Miscellaneous Exercise Question Bank

1. 4th shell of atom contains $4s$, $4p$, $4d$ and $4f$ subshell, which subshells are not filled in any 4th period element?

(A) $4p$, $4d$, $4f$ (B) $4s$, $4p$ (C) $4p$, $4f$ (D) $4d$, $4f$

2. Mulliken scale of electronegativity uses the concept of:

(A) E.A. and EN of Pauling scale   (B) E.A. and atomic size

(C) E.A. and IP   (D) E.A. and bond energy

3. The pair with minimum difference in electronegativity is:

(A) F, Cl   (B) C, H   (C) P, H   (D) Na, Cs

4. Ionisation enthalpy and electron affinity of fluorine are $17.42\,eV$ and $3.45\,eV$ respectively. Calculate the electronegativity of fluorine on Pauling scale.

5. In the periodic table, the metallic character of element:

(A) decreases from left to right across a period and on descending a group

(B) decreases from left to right across a period and increases on descending a group

(C) increases from left to right across a period and on descending a group

(D) increases from left to right across a period and decreases on descending a group

6. The chemistry of lithium is very similar to that of magnesium even though they are placed in different groups. Its reason is that:

(A) both are found together in nature

(B) both have nearly the same size

(C) both have similar electronic configurations

(D) the ratio of their charge to size is nearly the same

7. Which of the following will be the most hydrated salt ?

(A) NaCl   (B) $MgCl_2$ (C) $AlCl_3$ (D) $SiCl_4$

8. The electronegativities of the following elements, H,O,F, S and Cl increase in the order:

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

(C) H < S < O < Cl < F   (D) H < S < Cl < O < F

9. The covalent and van der Waals'radii of hydrogen respectively are:

(A) 0.37Å, 0.8Å   (B) 0.37 Å, 0.37Å   (C) 0.8 Å, 0.8Å   (D) 0.8 Å, 0.37Å

10. From the given set of species, point out the species from each set having the least atomic radius:

(P) O^{2-}, F^-, Na^+ (Q) Ni, Cu, Zn   (R) Li, Be, Mg   (S) He, Li^+, H^-

CORRECT answer is:

(A) O^{2-}, Cu, Li, H^- (B) Na^+, Ni, Be, Li^+ (C) F^-, Zn, Mg, He   (D) N^{3-}, Ne, Mg^{2+}

11. An element M has an atomic number 9 and atomic mass 19. Its ion will be represented by :

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

12. Select which is CORRECT representation for diagonal relationships in periodic table.

(A)
Li	Be	B	C
Na	Mg	Al	Si

(B)
Na	Mg	Al	Si
K	Ca	Ga	Ge

(C)
Li	Be	B	C
Na	Mg	Al	Si

(D)
Na	Mg	Al	Si
K	Ca	Sc	Ti

13. Which inert gas have same configuration in outer shell and penultimate shell?

(A) He   **(B)** Ne   **(C)** Ar   **(D)** Kr

14. Which will have the maximum value of electron affinity O^x, O^y and O^z (x, y and z are 0, −1 and −2) respectively ?

(A) O^x **(B)** O^y **(C)** O^z **(D)** All have equal

15. If the atomic number of an element is 58, it will be placed in the periodic table in the :

(A) III B-group and 6th period   **(B)** IV B-group and 6th period

(C) V B-group and 7th period   **(D)** None of these

16. An element belongs to 3rd period and group-13 of the periodic table. Which of the following properties will be shown by the element ?

(A) Good conductor of electricity   **(B)** Liquid, metallic

(C) Solid, metallic   **(D)** Solid, non-metallic

17. Which of the following elements can show covalency greater than 4 ?

(A) Be   **(B)** P   **(C)** S   **(D)** B

18. Assign TRUE (T) or FALSE (F) for following statements and select CORRECT option for you answer.

(I) I.P. of $O_{(g)}$ is less than I.P. of $O_{(g)}^-$ **(II)** I.P. of $Ne_{(g)}$ is greater than I.P. of $Ne_{(g)}^+$

(III) E.A. of $O_{(g)}^+$ is greater than E.A. of $O_{(g)}$ **(IV)** I.P. of $N_{(g)}$ is greater than I.P. of $N_{(g)}^+$

