fe < Al < K

Q.119 One element (A) is having four valence shell electron and which of following values will be maximum.

(A) EA of 'A' (B) $IE_4 - IE_3$ (C) $IE_5 - IE_3$ (D) $IE_2 - IE_1$

Q.120 The 2^{nd} ionisation potential of Mg is less than that of Na because

(A) Atomic size of Mg is less than that of Na.

(B) Atomic size of Mg is greater than that of Na.

(C) 2^{nd} electron removal from Na occur from inert gas configuration, while the same for Mg results inert gas configuration.

(D) Both are having same Z_{eff} value for 3s electron.

Q.121 Which of the following set of elements are having strongest tendency to form cation?

(A) I, Cl, Br (B) C, Sn, Se

(C) Na, K, Sr (D) Mn, Ti, Fe

Q.122 The ionisation potential values 54.40 eV & 39.30 eV correspond to

(A) H^+ & H (B) Li & Li^+

(C) He & He^+ (D) He^+ & He

Q.123 The ionisation energy for 'Sc', 'Y' and 'La' are x, y and z kcal/mol respectively. Choose the correct relationship between them.

(A) $z > x \approx y$ (B) $x > y > z$ (C) $x > z \approx y$ (D) $x < y > z$

Q.124 For an element 'A'.

$$A \xrightarrow{IE_1} A^+ \xrightarrow{IE_2} A^{2+} \xrightarrow{IE_3} A^{3+} \longrightarrow .....$$

The IE_1 and IE_3 values are 27 kJ/mole and 51 kJ/mole respectively. Then the value of IE_2 is _____ kJ/mole.

(A) 21 (B) 33 (C) 59 (D) 63

Q.125 Which of the following atom has highest ionisation energy.

(A) N (B) O (C) P (D) S

Q.126 Rb forms Rb^+ ion but it does not form Rb^{2+} because

(A) Very low value of $(I.E.)_1$ and $(I.E.)_2$

(B) Very high value of $(I.E.)_1$ and $(I.E.)_2$

(C) low value of $(I.E.)_1$ and low value of $(I.E.)_2$

(D) low value of $(I.E.)_1$ and high value of $(I.E.)_2$

Q.127 Choose the correct Ionisation potential order :

(A) $O^- > O$ (B) $N^- > N$ (C) $H^- > H$ (D) None of these

Q.128 $A^{n+}(g) \xrightarrow{X} A^{(n+1)^+}(g) + e^{\ominus}$

In above process 'X' is

(A) Electron gain enthalpy (B) Electronegativity

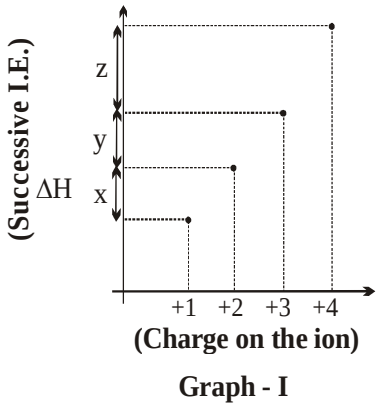
(C) Ionisation energy (D) None of these

Q.129 ΔH_{IE_1} (First Ionisation Enthalpy) of Na, Mg and Si is 496, 737 and 786 kJ mol^{-1}, respectively. What will be the ΔH_{IE_1} value of Al?

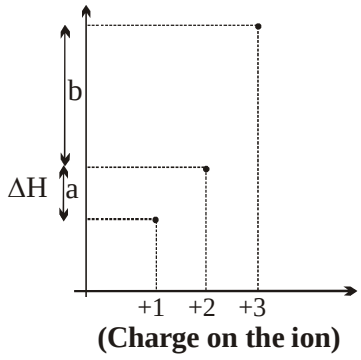
(A) 760 kJ mol^{-1} (B) 450 kJ mol^{-1}

(C) 580 kJ mol^{-1} (D) 800 kJ mol^{-1}

Q.130



Graph - I



Graph - II

Above graphs represent **successive ionisation energies** of an element.

Given : $x < y < 11$ eV and $z > 16$ eV ; $a < 11$ eV and $b > 16$ eV

Which of the following is **incorrect** according to above two graphs?

(A) **Graph I** may belong to the elements of 13^{th} group.

(B) **Graph II** may belong to the elements of 2^{nd} group.

(C) Stable oxidation state of metal ion according to **Graph-II** would be +2.

(D) ns^2np^1 may be the general electronic configuration of element according to **Graph-II**.

Q.131 Which of the following is the strongest reducing agent in aqueous solution?

(A) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^1$ (B) $1s^2\ 2s^1$

(C) $1s^2\ 2s^2\ 2p^6\ 3s^1$ (D) $[Xe]\ 6s^1$

Q.132 For an element 'A' belonging to **alkaline earth metal family.**

$A \xrightarrow[IE_1]{} A^+ \xrightarrow[IE_2]{} A^{2+} \xrightarrow[IE_3]{} A^{3+} \xrightarrow[IE_4]{} A^{4+}$ ..... are defined. If IE_3 and IE_4 are respectively 4.9 and 6.5 M J/ mol. What will be the values of IE_1 and IE_2 respectively.

(A) 1, 4 (B) 0.6, 1.1 (C) 4, 4.5 (D) 1.5 , 5.2

Q.133 The ionisation enthalpy of sodium is 500 kJ/mol at T K. How many sodium atoms may be converted into sodium ions (Na^+) by the absorption of 200 J heat at T K ? ($N_A = 6 \times 10^{23}$)

(A) 2.4×10^{23} (B) 2.4×10^{20} (C) 1.5×10^{21} (D) 1.5×10^{24}

Q.134 The successive ionisation energies of an element **(in eV/atom)** are :

$(I.E.)_1$	$(I.E.)_2$	$(I.E.)_3$	$(I.E.)_4$	$(I.E.)_5$
11.2	24.3	57.4	77.4	392.0

The outer electronic configuration of the element may be :

(A) $ns^2 np^0$ (B) ns^2np^3 (C) ns^2np^1 (D) ns^2np^2

Q.135 Ionisation energies of Cl^-, Cl and Cl^+ are respectively **(in KJ/mol)**

(A) 1251, 349, 2300 (B) 2300, 349,1251 (C) 349, 1251, 2300 (D) 349, 2300, 1251

Q.136 Which of the following isoelectronic species has the lowest ionisation energy?

(A) S^{2-} (B) K^+ (C) Cl^- (D) Ca^{2+}

Q.137 Which ionisation potential in the following equations involves the greatest amount of energy?

(A) $K^+ \rightarrow K^{2+} + e^-$ (B) $Ca^+ \rightarrow Ca^{2+} + e^-$ (C) $Fe \rightarrow Fe^+ + e^-$ (D) $Li^+ \rightarrow Li^{2+} + e^-$

Q.138 Which of the following has the lowest second ionisation energy?

(A) Sc (B) Ti (C) V (D) Ca

Q.139 Which of the following elements has the highest ionisation energy?

(A) [Ne] $3s^2 3p^1$ (B) [Ne] $3s^2 3p^3$ (C) [Ne] $3s^2 3p^2$ (D) $3d^{10}, 4s^2 4p^3$

Q.140 The first ionisation potential **(in eV)** of N , O atoms are:

(A) 14.6, 13.6 (B) 13.6, 14.6 (C) 13.6, 13.6 (D) 14.6, 14.6

Q.141 Ionisation potential of which element is highest?

(A) H (B) Cl (C) He (D) Fr

Q.142 Which of the following elements has the lowest ionisation potential?

(A) Na (B) K (C) Mg (D) Al

Q.143 Inert pair effect is prominent character of

(A) p-block element (B) d-block element (C) s-block element (D) f-block element

Q.144 For element, **A** there is large energy difference between **5^{th}** and **6^{th}** ionisation energy. This element is member of

(A) Pnictogen family (B) Chalcogen family (C) Halogen family (D) Noble gases

Q.145 Second ionization potential of Li, Be and B is in the order

(A) Li > Be > B (B) Li > B > Be (C) Li > Be < B (D) B > Be > Li

Q.146 Consider following electronic configuration of atoms and select correct code in order of increasing ionization energy

[I] $1s^2\ 2s^2\ 2p^6\ 3s^2$ [II] $1s^2\ 2s^2\ 2p^6\ 3s^1$

[III] $1s^2\ 2s^2\ 2p^4$ [IV] $1s^2\ 2s^2\ 2p^5$

[V] $1s^2\ 2s^2\ 2p^6$

(A) [II] < [I] < [III] < [IV] < [V] (B) [II] < [III] < [IV] < [I] < [V]

(C) [II] < [IV] < [III] < [I] < [V] (D) [II] < [III] < [I] < [IV] < [V]

Q.147 The incorrect statement among the following is :

(A) The first ionisation energy of calcium is more than first ionisation energy of gallium

(B) The second ionisation energy of copper is greater than that of potassium

(C) The third ionisation energy of Mg is greater than the third ionisation energy of Al

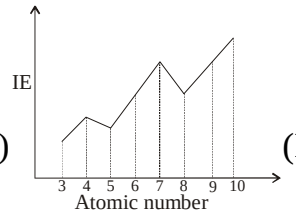
(D) The IE_1 of Mg^+ is less than the IE_1 of Na^+

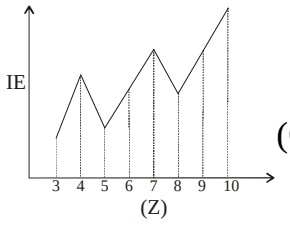
Q.148 Choose the correct ionisation energy order.

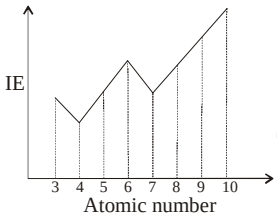
(A) Li < B < Be < C < N < O < F (B) Na < Mg < Al < Si < S < P < Cl

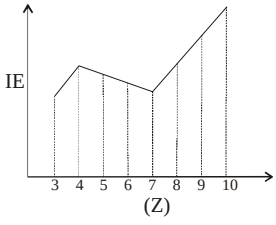
(C) K < Ga < Ca < Ge < As < Se < Br (D) Rb < Sr < In < Sn < Sb < Te < I

Q.149 Select **correct** graph, which is plotted between Ionisation Energy of 2^{nd} period elements and their atomic number.

(A) 

(B) 

(C) 

(D) 

Q.150 Which of the following has the highest second ionisation energy?

(A) Cr (B) Mn (C) Co (D) Fe

Q.151 Ionisation energy order is :

(A) Li < Be > B (B) Be < B < C (C) C < N < O (D) N < O < F

Q.152 The incorrect order of II^{nd} ionisation energy is

(A) Cu > Zn (B) Cr > Mn (C) Na > Mg (D) Mg > Al

Q.153 Select the correct order of IInd I.E. of C, N, O, F.

(A) C > N > O > F (B) C < N < O < F (C) C < N < O > F (D) C < N > O < F

Q.154 Successive ionization enthalpies **(in eV/atom)** of an element are 5, 8, 9, 90, 100. The number of valence electrons are :

(A) 1 (B) 2 (C) 3 (D) 4

Q.155 Which of the following element will have highest ionization energy?

(A) H (B) He (C) Ne (D) F

Q.156 The correct order of second ionisation energy.

(A) N > O (B) Li > Ne (C) P > N (D) Br > Cl

Q.157 I and III ionisation energies of an element are 40 and 60 eV/atom respectively. II ionization energy can be

(A) 51 eV/atom (B) 39 eV/atom (C) 65 eV/atom (D) 100 eV/atom

Q.158 Which of the following is **incorrect** statement(s):

(A) $Tl^{3+} > Tl^{+}$ (Stability order) (B) $Pb^{2+} > Pb^{4+}$ (Stability order)

(C) $Fe^{+} > Fe^{2+} > Fe^{3+}$ (Radius order) (D) $O^{2-} > F^{-} > Na^{+}$ (radius order)

Q.159 Which of the following is only incorrect increasing order of first ionisation energy of the atoms or ions mentioned?

(A) $Mg^{+} < Al^{2+} < Na^{+}$ (B) $I^{-} < I < I^{+}$ (C) Li < B < Be (D) $Br^{-} < Cl^{-} < F^{-}$

Q.160 Which of the following case is affected by lanthanoid contraction according to their given properties?

(A) Stable oxidation state of thallium is +1. (B) Atomic radius of Zr $\simeq$ Hf.

(C) Ionisation potential of Tl > In (D) all of these

Q.161 In which of the following, the energy change corresponds to first ionisation potential?

(A) $X_{(g)} \rightarrow X^{+}_{(g)} + e^{-}$ (B) $2X_{(g)} \rightarrow 2X^{+}_{(g)} + 2e^{-}$

(C) $X_{(s)} \rightarrow X^{+}_{(g)} + e^{-}$ (D) $X_{(aq)} \rightarrow X^{+}_{(aq)} + e^{-}$

Q.162 Out of N, O, Ne, Na and Na^{+}, select the species which have minimum and maximum ionisation energy respectively.

(A) N, Ne (B) O, Na^{+} (C) Na, Ne (D) Na, Na^{+}

Q.163 The first ionisation enthalpies of four consecutive elements present in the second period of the periodic table are 8.3, 11.3, 14.5 and 13.6 eV respectively. Which one of the following is the first ionisation enthalpy of nitrogen ?

(A) 13.6 (B) 14.5 (C) 11.3 (D) 8.3

Q.164 Stability of ions of Ge, Sn and Pb will be in the order :

(A) $Ge^{2+} > Sn^{2+} > Pb^{2+}$ (B) $Ge^{4+} > Sn^{4+} > Pb^{4+}$

(C) $Sn^{4+} < Sn^{2+}$ (D) $Pb^{2+} < Pb^{4+}$

Q.165 $M \xrightarrow{X} M^{+} \xrightarrow{Y} M^{+2}$

Select the **correct** statement regarding the value of 'X':

(A) The value of 'X' is equal to ionisation potential of M.

(B) The value of 'X' is equal to magnitude of electron affinity of M^{+}.

(C) Any information about 'X' can not $|X| = |Y|$

(D) Both option (A) and (B) regarding 'X' are correct.

