Ravi Maths Tuition Centre

Time : 1 Mins **CLASSIFICATION OF ELEMENTS AND PERIODICITY IN PROPERTIES 1** **Marks : 961**

1. In which element shielding effect is not possible?
   a) B b) N c) H d) Be
2. Similarity in the radius of Zr and Hf is explained on the basis of
   a) Lanthanide contraction b) Inert pair effect c) Same outershell configuration
   d) Anomalous configuration
3. Which of the following properties increases across a period:
   a) Reducing property b) Size of atom c) Acidic nature of oxides d) Metallic property
4. Which one of the following pairs of atomic numbers represents elements belonging to the same group?
   a) 11,20 b) 12,30 c) 13,31 d) 14,33
5. Some statements are given. Among them the correct statements are
   i) IP_2 of sodium is greater than that of Magnesium
   ii) IP_2 of lithium is greater than IP_1 of Helium
   iii) IP_2 of sodium is greater than IP_1 of Neon
   iv) IP_1 of oxygen is greater than that of Nitrogen
   a) All are correct b) Only i, ii and iii are correct c) Only i, ii are correct
   d) Only i, iv are correct
6. Correct order of ionic radius is
   a) $Ti^{4+} < Mn^{7+}$ b) $Cl^- < Cl$ c) $K^+ > Cl^-$ d) $P^{3+} > P^{5+}$
7. K^+, Cl^-, Ca^{2+}, S^{2-} ions are isoelectronic, The decreasing order of their size is :
   a) $S^{2-} > Cl^- > K^+ > Ca^{2+}$ b) $Ca^{2+} > K^+ > Cl^- > S^{2-}$ c) $K^+ > Cl^- > Ca^{2+} > S^{2-}$
   d) $Cl^- > S^{2-} > Ca^{2+} > K^+$
8. Which of the following statements is not correct about the electron gain enthalpy?
   a)
   In general, the electron gain enthalpy becomes less negative in going from top to bottom in a group.
   b) The electron gain enthalpy becomes less negative in a period from left to right.
   c)
   The elements having stable configuration like noble gases have large positive electron gain enthalpies.
   d) Noble gases have large positive electron gain enthalpies

9. Fill in the blanks with appropriate option.
   The ability of an atom to attract shared electrons to itself is called (i). It is generally measured on the (ii)scale. An arbitrary value of (iii) is assigned to fluorine (have greatest ability to attract electrons). It generally (iv) across a period and (v) down a group

a)

i	ii	iii	iv	v
polarity	Pauling	2.0	decreases	increases

b)

i	ii	iii	iv	v
electronegativity	Pauling	4.0	decreases	increases

c)

i	ii	iii	iv	v
valency	Mulliken	1.0	decreases	increases

d)

i	ii	iii	iv	v
electron affinity	Mulliken	2.0	increases	increases

10. Few values of enthalpies are given below:
    0=- 141 kJ mol^{-1} F = - 328 kl mol^{-1}
    S = - 200 kJ mol^{-1} Cl = - 349 kJ mol^{-1}
    What do these values show?
    a) Ionisation enthalpy b) Bond enthalpy c) Electron gain enthalpy d) Hydration enthalpy
11. The first periodic law stated by Mendeleev was:
    a) there is no correlation in the properties and atomic weights of the elements
    b) the properties of the elements are a periodic function of their atomic numbers
    c) the properties of the elements are a periodic function of their atomic weights
    d) the properties of the elements are a periodic function of their empirical formula.
12. The statement that is false for the long form of the periodic table is
    a) It reflects the sequence of filling the electrons in the order of sub energy levels s,p,d and f
    b) It helps to predict the stable valency states of the element
    c) It reflects trends in physical and chemical properties of the elements
    d) It helps to predict the relative ionicity of the bond between any two elements
13. Which one of the following sets of ions represents the collection of isoelectronic species?
    a) Na^+, Mg^{2+}, Al^{3+}, F^- b) K^+, Ca^{2+}, Sc^{3+}, Cl^- c) K^+, Cl^-, Mg^{2+}, Sc^{3+} d) Na^+, Mg^{2+}, Al^{3+},Cl^-
14. Which one of the following oxides is not neutral?
    a) CO b) OF_2 c) NO_2 d) both (b) and (c)
15. Largest ion among the following is
    a) Na^+ b) O^{2-} c) S^{-2} d) Cl^-
16. Which of the following is not a merit of Mendeleev's periodic table?
    a) It helped in correcting the atomic masses of some of the elements.
    b) He predicted the properties of some undiscovered elements and left gaps for them.
    c) He framed the periodic table with vertical and horizontal columns and gave shape to it.
    d) He gave separate places to isotopes in his periodic table.
17. The magnitude of first ionisation energy for Na (according to formula given) is equal to :
    a) energy of its 3s electron b) energy of its 1s electron c) energy of its 2s electron
    d) energy of its 2p electron
18. Z* for a ls electron in Fe atom is :
    a) 2.85 b) 25.7 c) 25.65 d) 3.75

19. Generally the ionisation potential in it period increases, but there are some exceptions. The one which is not an exception is
    a) Be & B b) N & O c) Mg & Al d) Na & Mg
20. The periodic table of today owes its development to two chemists namely
    a) Rutherford and Moseley b) Alexander Newlands and Dobereiner
    c) Dmitri Mendeleev and Lothar Meyer d) de Broglie and Neil Bohr
21. Identify the wrong statement in the following :
    a)
    Amongst isoelectronic species, smaller the positive charge on the cation, smaller is the ionic radius.
    b)
    Amongst isoelectronic species, greater the negative charge on the anion, larger is the ionic radius.
    c)
    Atomic radius of the elements increases as one moves down the first group of the periodic table.
    d)
    Atomic radius of the elements decreases as one moves across from left to right in the 2^{nd} period of the periodic table.
22. Which one of the following arrangements represents the correct order of least negative to most negative electron gain enthalpy for C, Ca, Al, F and O?
    a) Ca b) Al c) Al d) C
23. Considering the elements F, Cl, O and N, the correct order of their electron affinity values is :
    a) F > Cl > O > S b) F > O > Cl > S c) Cl > F > S > O d) O > F > S > Cl
24. In which of the following sets, elements have nearly same atomic radii?
    a) Li, Be, B b) Mg, Ca, Sr c) Fe, Co, Ni, Cu d) O, S, Se
25. Few elements are matched with their successive ionisation energies. Identify the elements.

Element	IE_1 (kJ/mol)	IE_2 (kJ/mol)
X	2372	5251
Y	520	7297
Z	900	1758

a)

X	Y	Z
A noble gas	Alkali metal	Alkaline earth metal

b)

X	Y	Z
Alkali metal	A noble gas	Alkaline earth metal

c)

X	Y	Z
Alkaline earth metal	Alkali metal	A noble gas

d)

X	Y	Z
Alkali metal	Alkaline earth metal	A noble gas

26. The first ($\Delta_i H_1$) and second ($\Delta_i H_2$) ionisation enthalpies (in kJ mol^{-1}) and the electron gain enthalpy (Δ_{eg} H (in kJ mol^{-1}) of the elements I, II, III, IV and V are given below:

Element	$\Delta_i H_1$	$\Delta_i H_2$	Δ_{eg} H
I	520	7300	-60
II	419	3051	-48

III	1681	3374	-328
IV	1008	1846	-295
V	2372	5251	+48

The most reactive metal and the least reactive nonmetal of these are respectively

a) I and V b) V and II c) II and V d) IV and V

27. The ground state electronic configurations of some elements, A, B, C, D and E (these symbols represent the some of the known elements given in the periodic table) are as follows.

P) $1s^2 2s^2 2p^6 3s^2 3p^2$ Q) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^1$ R) $1s^2 2s^2 2p^6 3s^2 3p^1$

S) $1s^2 2s^2 2p^6 3s^2 3p^6 3d^5 4s^1$ T) $1s^2 2s^2 2p^6 3s^2 3p^6 3d^{l0} 4s^2 4p^6$

Match the electronic configurations of the elements with the properties given below and select the correct sequence by choosing the correct codes given.

i) Element forms a cation which is isoelectronic with p^{3-}

ii) Element which in its compounds can show a maximum oxidation state of +6 and that is coloured too.

iii) Element has largest atomic radius and highest first ionisation energy in the respective period.

iv) Element which has intermediate value of electronegativity and its oxide forms salts with strong acids and bases.

a) QRTP b) QSTR c) QRST d) PQRS

28. In the periodic table, the maximum chemical reactivity is at the extreme left (alkali metals) and extreme right (halogens). Which properties of these two groups are responsible for this?

a)

Least ionisation enthalpy on the left and highest negative electron gain enthalpy on the right.

b) Non-metallic character on the left and metallic character on the right.

c) High atomic radii on the left and small atomic radii on the right.

d) Highest electronegativity on the left and least electronegativity on the right

29. A, B and C are hydroxy-compounds of the elements X, Y and Z respectively. X, Y and Z are the same period of the periodic table. A gives an aqueous solution of pH less than seven, B reacts with both strong acids and strong alkalis. C gives an aqueous solution which is strongly alkaline.

Which of the following statements is/are true?

I: The three elements are metals.

II: The electronegativities decrease form X to Y to Z

III: The atomic radius decreases in the order X, Y and Z.

IV: X, Y and Z could be phosphorus, aluminium and sodium respectively.

a) 1, II, III only correct b) I, III only correct c) II, IV only correct d) II, III, IV only correct

30. The elements with atomic numbers 90 to 103 are known as :

a) d-block elements b) lanthanides c) actinides d) transition elements

31. Electron affinity of Fluorine is less than that of Chlorine because

a) Electronegativity of Fluorine is more b) 2p sub shell of F is smaller

c) Chlorine is a stronger oxidant d) Bond dissociation energy of F_2 is less

32. An element X has atomic number 19. What will be the formula of its oxide?

a) X_2O b) XO c) XO_2 d) X_2O_3

33. Choose the incorrect statement

a)

Chemical reactivity tends to be high in group 1 metals, lower in elements in middle and increases to maximum in the group 17.

b) Halogens have very high negative electron gain enthalpy.

c) Noble gases have large positive electron gain enthalpy

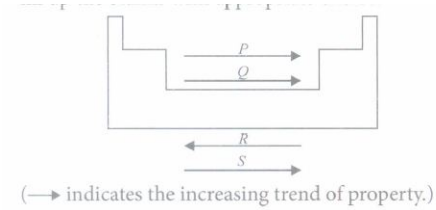
d)

Decrease in electronegativities across a period is accompanied by an increase in non-metallic properties.

34. In the periodic table, inversion of atomic weights took place in this pair

a) Argon - Potassium b) Boron - Scandium c) Hydrogen - Helium d) Beryllium-Boron

35. Study the given diagram of the periodic table and fill up the blanks with appropriate choice.



a)

P	Q	R	S
Ionisation enthalpy	Electron gain enthalpy	Atomic radius	Electro-negativity

b)

P	Q	R	S
Atomic radius	Ionisation enthalpy	Electro-negativity	Electron gain enthalpy

c)

P	Q	R	S
Ionisation enthalpy	Atomic radius	Electro-negativity	Electron gain enthalpy

d)

P	Q	R	S
Electro-negativity	Electron gain enthalpy	Ionisation enthalpy	Atomic radius

36. Electronegativity of an element is the average of its ionisation energy and electron affinity according to

a) Pauling b) Rutherford c) Bohr d) Mulliken

37. An element has the electronic configuration

$1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^8\ 4s^2$

What will be its position in the periodic table?

a) Period 4, Group 10 b) Period 2, Group 2 c) Period 4, Group 2 d) Period 2, Group 8

38. Which of the following pairs has elements containing same number of electrons in the outermost orbit?

a) N, O b) Na, Ca c) As, Bi d) Pb, Sb

39. If metal $X_{(s)}$ forms X^+ ion and $Y_{2(g)}$ forms Y^{2-} ion then, which of the following is the correct to calculate enthalpy of following reactions?