(A) F,F,T,F   **(D)** T,T,T,T   **(C)** T,T,T,F   **(D)** F,T,F,T
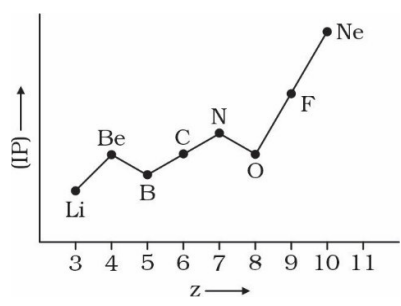
19. The electronic configuration of four elements are:

(i) $\left[Xe\right]6s^2$ **(ii)** $\left[Xe\right]4f^{14}5d^16s^2$

(iii) $\left[Ar\right]3d^{10}4s^24p^5$ **(iv)** $\left[Ar\right]3d^74s^2$

Which one of the following statements about these elements is **NOT TURE**?

(A) (i) is a strong reducing agent

(B) (ii) is a d-block element

(C) (iii) has high negative electron gain enthalpy

(D) (iv) show variable oxidation states

20. In the third period Na to Cl seven elements are called:

(A) lanthanides   **(B)** typical elements

**(C)** halogen elements   **(D)** metalloids

21. Zinc does not show the variable oxidation states as other elements of *d*-block, because:

(A) this is soft metal **(B)** its *d*-orbital is full

(C) its melting point is low **(D)** it is volatile metal

*22. The properties which are common to both groups 1 and 17 elements in the periodic table are :

(A) metallic character increases down the groups

(B) reactivity decreases from top to bottom in groups

(C) atomic radii increases as the atomic number increases

(D) electronegativity decreases on moving down a group

23. In which case, the maximum energy is needed in the formation of monopositive gaseous ion?

(A) 1 mole of Li atoms **(B)** 1 mole of Na atoms

(C) 1 mole of Cs atoms **(D)** 1 mole of Be atoms

24. In which orbital does an electron in a phosphorus atom experience the greatest effective nuclear charge?

(A) 1s **(B)** 2s **(C)** 2p **(D)** 3s

25. The **CORRECT** order of stability of Al^+, Al^{2+}, Al^{3+} is:

(A) $Al^{3+} > Al^{2+} > Al^+$ **(B)** $Al^{2+} > Al^{3+} > Al^+$

(C) $Al^{2+} < Al^+ > Al^{3+}$ **(D)** $Al^{3+} > Al^+ > Al^{2+}$

26. In the following electronic configuration;

$$ns^2(n-1)d^{0-1}(n-2)f^{1-14}$$

If value of $(n-1) = 6$ the configuration will be of :

(A) Lanthanides **(B)** d-block **(C)** Actinides **(D)** s-block

27. Following graph shows variation of ionisation potential (IP) with atomic number in second period (Li – Ne). Value of ionisation potential (IP) of Na(11) will be :

(A) above Ne **(B)** below Ne but above O

(C) below Li **(D)** between N and O

*28. Select the **CORRECT** statement(s)

(A) Sulphur has a lower electron affinity than chlorine

(B) Iodine has a lower electron affinity than bromine

(C) Boron has a lower Ist ionisation energy than beryllium

(D) Sulphur has a lower Ist ionisation energy than phosphorus

*29. Which is (are) correct among the following ?

(A) Radius of Cl^- ion is 1.56Å, while that of Na^+ ion is 0.95Å

(B) Radius of Cl atom is 0.99 while that of Na atom is 1.54

(C) The radius of Cl atom is 0.95, while that of Cl^- ion is 0.81

(D) Radius of Na atom is 0.95, while that of Na^+ ion is 1.54

*30. Assign the position of the element having outer electronic configuration,

(i) $A = ns^2np^2$ $(n = 6)$

(ii) $B = (n-1)d^2ns^2$ $(n = 4)$

(iii) $C = (n-2)f^7(n-1)d^1ns^2$ $(n = 6)$

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

(A) The element 'A' belong to 3rd period and 16th group

(B) The element 'B' belong to 4th period and 4th group

(C) The element 'C' belong to 6th period and 3rd group and is lanthanide element.