Q.166 The correct order of ionisation energy among the following is :

(A) $O > S > O^{-} > S^{-}$ (B) $O > O^{-} > S > S^{-}$

(C) $O > S > S^{-} > O^{-}$ (D) $S > O > S^{-} > O^{-}$

Q.167 Element which has maximum ionisation energy.

(A) Zn (B) Cu (C) Cd (D) Hg

Q.168 Element which has minimum first ionisation energy is -

(A) N (B) P (C) O (D) S

Q.169 For an element the successive ionisation energy values (in eV $atom^{-1}$) are given below 12.32, 26.84, 44.56, 65.63, 203.9, 251.12, 308.4

The element that satisfies the above values is :

(A) Si (B) Ca (C) Al (D) S

Q.170 The ionisation energies for B, Tℓ and In are X,Y and Z kcal/mol respectively, Choose the correct relationship between them -

(A) $Z > X = Y$ (B) $X > Y > Z$ (C) $X > Y = Z$ (D) $X < Y > Z$

Q.171 For an element having only one valence shell electron, then which of the following ionisation energy difference will have the maximum value -

(A) $IE_2 - IE_1$ (B) $IE_3 - IE_2$ (C) $IE_3 - IE_1$ (D) can't predict

Q.172 Which of the following represent second ionization energy?

(A) $O(g) \longrightarrow O^{2+}(g) + 2e^-$ (B) $O_2(g) \longrightarrow O_2^{2+}(g) + 2e^-$

(C) $O^+(g) \longrightarrow O^{2+}(g) + e^-$ (D) All of these

Q.173 The element having maximum tendency to form ionic bonds is

(A) Cs (B) Rb (C) K (D) Li

Q.174 Which of the following has maximum ionisation energy?

(A) Li^+ (B) He (C) Ne (D) Na

Q.175 The strongest reducing agent in gaseous phase is

(A) Li (B) Na (C) K (D) Cs

Q.176 $M(g) \xrightarrow[IP_1]{} M^+(g) \xrightarrow[IP_2]{} M^{+2}(g) \xrightarrow[X]{} M^{+3}(g)$

The ratio of $\frac{IP_1}{IP_2} = \frac{X}{2}$

Then calculate the value of IP_1 and IP_2 if

$M(g) \longrightarrow M^{+3}(g), \quad \Delta H = 5X$

(A) $\frac{8X}{3+X}, \frac{4X}{2+X}$ (B) $\frac{8X}{2+X}, \frac{4X^2}{2+X}$ (C) $\frac{4X^2}{2+X}, \frac{8X}{2+X}$ (D) $\frac{4X}{2+X}, \frac{8X}{3+X}$

Q.177 The ionisation potential value for process $M_{(g)} \longrightarrow M^+_{(g)}$ is 'X'. Then choose the correct code if ionisation potential value for $M^-_{(g)} \longrightarrow M_{(g)}$ process is 'Y'.

(A) X = Y (B) X > Y (C) X < Y (D) Data Insufficient

ELECTRON AFFINITY

Q.178 Which process can produce maximum number of Fe^{2+} ions from iron atom by absorbing energy from the given species.

Considering equal number of given species.

(A) Formation of N^- from N-atom. (B) Formation of F^- from F-atom.

(C) Formation of Cl^- from Cl-atom. (D) Formation of S^- from S-atom.

Q.179 In which of the following process, maximum amount of energy involved.

(A) $Cl \rightarrow Cl^-$ (B) $Br^- \rightarrow Br$ (C) $F^- \rightarrow F$ (D) $I^- \rightarrow I$

Q.180 Which of the following statement is **correct**.

(A) The 1st ionisation potential of N is greater than that of O^+.

(B) The 1st ionisation potential of N is equal to that of O^+.

(C) The 1st ionisation potential of N is less than that of O^+.

(D) The electron affinity of 'N' is greater than that of 'O'.

Q.181 Choose the correct order of the property given below :

(A) $N^{3-} < O^{2-}$: ionic radius (B) N > O : I st ionisation energy

(C) N > O : 2nd ionisation energy (D) N > O : Electron affinity order

Q.182 Calculate the value of **electron gain enthalpy ($\Delta_{eg}H$)** at 300 K if electron affinity of Cl is 90 Kcal.

(A) – 91.5 Kcal (B) + 88.5 Kcal (C) –88.5 Kcal (D) – 1590 Kcal

Q.183 The electron gain enthalpy ($\Delta_{eg}H$) of an element 'A' is $\left(-\frac{1}{2}\right)$ times of its ionisation enthalpy (Δ_iH).

When one mole of $A^+(g)$ is completely converted into $A^-(g)$, 900 kJ heat is released. The $\Delta_{eg}H$ of element 'A' is :

(A) – 300 kJ/mol (B) – 600 kJ/mol (C) 600 kJ/mol (D) 300 kJ/mol

Q.184 If $\Delta_{eg}H$ of $A^+(g) = -x$ kJ/mol, $\Delta_{eg}H$ of $A(g) = -y$ kJ/mol and $\Delta_{ionisation}H$ of $A^+(g) = +z$ kJ/mol, then ΔH for the process : $A^-(g) \rightarrow A^{2+}(g)$, is

(A) (x + y + z) kJ/mol (B) (z – x – y) kJ/mol

(C) (x + y – z) kJ/mol (D) (x – y + z) kJ/mol

Q.185 Which of the following are correct?

(I) 1st Ionisation Energy of N > O (II) 2nd Ionisation Energy of O > N

(III) 1st Electron Affinity of N < O (IV) 1st Electron Affinity of Be < B

(A) I & II (B) I and III (C) I, II, III (D) All of these

Q.186 Which of the following would require least energy?

(A) $Si^-(g) \longrightarrow Si(g) + e^-$ (B) $P^-(g) \longrightarrow P(g) + e^-$

(C) $S^-(g) \longrightarrow S(g) + e^-$ (D) $Cl^-(g) \longrightarrow Cl(g) + e^-$

Q.187 Which of the following represents correct order of electron affinity?

(A) O < S < F < Cl (B) O < F < S < Cl

(C) F > O > Cl > S (D) F > Cl > O > S

Q.188 Which of the following has the lowest electron affinity?

(A) O (B) S (C) F (D) Cl

Q.189 The incorrect order of electron affinity is :

(A) F < Cl (B) N > P (C) O < S (D) Cl > Br

Q.190 The first ionisation potential of Na is 5.1 eV. The value of electron gain enthalpy of Na^+ would be

(A) –2.55 eV (B) –5.1 eV (C) –10.2 eV (D) 2.55 eV

Q.191 The least stable anion is :

(A) Li^- (B) Be^- (C) B^- (D) C^-

Q.192 The increasing order of electron affinity is :

(A) N < O < Cl < Al (B) O < N < Al < Cl

(C) Al < N < O < Cl (D) Cl < N < O < Al

Q.193 Which is the correct order of ionisation energies?

(A) $F^- > F > Cl^- > Cl$ (B) $F > Cl > Cl^- > F^-$

(C) $F^- > Cl^- > Cl > F$ (D) $F^- > Cl^- > F > Cl$

Q.194 Which of the following statement is correct regarding following process.

(i) $Cl \xrightarrow{E.A.} Cl^-$ (ii) $Cl^- \xrightarrow{I.E.} Cl$

(iii) $Cl \xrightarrow{I.E.} Cl^+$ (iv) $Cl^+ \xrightarrow{I.E.} Cl^{2+}$

(A) | I.E. of process (ii) | = | E.A. of process (i) |

(B) | I.E. of process (iii) | = | I.E. of process (ii) |

(C) | I.E. of process (iv) | = | E.A. of process (i) |

(D) | I.E. of process (iv) | = | I.E. of process (iii) |

Q.195 Select incorrect order of E. A.

(A) Cl > F (B) O < S (C) N > P (D) C < Si

Q.196 Select correct relationship for Na atom.

(A) | I.E. of Na | < | E.A. of Na | (B) | I.E.of Na | > | I.E. of Na^- |

(C) | I.E. of Na | > | I.E. of Na^+ | (D) | E.A. of Na | = | I.E.of Na^+ |

Q.197 The **correct** order of electron affinity is

(A) N > P > S > Cl (B) P > N > S > Cl

(C) Cl > N > P > S (D) Cl> S > P > N

Q.198 Choose the incorrect statement.

(A) 2^{nd} electron gain enthalpy for any element is (+) ve.

(B) E.A. of an element $\propto Z_{eff}$

(C) The ionisation energy order : $F^- > Cl^-$

(D) The ionisation energy order : $F^- < Cl^-$

Q.199 Which of the following statements is **correct**?

(A) Ionisation energy of A^- is greater than A when A is a halogen atom.

(B) Ionisation energy of A^+ is greater than that of A^{2+} when A is the member of alkali metals.

(C) Successive ionisation energy is always increasing for 1^{st} and 2^{nd} period element.

(D) Electron affinity value of 'A^+' is numerically identical with the ionisation potential of A^- [for any atom].

Q.200 Which of the following is exothermic:

(A) $N(g) + 1e^- \rightarrow N^-(g)$ (B) $P(g) + 1e^- \rightarrow P^-(g)$

(C) $Na(g) \rightarrow Na^+(g) + 1e^-$ (D) $1e^- + Be(g) \rightarrow Be^-(g)$

Q.201 In which transition maximum amount of energy will be released.

(A) $S(g) + 1e^- \rightarrow S^-(g)$ (B) $O(g) + 1e^- \rightarrow O^-(g)$

(C) $N(g) \rightarrow N^+(g) + 1e^-$ (D) $He(g) + 1e^- \rightarrow He^-(g)$

Q.202 Which of the following is incorrect order of electron affinity:

(A) Li < Na (B) Al > B (C) Si > C (D) Cl > F

Q.203 Which of the following process is endothermic?

(A) $Na(g) + 1e^- \longrightarrow Na^-(g)$ (B) $O^+(g) + 1e^- \longrightarrow O(g)$

(C) $O^-(g) + 1e^- \longrightarrow O^{2-}(g)$ (D) $S + 1e^- \longrightarrow S^-(g)$

Q.204 Which of the following is incorrect?

(A) For $A(g) + e^- \longrightarrow A^-(g)$, ΔH may be positive

(B) For $A^-(g) + e^- \longrightarrow A^{2-}(g)$, ΔH may be negative

(C) For $A^-(g) + e^- \longrightarrow A^{2-}(g)$, ΔH must be positive

(D) For $A^{2+}(g) + e^- \longrightarrow A^+(g)$, ΔH must be negative

Q.205 If electron gain enthalpy of X(g) is – 4.0 eV, then the ionisation enthalpy of X(g) at the same temperature may be :

(A) 4.0 eV (B) 3.5 eV (C) 5.5 eV (D) any of these values

Q.206 The correct order of increasing electron affinity of halogens is :

(A) F < Cl < Br < I (B) I < Br < F < Cl (C) I < Br < Cl < F (D) Br < I < F < Cl

Q.207 For the process

$X(g) + e^- \longrightarrow X^-(g)$, $\Delta H = x$ and

$X^-(g) \longrightarrow X(g) + e^-$, $\Delta H = y$

Select correct alternate :

(A) Ionization energy of $X^-(g)$ is y (B) Electron affinity of X(g) is – x

(C) Electron affinity of X(g) is +y (D) All are correct statements

Q.208 If the amount of energy required in the process X to X^- is –5 kJ/mole then calculate how many energy is required in X to X^+ process

(A) –5 kJ/mole (B) > 5 kJ/mole (C) < 5 kJ/mole (D) 5 kJ/mole

Q.209 Which of the following speices has maximum tendency to accept electron cloud?

(A) O^{2-} (B) O^{-1} (C) O^{+1} (D) O^{+2}

Q.210 Select the correct order of electron affinity :

(A) $F^- > Cl^-$ (B) F > Cl (C) Cl > F (D) $F^- > F$

Q.211 The numerical value of energy involved in the given process ; $S \rightarrow S^-$ is less than, which of the following process :

(A) $S^- \rightarrow S$ (B) $Se \rightarrow Se^-$ (C) $S \rightarrow S^+$ (D) (B) and (C) both

Q.212 Which of the following process is exothermic ?

(A) $P \rightarrow P^+$ (B) $P \rightarrow P^-$ (C) $P^- \rightarrow P$ (D) $P^+ \rightarrow P^{+2}$

Q.213 Which is correct order of electron affinity?

(A) Li < Be (B) Be > B (C) Li > B (D) Li > C

Q.214 Which element has highest Electron Affinity?

(A) Be (B) B (C) Li (D) C

Q.215 If the amount of energy required in the process X to X^- is –8 kJ/mole then calculate how many energy is required in X to X^+ process

(A) –8 kJ/mole (B) > 8 kJ/mole (C) < 8 kJ/mole (D) 8 kJ/mole

Q.216 Select the atom which has maximum electron affinity -

(A) C (B) Si (C) N (D) P

Q.217 Which of the following process is associated with the energy release.

(A) $Li \longrightarrow Li^+$ (B) $O^- \longrightarrow O^{2-}$ (C) $Cl^+ \longrightarrow Cl$ (D) $Be \longrightarrow Be^-$

ELECTRONEGATIVITY

Q.218 In which of the following process, maximum amount of energy involved.

(A) $Cl \rightarrow Cl^-$ (B) $Br^- \rightarrow Br$ (C) $F^- \rightarrow F$ (D) $I^- \rightarrow I$

Q.219 The most acidic oxide is :

(A) SO_3 (B) P_2O_5 (C) Cl_2O_7 (D) P_2O_3

Q.220 The E.N. of H, X, O are 2.2, 3.0 and 3.5 respectively comment on the nature of the compound H–O–X, that is :

(A) Basic (B) Acidic (C) Amphoteric (D) Can't be predicted

Q.221 Find the **incorrect** acidic strength order:

(A) $K_2O > Rb_2O > Cs_2O$ (B) $N_2O < NO_2 < N_2O_3$

(C) $Li_2O < BeO < N_2O_5$ (D) $Cl_2O_7 > P_2O_5 > SiO_2$

Q.222 The correct order of electronegativity of C in C_2H_2, C_2H_4 and C_2H_6 is

(A) $C_2H_2 > C_2H_6 > C_2H_4$ (B) $C_2H_2 > C_2H_4 > C_2H_6$

(C) $C_2H_6 > C_2H_4 > C_2H_2$ (D) $C_2H_4 > C_2H_2 > C_2H_6$

Q.223 Ionisation energy and electron affinity of fluorine are respectively 17.42 eV and 3.45 eV, then electronegativity of F atom on Pauling scale will be

(A) 10.44 (B) 4.0 (C) 3.72 (D) None of these

Q.224 Which of the following order is wrong.