(if ΔH_f^0 of X_2Y is exothermic) $2X^+_{(g)}+Y^{2-}_{(g)} \sim X_2\ Y_{(s)}; \Delta H$ = -q(kJ/mole)

a) -q=ΔH_f^0 (X_2Y)-SE-IP_1-$\frac{BE}{2}$ +EGE_1-EGE_2

b) -q=ΔH_f^0 (X_2Y)-2SE-IP_1-$\frac{BE}{2}$ +EGE_1-EGE_2

c) -q=ΔH_f^0 (X_2Y)-2SE-IP_1-IP_2-$\frac{BE}{2}$ +EGE_1-EGE_2

d) -q=ΔH_f^0 (X_2Y)-2SE-2IP_1-$\frac{BE}{2}$ +EGE_1-EGE_2

40. Given below are the names of few elements based on their position in the periodic table. Identify the element which is not correctly placed.
    a) An element which tends to lose three electrons - Aluminium
    b) An element which tends to gain two electrons - Iodine
    c) An element with valency four - Silicon d) A transuranium element - Plutonium
41. Which one of the above elements is least reactive?
    a) R b) S c) T d) U
42. The correct sequence which shows decreasing order of the ionic radii of the elements is:
    a) $Na^+ > Mg^{2+} > Al^{3+} > O^{2-} > F^-$ b) $Na^+ > F^- > Mg^{2+} > O^{2-} > Al^{3+}$
    c) $O^{2-} > F^- > Na^+ > Mg^{2+} > Al^{3+}$ d) $Al^{3+} > Mg^{2+} > Na^+ > F^- > O^{2-}$
43. Amphoteric behaviour is shown by the oxides of:
    a) Al and Ca b) Pb and Ba c) Cr and Mg d) Sn and Zn
44. The electronic configuration of an element is $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^3$. What is the atomic number(X) of the element which is just below the above given element in the periodic table. Enter the value of X.
    a) 33 b) 34 c) 31 d) 49
45. Ionisation energy values of an atom are 495, 767, 1250 and 4540 kJ $mole^{-1}$ the formula of its sulphate is
    a) MSO_4 b) M_2SO_4 c) $M_2(SO_4)_3$ d) $M(SO_4)_2$
46. Which one of the following oxides is expected to exhibit paramagnetic behaviour:
    a) CO_2 b) SiO_2 c) SO_2 d) ClO_2
47. If Aufbau rule is not followed, K -19 will be placed in ..... block.
    a) s-Block b) p-Block c) d-Block d) f-Block
48. What is the position of the element in the periodic table satisfying the electronic configuration $(n - 1)\ d^1\ ns^2$ for n = 4?
    a) 3rd period and 3rd group b) 4th period and 3rd group c) 3rd period and 2nd group
    d) 4th period and 2nd group
49. Which of the following can most easily form unipositive gaseous ion?
    a) $1s^2\ 2s^2\ 2p^6\ 3s^2$ b) $1s^2\ 2s^2\ 2p^6\ 3s^1$ c) $1s^2\ 2s^2\ 2p^6\ 3s^23p^1$ d) $1s^2\ 2s^2\ 2p^6\ 3s^23p^3$
50. What were the main demerits of Mendeleev's periodic table?
    (i) Hydrogen has been placed in group I though it resembles to group VII as well.
    (ii) Position of some elements was not justified.

(iii) Isotopes were not given separate places.
(iv) Lanthanides and actinides were not included in the table.
a) (i), (ii) and (iii) b) (i), (ii), (iii) and (iv) c) (ii) and (iv) d) (i), (iii) and (iv)

51. Which is the most electropositive element?
a) Na b) Cu c) Cs d) Ca

52. An element X occurs in short period having configuration ns^2np^1. The formula and nature of its oxide is
a) X_2O_3 amphoteric b) XO_3, basic c) XO_3, acidic d) X_2O_3, basic

53. Which is correct increasing order of their tendency of the given elements to form M^{3-} ion?
a) Bi > Sb > As > P > N b) Bi < Sb < As < P < N c) N < P < Sb < Bi < As
d) Bi> Sb ~ N ~ P > As

54. Which has the highest second ionization potential?
a) Nitrogen b) Carbon c) Oxygen d) Fluorine

55. S-1 : Formation of Mg^{2+} and Al^{3+}, both require the absorption of energy.
S-2 : The following set of elements represent the correct order of electron affinity values S > Se > Te > O
S-3 : The size of the isoelectronic species is affected by electron-electron interaction in the outer orbitals.
S-4 : Chemistry of the elements depend on the valence shell electron configurations as well as nuclear masses.
a) TTFF b) TFTF c) TTFT d) TTTT

56. The order of first electron affinity of O, S and Se is :
a) O > S > Se b) S > Se > O c) Se > O > S d) S > O > Se

57. Atomic number of Ag is 47. In the same group the atomic number of elements placed above and below Ag in Long form of periodic table will be:
a) 37, 67 b) 29, 79 c) 39, 69 d) 18, 28

58. Which one of the following arrangements does not truly represent the property indicated against it?
a) $Br_2 < Cl_2 < F_2$ Oxidising power b) $Br_2 < Cl_2 < F_2$ Electronegativity
c) $Br_2 < F_2 < Cl_2$ Electron affinity d) $Br_2 < Cl_2 < F_2$ Bond energy

59. Which of the following oxides is neutral in nature?
a) SrO b) Al_2O_3 c) CO_2 d) CO

60. In which of the following pairs of species, the size of the first species is not more than the second species?
a) Na^+,F^- b) Fe^{2+},Fe^{3+} c) Li, F d) S, O

61. Elements belonging to the same group of periodic table have
a) same number of energy levels b) same number of valence electrons
c) same number of electrons d) same ionisation enthalpy.

62. Which of the following does not represent the correct order of the properties indicated?
a) $Ni^{2+} > Cr^{2+} > Fe^{2+} > Mn^{2+}$ (size) b) Sc > Ti > Cr > Mn (size)
c) $Mn^{2+} > Ni^{2+} < CO^{2+} < Fe^{2+}$(unpaired electron)
d) $Fe^{2+} > CO^{2+} > Ni^{2+} > Cu^{2+}$ (unpaired electron)

63. Match the columns I, II and III and mark the appropriate choice.

	Colum I		Colum II		Colum III
(A)	Bromine	(i)	Noble metal	(p)	Amalgam
(B)	Gold	(ii)	Crystalline non-metal	(q)	$4s^2\ 4p^5$
(C)	Mercury	(iii)	Liquid non-metal	(r)	Transition metal
(D)	Iodine	(iv)	Liquid metal	(s)	Violet

a) (A)→(iii, q); (B)→(i, r), (C)→(iv, p); (D)→(ii, s)
b) (A)→(ii, p); (B)→(i, s), (C)→(iii, q); (D)→(iv, r)
c) (A)→(i, s), (B)→(ii, p); (C)→(iv, r), (D)→(iii, q)
d) (A)→(iv, r), (B)→(iii, q): (C)→(ii, s): (D)→(i, p)

64. In crystals of which of the following ionic compounds would you expect maximum distance between centres of cations and anions?
a) LiF b) CsF c) CsI d) LiI

65. Of the metals Be, Mg, Ca and Sr of group 2 in the periodic table, the least ionic chloride will be formed by
a) Be b) Ca c) Mg d) Sr

66. Anomalous pair among the following is
a) Boron - Silicon b) Beryllium - Indium c) Aluminium - Gallium d) Cobalt - Nickel

67. Element in periodic table with electronic configuration as $[Ar]^{l8}3d^5 4s^1$ is placed in
a) IA, s-block b) VIA, s-block c) VIB, s-block d) VIB, d-block

68. Atomic radii of fluorine and neon in angstrom unit arc respectively given by:-
a) 0.75, 1.60 b) 0.72, 0.72 c) 1.2, 1.2 d) 1.62, 0.72

69. An element 'P' has atomic number 56. What will be the formula of its halide?
a) PX b) PX_2 c) PX_3 d) P_2X_3

70. The species Ar, K^+ and Ca^{2+} contain the same number of electrons. In which order do their radii increase?
a) $Ca^{2+} < K^+ < Ar$ b) $K^+ < Ar < Ca^{2+}$ c) $Ar < K^+ < Ca^{2+}$ d) $Ca^{2+} < Ar < K^+$

71. Amongst the elements with following electronic configurations, which one may have the highest ionization energy?
a) [Ne] $3s^2\ 3p^3$ b) [Ne] $3s^2\ 3p^2$ c) [Ar] $3d^{10}, 4s^2, 4p^3$ d) [Ne] $3s^2, 3p^1$

72. Correct order of 1^{st} IP among following elements Be, B, C, N, O is
a) B < Be < C < O < N b) B < Be < C < N < O c) Be < B < C < N < O
d) Be < B < C < O < N

73. Which of the following ions contains minimum number of unpaired electrons?
a) Fe^{2+} b) Fe^{3+} c) CO^{2+} d) CO^{3+}

74. Element with atomic number 15 and mass number 31 is present in
a) group 5 and period 4 b) group 5 and period 3 c) group 15 and period 3
d) group 15 and period 4

75. Pauling's electronegativity values for elements are useful in predicting
a) polarity of the molecules b) position in the emf series c) coordination numbers
d) dipole moments

76. Element with highest electronegativity is:
    a) Chlorine b) Fluorine c) Oxygen d) Nitrogen
77. In a given energy level, the order of penetration effect of different orbitals is:
    a) f < d < p < s b) s = p = d = f c) s < p < d < f d) P > s > d> f
78. Set of elements with the following atomic numbers belong to the same group
    a) 9, 16, 35, 3 b) 12, 20, 4, 38 c) 11, 19, 27, 5 d) 24, 47, 42, 55
79. In which of the following cases lattice energy of resulting product will be highest?
    a) X and Y both are monovalent b) X and Y both are divalent
    c) X is monovalent and Y is divalent d) X is divalent and Y is monovalent
80. In the isoelectronic species the ionic radii of N^{3-}, O^{2-} and F^{-} are respectively given by
    a) 1.36, 1.71, 1.40 b) 1.36, 1.40, 1.71 c) 1.71, 1.36, 1.40 d) 1.71, 1.40, 1.36
81. Meitnerium is IUPAC official name of an element with atomic number
    a) 113 b) 118 c) 104 d) 109
82. The general electronic configuration $(n-1)d^3ns^2$ indicates that the particular element belong to:
    a) V B group b) V A group c) IV B group d) II B group
83. Which of the following is the atomic number of a metal?
    a) 35 b) 34 c) 36 d) 38
84. Elements A, B, C, D and E have the following electronic configuration:
    A) $1s^2,2s^22p^1$
    B) $1s^2,2s^22p^6,3s^23p^1$
    C) $1s^2,2s^22p^6,3s^23p^3$
    D) $1s^2\ ,2s^2\ 2p^6\ ,3s^2\ 3p^5$
    E) $1s^2\ ,2s^2\ 2p^6\ ,3s^2\ 3p^6$
    Which among these will belong to same group in the periodic table?
    a) A and C b) A and D c) A and B d) A and E
85. The most abundant noble gas in atmosphere is:
    a) neon b) argon c) xenon d) krypton
86. Identify the correctly matched set among the following
    a) Scandium-d-block-representative element b) Lanthanum-d-block-innertransition element
    c) Cerium-f-block-transition element d) Actinium-d-block-transition element
87. Which electronic configuration of an element has abnormally high difference between second and third ionisation energy.
    a) $1s^2,\ 2s^2\ 2p^6,3s^1$ b) $1s^2,\ 2s^2\ 2p^6,3s^2\ 3p^1$ c) $1s^2,\ 2s^2\ 2p^6,3s^2\ 3p^2$ d) $1s^2,\ 2s^2,\ 2p^6\ ,3s^2$
88. The first ionisation enthalpy of the elements C, N, P, Si are in the order of
    a) C<N<Si<P b) N<Si<C<P c) Si < P < C < N d) P < Si < N < C
89. Predict the formulae of the binary compounds formed by combination of the following pairs of elements:
    (i) Magnesium and nitrogen
    (ii) Silicon and oxygen
    a) $MgN_2,\ SiO_2$ b) Mg_3N_2,SiO_2 c) $Mg_2N_3,\ Si_2O_3$ d) MgN, SiO_2
90. The property of an element that is not determined directly but is obtained indirectly using Bom Haber cycle:

a) Ionisation potential b) Electron affinity c) Electronegativity d) Metallic character