(D) All three elements A, B and C are metals

*31. Which of the following statement(s) regarding periodlic properties is/are incorrect?

(A) Alkali metals have highest I.E. in respective period

(B) Noble gas have highest I.E. in respective period

(C) First electron affinity of nitrogen is less than oxygen

(D) F atom has smallest radius in periodic table

*32. Which of the following properties among halogens (X) decrease(s) from fluorine to iodine?

(A) Electronegativity   **(B)** Bond energy of X_2

(C) Ionisation energy   **(D)** Electron affinity

*33. Mark the correct statements out of the following:

(A) He has the highest $I.E._1$ in the periodic table

(B) Cl has the highest E.A. out of all the elements in the periodic table

(C) Hg and Br are liquid at room temperature

(D) In any period, the atomic radius of the noble gas is lowest

*34. Which of the following statements concerning elements with atomic number 10 is true?

(A) It forms a covalent network solid

(B) Element is monoatomic

(C) It has a almost zero value of electronegativity

(D) It has extremely high value of ionization energy

*35. Which of the following pairs of elements have same number of electrons in their outermost shell?

(A) Mn, Fe   **(B)** Na, Sr   **(C)** As, Bi   **(D)** Se, Te

*36. The elements which are radioactive and have been named after the names of planets are:

(A) Hg   **(B)** Np   **(C)** Pu   **(D)** Ra

*37. Consider the following representation based on long form of periodic table.

Here P, Q, R and S are up, right, down and left elements with respect to the central element 'X' respectively. According to above representation the correct match is/are:

	X	P	Q	R	S
(A)	Ge	Si	As	Sn	Ga
(B)	Te	Se	I	Po	Sb
(C)	Sb	As	Te	Bi	Sn
(D)	In	Ga	Sn	Tl	Cd

	P	
S	X	Q
	R	
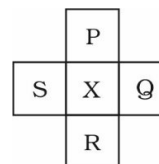
*38. Which of the following match is/are correct regarding B, Al, C and S elements?

(A) The highest first ionisation enthalpy : C

(B) The largest atomic size : Al

(C) the most negative electron gain enthalpy : C

(D) The most metallic character : Al

Paragraph for Question No. 39 - 41

Nuclear charge actually experienced by an electron is termed as effective nuclear charge. The effective nuclear charge Z^* actually depends on type of shell and orbital in which electron is actually present. The relative extent to which the various orbitals penetrate the electron clouds of other orbitals is $s > p > d > f$ (for the same value of n) The phenomenon in which penultimate shell electrons act as screen or shield in between nucleus and valence shell electrons and thereby reducing nuclear charge is known as shielding effect. The penultimate shell electrons repel the valence shell electron to keep them loosely held with nucleus. It is thus evident that more is the shielding effect, lesser is the effective nuclear charge and lesser is the ionization energy.

39. Which of the following valence electron experience maximum effective nuclear charge?

(A) $4s^1$ **(B)** $4p^1$ **(C)** $3d^1$ **(D)** $2p^3$

40. Which of the following is not concerned to effective nuclear charge?

(A) Higher ionization potential of carbon than boron

(B) Higher ionization potential of magnesium than aluminium

(C) Higher values of successive ionization energy

(D) Higher electronegativity of higher oxidation state

41. s-orbital is more penetrating because :

(A) Probability of finding electron is maximum on the surface of nucleus

(B) s-orbital is non-directional

(C) s-orbital is spherical in shape

(D) All of these

Paragraph for question no. 42 - 44

The I.E.$_1$, and the I.E.$_2$ in kJ mol^{-1} of a few elements designated by P, Q, R, S are shown below:

Atom	I.E.$_1$	I.E.$_2$
P	2372	5251
Q	520	7300
R	900	1760
S	1680	3380

Based on the above information, answer the following questions:

42. Which of the element is likely to be reactive metal?

    (A) P   **(B)** Q   **(C)** R   **(D)** S

43. Which of the elements is likely to be reactive non-metal?

    (A) P   **(B)** Q   **(C)** R   **(D)** S

44. Which represents a noble gas?

    (A) P   **(B)** Q   **(C)** R   **(D)** S

Paragraph for Question No. 45 - 47

J.C. Slater proposed an empirical constant that represents the cumulative extent to which the other electrons of an atom shield (or screen) any particular electron from the nuclear charge. Thus, Slater's screening constant σ is used as : $Z^* = Z - \sigma$

Here, z is the atomic number of the atom, and hence is equal to the actual number of protons in the atom. The parameter Z* is the effective nuclear charge, which according to is smaller than Z, since the electron in question is screened (shielded) from Z by an amount σ. We found that in cases for which screening is small, the effective nuclear charge Z* is large. Conversely, an electron that is well shielded from the nuclear charge Z experiences a small effective nuclear charge Z*.

The value of σ for any one electron in a given electron configuration (i.e., in the presence of the other electrons of the atom in question) is calculated using a set of empirical rules developed by Slater. According to these rules, the value of σ for the electron in question is the cumulative total provided by the various other electrons of the atom.

Calculation of value of σ for s and p electron,

- Electrons within the same group shield 0.35 (except for 1s which is 0.30)
- Electrons within the (n – 1) group shield 0.85
- Electrons within the (n – 2) group or lower groups shield 1.00

Calculation of value of σ for nd and nf valence electrons

- Electrons within the same group shield 0.35
- Electrons within the lower groups shield 1.00

45. The effective nuclear charge at the periphery of chromium atom [Z = 24]:

    (A) 4.25   **(B)** 2.60   **(C)** 3.60   **(D)** 1.21

46. Which of the following statement is correct?

(A) A 4s-orbital is filled earlier than a 3d-orbital because, Z* for 3d > Z* for 4s.

(B) A 4s-orbital is filled earlier than a 3d-orbital because, Z* for 4s > Z* for 3d

(C) The effective nuclear charge for 3d- and 4s-orbitals are same, but energy of 3d-orbital becomes higher

(D) The effective nuclear charge for 3d and 4s-orbitals are same, but energy of 4s-orbital becomes higher.

47. According to Slater's rule, order of effective nuclear charge (Z*) for last electron in case of Li, Na and K.

(A) Li > Na > K   **(B)** K > Na > Li   **(C)** Na > Li > K   **(D)** K = Na > Li

Paragraph for Question No. 48 - 53

There are nine elements A to I. These are belongs to p-block element other than halogen. If atomic number of B is average of atomic number of A and C and atomic number of E is average of atomic number of D and F and atomic number of H is average of atomic number of G and I. Atomic numbers of B, E and H are 7, 15 and 83 respectively and atomic numbers of C, I and F are greater than A, G and D respectively.
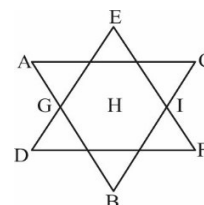
48. The incorrect order is:

(A) F > E: Second ionisation energy   **(B)** C > B: Z_{eff} on valence shell

(C) I > H: First ionisation energy   **(D)** C > F > E: Electronegativity

49. The correct statement is:

(A) +5 oxidation state of H is more stable than its +3 oxidation state.

(B) G^{2+} is better oxidizing agent than G^{4+}

(C) +3 oxidation state of E is more stable than its +5 oxidation state

(D) ionisation energy of G is greater than that of "Tin"

50. Which of the following statement is incorrect?

(A) B_2C_5 is acidic in nature   **(B)** AC_2 is acidic in nature

(C) FC_3 is basic in nature   **(D)** GC_2 is amphoteric in nature

51. Choose the correct statement :

(A) Isotope have nearly same chemical properties

(B) Isoelectronic species may be Neutral

(C) Na and K have nearly same $Z_{effective}$

(D) All of these

52. Electronegativity of an element is 1.0 on the Pauling scale. Its value on Mullikenscale :

(A) 2.8   **(B)** 1   **(C)** 2.0   **(D)** 1.5

53. 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) $f < d < p < s$ **(B)** $s = p = d = f$ **(C)** $s < p < d < f$ **(D)** $p > s > d > f$

Paragraph for Question No. 54 - 56

Consider the following representation based on long form of periodic table.