(A) $NH_3 < PH_3 < AsH_3$ – Acidic (B) $Li < Be < B < C - (IE)_1$

(C) $Al_2O_3 < MgO < Na_2O < K_2O$ – Basic (D) $Li^+(g) < Na^+(g) < K^+(g) < Cs^+(g)$ – Ionic radius

Q.225 Comment on the electronegativity (EN) of As in AsF_3 and AsF_5.

(A) E.N. of As (AsF_3) > E.N. of As (AsF_5)

(B) E.N. of As (AsF_3) < E.N. of As (AsF_5)

(C) E.N. of As is identical in both cases

(D) No comment can be predicted.

Q.226 Select the correct statement regarding oxides.

(A) As the electronegativity of element increase acidic character of oxide increases.

(B) Down the group the acidic nature of oxide increase.

(C) B_2O_3 and Al_2O_3 are both acidic oxides.

(D) Nitrogen forms all the three types of oxides (neutral, basic & acidic)

Q.227 A student went to meet his friend, where he saw that his friend was doing the study of a particular chemistry book. But he could not find the theoretical value of bond length in H-F but he found that r_H & r_F are 0.37 Å and 0.72 Å respectively & electronegativity of F & H are 4.0 and 2.1 respectively.What is bond length of H–F bond.

(A) 1.09 (B) 1.784 (C) 0.92 (D) 0.46

Q.228 Calculate the electronegativity of Cl in Pauling scale

[**Given** : E.A. (Cl) = 4.0 eV / atom and I.E. (Cl) = 13.0 eV / atom]

(A) 2 (B) 3.03 (C) 3.5 (D) 4.0

Q.229 Which of the following is strongest in basic character ?

(A) $Be(OH)_2$ (B) $Mg(OH)_2$ (C) $Al(OH)_3$ (D) $Si(OH)_4$

Q.230 For an inert gas element the atomic number is z, then which of the following element having atomic number '_____' is having highest electronegativity.

(A) z – 2 (B) z – 1 (C) z + 1 (D) z + 2

Q.231 The electronegativity of 'N' is maximum in which of the following compound of N.

(A) N_2O (B) N_2O_3 (C) NO (D) N_2O_4

Q.232 Which of the following acidic order is correct.

(A) HI > HCl > HBr > HF (B) HI < HCl < HBr < HF

(C) HOCl > HOBr > HOI (D) HOCl < HOBr < HOI

Q.233 The correct order of Electronegativity is :

(A) F > O > N (B) N > O > F (C) O > N > F (D) N = O > F

Q.234 Which of the following statement is **incorrect**?

(A) Order of acidic strength $N_2O < N_2O_3 < NO_2$.

(B) Electron Affinity of O is more than that of Cl.

(C) Percent ionic character of As – H bond is less than that of Sb–H bond.

(D) A 'sp' hybridised carbon is more Electronegative than a sp^2 hybridised carbon.

Q.235 An element X has electronegativity of 3.0 on Pauling scale. Which of the statements is **correct**?

(A) The ionisation energy (IE) of X > 8.4 eV/atom

(B) The electron affinity (EA) of X > 8.4 eV/atom

(C) Both IE and EA > 8.4 eV/atom.

(D) Both IE and EA < 8.4 eV/atm.

Q.236 The bond energies of A – A, B – B and A – B bonds are 81, 100 and 115 kcal/mol, respectively. If the electronegativity of B is 3.0 and B is more electronegative than A, then from Pauling's Scale, the electronegativity of A is :

(A) 4.04 (B) 1.96 (C) 2.96 (D) 2.04

Q.237 The bond lengths of A –A and B – B bonds are 1.6 and 2.0 Å, respectively. If the electronegativities of A and B are 2.8 and 2.1, respectively, the according to Schomaker and Stevenson's Equation, the bond length of A – B bond should be :

(A) 3.537 Å (B) 2.97 Å (C) 1.737 Å (D) 1.17 Å

Q.238 If X – Y bond is 30% ionic in character, then according to Hanny and Smyth Equation, the electronegativity difference between X and Y is :

(A) 1.0 (B) $\frac{11}{7}$ (C) $\frac{10}{7}$ (D) $\frac{9}{7}$

Q.239 The correct order of acidic strength of these hydra acids is :

(A) HCl < HBr < HI < HF (B) $CH_4 < SiH_4 < GeH_4$

(C) $NH_3 < CH_4 < H_2O < HF$ (D) $HBr < H_2S < NH_3$

Q.240 Which of the following is the most electropositive?

(A) Li (B) Na (C) K (D) Cs

Q.241 The most electronegative element is

(A) O (B) F (C) Cl (D) N

Q.242 Which of the following relations is correct? (E.N, is on Mulliken scale)

(A) 2 I.P. – E.A. – E.N. = 0 (B) 2 I.P. – E.N. + E.A. = 0

(C) 2 E.N. – I.P. – E.A. = 0 (D) E.N. – I.P. – E.A. = 0

Q.243 Calculate the percentage ionic character for molecule AB, if electronegativity difference between AB molecule is 1.5.

(A) 20.8 (B) 10.2 (C) 31.8 (D) None of these

Q.244 Ionisation energy and electron affinity of fluorine are respectively 18.42 eV and 2.45 eV, then electronegativity of F atom on Pauling scale will be

(A) 3.72 (B) 4.0 (C) 10.44 (D) None of these

Q.245 Which of the following has maximum difference in bond length if the electronegativity difference is considered and not considered?

(A) HCl (B) HF (C) HI (D) HBr

Q.246 Which of the following is amphoteric in nature?

(A) $HClO_4$ (B) NaOH (C) $Zn(OH)_2$ (D) N_2O

Q.247 Which of the following is the most acidic in nature?

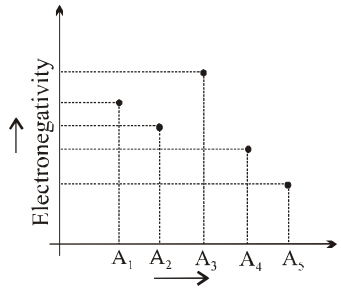
(A) SiO_2 (B) P_4O_{10} (C) CO_2 (D) SO_3

Q.248 The correct order of basic nature of given oxides is

(A) $V_2O_3 < V_2O_5 < V_2O_4$ (B) $V_2O_3 < V_2O_4 < V_2O_5$

(C) $V_2O_5 < V_2O_4 < V_2O_3$ (D) $V_2O_5 < V_2O_3 < V_2O_4$

Q.249 Following is the graph representating Electronegativity of certain elements A_1, A_2, A_3, A_4, A_5. Which of the following option(s) representing corresponding elements can be **correct**?



(A) A_1 = **N**, A_2 = **P**, A_3 = **F**, A_4 = **Cl**, A_5 = **Al**

(B) A_1 = **Cl**, A_2 = **P**, A_3 = **O**, A_4 = **N**, A_5 = **Al**

(C) A_1 = **N**, A_2 = **P**, A_3 = **O**, A_4 = **Si**, A_5 = **Al**

(D) None

Q.250 Identify incorrect order of acidic strength :

(A) $N_2O < NO < N_2O_3 < N_2O_5$ (B) $CaO < CO < CO_2$

(C) $H_2O < Na_2O < MgO$ (D) $H_2SO_3 < H_2SO_4$

Q.251 Find % covalent character of NO **[Given:** Electronegativity of N = 3 and O = 3.5**]**

(A) 8.875 % (B) 91.125 % (C) 20.2 % (D) 60.8 %

Q.252 Two elements A and B are such that Bond energy of A–A, B–B & A–B are respectively 81 kcal/mol, 64 kcal/mol and 88 kcal/mol. If electronegativity of B is 3 then electronegativity of A may be _____.

(A) 1.9 (B) 2.168 (C) 3.832 (D) 4.2

Q.253 Which is **incorrect** order of acidic strength?

(A) $N_2O < NO < N_2O_3 < NO_2$ (B) $SO_2 < SO_3$

(C) $HOCl < HClO_2 < HClO_3 < HClO_4$ (D) $CO_2 < B_2O_3 < BeO < Li_2O$

Q.254 Which of the following is **correct**?

(A) Pauling scale is based on bond energy data.

(B) Muliken scale is based on IE and EA data

(C) Allred Roschow is based on electrostatic attraction.

(D) All are correct

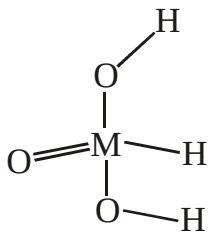
Q.255 The order in which the following oxides are arranged according to decreasing basic nature is-

(A) CuO, Na_2O, MgO, Al_2O_3 (B) Al_2O_3, MgO, CuO, Na_2O

(C) MgO, Al_2O_3, CuO, Na_2O (D) Na_2O, MgO, Al_2O_3, CuO

Q.256 Identify the oxidation state of unknown element 'M' in following structure -

Electronegativity of H < Oxygen atom but M > Hydrogen atom



(A) + 5 (B) + 6 (C) + 3 (D) +4

Q.257 On Muliken scale if electronegativity of particular atom 'X' is 'P' and electron affinity of atom 'X' is Q eV then identify the approximate value of electronegativity of 'X' on Pauling scale -

(A) $\frac{2P-Q}{2.8}$ (B) $P \times 2.8$ (C) $\frac{P}{2.8}$ (D) $(2P-Q) \times 2.8$

Q.258 Select the neutral oxide in following -

(A) CO_2 (B) CO (C) P_4O_{10} (D) NO_2

Q.259 What will be the C–X bond length if C – C bond length is 1.54 Å, X – X bond length is 1.00 Å and electronegativity values of C and X are 2.0 and 3.0 respectively.

(A) 2.45Å (B) 1.18 Å (C) 2.54 Å (D) 1.81 Å

Q.260 Which is amphoteric in nature.

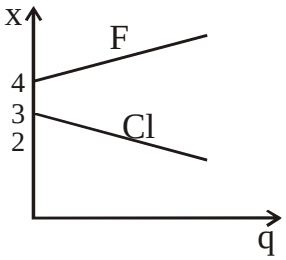
(A) ZnO (B) $Be(OH)_2$ (C) PbO_2 (D) All of these

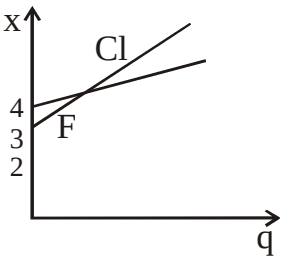
Q.261 Electronegativity of H-atom is 2.1 and F-atom is 4.1, find % ionic character of HF.

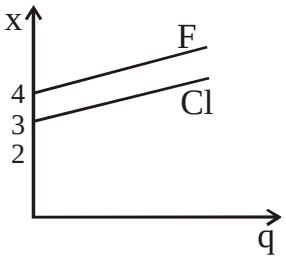
(A) 26 % (B) 32 % (C) 46 % (D) 62 %

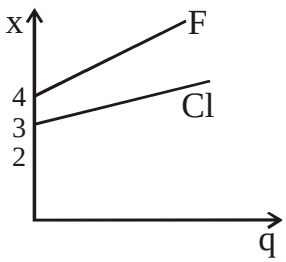
Q.262 On study it is seen that the electronegativity of the atom linearly increases with the partial ionic charge (q). Thus electronegativity can be written as, $x = a + bq$, where large and soft atoms have low value of b, while small and hard atoms have a large value of b, and a is constant, then which of the following given plot describes the electronegativity variation of F and Cl accurately?

[Given : $X_F = 4$, $X_{Cl} = 3$ and $X_H = 2$]

(A)


(B)


(C)


(D)


Q.263 Which of the following oxide is basic in nature?

(A) $B(OH)_3$ (B) I(OH) (C) Cl(OH) (D) Cs(OH)

Q.264 Which of the following nitrogen oxide is neutral ?

(A) NO_2 (B) N_2O_5 (C) N_2O (D) N_2O_3

Q.265 Which of the following compound has maximum acidic character?

(A) CO_2 (B) SiO_2 (C) NH_3 (D) H_2O

Q.266 Calculate the bond length of P–Q molecule if internuclear distance of P_2 is X and internuclear distance of Q_2 is $\frac{3X}{2}$ and electronegative difference of P and Q element is $\frac{X}{2}$.

(A) $\frac{3X}{2}$ (B) 1.20 X (C) 0.50 X (D) 0.20 X

Q.267 Least stable hydride is

(A) stannane (B) Silane (C) Plumbane (D) Germane

Q.268 Calculate the % ionic character for metal fluoride where the electronegativity of electropositive element is 2.1

(A) 43.03 % (B) 56.8 % (C) 50 % (D) 12 %

Q.269 Select the gas-phase reaction(s) which can proceed spontaneously?

(A) $Cl^- + I \longrightarrow I^- + Cl$ (B) $Si^+ + Cl \longrightarrow Si + Cl^+$

(C) Both (A) & (B) (D) $Kr + He^+ \longrightarrow Kr^+ + He$

Q.270 Comment on the electronegativity (E.N.) of P in PF_3 and PF_5.

(A) Electronegativity of $P(PF_3)$ > Electronegativity of $P(PF_5)$

(B) Electronegativity of $P(PF_3)$ < Electronegativity of $P(PF_5)$

(C) Electronegativity of P is identical in both cases

(D) No comment can be predicted

Q.271 The amphoteric oxide among the following is :

(A) Na_2O (B) ZnO (C) SO_2 (D) B_2O_3

Q.272 The correct order of acidic nature of the oxides of chlorine is :

(A) $Cl_2O < ClO_2 < Cl_2O_6 < Cl_2O_7$ (B) $ClO_2 < Cl_2O < Cl_2O_6 < Cl_2O_7$

(C) $Cl_2O < ClO_2 < Cl_2O_7 < Cl_2O_6$ (D) $Cl_2O_7 < Cl_2O_6 < ClO_2 < Cl_2O$

Q.273 Which one of the following is most acidic?