91. Ionic radii are :
    a) inversely proportional to effective nuclear charge
    b) inversely proportional to square of effective nuclear charge.
    c) directly proportional to effective nuclear charge.
    d) directly proportional to square of effective nuclear charge.
92. Which of the following best describes the relationship of electronegativity, bond energy and bond moment in a diatomic molecule?
    a) As electronegativity increases, both bond energy and bond moment increases
    b) As electronegativity increases, bond energy decreases but bond moment increases
    c) As elecctronegativity increases, bond energy increases but bond moment decreases
    d) As electronegativity increases, both bond energy and bond moment decreases
93. Select the incorrect statement(s).
    a) IE(I) of nitrogen atom is more than IE(1) of oxygen atom
    b) Electron gain enthalpy of oxygen is less negative than selenium
    c) Electronegativity on Pauling scale is 2.8 times the electronegativity on Mulliken scale.
    d) cr_6^+ is smaller than Cr^{3+}
94. Which of the following is not a periodic property for the elements?
    a) Electronegativity b) Atomic size c) Occurrence in nature d) Ionization energy
95. The electronic states X and Y of an atom are depicted below:
    X : $1s^2\ 2s^2\ 2p^6\ 3s^1$
    Y :$1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6 4s^1$
    Which of the following statements is not correct?
    a) X represents an alkali metal. b) Energy is required to change X into Y.
    c) Y represents ground state of the element
    d) Less energy is required to remove an electron from X than from Y.
96. Assertion: Atomic number of the element ununtrium is 113.
    Reason: According to IUPAC system of nomenclature, the numerical roots for 1, 1 and 3 are un, un and tri respectively
    a) If both assertion and reason are true and reason is the correct explanation of assertion.
    b)
    If both assertion and reason are true but reason is not the correct explanation of assertion.
    c) If assertion is true but reason is false. d) If both assertion and reason are false.
97. Anything that influences the valence electrons will affect the chemistry of the element. Which one of the following factors does not affect the valence shell?
    a) Valence principal quantum number (n) b) Nuclear charge (Z) c) Nuclear mass
    d) Number of core electrons
98. The number of protons, neutrons and electrons in $^{175}_{71}\mathrm{Lu}$ respectively, are:
    a) 175, 104 and 71 b) 71, 104 and 71 c) 104, 71 and 71 d) 71, 71 and 104
99. Van der waal's radius is used for
    a) Molecular substances in gaseous state only b) Molecular substances in solid state only
    c) Molecular substances in liquid state only d) Molecular substances in any state

100. Na^+, Mg^{2+}, $A1^{3+}$ and Si^{4+} are isoelectronic. The order of their ionic size is :
a) $Na^+ > Mg^{2+} < Al^{3+} < Si^{4+}$ b) $Na^+ < Mg^{2+} > Al^{3+} > Si^{4+}$ c) $Na^+ > Mg^{2+} > Al^{3+} > Si^{4+}$
d) $Na^+ < Mg^{2+} > Al^{3+} < Si^{4+}$

101. Which of the following order of radii is correct?
a) Li < Be < Mg b) $H^+ < Li^+ < H^-$ c) O < P < Ne d) $Na^+ > F^- > O^{-2}$

102. Which of the following is not an actinoid?
a) Curium (Z = 96) b) Californium (Z = 98) c) Uranium (Z = 92) d) Terbium (Z = 65)

103. Among, the elements Ca, Mg, P and Cl, the order of increasing atomic radii is
a) Ca b) Mg c) Cl d) P

104. The metal which can form a stable binary halide of the formula MX2 (X = halogen) :
a) P b) Q c) U d) S

105. Which group of elements shows lowest ionisation enthalpy?
a) Alkali metals b) Alkaline earth metals c) Halogens d) Noble gases

106. First and second ionization energies of magnesium are 7.646 and 15.035 eV respectively. The amount of energy in kJ needed to convert all the atoms of magnesium into Mg^{+2} ions present in 12 mg of magnesium vapours is [Given 1 eV=96.5kJ mol^{-1}]
a) 1.1 b) 1.5 c) 2.0 d) 0.5

107. Increasing order of acidic character is
a) $SO_3 > N_2O_5 > CO_2 > SiO_2$ b) $SO_3 < N_2O_5 < CO_2 < SiO_2$ c) $SO_3 < N_2O_5 > CO_2 < SiO_2$
d) $SO_3 > N2O_5 < CO_2 < SiO_2$

108. Beryllium shows diagonal relationship with aluminium. Which of the following similarity is incorrect?
a) Be_2C like Al_4C_3 yields methane on hydrolysis b) Be, like Al is rendered passive by HNO_3
c) Be $(OH)_2$ like $Al(OH)_3$ is basic d) Be forms beryllates and Al forms aluminate

109. The ionization of hydrogen atom would give rise to:
a) hydride ion b) hydronium ion c) proton d) hydroxyl ion

110. Which one of the following arrangements is the incorrect representation of the property indicated with it?
a) Br < Cl < F : Electro negativity b) F < Br < Cl : Electron - affinity
c) $F_2 < Br_2 < Cl_2$: Bond energy d) $Br_2 < Cl_2 < F_2$: Oxidising strength

111. Use (IE) and (EA) listed below to determine whether the following process is endothermic exothermic. $Mg_{(g)} + 2F_{(g)} \rightarrow Mg^{2+}{}_{(g)} + 2F^-{}_{(g)}$
$(IE)_1$ of $Mg_{(g)}$ = 737.7 kJ mol^{-1} ; $(IE)_2$ of $Mg_{(g)}$ = 1451 kJ mol^{-1} ; (EA) of $F_{(g)}$ = - 328 kJ mol^{-1}
a) Exothermic b) Endothermic c) Both d) can't be predicted

112. The correct order of the decreasing ionic radii among the following isoelectronic species are
a) $Ca^{2+} > K^+ > S^{2-} > Cl^-$ b) $Cl^- > S^{2-} > Ca^{2+} > K^+$ c) $S^{2-} > Cl^- > K^+ > Ca^{2+}$
d) $K^+ > Ca^{2+} Cl^- > S^{2-}$

113. The Ionisation energy of nitrogen is more than that of oxygen because:
a) of the extra stability of half-filled p orbitals in nitrogen b) more number of energy levels
c) less number of valence electrons d) smaller size

114. The main reason for showing anomalous properties of the first member of a group in s or p-block is

a) maximum chemical reactivity b) maximum electronegativity and different configurations
c) small size, large charge/radius ratio d) tendency to form multiple bonds

115. Which one of the following orders is not in accordance with the property stated against it?
a) $F_2 > Cl_2 > Br_2 > I_2$ (Oxidising power) b) HI > HBr > HBr > HF (Acidic property in water)
c) $F_2 > Cl_2 > Br_2 > I_2$ (Electronegativity) d) F2 > $Cl_2 > Br_2 > I_2$ (Bond dissociation energy)

116. Assertion: In the present form of periodic table, the period number corresponds to the highest principal quantum number of the elements in the period.
Reason: Elements having similar outer electronic configurations in their atoms belong to same period.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.

117. Assertion: Metallic character is highest at the extremely left side of the periodic table.
Reason: Ionization enthalpy increases across a period.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.

118. Which of the following statements regarding the variation of atomic radii in the periodic table is not true?
a) In a group, there is continuous increase in size with increase in atomic number.
b) In 4f-series, there is a continuous decrease in size with increase in atomic number
c) The size of inert gases is larger than halogens.
d) In 3^{rd} period, the size of atoms increases with increase in atomic number.

119. Which one of the above elements is most reactive metal?
a) P b) Q c) U d) S

120. Which of the following electronic configuration of an atom has the lowest ionization enthalpy?
a) $1s^2$, $2s^2$, $2p^5$ b) $1s^2$, $2s^2$ $2p^3$ c) $1s^2$, $2s^2$ $2p^6$, $3s^1$ d) $1s^2$, $2s^2$ $2p^6$

121. Among the following, the one which is most basic is
a) ZnO b) MgO c) Al_2O_3 d) N_2O_5

122. The transition elements (d-block elements) show variable oxidation states because
a) of the presence of ns, np and nd electrons
b)
the energy difference between (n-l)d and ns electrons is very less, thus (n-l)d electrons also behave like valence electrons
c) of the presence of ns and nd orbitals
d) of the presence of electrons in np and nd orbitals

123. The electro negativity of carbon from the following data is : E_{H-H} = 104.2 kcal mol^{-1}, E_{c-c} = 83.1 kcal mol^{-1}, E_{C-H}= 98.8 kcal mol^{-1}. X_H = 2.1
a) 3.0 b) 2.1 c) 2.5 d) 3.1

124. Pair of elements with equal values of electronegativity
a) Be, Al b) Mg, Al c) Mg, Ca d) F, Ne

125. What is the correct electronic configuration of the central atom in $K_4[Fe(CN)_6]$ based on crystal field theory?
a) $t_{2g}^6 e_g^0$ b) $e^3 t_2^3$ c) $e^4 t_2^2$ d) $t_{2g}^4 e_g^2$

126. Which electron is configuration of an element has abnormally high difference between second and third ionization energy?
a) $1s^2, 2s^2, 2p^2, 3s^1$ b) $1s^2, 2s^2\ 2p^6, 3s^2\ 3p^1$ c) $1s^2, 2s^2\ 2p^6, 3s^2\ 3p^2$
d) $1s^2, 2s^2\ 2p^6, 3s^2$

127. What would be the atomic number of the next halogen if discovered in future?
a) 115 b) 119 c) 117 d) 121

128. The starting element of fifth period is:
a) K b) Rb c) Kr d) Xe

129. The longest and shortest periods are
a) 1 & 6 b) 2 & 6 c) 6 & 1 d) 1 & 7

130. The element Z = 114 has been discovered recently. It will belong to which of the following family/group and electronic configuration?
a) Halogen family, [Rn] $5f^{14}\ 6d^{10}\ 7s^2\ 7p^5$ b) Carbon family, [Rn] $5f^{14}\ 6d^{10}\ 7s^2\ 7p^2$
c) Oxygen family, [Rn] $5f^{14}\ 6d^{10}\ 7s^2\ 7p^4$ d) Nitrogen family, [Rn] $5f^{14}\ 6d^{10}\ 7s^2 7p^6$

131. An increase in both atomic and ionic radii with atomic number occurs in any group of the periodic table and in accordance with this the ionic radii of Tiny) and Zr(IV) ions are 0.68A° and 0.74A° respectively; but for Hf(IV) ion, the ionic radius is O. 75A°, which is almost the same as that for Zr(IV) ion. This is due to
a) Greater degree of covalency in compounds of Hf^{4+} b) Lanthanide contraction
c) Actinide contraction
d) Difference in co-ordination number of Zn^{4+} and Hf^{4+} in their compounds

132. Based upon the electronegativity difference of bonded atoms, which of the following is correct about the chemical bond?
a) Ionic if ΔEN < I.2; Polar covalent if ΔEN > 1.2
b) Ionic if ΔEN > 1.2 Polar covalent if ΔEN < 1.12
c) Ionic if ΔEN < 2.0 ; Polar covalent if ΔEN > 2.0
d) Ionic if ΔEN > 2.0 ; Polar covalent if ΔEN < 2.0

133. Screening effect is not observed in:
a) He^+ b) Li^{2+} c) Be^{3+} d) In all the above cases

134. Which of the following sets of elements have the same number of electrons in outermost shell?
a) Elements with atomic numbers 30, 48, 80 b) Elements with atomic numbers 14, 15, 16
c) Elements with atomic numbers 20, 30, 50 d) Elements with atomic numbers 10, 18, 26

135. Which of tire following sets has strongest tendency to form anions
a) Ga, In, Tl b) Na, Mg, Al c) N,O, F d) V,Cr,Mn

136. Which pair of elements of atomic numbers given below will have similar chemical properties?
a) 13 & 22 b) 3 & 11 c) 4 & 24 d) 2 & 1

137. One would expect proton to have very large
a) charge b) ionisation potential c) hydration energy d) radius

138. Which of the following elements will have highest ionisation energy?
a) $1s^2\ 2s^2\ 2p^6\ 3s^1$ b) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^3$ c) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^4$ d) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^1$

139. The electronegativity of the following elements increase in the order
a) C, N, Si, P b) N, Si, C, P c) Si, P, C, N d) P, Si, N, C

140. Assertion: Among isoelectronic species, the cation with the greater positive charge will have a smaller radius.
Reason: Greater the attraction of the electrons to the nucleus, smaller is the size of atom/ion.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.