Value of all four quantum number for last electron of element 'X' in their ground state is $n = 4$, $l = 1$, $m = 1$ and $s = -\dfrac{1}{2}$ and spin multiplicity of element 'X' in their ground state is 4.

A		U	V	W
B		T		
C	D	X	S	R
		E		O
H	G	F		P

54. Which of the following order is incorrect?

(A) Magnetic moment : U > V > A

(B) Atomic radius : E > X > T

(C) Ionisation energy : R > X > B

(D) Stability : $F^{3+} < E^{3+} < X^{3+}$

55. The correct order is:

(A) Ionisation energy of V > ionisation energy of U

(B) Electron affinity of X > electron affinity of S

(C) Electron affinity of X > electron affinity of D

(D) $\left|\Delta H_{EGE}\right|$ of T $> \left|\Delta H_{EGE}\right|$ of U

56. Which of the following statement is incorrect?

(A) Element P is radioactive

(B) Elements B and C have their almost similar size

(C) Element G is more stable in +4 oxidation state

(D) Element G has electron with $n = 4$, $l = 3$, $m = 0$ and EA_2 quantum numbers

57. 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) $p > s > d > f$

58. For a non-metal 'A' IE_5 of $A^+(g)$ is equal to IE_a of $A^{3+}(g)$. Which is the value of 'a' ?

59. Which of the following atoms has the highest first ionization energy?

(A) Na (B) K (C) Sc (D) Rb

*60. $3p_x$ orbital and $4p_x$ orbital of an atom have same :
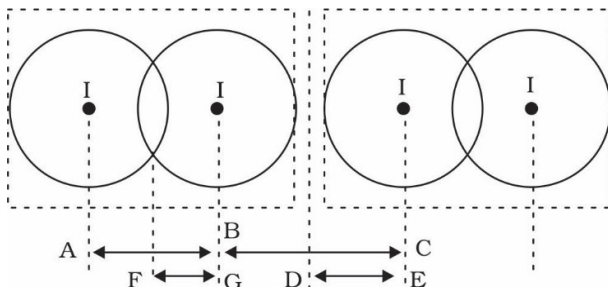
(A) Total nodes (B) Energy (C) Angular nodes (D) Shape

Paragraph for Question No. 61 - 63

I_2 is a crystalline solid. It is a molecular solid in which I_2 molecules are held together with van der Waal's forces. Given diagram represent two adjacent I_2 molecules in I_2 solid

If A-C length = 6.96 Å and covalent radius of iodine is = 1.33Å

61. Find van der Waal's radius of I atom.

    (A) 4.30 Å   **(B)** 2.15 Å   **(C)** 2.66 Å   **(D)** 1.33 Å

62. Which of the following data is smaller as compared to 1.33 Å ?

    (A) Bond length of I–I   **(B)** Size of I^- ion

    (C) Size of Xe atom   **(D)** Size of I^+ ion

63. "A–B" and "D–E" length represent respectively:

    (A) I_2 bond length; van der Waals' radius of I

    (B) covalent radius of I; van der Waals' radius of I

    (C) I_2 bond length; ionic radius of I^-

    (D) Ionic radius of I^+ ; ionic radius of I^-

64. Match the column:

	Column-I		Column-II
(A)	X (atomic number = 52)	**(P)**	Inner-transition element
(B)	Y (atomic number = 57)	**(Q)**	Representative element
(C)	Z (atomic number = 48)	**(R)**	Non-transition element
		(S)	d-block element

65. Match the column:

	Column-I		Column-II
(A)	Increasing order of I.E.	**(P)**	F < O < S < Se
(B)	Increasing order of electron affinity	**(Q)**	O < N < F < Ne
(C)	Increasing order of atomic size	**(R)**	Na < Mg < Al < Si
		(S)	$O^{2-} < O^- < O < O^+$

66. Match the column:

	Column-I		Column-II
(A)	F > Cl > Br > I	**(P)**	Ionisation energy
(B)	$Fe^{3+} > Fe^{2+} > Fe$	**(Q)**	Size
(C)	$I^- > I > I^+$	**(R)**	Magnitude of ΔH_{eg}
(D)	O > C > B > N	**(S)**	Effective nuclear charge