(A) SO_3 (B) Cl_2O_7 (C) P_2O_5 (D) SiO_2

Q.274 Calculate the **%** ionic character of molecule **AB** where the electronegative atom **A** is 3 and **B** is 2.1?

(A) 17.2 % (B) 19 % (C) 34 % (D) 50 %

Q.275 Which of following oxides is amphoteric in nature?

(i) ZnO (ii) N_2O (iii) Cl_2O_7 (iv) BeO

(A) (i) ,(iv) (B) (i), (ii) (C) (iii) & (ii) (D) (i), (iv), (ii)

BORN HABER'S CYCLE

Q.276 Choose the correct ionic mobility order in water.

(A) $Be^{2+} > Ba^{2+}$ (B) $Li^+ > Rb^+$ (C) $I^- < Cl^-$ (D) $Na^+ > Mg^{2+} > Al^{3+}$

Q.277 The compound having least lattice energy is

(A) BeO (B) BaO (C) BeS (D) BaS

Q.278 Which of the following is **incorrect** order of the mentioned property in **increasing order**?

(A) First ionization potential : Na<Al<Mg<Si

(B) Ionization energy : $Be^+ < C^+ < B^+ < N^+ < F^+ < O^+ < Li^+$

(C) Hydrated radius order : Ba^{2+} (aq) < Sr^{2+} (aq) < Mg^{2+}(aq)

(D) Polarity order : N–H < Sb–H < As–H < P–H

Q.279 The correct order of increasing hydration energy of following ion is

(A) $Fe^{+2} < Co^{+2} < Fe^{+3}$ (B) $Fe^{+2} < Co^{+2} > Fe^{+3}$

(C) $Fe^{+2} > Co^{+2} > Fe^{+3}$ (D) $Fe^{+2} < Fe^{+3} < Co^{+2}$

Q.280 Select the **correct** radius order :

(A) $Li^+_{(aq)} < Na^+_{(aq)} < K^+_{(aq)}$ (B) $Li^+_{(g)} < Be^{2+}_{(g)}$

(C) $Na_{(g)} < Mg_{(g)} < Al_{(g)}$ (D) $Li^+_{(g)} > Al^{3+}_{(g)}$

Q.281 Choose the correct statement :

(A) $Na^+_{(g)} > Mg^{2+}_{(g)} > Al^{3+}_{(g)}$ (Hydration energy)

(B) $Li^+_{(aq)} < Na^+_{(aq)} < K^+_{(aq)}$ (Ionic Mobility)

(C) $F^-_{(aq)} < Cl^-_{(aq)} < Br^-_{(aq)}$ (Hydrated radius)

(D) $CaF_2 > CaO$ (Lattice energy)

Q.282 Which of the following ions attach the least number of water molecules to itself when dissolved in water?

(A) Mg^{2+} (B) Li^+ (C) $[(CH_3)_4N]^+$ (D) NH_4^+

Q.283 The ion having highest mobility in aqueous solution is :

(A) Be^{2+} (B) Mg^{2+} (C) Ca^{2+} (D) Ba^{2+}

Q.284 Which of the following property increases down the group in a aqueous solution?

(A) Hydration energy (B) Ionic mobility (C) Ionic size (D) All of these

Q.285 Given

Reaction	**Energy Change (in kJ)**
$Li(s) \rightarrow Li(g)$	161
$Li(g) \rightarrow Li^+(g)$	520
$\frac{1}{2} F_2(g) \rightarrow F(g)$	77
$F(g) + e^- \rightarrow F^-(g)$	(Electron gain enthalpy)
$Li^+(g) + F^-(g) \rightarrow LiF(s)$	–1047
$Li(s) + \frac{1}{2} F_2(g) \rightarrow LiF(s)$	–617

Based on data provided, the value of electron gain enthalpy of fluorine would be :

(A) –300 kJ mol^{-1} (B) –228 kJ mol^{-1} (C) – 328 kJ mol^{-1} (D) –350 kJ mol^{-1}

Q.286 Identify the correct order of conductivity in an aqueous solution.

[Where M is the d-block metal]

(A) $[M(H_2O)_x]^{+2} > [M(H_2O)_y]^{+4}$ (B) $[M(H_2O)_x]^{+2} < [M(H_2O)_y]^{+4}$

(C) $[M(H_2O)_x]^{+2} = [M(H_2O)_y]^{+4}$ (D) we can not predict

Q.287 Choose the **correct** order of the following:

(A) $Na^+(g) < Mg^{2+}(g) < Al^{3+}(g)$: Hydration energy

(B) $Mg^{2+}(aq) > Sr^{2+}(aq) > Ba^{2+}(aq)$: Hydrated radius order

(C) $Mg^{2+}(aq) > Sr^{2+}(aq) > Ba^{2+}(aq)$: Ionic mobility order

(D) NaF > MgO > SrO : Lattice energy order

Q.288 Which one of the following is correct sequence followed by molar ionic conductance of the ions in aqueous solution.

(A) $Li^+ < Na^+ < K^+ < Rb^+$ (B) $Rb^+ < K^+ < Na^+ < Li^+$

(C) $Sr^{2+} < Ca^{2+} < Mg^{2+} < Be^{2+}$ (D) $Na^+ < K^+ < Li^+ < Rb^+$

Q.289 Choose the correct statement

(A) Ionic mobility Al^{3+} is greater than Mg^{2+} in water

(B) $K^+(aq)$ is having lesser ionic mobility than $Ca^{2+}(aq)$

(C) $Cl^-(aq)$ is having highest ionic mobility among halide(aq) ions

(D) Ionic mobility of $Cs^+(aq)$ is the highest among the alkali metal ions

Q.290 The incorrect hydrated radius order is :

(A) $Li^+(aq) < Be^{2+}(aq)$ (B) $Na^+(aq) < Al^{3+}(aq)$

(C) $I^-(aq) > Cl^-(aq)$ (D) $Ba^{2+}(aq) < Ca^{2+}(aq)$

Q.291 The correct order of the lattice energy of the following hypothetical ionic compounds AB, A_2B & A_2B_3 where in all compounds B is in –2 oxidation state & A has variable oxidation state.

(A) $A_2B > AB > A_2B_3$ (B) $A_2B_3 > AB > A_2B$

(C) $AB > A_2B > A_2B_3$ (D) $A_2B_3 > A_2B > AB$

EXERCISE-2

[MULTIPLE CORRECT CHOICE TYPE]

Q.1 For which of the following species the contribution of 's' electron to the shielding constant is 0.3.

(A) H^+ (B) He (C) Li^+ (D) H^-

Q.2 Choose the **correct** statement.

(A) Be and Al are not in same group.

(B) All the transition metal ions are generally typical Lewis acid

(C) Be and Al are having lot of similarities in their properties.

(D) The atomic radius gradually decreases from Sc to Zn.

Q.3 Which of the following is false

(A) $Cr^{2+}(g)$ ion has greater magnetic moment compared to $Co^{3+}(g)$.

(B) The magnitude of ionization potential of iron anion (monoanion) would be equal to electron gain enthalpy of iron.

(C) lanthanide contraction is cause of lower I.P. of Pb than Sn.

(D) If successive ionization energy are 332, 738, 849, 4080, 4958 (in kJ/mol). Then this element can be of 15th group.

Q.4 Which prediction/s is/are incorrect according to the Lother meyer curve.

(A) Each peak of the curve is occupied by the alkali metals.

(B) Alkaline earth metals occupy ascending position of curve

(C) Atomic volume increases first and then decreases in a period (which is defined later) in Lother Meyer curve.

(D) Identically placed elements in the atomic volume v/s atomic mass curve, occur in the same period, in the periodic table.

Q.5 Which of the following properties are the properties of metal.

(A) They are sonorous

(B) They are in general poor conductor of heat and electricity.

(C) They are malleable and ductile

(D) They are hard

Q.6 Four elements P, Q, R & S have ground state electronic configuration as:

P → $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^3$ **Q** → $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^1$

R → $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^{10}\ 4s^2\ 4p^3$ **S** → $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^{10}\ 4s^2\ 4p^1$

Select the correct statement(s).

(A) size of P < size of Q

(B) size of R < size of S

(C) size of P < size of R (appreciable difference)

(D) size of Q < size of S (appreciable difference)

Q.7 Find the correct 2nd ionisation energy order from following option(s).

(A) Al > Mg (B) Te > Sb (C) Fe > Fe^+ (D) In > Sr

Q.8 The correct statements among the following are :

(A) Helium has the highest first I.P. in the periodic table.

(B) The process $O^{\ominus}(g) + e^{\ominus} \longrightarrow O^{-2}(g)$ is exothermic.

(C) The electron affinities of S and P are less than that of O and N respectively.

(D) In any period, the first ionisation potential of noble gas is the highest.

Q.9 Which of the following represents the correct order of the properties indicated?

(A) $Ni^{2+} > Cr^{2+} > Fe^{2+} > Mn^{2+}$ (size)

(B) Sc > Ti > Cr > Mn (size)

(C) $Ni^{2+} < Co^{2+} < Fe^{2+} < Mn^{2+}$ (unpaired electron)

(D) $H_3AsO_4 > H_3PO_4$ (Acidic strength order)

Q.10 The ionic radii depends upon the following factors

(A) charge of cation.

(B) charge of anion.

(C) Shell number of valence shell electron(s) of the ion.

(D) number of atoms for multiatomic ion.

Q.11 Which of the following pair(s) of elements is/are chemically most similar?

(A) Be, Al (B) Al, In (C) Ge, Sb (D) Ti, Hf

Q.12 Which of the following element/s have same value of shielding constant (σ) for 3s-electron.

(A) Cr (B) Fe (C) Ar (D) Cl

Q.13 Which of the following ionisation energy order is correct.

(A) S > S^- (B) O > S^- (C) O > O^- (D) S > O^-

Q.14 Choose the correct order of the following properties:

(A) $Fe^{+3}(aq) > Fe^{2+}(aq)$: Ionic mobility order

(B) $Br^{-}(aq) < Cl^{-}(aq) < F^{-}(aq)$: Hydrated radius order

(C) $SbH_3 > AsH_3 > PH_3$: M–H bond polarity order

(D) S > C > H > B : Electronegativity order

Q.15 Which of the following set of elements are showing diagonal relationship.

(A) Na → Ca (B) Li → Mg (C) B → Si (D) N → P

Q.16 Which of the following is / are true.

(A) Multiplicity in Fe^{3+} is greater than that in Co^{3+}.

(B) Ti^{3+}, Cr^{+}, Sc^{2+} ions are diamagnetic.

(C) Value of $(n + l + m)$ for last electron of Mg is 3.

(D) The value of Z_{eff} for 3s electron of Cl is 10.9.

Q.17 Which of the following statements is/are incorrect.

(A) Boron is diagonally related to magnesium.

(B) Bi^{5+} ion has smaller radius compared to Bi^{3+}.

(C) last number of the seventh period of periodic table will have atomic number of 124 if discovered.

(D) Al_2O_3 is an amphoteric oxide.

Q.18 Which of the following species is/are paramagnetic?

(A) Cr^{3+} (B) Cr^{6+} (C) Al^{3+} (D) O^{-}

Q.19 Select the correct statement(s).

(A) According to Mulliken, electronegativity is related to the average of the ionization energy and electron affinity of the atom when they are expressed in eV / atom.

(B) Electronegativity of an atom having half filled electronic configuration will be more in general.

(C) $HClO_3$ is stronger acid than HClO.

(D) Electronegativity goes on increasing with increase in atomic number in general as we move along a period.

Q.20 Select the correct order of Ionic radii .

(A) $Mn^{2+} > Mn^{4+}$ (B) $Mn^{4+} > Mn^{2+}$ (C) $N > N^{3-}$ (D) $N^{3-} > N$

Q.21 Which of the following set of molecules have same group.

(A) Ba, Ca, Na (B) In, Al, T*l* (C) Sc, Ac, La (D) Ge, Ga, Se

Q.22 Which of the following I^{st} ionisation energy order is / are correct

(A) Be < B (B) N < O (C) Mg > Na (D) P > S

Q.23 Which of the following process is endothermic

(A) $A^{2-} \longrightarrow A^{-}$ (B) $A^{3+} \longrightarrow A^{2+}$

(C) $A^{+} \longrightarrow A^{3+}$ (D) $A^{+}(ns^2np^6(n+)s^1) \longrightarrow A^{2+}$

Q.24 Choose the incorrect hydration energy order:

(A) $Li^{+} > H^{+}$ (B) $H^{+} > Rb^{+}$ (C) $Be^{2+} < Sr^{2+}$ (D) All are correct

Q.25 Which of the following term can be calculated from the Born-Haber cycle of formation of Al_2O_3.

(A) Lattice energy of Al_2O_3 (B) Electron affinity of O-atom.

(C) Hydration energy of Al^{3+} (D) Ionisation energy of Al

Q.26 Choose the incorrect statement.

(A) 2^{nd} electron gain enthalpy for any element is (+) ve.

(B) E.A. of an element $\propto Z_{eff}$

(C) The ionisation energy order : $F^{-} > Cl^{-}$

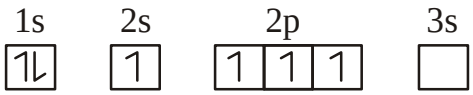
(D) All are correct

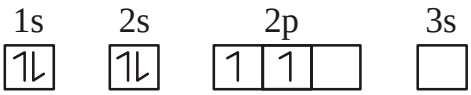
Q.27 When σ is increases then which of the following periodic properties is/ are decreasing

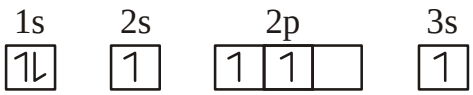
(A) Electron gain enthalpy (B) Electronegativity

(C) Ionisation energy (D) Atomic radius

Q.28 Which of the following may represent the excited state of C–atom.

(A) 

(B) 

(C) 

(D) None of these

Q.29 Which of the following pairs of elements show diagonal relationship.

(A) Li – Mg (B) Be – Mg (C) Be – Al (D) B – Si

Q.30 Which of the following statements are **correct**?

(A) First ionisation energy (IE_1) of Be is higher than that of B.