141. The order of ionic mobility in aqueous solution of the following ions will be (If R, S belong to same group):
a) $R^{2+}_{(aq)} > S^{2+}_{(aq)}$ b) $S^{2+}_{(aq)} > R^{2+}_{(aq)}$ c) $S^{2+}_{(aq)} = R^{2+}_{(aq)}$ d) can not be co-related

142. The reference element in Pauling scale of electronegativity is:
a) H b) C c) Cl d) He

143. $N_0/2$ atoms of X(g) are converted into $X^+(g)$ by energy E_1.$N_0/2$ atoms of X(g) are converted into $X^-(g)$ by the energy E_2. Hence ionisation potential and electron affinity of X(g) are:
a) $\frac{2E_1}{N_0}, \frac{2\left(E_1 - E_2\right)}{N_0}$ b) $\frac{E_1}{N_0}, \frac{2E_2}{N_0}$ c) $\frac{2\left(E_1 - E_2\right)}{N_0}, \frac{2E_2}{N_0}$ d) $\frac{2E_1}{N_0}, \frac{2E_2}{N_0}$

144. Fill in the blanks by picking the correct option.
There are _____ groups and _____ periods in the extended form of periodic table. The group, all members of which are in gaseous state under ordinary conditions is_____ group. Most electropositive elements belong to _____ group.
a) 16, 8, 17, 2 b) 18, 7, 18, 1 c) 8, 7, 0, 2 d) 16, 8, 18, 1

145. The element with the atomic number 118, will be :
a) alkali b) noble gas c) lanthanide d) transition element

146. Which of the following element has maximum electron affinity?
a) Cl b) Br c) I d) F

147. Some statements are given regarding nature of oxides
i) In second period, nitrogen form strongest acidic oxide
ii) In third period, sodium froms strongest basic oxide
iii) Oxides of metalloids are generally amphoteric in nature
a) i and iii are correct b) ii and iii are correct c) i and ii are correct
d) i, ii and iii are correct

148. Match the atomic numbers of the elements given in column I with the periods given in column II and mark the appropriate choice

Column I (Atomic number)		Column II (Period)	
(A)	31	(i)	5
(B)	50	(ii)	3
(C)	56	(iii)	4

(D)	14	(iv)	6

a) (A) ⟶ (i), (B) ⟶ (ii), (C) ⟶ (iii), (D) ⟶ (iv) b) (A) ⟶ (ii), (B) ⟶ (i), (C) ⟶ (iv), (D) ⟶ (iii)
c) (A) ⟶ (iii), (B) ⟶ (iv), (C) ⟶ (i), (D) ⟶ (ii) d) (A) ⟶ (iii), (B) ⟶ (i), (C) ⟶ (iv), (D) ⟶ (ii)

149. Beryllium has higher ionisation enthalpy than boron. This can be explained as,
a) ionisation energy increases in a period.
b) beryllium has higher size than boron hence its ionisation enthalpy is higher
c) penetration of 2p-electrons to the nucleus is more than the 2s-electrons
d)
it is easier to remove electron from 2porbital as compared to 2s-orbital due to more penetration of s-electrons

150. If each orbital can hold a maximum of 3 electrons. The number of elements in 2^{nd} period of the periodic table (long form) will be:
a) 12 b) 6 c) 8 d) 24

151. Electronic configurations of few elements are given below. Mark the incorrect match.
a) $1s^2\ 2s^2\ 2p^5$ - Most electronegative element
b) $1s^2\ 2s^2\ 2p^3$ -An element belonging to 3^{rd} period and 5^{th} group
c) $1s^2\ 2s^2\ 2p^6 3s^2\ 3p^6\ 3d^8\ 4s^2$ -A d-block element
d) $1s^2\ 2s^2\ 2p^6 3s^2\ 3p^6$ -An element from 18^{th} group

152. Few general names are given along with their valence shell configurations. Mark the incorrect name:
a) $ns^2\ np^6$ - Noble gases b) $ns^2\ np^5$- Halogens c) ns^1 - Alkali metals
d) $ns^2\ np^2$ -Chalcogens

153. The element with the atomic number 118, will be
a) alkali b) noble gas c) lanthanide d) transition element

154. Which are correct match?
i) Eka silicon-Ge ii) Eka aluminium-Ga iii) Eka manganese-Ar iv) Eka scandium-B
a) ii, iii b) i, ii, iii c) i, iv d) i,ii

155. Which of the following process refers to ionisation potential?
a) $X_{(s)} \longrightarrow X^+_{(g)} + e^-$ b) $X_{(g)} \longrightarrow X^+_{(g)} + e^-$ c) $X_{(g)} + aq \longrightarrow X^+_{(ag)} + e^-$ d) $X_{(g)} + e^- \longrightarrow X^-_{(g)}$

156. In the periodic table, with the increase in atomic number, the metallic character of an element
a) decrease in a period and increases in a group
b) increases in a period and decreases in a group
c) increases in a period as well as in the group
d) decreases in a period and also in the group

157. The stability of +1 oxidation state among Al, Ga, In and Tl increases in the sequence:
a) Tl < In < Ga < Al b) In < Tl < Ga < Al c) Ga < In < Al < Tl d) Al < Ga < In < Tl

158. Identify the incorrect order of acidic strengths of CO_2, CuO, CaO, H_2O.
a) CaO < CuO < CO_2 < H_2O b) H_2O < CuO < CaO < CO_2 c) CaO < H_2O < CuO < CO_2
d) all of these

159. The first element of the groups 1 and 2 are different from other members of the respective groups. Their behaviour is more similar to the second element of the following groups. What is this relationship known as?

a) Anomalous relationship b) Periodic relationship c) Diagonal relationship
d) Chemical relationship

160. The covalent and van der Waals radii of chlorine respectively are
a) 1.80$\overset{\circ}{A}$ & 0.99$\overset{\circ}{A}$ b) 0.99$\overset{\circ}{A}$ & 1.80$\overset{\circ}{A}$ c) 1.80$\overset{\circ}{A}$ & 1.80$\overset{\circ}{A}$ d) 0.99$\overset{\circ}{A}$ &0.99$\overset{\circ}{A}$

161. The order of which of the following oxides is arranged according to decreasing basic nature?
a) Na_2O, MgO, Al_2O_3, CuO b) CuO, Al_2O_3, MgO, Na_2O c) Na_2O_3, CuO, MgO, Na_2O
d) CuO, MgO, Na_2O, Na_2O_3

162. Law of octaves stated :
a) every eighth element had properties similar to the first element
b) every third element had properties similar to the first element
c) the properties of the middle element were in between the other two members
d) the properties of the elements were repeated after regular intervals of 3, 4 or 8 elements

163. Which of the following orders is not correct for the size?
a) $Al^{3+} < Mg^{2+} < Na^{+} < F^{-}$ b) $Te^{2-} > I^{-} > Cs^{+} > Ba^{2+}$ c) $Fe^{3+} < Fe^{2+} < Fe^{4+}$
d) Mg > Al> Si > P

164. When we go from left to right in a period:
a) the basic nature of the oxides increases b) the basic nature of the oxides decreases
c) there is no regular trend in the nature of oxides
d) oxides of only first two groups are basic in nature.

165. Assertion: Shielding effect increases as we go down the group.
Reason: More is the number of electrons in the penultimate shell, more is the shielding.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.

166. Assertion: Electronegativity is not a measurable quantity.
Reason: The electronegativity of any given element is not constant, it varies depending on the element to which it bound.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.

167. Which of the following statement is incorrect?
a) Oxide of aluminium (Al_2O_3) , and arsenic (AS_2O_3) are amphoteric.
b) Oxide of chlorine (Cl_2O_7) is less acidic than oxide of nitrogen (N_2O_5).
c) Oxide of carbon (CO_2) is more acidic than oxide of silica (SiO_2).
d)
The correct increasing order of basic character of various oxides is H_2O < CuO < MgO < CaO.

168. The electronic configuration of an element is $1s^2$,$2s^2$ $2p^6$, $3s^2$ $3p^3$. What is the atomic number of the element, which is present just below the above element in the periodic table?
a) 33 b) 34 c) 36 d) 49

169. The oxidation state of an element in a particular compound can be defined as
a)
the charge acquired by its atom on the basis of electronegative consideration from other atoms in the molecule
b)
the residual charge acquired by its atom after removing all electronegative atoms from the molecule
c) the valency of the most electronegative atom present in the molecule
d) total number of electrons accepted by an atom to form a molecule.

170. The first ionisation potential (in eV) of Be and B, respectively are
a) 8.29,9.32 b) 9.32,9.32 c) 8.29,8.29 d) 9.32,8.29

171. The correct order of decreasing second ionization enthalpy of Ti (22), V (23), Cr (24) and Mn (25) is :
a) Cr > Mn > V > Ti b) V > Mn > Cr > Ti c) Mn > Cr > Ti > V d) Ti > V > Cr > Mn

172. In the long form of periodic table, elements are arranged in the increasing order of
a) atomic mass b) atomic number c) mass number d) metallic character

173. Which of the following is the correct order of size of the given species?
a) $I > I^- > I^+$ b) $1^+ > I^- > I$ c) $I > I^+ > I^-$ d) $I^- > I > I^+$

174. In which of the following options order of arrangement does not match with the variation of property indicated against it?
a) $A1^{3+} < Mg^{2+} < Na^+ < F^-$ (increasing ionic size)
b) B < C < N < O (increasing first ionisation enthalpy)
c) I < Br < F < CI (increasing electron gain enthalpy)
d) Li < Na < K < Rb (increasing metallic radius)

175. In lanthanides, the differentiating electron enters into:
a) d - subshell b) f - subshell c) P - subshell d) s - subshell

176. A sudden large jump between the values of second and third ionization energies of an element would be associated with which of the following electronic configuration?
a) $1s^2\ 2s^2\ 2p^6\ 3s^1\ 3p^2$ b) $1s^2\ 2s^2\ 2p^6\ 3s^1\ 3p^1$ c) $1s^2\ 2s^2\ 2p^6\ 3s^1$ d) $1s^2\ 2s^2\ 2p^6\ 3s^2$

177. One of the characteristic properties of non-metals is that they
a) are reducing agents b) form basic oxides c) form cations by electron gain
d) are electronegative

178. In which of the following, the order is not in accordance with the property mentioned?
a) Li < Na < K < Rb - Atomic radius b) F > N > O > C - Ionisation enthalpy
c) Si < P < S < CI- Electronegativity d) F < CI < Br < I - Electronegativity

179. Which of the element can make MX type compound (X is the halogen)?
a) P b) Q c) R d) S

180. What is the common property of the oxides CO, NO and N_2O?
a) All are basic oxides. b) All are neutral oxides c) All are amphoteric oxides
d) All are acidic oxides

181. An element belongs to group 17 with atomic number is 17. What is the atomic number of the element belonging to same group and present in fifth period:

a) 25 b) 33 c) 35 d) 53

182. Indicate the wrong statement on the basis of the periodic table.
a) The most electronegative element in the periodic table is fluorine
b) Scandium is the first transition element and belongs to fourth period.
c) There are four transition series in the periodic table each containing 10 elements.
d) Along a period halogens have maximum negative electron gain enthalpy.