67. Match the column:

	Column-I			Column-II
	$(IE)_1$	$(IE)_2$		
(A)	2372	5251	**(P)**	More reactive metal
(B)	520	7300	**(Q)**	Reactive non-metal
(C)	900	1760	**(R)**	Noble gas
(D)	1680	3380	**(S)**	Metal forms a stable binary halide of the formula AX_2

68. Match the column:

	Column-I (atomic number of element)		Column-II (IUPAC name)
(A)	105	**(P)**	Uun
(B)	107	**(Q)**	Uns
(C)	109	**(R)**	Unp
(D)	110	**(S)**	Une

69. Match the column:

	Column-I (atomic number)		Column-II (position in the periodic table)
(A)	52	**(P)**	s-block
(B)	56	**(Q)**	p-block
(C)	57	**(R)**	d-block
(D)	60	**(S)**	f-block

70. Match the column:

	Column-I (type of elements)		Column-II (outer electronic configuration)
(A)	Inert gas elements	**(P)**	ns^{1-2} to $ns^2 np^5$
(B)	Representative elements	**(Q)**	$1s^2$ and $ns^2 np^6$
(C)	Transition elements	**(R)**	$(n-2)f^{1-14}(n-1)d^{1\text{ or }0}ns^2$
(D)	Inner transition elements	**(S)**	$(n-1)d^{1-10}ns^{1\text{ or }2}$

71. Match the column:

	Column-I (elements)		Column-II (periodic properties)
(A)	F	**(P)**	Maximum ionization energy
(B)	Cl	**(Q)**	Maximum electronegativity
(C)	Fe	**(R)**	Maximum electron affinity
(D)	He	**(S)**	Variable oxidation state

72. Match the column:

	Column-I		Column-II
(A)	Fullerene	**(P)**	Actinoids
(B)	Promethium	**(Q)**	Lewis base
(C)	Water	**(R)**	Allotrope
(D)	Lawrencium	**(S)**	Lanthanoids

73. Match the column:

	Column-I		Column-II
(A)	$1s^2, 2s^2 2p^6, 3s^2 3p^1$	**(P)**	Largest $(I.E.)_1$
(B)	$1s^2, 2s^2 2p^6, 3s^2 3p^5$	**(Q)**	Largest $(I.E.)_4$
(C)	$1s^2, 2s^2 2p^6, 3s^2 3p^6, 4s^1$	**(R)**	Largest $(I.E.)_3$
(D)	$1s^2, 2s^2 2p^6, 3s^2 3p^6$	**(S)**	Lowest $(I.E.)_1$
		(T)	Largest $(I.E.)_2$

74. Match the column:

	Column-I		Column-II
	Elements (Electrons in K, L, M, N...)		**(Statements)**
(A)	W (2, 8, 7)	**(P)**	Paramagnetic
(B)	X (2, 8, 18, 8)	**(Q)**	3rd ground element
(C)	Y (2, 8, 14, 2)	**(R)**	Last electron does not enter to valence shell
(D)	Z (2, 8, 18, 25, 8, 2)	**(S)**	Reactive non-metal
		(T)	Diamagnetic

75. Calculate the electronegativity of carbon from following data :

$E_{H-H} = 104.2$ kcal mol^{-1}. $E_{C-C} = 83.1$ kcal mol^{-1}, $E_{H-C} = 98.8$ kcal mol^{-1}. (Given $\chi_H = 2.1$)

Assertion Reason Type Questions

These questions consist of two statements each, printed as assertion and reason, while answering these questions are required to choose any one of the following responses.

(A) If both assertion and reason are true and the 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 the reason is false

(D) If assertion is false but the reason is true

76. **Assertion :** In CsF salt, size of Cs^+ is slight higher than size of F^-.

   Reason : Cs^+ is largest monoatomic cation F^- is smallest anion.

77. **Assertion :** First electron affinity of all elements is negative.

   Reason : Successive electron affinity of all elements is negative.

78. **Assertion :** F^- ion has highest hydrated radius among the other halide ions.

   Reason : Ionic radius of F^- is smallest among anion.