(B) Second ionisation energy (IE_2) of O is higher than that of first ionisation energy of O.

(C) F is more electronegative than Cl.

(D) CH_4 and SiH_4 have all equal bond angles.

Q.31 Which of the following options have correct comparison of the radii of the species involved.

(A) Na > P (B) K > Si

(C) $A^{-2} > A^{-1} > A^{+1} > A$ (D) $Mg > Al^{+3}$

Q.32 Which of the following statements are **correct** :

(A) IE_2 of Cu > IE_2 of Zn where as IE_1 of Cu < IE_1 of Zn.

(B) $|\Delta_{eg}H|$ of S > $|\Delta_{eg}H|$ of O.

(C) Reducing nature of Li in aqueous solution is more than that of Na.

(D) There is a substantial contraction in size observed on moving from 3rd group to 4th group in 6th period of periodic table.

Q.33 Which of the following order is **correct**?

(A) $NH_3 < PH_3 < AsH_3$: Acidic nature

(B) Li < Be < B < C : IE_1

(C) $Al_2O_3 < MgO < Na_2O < K_2O$: Basic nature

(D) $Li^+(g) < Na^+(g) < K^+(g) < Cs^+(g)$: Ionic radius

Q.34 Choose the incorrect statement(s) :

(A) Ionic mobility of Al^{3+} is greater than Mg^{2+} in water

(B) $K^+(aq)$ is having lesser ionic mobility than $Ca^{2+}(aq)$

(C) $Cl^-(aq)$ is having highest ionic mobility among halide(aq) ions

(D) Ionic mobility of $Cs^+(aq)$ is the highest among the alkali metal ions

Q.35 Identify correct statement(s) from the following?

(A) Diamond is the hardest natural substance

(B) H^+ is the smallest cation of the periodic table.

(C) Metalloids are present only in p-block.

(D) O^{2-} has fullyfilled configuration and hence energy will be released when $O^{2-}(g)$ is formed from O(g) atom.

Q.36 Which of the following ions in ground state electronic configuration will behave as diamagnetic?

(A) Na^+ (B) Mg^{+2} (C) Sc^{+1} (D) K^+

Q.37 Select the correct statement :

(A) Atomic size of Al is nearly equal to Atomic size of Ga.

(B) In Ist group from Na to Cs, Z_{eff} remains constant

(C) If for an atom all the three types of radius can be measured then $r_{vanderwall} > r_{metallic} > r_{covalent}$

(D) For the 3d-series elements, atomic radius remains almost constant.

Q.38 Which statement/statements are true for Zn (30) ?

(A) Z_{eff} for 3d electron is 8.85 (B) Z_{eff} for 4s electron is 4.35

(C) σ_{3d} for Zn is 21.15 (D) σ_{4s} for Zn is 25.65

Q.39 The ionisation energy and electron affinity of an element is 12.9 eV/atom and 3.9 eV/atom, respectively. The electronegativity of the element is :

(A) 3.0, on Pauling scale (B) 3.0, on Mulliken scale

(C) 8.4, on Pauling scale (D) 8.4, on Mulliken scale

Q.40 Which of the following is/are correct statement(s) ?

(A) In gaseous state, Cs is stronger reducing agent than Li.

(B) In gaseous atomic state, Chlorine is stronger oxidising agent than Fluorine.

(C) In gaseous molecular state, Fluorine is stronger oxidising agent than Chlorine.

(D) In gaseous state, Al should be stronger reducing agent than Mg, if both the gaseous atoms are converting into $Al^+(g)$ and $Mg^+(g)$ ions, respectively.

Q.41 Which of the following is/are correct order?

(A) Acidic strength : HClO < HBrO < HIO

(B) Basic strength : $Na_2O > MgO > Al_2O_3 > SiO_2$

(C) Electron affinity : I < Br < F < Cl

(D) Ionisation energy : $Cl^- < Cl < Cl^+$

Q.42 The ionic compound A^+B^- is formed when the

(A) electron gain enthalpy of B is high (B) ionization energy of A is low

(C) lattice energy of AB is high (D) lattice energy of AB is low

Q.43 The correct order of atomic radii is

(A) N < Be < B (B) $F^- < O^{2-} < N^{3-}$ (C) Na > Li < K (D) $Fe^{2+} > Fe^{3+} > Fe^{4+}$

Q.44 Which of the following do(es) not have higher ionisation energy as compared to their adjacent elements across period?

(A) Al (B) Si (C) P (D) C*l*

Q.45 Which of the following order is correct for first ionisation energy?

(A) Ga > Al (B) Na < Li (C) Be > Mg (D) F < Cl

Q.46 Which of the following process energy is liberated?

(A) $Cl \rightarrow Cl^+ + e^-$ (B) $I + e^- \rightarrow I^-$ (C) $Cl + e^- \rightarrow Cl^-$ (D) $O^- + e^- \rightarrow O^{2-}$

Q.47 Which option is/are **not correct** with respect to increasing order of atomic weight?

(A) Ar < K (B) Te < I (C) Th < Pa (D) Co < Ni

Q.48 Which of the following is **correct**?

(A) O has more electron affinity than Se.

(B) Cl has more electron affinity than F.

(C) F is most electronegative among Halogens.

(D) Ne has highest ionisation energy in periodic table.

Q.49 Which of the following is correct regarding I^{st} ionisation energy?

(A) B > Al (B) T*l* > In (C) Ga ≥ Al (D) B < T*l*

Q.50 Which of the following is/are correct order of first ionisation energy?

(A) P > S (B) Be > B (C) N > O (D) Li > Be

Q.51 Which of the following is/are **correctly** matched?

(A) F > O (Electronegativity) (B) Mg > Al (I^{st} ionisation energy)

(C) HCl > HI (Thermal stability) (D) Diamond > Graphite (Electrical conductance)

Q.52 Which of the following statements is/are **incorrect**?

(A) Ionisation energy of A^- is greater than A when A is a halogen atom.

(B) Ionisation energy of A^+ is greater than that of A^{2+} when A is the member of alkali metals.

(C) Successive ionisation energy is always increasing for 1^{st} and 2^{nd} period element.

(D) Electron affinity value of 'A^+' is numerically identical with the ionisation potential of A^- [for any atom].

Q.53 Select the pair which follows energy order according to Aufbau principle.

(A) 4f < 6s (B) 5d > 5p (C) 3d < 4d (D) 4s < 3s

Q.54 Select the classification which can explain same property of 'Li, Na, K'.

(A) Lavoisier Classification (B) Dobereiners Triad Law

(C) Newland Octave (D) Mendleev

Q.55 Select the element(s) which belongs to d-block but **not** transition elements

(A) Zn (B) Cd (C) Hg (D) Pt

Q.56 Degenerate orbital always have :

(A) n same (B) *l* same (C) m different (D) same shape

Q.57 Which of the following pairs were incorrectly arranged in Mendeleev's Periodic table?

(A) Ar - K (B) Te - I (C) Th - Pa (D) Co - Ni

Q.58 Which option is correct for atomic radius?

(A) Ne > F (B) Ar > Cl (C) F > Ne (D) Cl > Ar

Q.59 Choose the correct order of ionic size :

(A) $Na^+ > Mg^{2+} > Al^{3+}$ (B) $Na^+ < Mg^{2+} < Al^{3+}$

(C) $N^{3-} > O^{2-} > F^-$ (D) $Pb^{2+} > Pb > Pb^{4+}$

Q.60 The species having 4 or more unpaired electrons are

(A) Fe^{2+} (B) Co^{3+} (C) Mn^{2+} (D) Ni^{2+}

Q.61 Which option is / are **correct**?

(A) Atomic radius decreases with increase in Z_{eff}

(B) The atomic number 50 element present in a 5^{th} period

(C) Alkaline earth elements are II A group elements

(D) Alkali metals are I A group elements.

Q.62 Ionisation energy of an element is

(A) Equal in magnitude but opposite in sign to the electron affinity of the cation of the element.

(B) Same as electron affinity of the element

(C) Energy required to remove one valence electron from an isolated gaseous atom in its ground state.

(D) Equal in magnitude but opposite in sign to the electron affinity of the anion of the element.

Q.63 Which of the following ionisation energy order is/are correct :

(A) $F > Cl^-$ (B) F > Cl (C) $Cl > F^-$ (D) $Cl^- > F^-$

Q.64 Which of the following statement is incorrect?

(A) Order of acidic strength $N_2O < NO_2 < N_2O_3$

(B) Electron affinity of O is more than that of Cl.

(C) Percent ionic character of As–H bond is less than that of Sb–H bond.

(D) A monoatomic cation is more electronegative than its parent atom.

Q.65 Which of the following gas - phase reactions can proceed spontaneously?

(A) $Kr + He^+ \rightarrow Kr^+ + He$ (B) $Si + Cl^+ \rightarrow Si^+ + Cl$

(C) $Cl^- + I \rightarrow I^- + Cl$ (D) $Cl^- + F \rightarrow F^- + Cl$

Q.66 Mendlev left the space for elements in periodic table elements are :

(A) Ga (B) Sc (C) Ge (D) Tc

Q.67 If an element with atomic number 120 has discovered, then the **correct** information(s) regarding the position of this element is modern long form of periodic table and its configuration is/are :

(A) It should belong from 8^{th} period

(B) It's group number should be 2.

(C) It's ground state electronic configuration should be [Uuo] $8s^2$.

(D) It should have 28 electrons with $l = 3$, in the ground state.

Q.68 The increasing order of electron affinity.

(A) B < Al < O < S (B) Al < B < O < S (C) Al < B < S < O (D) Be < B < C < Si

Q.69 Which of the following is/are correct regarding p - orbital?

(A) Probability of finding a p-electron near nucleus is zero.

(B) There are three allowable values of magnetic quantum number (m_ℓ)

(C) All p-orbitals are at 90° to each other.

(D) p orbitals have more penetration effect than s-orbital

Q.70 Within a given energy level order of energy can be :

(A) s > p > d > f (B) f > d > p > s (C) d > f > p > s (D) d = p = f = s

Q.71 The increasing order of atomic radius :

(A) O < N < S < P (B) Al < Se < Br < Ca

(C) Be < Li < Mg < Na (D) Al < Br < Se < Ca

Q.72 Which of the following set(s) all elements will have zero or negative electron affinity?

(A) Zn, Cd, Hg, N (B) Zn, Cd, Hg, P (C) He, Ne, Ar, Kr (D) F, Cl, Br, I

Q.73 Which of the following is **incorrect** order of ionisation energy.

(A) Sc > Y > La (B) B > Al > Ga > In > T*l*

(C) Li > Na > K (D) B > Be

Q.74 Which of the following set, have elements, which are having same number of electrons in their penultimate shell?

(A) K, Na (B) Na, Mg (C) Rb, Sr (D) None of these

Q.75 In which of the following pair, size of first element is higher as compare to second.

(A) Sc, Zn (B) Ga, Al (C) N, F (D) Fe, Co

Q.76 Choose the correct ionisation energy order for the given species?

(A) $O > S > S^- > O^-$ (B) $F > F^- > Cl^- > Cl$

(C) $O > O^- > S^- > S$ (D) $F > Cl > Cl^- > F^-$

Q.77 Select the correct order according to their given properties.

(A) F > Cl > Br > I [Order of Electronegativity]

(B) $F^- > Cl^- > Br^- > I^-$ [Order of Hydrated radii]

(C) $F^- > Cl^- > Br^- > I^-$ [Order of Ionic radii]

(D) $F^- < Cl^- < Br^- < I^-$ [Order of Electrical conductivity]

Q.78 Select the incorrect statements:

(A) Halogens are at ascending part of the Lother-Mayer's atomic volume curve.

(B) Maximum number of elements possible in the 9^{th} period of the periodic table are 50.

(C) As radius of Zn is greater than Cu so its ionisation energy is less than Cu.

(D) A p-orbital can take maximum of six electron.

Q.79 Select correct statements among the following:

(A) The 1^{st} IP of Al is less than that of Ga

(B) The 2^{nd} IP of oxygen is greater than 2^{nd} IP of F

(C) The 2^{nd} IP of lithium is less than 2^{nd} IP of oxygen

(D) The EA_1 of sodium is greater than EA_1 of Al

Q.80 Which of the following order is / are incorrect :

(A) O < Se < S [EA_1 order]

(B) $O^{2-} < Na^+ < F^- < Mg^{+2}$ [Ionic radius order]

(C) Li < Be < B < C [IE_1 order]

(D) Cl < F < Br < I [EA_1 order]

Q.81 Which of the following is / are Bridge elements?

(A) Na (B) K (C) Mg (D) Ca

Q.82 In which of the following elements Aufbau principle is violated?

(A) Cr (B) Cd (C) Cu (D) Co

Q.83 The stable oxidation states of the element with the following values of successive ionisation energy will be:

IE_1	IE_2	IE_3	IE_4	IE_5	**(eV/ atom)**
18	**26**	**46**	**54**	**65**	

(A) +1 (B) +2 (C) +4 (D) +5

Q.84 Choose the **correct** options :

(A) First Ionisation Energy of N > First Ionisation Energy of O - atom

(B) First Ionisation Energy of $N^{\oplus}$ < First Ionisation Energy of $O^{\oplus}$ atom

(C) First Ionisation Energy of N < First Ionisation Energy of $N^{\oplus}$ atom

(D) First Ionisation Energy of $O^{\oplus}$ < Second Ionisation Energy of O- atom

[PARAGRAPH TYPE]

Paragraph for question nos. 85 to 87

Electronegativity is important periodic property of the elements. It varies across the period and down the group. There are certain reasons of its variation. It also affects the properties of the compounds.

Q.85 In which of the following hydrocarbons, carbon has highest electronegativity?

(A) C_2H_4 (B) CH_4 (C) C_2H_2 (D) C_2H_6

Q.86 Which of the following oxide is most acidic?

(A) NO (B) N_2O_5 (C) N_2O_3 (D) NO_2

Q.87 Which of the following species of Mn has lowest electronegativity?