183. Which of the following represents the correct order of increasing electron gain enthalpy with negative sign for the elements O, S, F and Cl?
a) Cl < F < O < S b) O < S < F < Cl c) F < S < O < Cl d) S < O < Cl < F

184. The first ionization potential (in eV) of Be and B, respectively are :
a) 8.29, 9.32 b) 9.32, 9.32 c) 8.29, 8.29 d) 9.32, 8.29

185. The correct decreasing order of electropositive character among the following elements is: Fe, Sc, Rb, Br, Te, F, Ca
a) Fe > Sc > Rb > Br > Te > F> Ca b) Ca > Rb > Sc > Fe > Te > F > Br
c) Rb > Ca > Sc > Fe > Br > Te > F d) Rb > Ca > Sc > Fe > Te > Br > F

186. The correct order of negative electron gain enthalpy is:
a) Cl < F b) F < Br c) S < O d) O < F

187. The order of basic character of given oxides is
a) $Na_2O > MgO > CuO > SiO_2$ b) $MgO > SiO_2 > CuO > Na_2O$
c) $SiO_2 > MgO > CuO > Na_2O$ d) $CuO > Na_2O > MgO > SiO_2$

188. The correct order of radii is :
a) N < Be < B b) $Mg^{2+} < Li^{+} < N^{3-}$ c) Na < Li < K d) $Fe^{+3} < Fe^{2+} < Fe^{4+}$

189. Match the atomic numbers given in column I with the block in which the element is placed in column II and mark the appropriate choice.

Column I (Atomic number)		Column II (Block)	
(A)	62	(i)	d - block
(B)	47	(ii)	p - block
(C)	56	(iii)	f - block
(D)	53	(iv)	s - block

a) (A) ⟶ (iii), (B) ⟶ (i), (C) ⟶ (iv), (D) ⟶ (ii) b) (A) ⟶ (i), (B) ⟶ (ii), (C) ⟶ (iii), (D) ⟶ (iv)
c) (A) ⟶ (ii), (B) ⟶ (iv), (C) ⟶ (i), (D) ⟶ (iii) d) (A) ⟶ (iv), (B) ⟶ (i), (C) ⟶ (ii), (D) ⟶ (iii)

190. An element of 5f-series but has no electrons filled in 5f-sub shell:
a) Ac b) Ce c) Th d) U

191. The first (IE_1) and second (IE_2) ionization energies (kJ/mol) of a few elements designated by Roman numerals are given below. Which of these would be an alkali metal?

a)

	IE_1	IE_2
I	2372	5251

b)

	IE_1	IE_2
II	520	7300

c)

	IE_1	IE_2
III	900	1760

d)

	IE_1	IE_2
IV	1680	3380

192. Which of the following will have lowest electron affinity?
a) Nitrogen b) Oxygen c) Argon d) Boron

193. Identify the correct order of the size of the following :
a) $Ca^{2+} < K^{+} < Ar < S^{2-} < cl^{-}$ b) $Ca^{2+} < K^{+} < Ar < cl^{-} < S^{2-}$ c) $Ar < Ca^{2+} < K^{+} < Cl^{-} < S^{2-}$
d) $Ca^{2+} < Ar < K^{+} < Cl^{-} < S^{2-}$

194. The atomic weights of Be were corrected by Mendeleef using the formula:
a) $\sqrt{v}$ =a(Z-b) b) $mvr = \frac{nh}{2\pi}$ c) Atomic weight = Equivalent weight x valency
d) Equivalent weight = Atomic weight x valency

195. Of the following four elements which represents an inert gas?
a) P b) Q c) R d) S

196. Among halogens, the correct order of amount of energy released in electron gain (electron gain enthalpy) is
a) F > Cl > Br > I b) F < Cl < Br < I c) F < Cl > Br > I d) F < Cl < Br > I

197. By taking chemical properties into consideration, the atomic weights of the following elements were corrected
a) Te & I b) Ar & K c) Co & Ni d) Be & In

198. Elements X, Y and Z have atomic numbers 19,37 and 55 respectively. Which of the following statements is true about them?
a) Their ionization potential would increase with increasing atomic number.
b) Y would have an ionization potential between those of X and Z.
c) Z would have the highest ionization potential.
d) Y would have the highest ionization potential.

199. The correct order of atomic radii in group 13 elements is :
a) B < Al < In < Ga < Tl b) B < Al < Ga < In < Tl c) B < Ga < Al < Tl < In
d) B < Ga < Al < In < Tl

200. Which is not a transition metal?
a) Ag b) Pb c) Cr d) Pt

201. Match the column I with column II and mark the appropriate choice.

Column I (Atomic number)		Column II (Period, Group)	
(A)	14	(i)	3, 14
(B)	53	(ii)	5, 2
(C)	38	(iii)	6, 10
(D)	78	(iv)	5, 17

a) (A) ⟶ (ii), (B) ⟶ (iv), (C) ⟶ (iii), (D) ⟶ (i) b) (A)·⟶ (i), (B) ⟶ (iv), (C) ⟶ (ii), (D) ⟶ (iii)
c) (A) ⟶ (iii), (B) ⟶ (ii), (C) ⟶ (i), (D) ⟶ (iv) d) (A) ⟶ (ii), (B) ⟶ (i), (C) ⟶ (iii), (D) ⟶ (iv)

202. 4d, 5p, 5f and 6p orbitals are arranged in the order of decreasing energy. The correct option is:
a) 6p>5f>5p>4d b) 6p>5f>4d>5p c) 5f>6p>4d>5p d) 5f>6p>5p>4d

203. Amongst K, Ca, Fe and Zn the element which can form more than one binary compound with chlorine is
a) Fe b) Zn c) K d) Ca

204. The amount of energy when million atoms of iodine are completely converted into I^- ions in the vapour state according to the equation, $I_{(g)} + e^- \rightarrow I^-_{(g)}$ is 4.9×10^{-13} J. What would be the electron gain enthalpy of iodine in terms of kJ mol^{-1} and eV per atom?
a) 295, 3.06 b) -295, -3.06 c) 439,5.09 d) -356, -7.08

205. Which of the following pairs of ions have the same electronic configuration:
a) Cr^{+3}, Fe^{+3} b) Sc^{+3}, Cr^{+3} c) Fe^{3+}, Co^{+3} d) Fe^{3+}, Mn^{2+}

206. The element which belong to 3rd period and IVA group of periodic table is
a) Silicon b) Carbon c) Germanium d) Tin

207. The lanthanides contraction refers to
a) radius of the series b) valence electrons of the series c) the density of the series
d) electronegativity of the series

208. An ion M^{3+} has electronic configuration $[Ar]3d^{10}4s^2$, Element M belongs to:
a) s-block b) p-block c) d-block d) f-block

209. Fluorine is more electronegative than nitrogen, The best explanation is that
a) The valence electrons in F are on the average, a little farther to the nucleus than in N.
b) The charge on a F nucleus is +9, while that on N nucleus is +7
c)
The nitrogen has half filled valence shell electron configuration, ns-np ' where as fluorine has partially filled electron configuration ns^2np^5
d)
The electronegativity decreases from top to bottom in each of the group as the effective nuclear charge remains constant.

210. The first ionization enthalpies of Na, Mg, Al and Si are in the order
a) NaAl b) Na>Mg>Al>Si c) Na < Mg < Al < Si d) Na > Mg > Al < Si

211. Which one of the following ions will be smallest in size?
a) Na^+ b) Mg^{2+} c) F^- d) O_2^-

212. (A), (B) and (C) are elements in the third short period. Oxide of (A) is ionic, that of (B) is amphoteric and of (C) a giant molecule. (A), (B) and (C) have atomic number in the order:
a) (A) < (B) < (C) b) (C) < (B) < (A) c) (A) < (C) < (B) d) (B) < (A) < (C)

213. Atomic radius depends upon
i) Number of bonds formed by the atom
ii) Nature of the bonding
iii) Oxidation state of the atom
a) i and ii b) ii and iii c) i and iii d) i, ii, iii

214. Which of the following sequence regarding ionisation potential of coinage metal is correct?
a) Cu > Ag > Au b) Cu < Ag < Au c) Cu > Ag < Au d) Ag > Cu

215. The order of screening effect of electrons of s, p, d and f orbitals of a given shell of an atom on its outer shell electrons is:
a) s > p > d >f b) f > d > p > s c) p < d < s < f d) f > p > s > d

216. Electronic configurations of four elements A, B, C and D are given below
(A) $1s^2\ 2s^2\ 2p^6$
(B) $1s^2\ 2s^2\ 2p^4$

(C) $1s^2\ 2s^2\ 2p^6\ 3s^1$

(D) $1s^2\ 2s^2\ 2p^5$

Which of the following is the correct order of increasing tendency to gain electron?

a) A < C < B < D b) A < B < C < D c) D < B < C < A d) D < A < B < C

217. Which of the properties of isotopes of an element is different?

a) First ionisation enthalpy b) Effective nuclear charge c) Electron affinity

d) Melting point and boiling point

218. Which of the following statements regarding an anion is not true?

a) The gain of an electron leads to the formation of an anion.

b) The radius of the anion is larger than the atomic radius of its parent atom.

c) The effective nuclear charge increases when an anion is formed.

d) Electron cloud expands due to increased repulsion among the electrons

219. Atomic numbers of few elements are given below. Which of the pairs belongs to s-block?

a) 7, 14 b) 3, 20 c) 8, 15 d) 9, 17

220. Incorrect statement is

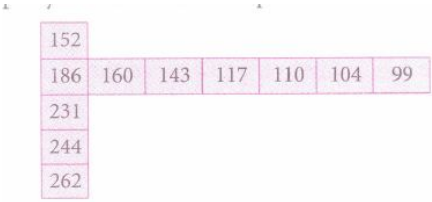
a) Fluorine has the highest electron affinity

b) Greater the nuclear charge, greater is the electron affinity

c) The electron affinity of Nitrogen is positive (energy is absorbed)

d) Chlorine has highest electron affinity

221. Few values are given in the table in the direction from left to right and top to bottom. Predict the property which could be depicted in the table.



152						
186	160	143	117	110	104	99
231						
244						
262						

a) Atomic number b) Ionisation enthalpy c) Atomic radius d) Electron gain enthalpy

222. Four successive members of the first row transition elements are listed below with their atomic numbers. Which one of them is expected to have the highest third ionization enthalpy?

a) Vanadium (Z = 23) b) Chromium (Z = 24) c) Iron (Z = 26) d) Manganese (Z = 25)

223. Ionic radii are

a) inversely proportional to effective nuclear charge

b) inversely proportional to square of effective nuclear charge

c) directly proportional to effective nuclear charge

d) directly proportional to square of effective nuclear charge

224. Two elements X and Y contain only one electron in the outer level. Element X is reactive and loses electron easily while element Y is relatively unreactive and non-corrosive. The elements X and Y respectively ar

a) Cs and Li b) Rb and Na c) Li and Cu d) Ag and Au

225. For the second period elements the correct increasing order of first ionisation enthalpy is:

a) Li < B < Be < C < N < O < F < Ne b) Li < Be < B < C < O < N < F < Ne

c) Li < Be < B < C < N < O < F < Ne d) Li < B < Be < C < O < N < F < Ne

226. What is the name and symbol of the element with atomic number 112?

a) Ununbium, Uub b) Unnilbium, Unb c) Ununnillum, Uun d) Ununtrium, Uut

227. Which of the following oxide is amphoteric?
a) SnO_2 b) Cr_2O_3 c) CrO_3 d) CrO_5

228. Which block of the periodic table contains elements with the general electronic configuration $(n - 2)f^{1-14}$ $(n -1)$ d^{0-1} ns^2?
a) s-block b) p-block c) d-block d) f-block

229. Which of the following statement is/are incorrect about the modern form of periodic table?
a) Third group of periodic table accommodates maximum number of elements
b)
Due to presence of half filled and fully subshells in electronic configuration electronegativity of atom increases
c) The element of 13th group and 7th period will have atomic number 113
d)
Diagonal relationship in 2nd and 3rd period element is found due to similar polarising power.