79. **Assertion :** Magnitude of electron gain enthalpy oxygen is less than that of fluorine but greater than that of nitrogen.

   Reason : Ionisation enthalpy order is as follows : N > O < F.

80. **Assertion :** Formation of Cl^- ion is exothermic whereas O^{2-} ion formation is endothermic.

   Reason : EA_2 of oxygen is endothermic and greater than its exothermic EA_1 value.

81. **Assertion :** The electron gain enthalpy of N is +ve while that P is –ve.

    Reason : Smaller atomic number of N in which there is a considerable electron-electron repulsion andhence the additional electron is not accepted easily.

82. **Assertion :** The formation of $F^-(g)$ from $F(g)$ is exothermic, whereas that of $O^{2-}(g)$ from $O(g)$ is endothermic.

    Reason : The addition of second electron to a monovalent anion is difficult because both have the same charge and experience more repulsion.

83. **Assertion :** Na^+ and Al^{3+} are isoelectronic but ionic radius Al^{3+} is less than that of Na^+.

    Reason : The magnitude of effective nuclear charge on the outershell electrons in Al^{3+} is greater than that in Na^+.

84. **Assertion :** The third period contains only 8 electrons and not 18 like 4th period.

    Reason : In III period filling starts from $3s^1$ and complete at $3p^6$ whereas in IV period it starts from $4s^1$ and complete after $3d^{10}$.

85. **Assertion :** Cs and F_2 combines violently to form CsF.

    Reason : Cs is most electropositive and F is most electronegative.

86. **Assertion :** Second E.A. for halogens is almost zero.

    Reason : Fluorine has maximum value of electron affinity.

87. **Assertion :** F atom has less electron affinity than Cl atom.

    Reason : Additional electrons are repelled more strongly by 3p electrons in Cl atom than by 2p electrons in F atom.

88. **Assertion :** The first ionization energy of Be is greater than that of B.

    Reason : 2p-orbital is lower in energy than 2s-orbital.

89. **Assertion :** Noble gases have highest ionization enthalpies in their respective periods.

    Reason : Noble gases have stable closed shell electronic configuration.

90. **Assertion :** Helium and beryllium have similar outer electronic configuration of the type ns^2.

    Reason : Both are chemically inert.

91. **Assertion :** The first ionization enthalpy of aluminium is lower than that of magnesium.

    Reason : Ionic radius of aluminium cation is smaller than that of magnesium cation.

92. The number of electrons for Zn^{2+} cation that have the value of azimuthal quantum number = 0 is:

93. Which oxide is more basic, MgO or BaO? Why?

94. Among the elements of the third period (Na to Air), pick out the element:

    1. with the highest first ionization enthalpy
    2. with the largest atomic radius
    3. that is the most reactive non-metal
    4. that is the most reactive metal

95. The first (IE_1) and the second (IE_2) ionization enthalpies (kJ mol^{-1}) of a few elements designated by Roman numerals are shown below :

Element	IE_1	IE_2
I.	2372	5251
II.	520	7300
III.	900	1760
IV.	1680	3380

Which of the above elements is likely to be a,

1. reactive metal   2. reactive non-metal   3. noble gas

4. metal that forms a stable binary halide of the formula AX_2 (X = halogen)

96. Find out total number of representative elements in the given elements:
Cd, Nb, Ta, Te, Ra, Mo, Po, Pd, Tc

97. An element 'X' has its electronic configuration of 'K' shell in $(n-5)s^2$ and the total number of electrons in its outermost, penultimate and antepenultimate shell are 2, 8 and 25 respectively, then find out total number of unpaired electrons in element 'X' in their ground state.

98. If value of spin quantum number(s) = $-1/2$, 0, $+1/2$ then calculate number of groups in the new form of periodic table if all other rules of electronic configurations are remain same.

99. How many pairs are, in which first species has lower ionisation energy than second species :

(i) N and O   (ii) Br and K   (iii) Be and B   (iv) I and I$^-$

(v) Li and Li$^+$ (vi) O and S   (vii) Ba and Sr

100. Total number of element(s) which have only single oxidation state (other than zero) in their corresponding stable compounds: Cs, Ba, F, Zn, Be, Al, Sr, Ga, Pb