(A) Mn(II) (B) Mn(IV) (C) Mn(VI) (D) Mn(VII)

Paragraph for question nos. 88 to 90

Electronic configuration (E.C.) of following elements are given as follows :

(I) $1s^2\ 2s^2\ 2p^2$ (III) $1s^2\ 2s^2\ 2p^3$

(II) $1s^2\ 2s^2\ 2p^2\ 3s^1\ 3p^6\ 4s^1$ (IV) $1s^2\ 2s^2\ 2p^0\ 3s^2\ 3p^6\ 3d^1\ 4s^2$

Q.88 Select the correct set of block, group and period number for the above E.C. in periodic table.

	Block	**Group**	**Period Number**
(A)	Ip	IV A	2
(B)	II s	I A	4
(C)	III p	VI A	2
(D)	IV d	I B	4

Q.89 Select the decreasing order of radius for the above E.C. in periodic table.

(A) II > I > IV > III (B) IV > III > II > I

(C) II > IV > I > III (D) III > IV > II > I

Q.90 Select the decreasing order of electron affinity for the above E.C. in periodic table.

(A) II > III > I > IV (B) I > II > IV > III

(C) II > I > IV > III (D) III > I > II > IV

Paragraph for question nos. 91 to 93

Ionisation energy of the elements increases along the period and decreases along the group. Ionisation energy of an element is numerically identical with electron affinity of the respective univalent cation.

Q.91 The first ionisation potential (in eV) of N, O atoms are:

(A) 14.6, 13.6 (B) 13.6, 14.6

(C) 13.6, 13.6 (D) 14.6, 14.6

Q.92 For the process

$X(g) + e^- \longrightarrow X^-(g)$, $\Delta H = x$

and $X^-(g) \longrightarrow X(g) + e^-$, $\Delta H = y$

Select correct alternate:

(A) Ionisation energy of $X^-(g)$ is y (B) Electron affinity of X(g) is x

(C) Electron affinity of X(g) is –y (D) All are correct statements

Q.93 Sodium forms Na^+ ion but it does not form Na^{2+} because:

(A) Very low value of $(IE)_1$ and $(IE)_2$

(B) Very high value of $(IE)_1$ and $(IE)_2$

(C) Low value of $(IE)_1$ and low value of $(IE)_2$

(D) Low value of $(IE)_1$ and high value of $(IE)_2$

Paragraph for question nos. 94 to 96

The distribution of electrons in various shells, subshells and orbitals in an atom of an element, is called its electronic configuration.

nl^x

n = represent shell

l = represent subshell

x = number of electrons in subshell

Q.94 $ns^2\ np^4$ electronic configuration of outermost shell correspond to which atomic number.

(A) 82 (B) 54 (C) 34 (D) 14

Q.95 Find the species having same number of d-electron in last possible filled d-subshell in Zn.

(A) Ga (B) Pd (C) Pt (D) None of these

Q.96 For the given electronic configuration the correct set of period number, group number & block is respectively. $1s^1\ 2s^2\ 2p^5\ 3s^2\ 3p^3\ 3d^9\ 4s^1\ 4p^0$

(A) 4, 3, d (B) 4, 5, d (C) 3, 13, p (D) 3, 1, s

Paragraph for question nos. 97 to 98

The electron affinity is a inherent property of the atom and it depends upon several factors.

Q.97 The correct electron affinity order is

(A) F > Cl (B) Cl > F (C) S < P (D) N > O

Q.98 Choose the incorrect statement.

(A) 1st I.E. of A^- is equal to electron affinity of A

(B) 2nd electron affinity is always greater than 1st electron affinity.

(C) $O \longrightarrow O^{2-}$ process is endothermic

(D) $Li \longrightarrow Li^+$ process is endothermic.

Paragraph for question nos. 99 to 101

The radius of an element can be measured in three ways, covalent radii (r_c), metallic radii (r_m) and Vander Waal's radii (r_v) because they are not available in a single state. Ionic radii (r_i) also measured from their crystal lattices and it depends upon their different arrangement also.

Q.99 The radius of F and Ne are respectively (approximately).

(A) 1.6Å, 0.72Å (B) 0.72Å, 0.72Å (C) 0.72Å, 1.6Å (D) 1.21Å, 1.05Å

Q.100 Which of the following order is correct for the radii of the species.

(A) $Fe^{3+} > Fe^{2+}$ (B) $O_2^{2-} > O_2^-$ (C) $S^{2-} < Cl^-$ (D) Ga >> Al

Q.101 For a particular element, the correct order of radii is

(A) $r_c < r_v < r_m$ (B) $r_c \approx r_v > r_m$ (C) $r_m > r_v > r_c$ (D) $r_v > r_m > r_c$

Paragraph for question nos. 102 & 103

Elements A,B,C,D and E are having the electronic configuration of:

A : $1s^2$, $2s^2$, $2p^1$

B : $1s^2$, $2s^2$, $2p^6$, $3s^2$, $3p^2$

C : $1s^2$, $2s^2$, $2p^6$, $3s^1$

D : $1s^2$, $2s^2$, $2p^6$, $3s^2$, $3p^1$

E : $1s^2$, $2s^2$, $2p^6$

Q.102 Which among these will belong to same group in the periodic table.

(A) A and B (B) A and D (C) B and D (D) C and E

Q.103 The element having maximum ionisation energy is

(A) D (B) B (C) E (D) C

Paragraph for question nos. 104 to 106

From the following information

$A^-(g) \longrightarrow A^{+2}(g) + 3e^-$ $\Delta H_1 = 1400$ kJ/mole

$A(g) \longrightarrow A^{+2}(aq) + 2e^-$ $\Delta H_2 = 700$ kJ/mole

$\Delta H_{e.g}[A^+(g)] = -350$ kJ /mol

$(IE_1 + IE_2)$ for A(g) = 950 kJ /mol

Q.104 Find the value of $\Delta_{eg}H$ of $A^{2+}(g)$ in kJ / mole.

(A) + 600 (B) – 600 (C) – 500 (D) + 500

Q.105 Find the value of IE_1 of A^- in kJ/mole.

(A) + 450 (B) + 350 (C) + 600 (D) + 250

Q.106 Find the $\Delta H_{hydration}$ of $A^{2+}(g)$ in kJ/mole .

(A) + 250 (B) – 350 (C) – 250 (D) – 300

Paragraph for question nos. 107 to 109

Some of the properties which depend on electronic configuration of elements such as atomic radii, ionisation potential, and electronegativity etc.

Q.107 The element with maximum electronegativity belongs to

(A) Period 2, group 17 (B) Period 3, group 18

(C) Period 4, group 17 (D) Period 2, group 16

Q.108 In period, the ionisation energy is lowest for the

(A) Noble gases (B) Halogen

(C) Alkaline earth metals (D) Alkali metals

Q.109 The values of electronegativity of atoms A and B are 1.20 and 4 respectively. The percentage ionic character of A – B bond is :

(A) 50% (B) 72.2% (C) 55.3% (D) 43.0%

Paragraph for question nos. 110 to 112

Ionization energy is the amount of energy required to knock out the most loosely bound electron in the outer most shell in an isolated atom in the gaseous phase.

$I.E_1$ = 40 eV / atom

$I.E_2$ = 42 eV / atom

$I.E_3$ = 200 eV / atom

Q.110 The element may belong to group

(A) 1^{st} (B) 2^{nd} (C) 13^{th} (D) 14^{th}

Q.111 The most stable oxidation state for the metal is

(A) +1 (B) +2 (C) +3 (D) +4

Q.112 Compare ionisation energy of X and X^+.

$X = 1s^2\ 2s^2$

$X^+ = 1s^2\ 2s^1$

(A) $X^+ > X$ (B) $X > X^+$ (C) $X^+ \approx X$ (D) None of these

Paragraph for question nos. 113 to 115

The minimum amount of energy which is required to remove an outermost electron from any isolated neutral gaseous atom is known as first ionisation energy. These are the following factors which effect ionisation energy.

(i) Ionisation Energy $\propto \frac{1}{\text{principal quantum number}}$

(ii) Ionisation Energy $\propto Z_{eff}$

(iii) If orbitals are fully filled or half filled so stability will be more and ionisation energy will be high.

(iv) If penultimate electron will effectively shield the nucleus ionisation energy will be less and vise versa.

Q.113 Choose the correct order of I^{st} ionisation energy.

(A) Ne < F (B) O > N (C) Na > Al (D) Mg > Al

Q.114 Which of the following has maximum I^{st} ionisation energy?

(A) He (B) Mg (C) N (D) Na

Q.115 IE_1 and IE_2 of Mg are 178 kcal/mol and 348 kcal/mol. The enthalpy required for the reaction $Mg \rightarrow Mg^{2+} + 2\,e^-$ is :

(A) +170 kcal/mol (B) +526 kcal/mol

(C) – 170 kcal/mol (D) – 526 kcal/mol

Paragraph for question nos..116 to 118

The ionisation energy (IE_1) of an atom is defined as the energy needed to remove an electron from gaseous atom in its ground state. The 2^{nd} ionisation energy (IE_2) is the additional energy needed to remove the 2^{nd} electron and so forth. The successive ionisation energy of any specie is increasing always.

Q.116 If the ionisation values of elements are plotted against atomic number, then peaks are occupied by

(A) Alkali metals (B) Alkaline earth metals

(C) Noble gas elements (D) Halogens

Q.117 The **correct** order of II^{nd} ionisation energy is :

(A) Li > Ne > O (B) Ne > F > O (C) N > O > F (D) N > O > Li

Q.118 The I^{st} and III^{rd} ionisation energy of an element is 20 eV and 50 eV respectively than IE_2 is :

(A) 40 eV (B) 60 eV (C) 55 eV (D) 10 eV

Paragraph for question nos. 119 to 121

An atom is assumed to be spherical in shape and thus , the size of atom is generally given in terms of radius of the sphere and is called atomic radius. It is usually defined as the distance between the centre of the nucleus and outermost shell where electron or electrons are present. The exact measure of atomic radius is not easy due to following reasons:

(i) The atom does not have well defined boundary. The probability of finding the electron is never zero even at large distances from the nucleus.

(ii) It is not possible to get an isolated atom. The electron density around an atom is affected by the presence of neighbouring atoms, i.e., the size of the atom changes in going from one set of environment to another.

(iii) The size of an atom is very small, of the order of about 1.2 Å, i.e., 1.2×10^{-10} m.

An estimate of the size of the atom can, however, be made by knowing the distance between the atoms in the combined state. The distance between the atoms, i.e., bond lengths are generally measured by the application of techniques such as X-ray diffraction, electron diffraction, infrared spectroscopy, nuclear magnetic resonance spectroscopy, etc. However, bond lengths change with different type of bonding. Three types of radius are commonly used, i.e.,

(a) Covalent radius

(b) Crystal radius

(c) Vander Waal's radius

Q.119 The correct order of effective nuclear charge Z_{eff} is

(A) Na < Mg < Al < Si < P (B) Na = Mg = Al = Si = P

(C) Na > Mg > Al > Si > P (D) None of these

Q.120 Choose **incorrect** option regarding atomic radius.

(A) $F^- < Cl^- < H^-$ (B) $N^{3-} > O^{2-} > F^-$

(C) $Fe^{2+} < Fe^{3+}$ (D) $Fe^{2+} > Fe^{3+}$

Q.121 Which of the following set of ions have the same value of screening constant for the valence electron, calculated from Slater's rule?

(A) Li^+, Na^+, K^+ (B) Na^+, Mg^{2+}, Al^{3+}

(C) F^-, Cl^-, Br^- (D) F^-, O^{2-}, S^{2-}

Paragraph for question nos.122 to 124

The ionisation energy (IE_1) of an atom is defined as the energy needed to remove an electron from gaseous atom in its ground state. The 2^{nd} ionisation energy (IE_2) is the additional energy needed to remove the 2^{nd} electron and so forth. The successive ionisation energy of any specie is increasing always.

Q.122 Suppose a gas mixture of He, Ne, Ar and Kr is irradiated with photons of the frequency appropriate to ionise Ne. What ions will be present in the mixture.

(A) He^+ only (B) Ne^+ only

(C) He^+, Ne^+, Ar^+ only (D) Ne^+, Kr^+, Ar^+ only

Q.123 If the ionisation values of elements are plotted against atomic number, then peaks are occupied by

(A) Alkali metals (B) Alkaline earth metals

(C) Noble gas elements (D) Halogens

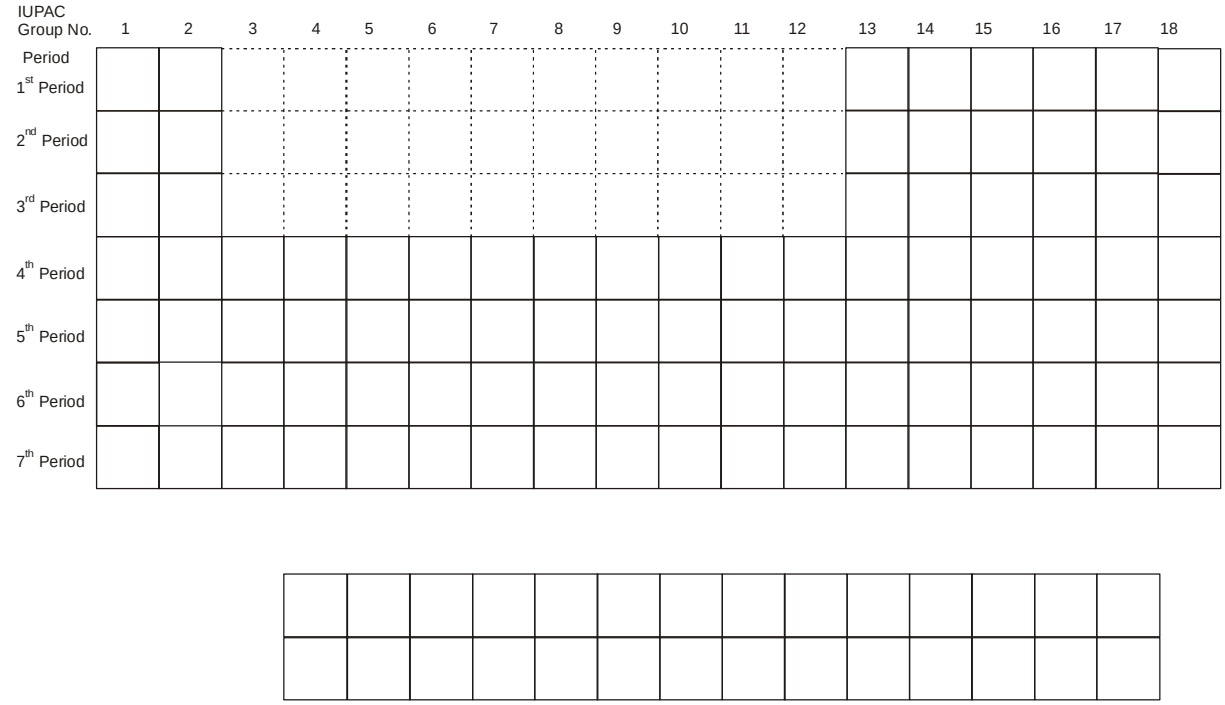
Q.124 The numerical value of energy involved in the given process; $Na \longrightarrow Na^-$ is less than that of which of the following processes.