230. An element with atomic number 117 is known as
a) nihonium b) flerovium c) tennessine d) roentgenium

231. The C-C single bond length is 1.54A° and that of Cl-Cl is 1.98A°. If the elcctroncgativity of Cl and C are 3.0 and 2.5 respectively, the C-Cl bond-length will be equal to
a) 3.12A° b) 1.67A° c) 1.71A° d) 2.12A°

232. Which of the following statement is wrong for the transition elements?
a) Last electron enters in (n-1)d subshell
b) Transition elements are placed from 3rd to 6th period c) Exhibits variable valency
d) General electronic configuration is $(n-1)d^{1-10}ns^{1-2}$

233. Consider the isoelectronic species, Na^+, Mg^{2+}, F^- and O^{2-}. The correct order of increasing length of their radii is
a) $F^- < O^{2-} < Mg^{2+} < Na^+$ b) $Mg^{2+} < Na^+ < F^- < O^{2-}$ c) $O^{2-} < F^- < Na^+ < Mg^{2+}$
d) $O^{2-} < F^- < Mg^{2+} < Na^+$

234. Which of the following statements is correct?
a) Elements of 3d and 4d-series are kept separately in periodic table.
b) Elements of 4f and Sf-series are kept separately in periodic table
c) Elements of 5p and 6p-series are kept separately in periodic table
d) All statements are correct.

235. The atomic radii of transition elements from Cr to Cu are almost equal because
a)
Increased effective nuclear charge is balanced by decreased screening effect of (n-l)d orbitals
b)
Increased effective nuclear charge is balanced by increased screening effect of (n-l)d orbitals

c)
Decreased effective nuclear charge is balanced by increased screening effect of (n-l)d orbitals
d)
Decreased effective nuclear charge is balanced by decreased screening effect of (n-l)d orbitals

236. The statement that is not correct for periodic classification of elements is
a) the properties of elements are periodic function of their atomic numbers
b) non-metallic elements are less in number than metallic elements
c)
for transition elements, the 3d orbitals are filled with electrons after 4p orbitals and before 4s orbitals
d)
the first ionization enthalpies of elements generally increase with increase in atomic number as we go along a period

237. Which one of the elements with the following outer orbital configurations may exhibit largest number of oxidation states?
a) $3d^3, 4s^2$ b) $3d^5, 4s^1$ c) $3d^5, 4s^2$ d) $3d^2, 4s^2$

238. Assertion : Na_2O is basic oxide whereas Cl_2O_7 is acidic oxide.
Reason: Elements on extreme left form basic oxides whereas elements on extreme right form acidic oxides.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.

239. Which of the following is not correct statement for periodic classification of elements?
a) The properties of elements are the periodic functions of their atomic number.
b) Non-metallic elements are less in number than metallic elements.
c) For transition elements, the last electron enters into (n - 2) d-subshell. d) None of these

240. The period in which s-block, p-block and d-block elements are present
a) 1 b) 6 c) 7 d) 3

241. As per the modern periodic law, the physical and chemical properties of elements are in periodic functions of their
a) atomic number b) electronic configuration c) atomic weight d) atomic size

242. Which of the following sets of oxides is amphoteric in nature?
a) Al_2O_3, As_2O_3, ZnO b) CO, NO, N_2O c) SO_3, S_{O2}, Cl_2O_7 d) Na_2O, MgO, BaO

243. Which of the following elements shown as pairs with their atomic numbers belong to the same period?
a) Z = 19 and Z = 38 b) Z = 12 and Z = 17 c) Z = 11 and Z = 21 d) Z = 16 and Z = 35

244. Which of the following order is correct for the size of Fe^{3+}, Fe and Fe^{2+} ?
a) $Fe < Fe^{2+} < Fe^{3+}$ b) $Fe^{2+} < Fe^{3+} < Fe$ c) $Fe < Fe^{3+} < Fe^{2+}$ d) $Fe^{3+} < Fe^{2+} < Fe$

245. Ionization enthalpies of transition metals are

a) intermediate between those of s- and p-block elements b) more than p-block elements
c) highest in all the elements d) lower than s-block elements.

246. The period number in the long form of the periodic table is equal to:
a) magnetic quantum number of any element of the period
b) atomic number of any element of the period
c) maximum principal quantum number of any element of the period
d) maximum azimuthal quantum number of any element of the period.

247. With an increase in the extent of penetration of valence electrons, ionisation energy
a) Decreases b) Increases c) Remains constant d) Both are not related

248. Assertion: Atomic number is a more fundamental property of an element than its atomic mass.
Reason : Atomic number is equal to number of protons in an atom.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.

249. The five successive ionisation energies of the element are 800, 2427, 3658, 25024 and 32824 $kJmol^{-1}$ respectively. The number of valence electrons is
a) 3 b) 5 c) 4 d) 2

250. Which of the following groups contains metals, non-metals and metalloids?
a) Group 17 b) Group 14 c) Group 13 d) Group 12

251. Identify the incorrect match

a)

Name	IUPAC official Name
Unnilunium	Mendelevium

b)

Name	IUPAC official Name
Unniltriurn	Lawrencium

c)

Name	IUPAC official Name
Unnilhexium	Seaborgiurn

d)

Name	IUPAC official Name
Unununnium	Darmstadtium

252. Which one of the following arrangements represents the correct order of electron gain enthalpy (with negative sign) of given atomic species?
a) F < Cl < O < S b) S < O < Cl < F c) O < S < F < Cl d) Cl < F < S < O

253. According to the law of triads:
a) the properties of the middle element were in between those of the other two members
b) three elements arranged according to increasing weights have similar properties
c) the elements can be grouped in the groups of six elements
d) every third element resembles the first element in periodic table.

254. Amongst the elements with following electronic configurations which one of them may have the highest ionization energy
a) $[Ne]3s^2 3p^1$ b) $[Ne]3s^2 3p^3$ c) $[Ne]3s^2 3p^2$ d) $[Ar]3d^{10} 4s^2 4p^3$

255. Assertion: According to Mendeleev, the properties of elements are a periodic function of their atomic weights.
Reason : Mendeleev left the gap under aluminium and a gap under silicon, and called these elements Eka-Aluminium and Eka-Silicon.

a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.

256. $M_{(g)} \rightarrow M^{+}_{(g)} + e^{-}$, $\Delta H = 100eV$; $M_{(g)} \rightarrow M^{2+}_{(g)} + 2e^{-}$, $\Delta H = 250eV$
Which is incorrect statement?
a) I_1 of $M_{(g)}$ is 100 eV b) I_1 of $M^{+}_{(g)}$ is 150 eV c) I_2 of $M_{(g)}$ is 250 eV
d) I_2 of $M_{(g)}$ is 150 eV

257. Predict the formula of stable compound formed by an element with atomic number 114 and fluorine.
a) AF_3 b) AF_2 c) AF d) AF_4

258. The size of the following species increases in the order:
a) $Mg^{2+} < Na^{+} < F^{-} < Al$ b) $Al^{3+} < Mg^{2+} < Na^{+} < F^{-}$ c) $Na^{+} < F^{-} < Al^{3+} < Mg^{2+}$
d) $Na^{+} < Al^{3+} < Mg^{2+} < F^{-}$

259. Which of the following element has the greatest tendency to lose electrons?
a) F b) S c) Fe d) Be

260. An atom has electronic configuration $1s^2 2s^2\ 2p^6 3s^2 3p^6 4s^2$, you will place it in which group?
a) Fifth b) Fifteenth c) Second d) Third

261. Atomic numbers of actinides are
a) 57 to 71 b) 80 to 103 c) 58 to 71 d) 90 to 103

262. The electronic configurations of four elements are given below. Which element does not belong to the same family as others?
a) [Xe] $4f^{14}, 5d^{10}, 6s^2$ b) [Kr] $4d^{10}, 5s^2$ c) [Ne] $3s^2 3p^5$ d) [Ar] $3d^{10}, 4s^2$

263. What is the value of electron gain enthalpy of Na^{+} if IEI of Na = 5.1 eV.
a) -5.1 eV b) -10.2 eV c) +2.55 eV d) +10.2 eV

264. The elements in which electrons are progressively filled in 4f orbital are called
a) actinoids b) transition elements c) lanthanoids d) halogens

265. The ionisation of hydrogen atom would give rise to
a) hydride ion b) hydronium ion c) proton d) hydroxyl ion

266. Which of the following statements is true about the variation of density of elements in the periodic table?
a)
In a period from left to right density first increases upto the middle and then starts decreasing
b) In a group on moving down the density decreases from top to bottom.
c) A less closely packed solid has higher density
d) Density of elements is not a periodic property

267. There are two rows of inner transition elements in the periodic table each containing 14 elements. The reason for this may be
a) f-orbital has seven values for magnetic quantum number, hence total electrons are 14
b) in the periodic table there is space to accommodate 14 electrons only
c) only 28 inner transition elements have been discovered till date
d) 28 is the maximum number of elements that any block can accommodate.

268. An element has 18 electrons in the outer most shell. The element is
a) Transition metal b) Rare earth metal c) Alkaline earth metal d) Alkali metal

269. Which one of the following groups represents a collection of isoelectronic species? (At. nos.: Cs-55, Br-35)
a) Na^+, Ca^{2+}, Mg^{2+} b) $N3^-$, F^-, Na^+ c) Be, $Al3^+$, Cl^- d) Ca^{2+}, Cs^+Br

270. The general electronic configuration of f-block elements is
a) $(n - 2)f^{1-14}(n - 1)d^{0-1}ns^2$ b) ns^2 $(n-l)d^{0-1}$ $(n-2)f^{l-14}$ c) ns^2 nd^{0-1} nf^{l-14}
d) ns^2 $(n-l)d^{0-1}$ $(n-l)f^{1-14}$

271. What is the correct order of successive ionisation enthalpies?
a) $IE_{III} > IE_{II} > IE_I$ b) $IE_I > IE_{II} > IE_{III}$ c) $IE_{II} > IE_I > IE_{III}$ d) $IE_{III} > IE_I > IE_{II}$

272. The formation of the oxide ion $O^{2-}(g)$, from oxygen atom requires first an exothermic and then an endothermic step as shown below?
$$\mathrm{O}(g) + e^- \rightarrow \mathrm{O}^-(g); \Delta_f \mathrm{H}^\Theta = -141 \text{ kJ mol}^{-1}$$
$$\mathrm{O}^-(g) + e^- \rightarrow \mathrm{O}^{2-}(g); \Delta_f \mathrm{H}^\Theta = +780 \text{ kJ mol}^{-1}$$
Thus process of formation of O2 in gas phase is unfavorable even though O^{2-} is isoelectronic with neon. It is due to the fact that
a) Electron repulsion outweighs the stability gained by achieving noble gas configuration
b) O- ion has comparatively smaller size than oxygen atom
c) Oxygen is more electronegative
d) Addition of electron in oxygen results in larger size of the ion.

273. If electro negativity of x be 3.2 and that of y be 2.2, the percentage ionic character of xy is
a) 19.5 b) 18.5 c) 9.5 d) 29.5

274. Electronegativity values for elements are useful in predicting:
a) bond energy of a molecule b) polarity of a molecule c) nature of an oxide d) All

275. As we move from left to right, the electronegativity increases. An atom which is highly electronegative has
a) large size b) low electron affinity c) high ionisation enthalpy
d) low chemical reactivity.

276. The 4f-subshell is successively filled for
a) Rare earths b) Rare gases c) Transition metals d) Alkaline earth metals

277. Among the following which electron of Fe atom experience minimum attraction from nucleus? (Atomic number of Fe = 26).
a) 3d b) 4s c) 2s d) 2p

278. Why is the electron gain enthalpy of O or F less than that of S or Cl?
a) O and F are more electronegative than Sand Cl.
b)
When an electron is added to O or F, it goes to a smaller (n = 2) level and suffers more repulsion than the electron in S or Cl in larger level (n = 3).
c) Adding an electron to 3p-orbital leads to more repulsion than 2p-orbital.
d) Electron gain enthalpy depends upon the electron affinity of the atom.

279. Which of the following statement is correct ?

a) Metallic radius refer to metals only and is greater than covalent radius

b) Metallic radius refer to metals only and is smaller than covalent radius

c)

Generally covalent radius refer to non-metals as well as metals in bonded state (covalent bond).

d)

Atomic radii of noble gases are expressed as van der Waal's radii which are smaller than metallic radii.

280. Which of the following is not isoelectronic series?

a) Cl^-, P^{3-}, Ar b) N^{3-}, Ne, Mg^{2+} c) B^{3+}, He, Li^+ d) N^{3-}, S^{2-}, Cl^-

281. The species Ar, K^+ and Ca^{2+} contain the same number of electrons. In which order do their radii increase?

a) Ca^{2+} + b) $Ca^{2+} < K^+ <$ Ar c) K^+2+ d) Ar+2+

282. What is the formula of ionic compound if electronic configurations of outermost shell of X = ns^2 and Y = ns^2np^3?

a) X_3Y_2 b) X_3Y c) XY_2 d) XY

283. Aqueous solutions of two compounds M-O-H and M' -O-H have been prepared in two different beakers. If the electronegativity of M = 3.5, M' = 1.72, O = 3.0 and H = 2.1, then the solutions respectively are

a) acidic, acidic b) acidic, basic c) basic, basic d) basic, acidic.

284. The electronic configuration of few elements is given below. Mark the statement which is not correct about these elements.

(i) $1s^2\ 2s^2\ 2p^6\ 3s^1$

(ii) $1s^2\ 2s^2\ 2p^5$

(iii) $1s^2\ 2s^2\ 2p^6$

(iv)$1s^2\ 2s^2\ 2p^3$

a) (i) is an alkali metal. b) (iii) is a noble metal c) (i) and (ii) form ionic compounds

d) (iv) has high ionisation enthalpy

285. What is common between given cations and anions, O^{2-}, F^-, Na^+, Mg^{2+}, Al^{3+}?

a) All have same ionic radii. b) All are isoelectronic species having 10 electrons.

c) All of them belong to the third period. d) The nature of oxides of all the ions is basic

286. Correct order of I^{st} ionization potential (IP) among following elements Be, B, C, N, O is :

a) B < Be < C < O < N b) B < Be < C < N < O c) Be < B < C < N < O

d) Be < B < C < O < N

287. Electronic configuration of four elements is given below. Which of the following does not belong to the same group?

a) $[Kr]4d^{10}\ 5s^2$ b) [Ar] $3d^{10}\ 4S^2$ c) $[Xe]4f^{14}\ 5d^{10}\ 6s^2$ d) [Xe] $5p^6\ 6s^2$

288. Select correct statement :

a)

Across a transition series (from Cr to Cu), there is only a small decrease in atomic radius from one element to another due to very small increase in effective nuclear charge

b)

The rate of decrease in the size across the lanthanide series is less than the across the first transition series

c) Both are correct statements d) None of the statement is correct

289. Which of the following transitions will involve maximum amount of energy?

a) $M \rightarrow M^{+}+e^{-}$ b) $M^{-} \rightarrow M^{+}+2e^{-}$ c) $M^{2+} \rightarrow M^{3+}+e^{-}$ d) $M^{+} \rightarrow M^{2+}+e^{-}$

290. Assertion: The chemistry of the early actinoids is more complicated than the corresponding lanthanoids.

Reason: Outer electronic configuration of actinoids is $(n - 2)f^{1-14}\ (n - 1)d^{0-1}\ ns^{2}$.

a) If both assertion and reason are false.

b) If both assertion and reason are true and reason is the correct explanation of assertion.

c) If both assertion and reason are true but reason is not the correct explanation of assertion.

d) If assertion is true but reason is false.

291. The period to which an element belongs to in the long form of periodic table represents

a) atomic mass b) atomic number c) principal quantum number

d) azimuthal quantum number

292. 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+}

293. Which of the following statements related to the modem periodic table is incorrect?

a) The p-block has 6 vertical columns, i.e., groups b) The d-block has 8 vertical columns

c)

Each block contains a number of columns equal to the number of electrons that can occupy that subshell

d)

The block indicates value of azimuthal quantum number (l) for the last subshell that received electrons in building up the electronic configuration

294. Predict the formula of a compound formed by aluminium and sulphur.

a) Al_2S_2 b) Al_3S_2 c) Al_2S3 d) AlS

295. Match the column I with column II and mark the appropriate choice.

Column I		Column II	
(A)	3d-transition series	(i)	Z = 58 to Z = 71
(B)	Lanthanoid series	(ii)	Z = 39 to Z = 48
(C)	Actinoid series	(iii)	Z = 21 to Z = 30
(D)	4d-transition series	(iv)	Z = 90 to Z = 103

a) (A) ⟶ (i), (B) ⟶ (ii), (C) ⟶ (iii), (D) ⟶ (iv) b) (A) ⟶ (ii), (B) ⟶ (iii), (C) ⟶ (iv), (D) ⟶ (i)

c) (A) ⟶ (iii), (B) ⟶ (i), (C) ⟶ (iv), (D) ⟶ (ii) d) (A) ⟶ (iv), (B) ⟶ (iii), ⟶ (C) (i), (D) ⟶ (ii)

296. The correct order of acidic character of oxides in third period of periodic table is

a) $SiO_2 < P_4O_{10} < SO_3 < Cl_2O_7$ b) $Cl_2O_7 < SO_3 < P_4O_{10} < SiO_2$
c) $SO_3 < Cl_2O_7 < P_4O_{10} < SiO_2$ d) $SiO_2 < Cl_2O_7 < P_4O_{10} < SiO_2$

297. Among the elements A, B, C and D having atomic numbers 9, 10, 11 and 12 respectively the correct order of ionisation energies is
a) A > B > C > D b) B > A> D > C c) B > A> C > D d) D > C > B > A

298. Which of the following is the wrong statement?
a) All the actinide element are radioactive
b) Alkali and alkaline earth metals are s-block elements
c) Chalcogens and halogens are p-block elements
d) The first member of the lanthanide series is lanthanum

299. Which is the most non-metallic element among the following
a) $1s^2\ 2s^2\ 2p^6\ 3s^1$ b) $1s^2\ 2s^2\ 2p^5$ c) $1s^2\ 2s^2\ 2p^6\ 3s^2$ d) $1s^2\ 2s^2\ 2p^3$

300. Which of the following elements will have highest second ionisation enthalpy?
a) $1s^2\ 2s^2\ 2p^6\ 3s^2$ b) $1s^2\ 2s^2\ 2p^6\ 3s^1$ c) $1s^2\ 2s^2\ 2p^6\ 3s^2 3p^2$ d) $1s^2\ 2s^2\ 2p^6\ 3s^2 3p^3$

301. Why do noble gases have positive electron gain enthalpy?
a) It is difficult to add an electron due to small size
b) It is difficult to add an electron due to high electronegativity
c) It is difficult to add an electron due to stable configuration
d) It is difficult to add an electron due to high electron affinity

302. The number of elements present in 2nd, 3rd, 4th and 5th periods of modem periodic table respectively are:
a) 2, 8, 8 & 18 b) 8, 8, 18 & 32 c) 8, 8, 18 & 18 d) 8, 18, 18 & 32

303. Mercury is the only metal which is liquid at 0°c. This is due to its:
a) high ionisation energy and weak metallic bond
b) Low ionisation potential and high electrogativity c) High atomic mass and small size
d) High electronegativity and low ionisation potential

304. 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

305. In a period of representative elements, the decrease in ionic radius when compared with the corresponding decrease in atomic radius
a) is equal b) is less c) is more d) Cannot be predicted

306. Thallium shows different oxidation states due to:
a) of its high reactivity b) of inert pair of electrons c) of its amphoteric nature
d) its is a transition metal

307. Two elements A and B have the following electronic configurations. The formula of the compound formed between them can be A = $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^1$: B = $1s^2\ 2s^2\ 2p^4$
a) AB b) AB_2 c) A_2B_3 d) A_3B_2

308. The period that includes all blocks of elements is
a) 1 b) 2 c) 6 d) 7

309. Correct statement among the following is:
a) Covalent radius is 40% more than Van der waals radius
b) Van der waals radius is less than covalent radius

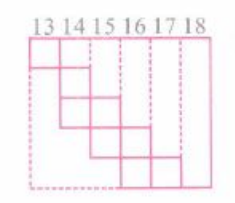
c) Van der waal's radius is 40% more than covalent radius d) Radii cannot be compared

310. Which of the following series of elements have nearly the same atomic radii?
a) F, Cl, Br, I b) Na, K, Rb, Cs c) Li, Be, B, C d) Fe, Co, Ni, Cu

311. If an element 'X' is assumed to have the types of radii, then their order is
a) Crystal radius> Van der waals radius> Covalent radius
b) van der waals radius > Crystal radius > Covalent radius
c) Covalent radius > Crystal radius > van der waals radius
d) Van der waals radius > Covalent radius > Crystal radius

312. Examples of elements belonging to s,p,d or f-block are given below. Identify the wrong example.
a) s-block element - Caesium b) p-block element - Barium
c) d-block element - Chromium d) f-block element - Thorium

313. Part of the periodic table showing p-block is depicted below. What are the elements shown in the zig-zag boxes called? What is the nature of the elements outside this boundary on the right side of the table?



a) Transition elements, metalloids b) Metalloids, non-metals c) Metals, non-metals
d) Non-metals, noble gases

314. Element with atomic number 52 belongs to
a) s-block b) p-block c) d-block d) f-block

315. The electronic configuration of gadolinium (atomic number 64) is
a) [Xe] $4f^3\ 5d^5\ 6s^2$ b) [Xe] $4f^7\ 5d^2\ 6s^1$ c) [Xe] $4f^7\ 5d^1\ 6s^2$ d) [Xe] $4f^8\ 5d^6\ 6s^2$

316. Which of the following statements is true?
a) Silicon exhibits 4 coordinates number in its compounds
b) Bond energy of F_2 is less than Cl_2
c) Mn (III) oxidation state is more stable than Mn (II) in aqueous state
d) Elements of 15th group shows only +1 and +5 oxidation states

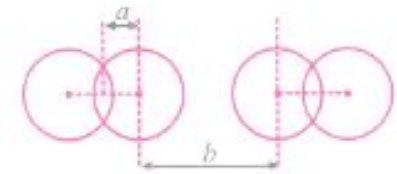
317. Which of the following order is wrong?
a) $NH_3 < PH_3 < AsH_3$ - Acidic b) Li < Be < B < C - First IP
c) $Al_2O_3 < MgO < Na_2O < K_2O$ - Basic d) $Li^+ < Na^+ < K^+ < Cs^+$ - Ionic radius

318. Assertion: Oxidation state of oxygen in OF_2 and Na_2O is +2 and -2 respectively.
Reason: Oxygen is an electronegative element
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.