(A) $Na^- \longrightarrow Na$ (B) $Na \longrightarrow Na^+$

(C) Both (A) & (B) (D) None of these

Paragraph for question nos. 125 to 127

Over view of long form of periodic table is as shown in which seven period and eighteen groups are present.



Q.125 If same structure will maintain for further discovery of new elements, then what is the maximum number of elements that can be accomodated by 10^{th} period of periodic table?

(A) 18 (B) 36 (C) 72 (D) 90

Q.126 If each orbital can hold a maximum of 3 electron. The number of elements in 4^{th} period of periodic table is :

(A) 48 (B) 57 (C) 27 (D) 36

Q.127 Element with atomic number 58 belongs to which IUPAC group number in the periodic table.

(A) 1 (B) 2 (C) 3 (D) 4

Paragraph for question nos. 128 to 130

The force of attraction exerted by the nucleus on a given electron is decreased due to repulsion caused by the intervening electrons. The net force of attraction is represented by Z_{eff} where $Z_{eff} = Z - \sigma$.

Q.128 The value of Z_{eff} is minimum for

(A) Li (B) Na (C) K (D) Same for all

Q.129 The value of σ for 5s electron of Rb^{37} is

(A) 2.2 (B) 34.8 (C) 27.9 (D) None of these

Q.130 The force of attraction exerted the nucleus will be maximum on:

(A) 4s (B) 4p (C) 4d (D) 4f

[MATCH THE COLUMN]

Q.131

	Column I		**Column II**
(A)	N, F, O, Li	(P)	Increasing order of | EA |
(B)	F, N, Si, Mg, Rb	(Q)	Increasing order of IE_1
(C)	K, Na, Al, Mg	(R)	Increasing order of IE_2
(D)	N, B, O, Cl	(S)	Increasing order of radius

Q.132 Match the column :

	Column-I		**Column-II**
(A)	Ni	(P)	Elements having same number of unpaired electron in their dipositive ion in column I.
(B)	K	(Q)	At least 13 electrons are having magnetic quantum number 'zero'.
(C)	Mn	(R)	Atom is paramagnetic.
(D)	Pd	(S)	Element is not transition element
		(T)	Element having pseudo inert gas configuration in its dipositive cation.

Q.133

	Column I (Atomic Number)		**Column II**
(A)	57	(P)	d-Block or p-Block
(B)	17	(Q)	4^{th} Period element
(C)	19	(R)	Violates Aufbau's Principle
(D)	29	(S)	Not lanthanides

Q.134 Match the column:

	Column I		**Column II**
(A)	Zn	(P)	Solid at room temperature
(B)	Hg	(Q)	Transition element
(C)	Cr	(R)	d-block element
		(S)	Liquid at room temperature

Q.135

	Column I (Characteristic involved in the given process of Column II)		**Column II (Process described)**
(A)	Energy released	(P)	$S \longrightarrow S^{-}$
(B)	Energy absorbed	(Q)	$O^{-} \longrightarrow O^{2-}$
(C)	Inert gas configuration is achieved	(R)	$Sr \longrightarrow Sr^{2+}$
(D)	Half filled configuration is achieved	(S)	$N^{-} \longrightarrow N$
		(T)	$Ge \longrightarrow Ge^{-}$

Q.136

	Column I		**Column II**
(A)	Si	(P)	Having diagonal relationship with B
(B)	He	(Q)	p-block element
(C)	O	(R)	Two unpaired electrons present in its ground state
		(S)	Having highest ionisation energy.

Q.137

	Column I		**Column II**
(A)	Cl	(P)	Non transition element
(B)	Be	(Q)	Having highest electronegativity among the three.
(C)	Cd	(R)	Element which is present in II B group
		(S)	Element which is first element of its group.

Q.138

	Column I *(Set of substances)*		**Column II** *(Characteristic the set)*
(A)	Ag^{+} , Cd^{+2}, Sn^{+4}	(P)	Corresponding elements are representative elements.
(B)	F, Br, Cl	(Q)	Isoelectronic species.
(C)	Li, Na, K	(R)	Corresponding elements will lie on similar positions in Lothermeyer's curve.
(D)	Ba^{+2}, Sr^{+2}, La^{+1}	(S)	Arranged in increasing order of size.
		(T)	At least one of the corresponding elements belong to different block.

[**Given Data :** Sr (Z = 38) , Ba (Z = 56), Ag (Z = 47), Cd (Z = 48), Sn (Z = 50)]

Q.139

	Column I		**Column II**
(A)	K	(P)	s-block element
(B)	Mg	(Q)	element of 4^{th} period
(C)	Cr	(R)	d-block element
(D)	Zn	(S)	transition element
		(T)	all the electrons are paired

Q.140

	Column-I ***(Number of Elements)***		**Column-II** ***(Period number of modern long form of periodic table)***
(A)	8	(P)	2
(B)	18	(Q)	3
(C)	32	(R)	5
		(S)	6

Q.141

	Column I		**Column II**
(A)	Na^+, Na, Na^-	(P)	Increasing order of radius
(B)	B, C, N	(Q)	Decreasing order of I E
(C)	F^-, Cl^-, Br^-, I^-	(R)	Same number of outermost shell electrons
(D)	Be, Mg, Ca	(S)	Same principal quantum number 'n' for the outermost shell containing electron(s).
		(T)	increasing order of total electrons

Q.142

	Column-I	**Column-II**
(A)	Be	(P) Bridge element
(B)	Al	(Q) Element having diagonal relationship
(C)	O	(R) Have unpaired electron
(D)	Fe	(S) Transition element
		(T) Have no unpaired electron

Q.143

	List -I	List - II
(P)	Total number of s-block elements	(1) 14
(Q)	Maximum number of electrons in some spin in the ground state of Chromium(Z = 24)	(2) 15
(R)	Number of metalloid in group-13 of the modern long form of periodic table	(3) 0
(S)	Effective nuclear charge for 3p- electron in the ground state of iron (Fe = 26), as per Slater's rule.	(4) 14.75

Codes :

	P	Q	R	S
(A)	4	2	1	3
(B)	1	3	2	4
(C)	2	1	3	4
(D)	1	2	3	4

Q.144

	Column I		Column II
(A)	Atomic Number = 7	(P)	It belong to d-block
(B)	Atomic Number = 21	(Q)	Normal element
(C)	Atomic Number = 16	(R)	It can have magnetic quantum number value m = –2
(D)	Atomic Number = 29	(S)	If each orbital is occupy by 3-electrons then It belong to p-block
		(T)	It have total number of even electron which has $l = 1$ and $s = +\frac{1}{2}$

Q.145

	Column I		Column II
(A)	He (g) > H (g)	(P)	I^{st} ionisation energy
(B)	Li^{+} (g) < Be^{+2} (g)	(Q)	Tendency to gain an electron
(C)	O(g) > P (g)	(R)	Electronegativity
		(S)	Effective nuclear charge value

Q.146

	Column I		Column II
(A)	N	(P)	Paramagnetic
(B)	Cu^+	(Q)	Diamagnetic
(C)	Fe	(R)	p-block
(D)	O	(S)	d-block
		(T)	Partially filled d-orbitals

[INTEGER TYPE]

Q.147 The IE_1, IE_2, IE_3, IE_4 and IE_5 of an element are 7.1, 14.3, 32.5, 46.8 and 162.2 eV respectively. The stable oxidation state of the element is _____.

Q.148 Calculate the Z_{eff} (approx) for 4s electron of Ni-atom according to Slater's rule.

Q.149 Find total number of elements upto atomic number 10 having positive ΔH_{eg_1}.

Q.150 If there were 9 periods in the periodic table & each orbital can have maximum 5 electrons, then how many maximum number of elements will be present in period 9?

Q.151 Calculate the value of Z_{eff} on 3d electron of Sc?

Q.152 How many elements from the following are not transition element?
Zr, Co, Cd, Hg, Au, Cu

Q.153 The amount of energy released when one million atoms of iodine in vapour state are converted to I^- ions is 4.9×10^{-13} J. What is the electron affinity of Iodine in eV per atom.

Q.154 Given
Bond energy of F – F bond = 38 Kcal / mol^{-1}
Bond energy of Cl – Cl bond = 58 Kcal / mol^{-1}
Bond energy of Cl – F bond = 61 Kcal / mol^{-1}
Electronegativity of fluorine = 4 eV
Calculate the electronegativity of chlorine atom.

Q.155 Calculate the Z_{eff} on the electron present in 5d-orbital of Gd (Atomic number = 64).

Q.156 Calculate the Z_{eff} of 39^{th} electron of Y (Yttrium).

Q.157 Find the total number of species having magnetic moment value of 2.84 B.M. from following species.
Fe^{2+}, Cr, Cr^{3+}, Ti^{2+}, Mn^{2+}, V^{3+}

Q.158 Find the total number of low shielding electrons in Hg^{2+} ions.

Q.159 Find the number of 'p' block elements from the following atomic numbers given below.
83 79 42 64 37 54 34

Q.160 Find the total number of electron in d-orbital.

Q.161 The number of p block elements accordingly to following configuration is _____.
$1s^2 2s^2 2p^6$, $1s^2 2s^2$, $1s^2 2s^2 2p^6 3s^2\ 3p^6 3d^{10} 4s^2$, $1s^2 2s^2 2p^6 3s^2\ 3p^1$

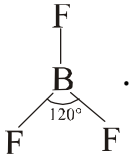
Q.162 The number of electrons present in the s-subshell within Mn.

Q.163 The value of σ (screening constant) for 3s electron of **P** is 10.5 then what is value of σ for 3p electron of **S**.
[If your answer is 3.45 then write 0345]

Q.164 The internuclear distance (x Å) between C and H in C–H bond is determined by using Schomaker & Stevenson equation . If internuclear distance between the two carbon atoms in C–C bond is 2.4 Å and between the two hydrogen atoms in H–H bond is 0.8Å. Given Electronegativities of C and H are 2.4 and 2.1 respectively. Calculate the value of 1000x.

Q.165 The number of process that are **definitely exothermic (Energy is released)** out of the following processes are :

(i) $2Cl(g) \rightarrow Cl_2(g)$
(ii) $Na^+(g) + F(g) + e^- \rightarrow NaF(s)$
(iii) $Cl(g) + H_2O + e^- \rightarrow Cl^-(aq)$
(iv) $Al^{+2}(g) + e^- \rightarrow Al^{+1}(g)$
(v) $P(g) + e^- \rightarrow P^-(g)$
(vi) $Ne(g) + e^- \rightarrow Ne^-(g)$
(vii) ΔH_f of $H^+(g)$
(viii) $A(s) \rightarrow A(g)$ where A is any element

Q.166 BF_3 has the following structure 

. If covalent radius of B is 0.85 Å and that of F is 0.73 Å and electronegativity of B is 2 and F is 4 then calculate the value of $\frac{100\,Y}{\sqrt{3}}$ where Y is the intermolecular distance between two fluorine atoms in Å.

Q.167 Given: $\Delta_{eg}H$ of $A^+ = -5x$

$\Delta_{eg}H$ of $A^{2+} = -8x$

ΔH_{IE} of $A^{2+} = 15x$

$\Delta_{eg}H$ of $A^{4+} = -23x$

If the enthalpy change in the given process $A^+(g) \longrightarrow A^{4+}(g)$ is $\Delta H = ax$
Then 'a' will be

Q.168 Calculate the sum of **"Code numbers"** of all the cases in which correct order of the mentioned parameter is represented.

S.No.	Order	Parameter	Code Number
1.	Na < Cl < F	Electronegativity	28
2.	Be < Mg < Na	Metallic character	53
3.	Al^{3+} > Mg	Ionic radius	14
4.	O < F < Cl	$\lvert\Delta_{eg}H\rvert$	8
5.	$Cl_2O_7 > Al_2O_3 > Na_2O$	Basic nature of oxide	59

For example if S.No. (3) & (5) are correct your answer should be 59 + 14 = 73 therefore fill 0073.

Q.169 Calculate sum of code numbers of all those orders which are incorrectly written.

S.No.	Parameter	Order	Code No.
1.	Ionisation energy (IE_1)	$O^- > S^-$	58
2.	Atomic Size	Mg > Cl > Si	22
3.	Acidic nature of oxides	$Na_2O < H_2O < CO_2 < SO_3$	46
4.	Number of unpaired electron	$Na^+ < Fe^{2+} < Cr < Mn$	113

Q.170 The outermost shell of an element has only one electron in the ground state. If the outermost shell is the 'N' shell, then the minimum and maximum atomic numbers for the element is/are :
[If the minimum and maximum atomic numbers are 9 and 45, then fill the OMR as 0945]

Q.171 If $Q = Z_{eff}$ of the 26th electron of Fe then find out the value of $100 \times Q$?

Q.172 The difference in atomic numbers of the inert gas and alkali metal in the 5th period of the modern long form of periodic table is

Q.173 The ratio of 1^{st}, 2^{nd} and 3^{rd} ionisation enthalpies of A^- (g) is 1 : 3 : 12. If ΔH for the process : A^{2+} (g) $\rightarrow A^-$ (g) is – 320 Kcal/mol, then the 2^{nd} ionisation enthalpy of A(g) (in Kcal/mol) is :

Q.174 The species having one or more unpaired electron are paramagnetic. Among the following ions :
Cu^{2+}, Zn^{2+} , Fe^{2+} , Ni^{2+}, Cr^{3+}, Co^{3+}, Sc^{3+}, Ti^{4+}
the number of paramagnetic ions is :

Q.175 Read the following statements :
(i) The number of unpaired electrons in ground state of N-atom is 'x'
(ii) The maximum number of unpaired electrons in parallel spin in the ground state of Ni - atom is 'y'
(iii) The minimum number of electrons in parallel spin in the ground state of Cr-atom is 'z'.
The sum of (x + y + z) is :

Q.176 According to Pauling, the percentage ionic character in A–B molecule may be given as :
Percent ionic character = $18 (X_B - X_A)^{1.4}$
Where X_B and X_A are electronegativities of B and A, respectively and $X_B > X_A$. If $X_A = 1.84$ and $X_B = 3.48$, then the percentage ionic character in A–B is **(Given : $(2)^{5/7} = 1.64$)**

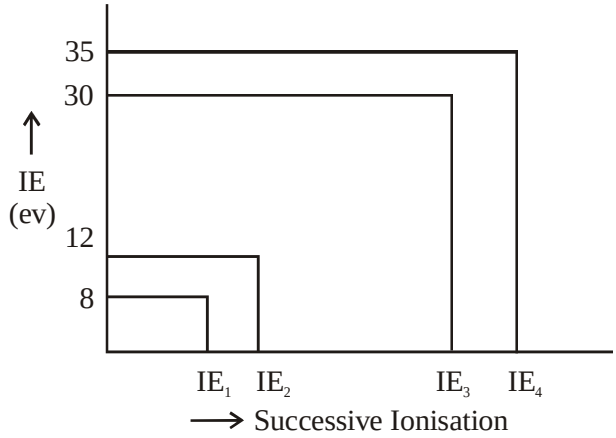
Q.177 For an element, the metallic radius is 20% greater than its covalent radius. If the metallic radius of the element is 180 pm, then its covalent radius (in pm) is :

Q.178 Among the following compounds, the number of compounds having greater magnitude of lattice energy than RbBr, are

NaCl, KF, RbCl, CsBr, NaBr, KCl, CsI, RbI.

Q.179 If therewere more periods in the modern long form of the periodic table, then the maximum number of elements in the 9^{th} and 10^{th} period should be (If number of elements in 9^{th} and 10^{th} period are 36 and 8, respectively, then answer as 3608)

Q.180 Find the group number of element 'X' which belongs to s- or p- block, having successive ionisation energies as per the graph gives below :



If your answer is group-I, write it as 0001.

Q.181 Find the total number of species having two unpaired electron from the following species.

Fe^{2+}, Cr, Cr^{3+}, Ti^{2+}, Mn^{2+}, V^{3+}

[If your answer is 9 then write the answer as 0009]

Q.182 Find the difference(magnitude) in effective nuclear charge between a 3d electron of Ni (Z = 28) and a 2p electron of oxygen.

Q.183 Find the total number of elements which have higher ionisation energy than their both adjacent elements (either in a period or in a group in the long form of periodic table.)

Be, B, N, P, Ga, S, Mg

Q.184 What is the atomic number of element having IUPAC name 'Uub'?

Q.185 The magnetic moment value of species 'X' is 4.8 B.M. Find out the number of unpaired electrons in 'X'.

Q.186 From the given compounds if 'X' number of compounds which are acidic in water.

Li_2O, SiO_2, Cl_2O_7, B_2O_3, Cr_2O_3, CO, CO_2, SO_3, MgO, Al_2O_3

then find the value of 'X'

Q.187 For atom **'A'** ionisation energy is given in eV :

$I.E._1$	$I.E._2$	$I.E._3$	$I.E._4$	$I.E._5$
11.2	24.3	37.4	48.4	392.0

How many electrons are present in valance shell of that atom?

Q.188 For X^{5+} ion, the successive electron affinities **(in eV)** are 289.7, 270.9, 30.1, 17.9 and 8.3. The expected number of electrons in the outermost shell of X-atom is

Q.189 Representative elements 'x', 'y' and 'z' are p-block element except inert gas. If order of their magnetic moment is x > y > z. Find the difference in possible value of group number of element 'z'.

Q.190 How many following total number of process are endothermic -

$O \longrightarrow O^-$	$N \longrightarrow N^-$	$Cl^+ \longrightarrow Cl$
$N \longrightarrow N^+$	$Ne \longrightarrow Ne^+$	$P \longrightarrow P^+$
$S \longrightarrow S^+$	$Be \longrightarrow Be^+$	$Se \longrightarrow Se^{-2}$

Q.191 What will be the difference of Z_{eff} in $_{11}Na$ and $_{19}K$ for last electron -

[ANSWER KEY]

EXERCISE-1

Q.1 C	Q.2 B	Q.3 C	Q.4 D	Q.5 B
Q.6 C	Q.7 B	Q.8 C	Q.9 C	Q.10 A
Q.11 C	Q.12 C	Q.13 B	Q.14 C	Q.15 D
Q.16 C	Q.17 C	Q.18 C	Q.19 B	Q.20 C
Q.21 A	Q.22 B	Q.23 D	Q.24 C	Q.25 B
Q.26 D	Q.27 C	Q.28 D	Q.29 A	Q.30 A
Q.31 C	Q.32 D	Q.33 C	Q.34 D	Q.35 C
Q.36 B	Q.37 B	Q.38 D	Q.39 D	Q.40 C
Q.41 C	Q.42 C	Q.43 B	Q.44 C	Q.45 A
Q.46 D	Q.47 C	Q.48 B	Q.49 D	Q.50 D
Q.51 A	Q.52 B	Q.53 B	Q.54 C	Q.55 C
Q.56 C	Q.57 B	Q.58 B	Q.59 C	Q.60 A
Q.61 D	Q.62 A	Q.63 C	Q.64 B	Q.65 C
Q.66 C	Q.67 D	Q.68 B	Q.69 C	Q.70 D
Q.71 C	Q.72 A	Q.73 B	Q.74 B	Q.75 C
Q.76 D	Q.77 B	Q.78 B	Q.79 C	Q.80 A
Q.81 C	Q.82 B	Q.83 A	Q.84 C	Q.85 A
Q.86 A	Q.87 D	Q.88 D	Q.89 A	Q.90 C
Q.91 A	Q.92 A	Q.93 A	Q.94 D	Q.95 A
Q.96 D	Q.97 A	Q.98 D	Q.99 D	Q.100 A
Q.101 A	Q.102 B	Q.103 C	Q.104 C	Q.105 B
Q.106 C	Q.107 A	Q.108 C	Q.109 D	Q.110 C
Q.111 B	Q.112 C	Q.113 C	Q.114 A	Q.115 D
Q.116 A	Q.117 D	Q.118 A	Q.119 C	Q.120 C
Q.121 C	Q.122 D	Q.123 B	Q.124 B	Q.125 A
Q.126 D	Q.127 D	Q.128 C	Q.129 C	Q.130 D
Q.131 B	Q.132 B	Q.133 B	Q.134 D	Q.135 C
Q.136 A	Q.137 D	Q.138 D	Q.139 B	Q.140 A
Q.141 C	Q.142 B	Q.143 A	Q.144 A	Q.145 B
Q.146 A	Q.147 B	Q.148 D	Q.149 A	Q.150 A
Q.151 A	Q.152 D	Q.153 C	Q.154 C	Q.155 B
Q.156 B	Q.157 A	Q.158 A	Q.159 D	Q.160 D
Q.161 A	Q.162 D	Q.163 B	Q.164 B	Q.165 D
Q.166 C	Q.167 D	Q.168 D	Q.169 A	Q.170 B
Q.171 C	Q.172 C	Q.173 A	Q.174 A	Q.175 D

Q.176 C	Q.177 B	Q.178 C	Q.179 A	Q.180 C
Q.181 B	Q.182 A	Q.183 A	Q.184 A	Q.185 D
Q.186 B	Q.187 A	Q.188 A	Q.189 B	Q.190 B
Q.191 B	Q.192 C	Q.193 B	Q.194 A	Q.195 C
Q.196 B	Q.197 D	Q.198 C	Q.199 C	Q.200 B
Q.201 A	Q.202 A	Q.203 C	Q.204 B	Q.205 C
Q.206 B	Q.207 D	Q.208 B	Q.209 D	Q.210 C
Q.211 C	Q.212 B	Q.213 C	Q.214 D	Q.215 B
Q.216 B	Q.217 C	Q.218 A	Q.219 C	Q.220 B
Q.221 B	Q.222 B	Q.223 C	Q.224 B	Q.225 B
Q.226 A	Q.227 C	Q.228 B	Q.229 B	Q.230 B
Q.231 D	Q.232 C	Q.233 A	Q.234 B	Q.235 A
Q.236 B	Q.237 C	Q.238 C	Q.239 B	Q.240 D
Q.241 B	Q.242 C	Q.243 C	Q.244 A	Q.245 B
Q.246 C	Q.247 D	Q.248 C	Q.249 C	Q.250 C
Q.251 B	Q.252 BC	Q.253 D	Q.254 D	Q.255 D
Q.256 C	Q.257 C	Q.258 B	Q.259 B	Q.260 D
Q.261 C	Q.262 D	Q.263 D	Q.264 C	Q.265 A
Q.266 B	Q.267 C	Q.268 A	Q.269 D	Q.270 B
Q.271 B	Q.272 A	Q.273 B	Q.274 A	Q.275 A
Q.276 D	Q.277 D	Q.278 D	Q.279 A	Q.280 D
Q.281 B	Q.282 C	Q.283 D	Q.284 B	Q.285 C
Q.286 A	Q.287 B	Q.288 A	Q.289 D	Q.290 C
Q.291 B				

EXERCISE-2

Q.1 BC	Q.2 ABC	Q.3 ACD	Q.4 BCD	Q.5 ACD
Q.6 ABC	Q.7 ABD	Q.8 AD	Q.9 BC	Q.10 ABCD
Q.11 ABD	Q.12 ABC	Q.13 ABCD	Q.14 BCD	Q.15 BC
Q.16 AC	Q.17 AC	Q.18 AD	Q.19 ACD	Q.20 AD
Q.21 BC	Q.22 CD	Q.23 CD	Q.24 AC	Q.25 ABD
Q.26 CD	Q.27 ABC	Q.28 AC	Q.29 ACD	Q.30 ABCD
Q.31 ABD	Q.32 ABCD	Q.33 ACD	Q.34 ABC	Q.35 ABC
Q.36 ABD	Q.37 ABC	Q.38 ABCD	Q.39 AD	Q.40 ABCD
Q.41 BCD	Q.42 ABC	Q.43 BCD	Q.44 ABD	Q.45 ABC
Q.46 BC	Q.47 ABCD	Q.48 BC	Q.49 ABC	Q.50 ABC
Q.51 ABC	Q.52 ABD	Q.53 BC	Q.54 ABCD	Q.55 ABC
Q.56 ABC	Q.57 ABCD	Q.58 AB	Q.59 AC	Q.60 ABC

Q.61	ABCD	Q.62	AC	Q.63	ABCD	Q.64	AB	Q.65	AB
Q.66	ABCD	Q.67	ABCD	Q.68	AD	Q.69	ABC	Q.70	BD
Q.71	ACD	Q.72	AC	Q.73	BD	Q.74	ABC	Q.75	AC
Q.76	AD	Q.77	ABD	Q.78	CD	Q.79	ABD	Q.80	BCD
Q.81	AC	Q.82	AC	Q.83	BCD	Q.84	ABC	Q.85	C
Q.86	B	Q.87	A	Q.88	A	Q.89	C	Q.90	C
Q.91	A	Q.92	A	Q.93	D	Q.94	C	Q.95	AB
Q.96	B	Q.97	B	Q.98	B	Q.99	C	Q.100	B
Q.101	D	Q.102	B	Q.103	C	Q.104	B	Q.105	A
Q.106	C	Q.107	A	Q.108	D	Q.109	B	Q.110	B
Q.111	B	Q.112	A	Q.113	D	Q.114	A	Q.115	B
Q.116	C	Q.117	A	Q.118	A	Q.119	A	Q.120	C
Q.121	B	Q.122	D	Q.123	C	Q.124	B	Q.125	C
Q.126	C	Q.127	C	Q.128	A	Q.129	B	Q.130	A

Q.131 (A) R; (B) S; (C) Q ; (D) P

Q.132 (A) P,Q,R (B) R,S (C) P,Q,R (D) P,Q

Q.133 (A) P,R,S (B) P,S (C) Q,S (D) P,Q,R,S

Q.134 (A) P,R ; (B) R,S ; (C) P,Q,R

Q.135 (A) P,S,T (B) Q,R (C) Q,R (D) S,T

Q.136 (A) P,Q,R (B) S (C) Q,R

Q.137 (A) P, Q (B) P, S (C) P, R

Q.138 (A) Q, T (B) P,R, (C) P,R,S (D) T

Q.139 (A) P,Q, (B) PT (C) Q,R,S (D) Q,R,T

Q.140 (A) P,Q (B) R (C) S

Q.141 (A) P, Q, T; (B) S, T; (C) P, R, T ; (D) P, Q, R, T

Q.142 (A) QT (B) PQR (C) R (D) RS

Q.143 D

Q.144 (A) QS (B) PRST (C) QT (D) PRT

Q.145 (A) PS (B) PQRS (C) PQR

Q.146 (A) PR (B) QS (C) PST (D) PR

		Q.147	+ 4	Q.148	0004	Q.149	4	Q.150	0125
Q.151	0003	Q.152	0002	Q.153	3.06	Q.154	3.22 eV	Q.155	3
Q.156	0003	Q.157	2	Q.158	44	Q.159	3	Q.160	2
Q.161	2	Q.162	8	Q.163	1085	Q.164	1573	Q.165	0005
Q.166	140 Å	Q.167	0046	Q.168	0089	Q.169	0193	Q.170	1929
Q.171	625	Q.172	0017	Q.173	0240	Q.174	0005	Q.175	0014
Q.176	0036	Q.177	0150	Q.178	0005	Q.179	5072	Q.180	0002
Q.181	0002	Q.182	0003	Q.183	0005	Q.184	0112	Q.185	0004
Q.186	5	Q.187	4	Q.188	3	Q.189	4	Q.190	7

Q.191 0