319. An element 'X' belongs to fourth period and fifteenth group of the periodic table. Which one of the following is true regarding the outer electronic configuration of 'X'?

a) It has partially filled d-orbitals and completely filled s-orbitals.
b) It has completely filled s-orbitals and completely filled p-orbitals.
c) It has completely filled s-orbitals and halffilled p-orbitals.
d) It has half-filled d-orbitals and completely filled s-orbitals.

320. What are the two radii shown as 'a' and 'b' in the figure known as



a) a = Atomic radius, b = Molecular radius
b) a = Covalent radius, b = van der Waals' radius c) a = Ionic radius, b = Covalent radius
d) a = Covalent radius, b = Atomic radius

321. Which of the following order(s) is/are incorrect?
a) $O^{2-} < F^{-} < Na^{+} < Mg^{2+}$ Increasing $Z_{effective}$ b) $Mg^{2+} < Na^{+} < O^{2-} < F^{-}$ Increasing size
c) $O^{2-} < F^{-} < Na^{+} < Mg^{2+}$ Increasing ionisation energy
d) $O^{2-} < F^{-} < Na^{+} < Mg^{2+}$ Increasing electron affinity

322. Gd (64) has_____ unpaired electrons with sum of spin_____
a) 7. 3.5 b) 8, 3 c) 6, 3 d) 8, 4

323. Which of the following orders of ionic radii is correctly represented?
a) $H^{-} > H^{+} > H$ b) $Na^{+} > F^{-} > O^{2-}$ c) $F^{-} > O^{2-} > Na^{+}$ d) all are wrong

324. In the long form of periodic table, the non-metals are placed in
a) s-block b) p-block c) d-block d) f-block

325. The electronic configuration of four elements are given below. Which element does not belong to the same family as others
a) [xe] $4f^{14},5d^{10},6s^{2}$ b) [Kr] $4d^{10},5s^{2}$ c) [Ne] $3s^{2},3p^{5}$ d) [Ar] $3d^{10},4s^{2}$

326. Which of the following is arranged in order of increasing metallic character?
a) P < Si < Na < Be < Mg b) Be < Mg < P < Na < Si c) Si < Be > Mg < Na < P
d) P < Si < Be < Mg < Na

327. Atomic radius is measured by
a) Mulliken oil drop method b) Rutherford's a-ray scattering experiment
c) X-ray diffraction technique d) Electric discharge tube experiment

328. Assertion: For the element O or F, the electron gain enthalpy is less negative than that of the succeeding element.
Reason: Electron gain enthalpy becomes less negative as we go down a group.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.

329. Which element exhibit inert pair effect
a) Pb b) Al c) Tl d) both a and c

330. Configuration that does not denote a transition element
a) $3d^{1}\ 4s^{2}$ b) $3d^{10}\ 4s^{1}$ c) $3d^{10}\ 4s^{2}\ 4p^{2}$ d) $3d^{8}\ 4s^{2}$

331. Inert gas element which has a different valence shell configuration
a) Xe b) Ne c) Kr d) He

332. Which one of the following arrangements represents the correct order of electron gain enthalpy (with negative sign) of the given atomic species?
a) Cl < F < S < O b) O < S < F < Cl c) S < O < Cl < F d) F < Cl < O < S

333. Which of the following is true about the element $_{33}As$?
a) It is the 5th period element b) It is p-block element c) It belongs to 16th group
d) It is the member of VIA group

334. Which of the following order of atomic/ionic radius is not correct?
a) $I^- > I > I^+$ b) $Mg^{+2} > Na^+ > F^-$ c) $p^{5+} < p^{3+}$ d) Li > Be > B

335. IP_1 and IP_2 of Mg are 178 and 348 kcal $mole^{-1}$. The energy required for the reaction. $Mg \rightarrow Mg^{2+} + 2e^-$ is :
a) + 170 kcal/mol b) +526 kcal/mol c) -170 kcal/mol d) -526 kcal/mol

336. There are many elements in the periodic table which exhibit variable valency. This is a particular characteristic of:
a) representative elements b) transition elements c) noble gases d) non-metals.

337. K^+ and Cl^- ions are isoelectronic. Which of the statements is not correct?
a) Both K^+ and Cl^- ions contain 18 electrons.
b) Both K^+ and cl^- ions have same configuration.
c) K^+ ion is bigger than Cl^- ion in ionic size. d) Cl^- ion is bigger than K^+ ion in ionic size.

338. In which of the following orders the ionic radii is correctly represented?
a) $H^- > H^+ > H$ b) $Na^+ > F^- > O^{2-}$ c) $F^- > O^{2-} > Na^+$ d) None of these

339. The correct order of electron affinity of the elements of oxygen family in the periodic table is
a) O > S > Se b) S > O > Se c) S > Se > O d) Se > O > S

340. Arrange the isotopes of hydrogen in correct order of ionisation potential:
a) D = T = P b) D>T>P c) D < T < P d) D < T > P

341. Assertion: The atomic size generally increases across a period and decreases down the group.
Reason: Atomic size depends upon valence shell electronic configuration.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.

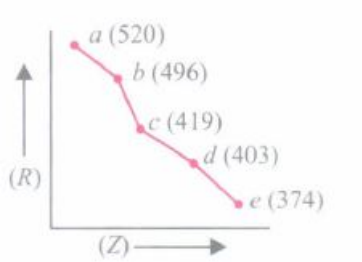
342. In which of the following options the order of arrangement does not agree with the variation of properties indicated against it?
a) B < C < N < 0 (increasing first ionisation enthalpy)
b) I < Br < Cl < F (increasing electron gain enthalpy)
c) Li < Na < K < Rb (increasing metallic radius)
d) $Al^{3+} < Mg^2 + < Na^+ < F^-$ (increasing ionic size)

343. Among the elements with atomic numbers 9, 12, 16 and 36 which is highly electropositive?
a) Element with atomic number 9 b) Element with atomic number 12
c) Element with atomic number 16 d) Element with atomic number 36

344. Which of the following represents correct order of electron affinity?
a) Cl > F > S > O b) F > O > S > Cl c) F > Cl > S > O d) Cl > S > O > F

345. Among chalcogens electron affinity is highest for
a) O b) S c) Se d) Te

346. In the given graph, a periodic property (R) is plotted against atomic numbers (Z) of the elements. Which property is shown in the graph andhow it is correlated with reactivity of the elements?



a) Ionisation enthalpy in a group, reactivity decreases from a -7 e.
b) Ionisation enthalpy in a group, reactivity increases from a -7 e.
c) Atomic radius in a group, reactivity decreases from a -7 e.
d) Metallic character in a group, reactivity increases from a -7 e.

347. First and second ionization enthalpies (in kJ/mol) of few elements are given below:

Element	IE_1	IE_2
(i)	520	980
(ii)	900	1760
(iii)	1680	3380
(iv)	2080	3963

Which of the above elements will form halides with formula MX_2?
a) (i) and (ii) b) (i) and (iii) c) (ii) and (iii) d) (i) and (iv)

348. The plot of $\sqrt{v}$ vs Z is
a) Straight line b) Exponential curve c) Hyperbolic d) Curve with -ve slope

349. Second ionisation potential of oxygen is:
a) Equal to that of fluorine b) Less than that of fluorine c) Greater than that of fluorine
d) Half of that of fluorine

350. The electronic configuration $1s^2 2s^2 2p^6 3s^2 3p^4$ represents
a) Oxygen b) Magnesium c) Calcium d) Sulphur

351. In the periodic table, the elements are arranged in the periods following the
a) Hund's rule of maximum multiplicity b) Pauli's exclusion principle c) Aufbau principle
d) Both (1) and (2)

352. In general, the configuration of lanthanides is $(n - 2)f^{1-14}(n - 1)s^2p^6d^{0-1}ns^2$. It has been observed that, with increase in atomic number of lanthanides, there is a gradual decrease in ionic radii from La($1.22A^0$) to Lu($0.99A^0$). The reason for decrease in ionic radii is an increase in
a) Electronegative character b) Valency electrons and number of shells
c) Atomic and ionic volumes
d) Nuclear attraction for valence electrons leading to inward shrinking of shell

353. The amount of energy released when 10^6 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?
a) 2.0 b) 2.5 c) 2.75 d) 3.0

354. Astatine is a radioactive halogen. It is a solid at room temperature because
a) of greater van der Waal's force of attraction between large atoms of astatine
b) of less van der Waal's force of attraction between large atoms of astatine
c) of less van der Waal's force of attraction between small atoms of astatine
d) it shows non-metallic characters

355. Assertion: Boron can only form $[BF_4]^-$ whereas aluminium forms $[AlF_6]^{3-}$.
Reason:The first member of a group of elements in the s- and p- blocks shows anomalous behaviour.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.

356. Ionic radius in a group while moving down?
a) remains same from top to bottom b) decreases from top to bottom
c) increases from top to bottom d) first increases and then decreases

357. In which of the following element +3 oxidation state is more stable than +5?
a) Pb b) Al c) Tl d) Bi

358. An element has atomic number 79. Predict the group and period in which the element is placed.
a) 2^{nd} group, 7^{th} period b) 11^{th} group, 6^{th} period c) 13^{th} group, 6^{th} period
d) 12^{th} group, 6^{th} period

359. Select correct statement(s) about radius of an atom
a)
values of van der Waal's radii are larger than those of covalent radii because the van der waal's forces are much weaker than the forces operating between atoms in covalently bonded molecule
b)
the metallic radii are smaller than the van der waal's radii, since the bonding forces in the metallic crystal lattice are much stronger than the vander waal's forces.
c) both are correct d) none is correct

360. The more basic oxide is
a) CaO b) MgO c) K_2O d) Na_2O

361. Metallic radius of Ca is 200 pm. Covalent radius of Ca is:
a) 200 pm b) 230 pm c) 280 pm d) 174 pm

362. Which one of the following ionic species has the greatest proton affinity to form stable compound?
a) NH_2^- b) F^- c) I^- d) HS^-

363. The characteristic properties of transition elements are due to
a) Unpaired electrons in d-sub shell b) d-orbitals have five fold degeneracy
c) Presence of 2 nodal planes for d-orbital d) Because they belong to d-block

364. To which group, an element with atomic number 88 will belong?
a) Group 12 b) Group 17 c) Group 10 d) Group 2

365. The ionization enthalpies of Li and Na are 520 kJ mol^{-1} and 495 kJ mol^{-l} respectively. The energy required to convert all the atoms present in 7 mg of Li vapours and 23 mg of sodium vapours of their respective gaseous cations respectively are
a) 52 J, 49.5 J b) 520 J, 495 J c) 49.5 J, 52 J d) 495 J, 520 J

366. Which of the following is true regarding inert pair effect
a) due to poor shielding of p orbital b) due to poor shielding of d & f orbital
c) due to poor shielding of s orbital d) due to poor shielding of s & p orbital

367. In the periodic table from left to right in a period, the atomic volume :
a) decreases b) increases c) remains same d) first decreases then increases

368. Assertion: On moving down the group, ionization enthalpy decreases.
Reason: With decrease in size of the atom, the force of attraction between the nucleus and valence electrons decreases.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.

369. In which of the following arrangements, the order is correct according to the property indicated against it :
a) increasing IE_1 : Na< Al < Mg < Si b) increasing $I.E_1$: B < C < N < O
c) increasing size : $Cu^{2+} < Cu < Cu^{+}$ d) increasing IE_1 : Li < Na < K < Rb

370. Arange Ce^{3+}, La^{3+}, Pm^{3+} and Yb^{3+} in increasing order of their size
a) $Yb^{3+} < Pm^{3+} < Ce^{3+} < La^{3+}$ b) $Ce^{3+} < Yb^{3+} < Pm^{3+} < La^{3+}$ c) $Yb^{3+} < Pm^{3+} < La^{3+} < Ce^{3+}$
d) $Pm^{3+} < La^{3+} < ce^{3+} < Yb^{3+}$