Tagore Sr. Sec.School

Max Time : 3 hr **Class : 11th Chemistry** **Max Marks : 70**

Mid Term Exam

Section – A **[1 X 23 = 23]**

Q.1 Which of the following remains unchanged on descending a group in the periodic table \
a) Valence electrons b) Atomic size c) Density d) Metallic character

Q.2 Screening effect is not observed in
a) He^+ b) Li^{2+} c) Be^{3+} d) in all the three

Q.3 Covalent radius of nitrogen is 70 pm. Hence covalent radius of boron is about
a) 60 pm b) 110 pm c) 50 pm d) 40 pm

Q.4 The first ionization potential (eV) of Be and B respectively are
a) 8·29, 9·32 b) 9·32, 8·29 c) 9·32, 9·32 d) 8·29, 8·29

Q.5 The ionic radii of isoelectronic species N^{3-} , O^{2-} and F^- in Å are in the order :
a) 1·36 , 1·40 , 1·71 b) 1·36 , 1·71 , 1·40 c) 1·71 , 1·40 , 1·36 d) 1·71 , 1·36 , 1·40

Q.6 Which pair of atomic numbers represents s-block elements ?
a) 7, 15 b) 6, 12 c) 9, 17 d) 4, 12

Q.7 Which one of the following represents smallest quantity
a) 1850 ng b) 1.85×10^{-4} g c) $1.85 \times 10^{3}\ \mu g$ d) 1.85×10^{-6} kg

Q.8 How many moles of electrons weigh one kilogram ?
a) 6.022×10^{23} b) $\frac{1}{9.108} \times 10^{31}$ c) $\frac{6.023}{9.108} \times 10^{54}$ d) $\frac{1}{9.108 \times 6.023} \times 10^{8}$

Q.9 Number of moles in 1 cm^3 gas at NTP are
a) 4.46 b) 44.6 c) 446 d) 4460

Q.10 If n = 3 , l = 0 , m = 0 then atomic number is :
a) 12 , 13 b) 13 , 14 c) 10 , 11 d) 11 , 12

Q.11 The electronic configuration : $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^9$, represents a :
a) Metal atom b) Non-metal atom c) Non-metallic anion d) Metallic cation

Q.12 Which of the following transitions will have minimum wavelength ?
a) $n_4 \rightarrow n_1$ b) $n_2 \rightarrow n_1$ c) $n_4 \rightarrow n_2$ d) $n_3 \rightarrow n_1$

Q.13 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) $O^{2-} < F^- < Mg^{2+} < Na^+$

Q.14 Which of the following is not an actinoids ?
a) Curium (Z = 96) b) Californium (Z = 98) c) Uranium (Z = 92) d) Terbium (Z = 65)

Q.15 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

Q.16 The first ionization enthalpies of Na, Mg, Al and Si are in the order :
a) Na < Mg > Al < Si b) Na > Mg > Al > Si c) Na < Mg < Al < Si d) Na > Mg > Al < Si

Q.17 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] $4f^8\ 5d^6\ 6s^2$

Q.18 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

Q.19 The general outer electronic configuration of transition metal is:

a) $ns^2\ nd^{1-10}$ b) $ns^2\ np^1\ (n-1)d^{1-10}$ c) $ns^2\ np^6\ (n-1)d^{1-10}$ d) $ns^{0-2}\ (n-1)d^{1-10}$

Q.20 Element with valence shell electronic configuration as $(n-1)d^5\ ns^1$ is placed

a) 1, s-block b) 16, s-block c) 7, s-block d) 6, s-block

Q.21 The element with atomic number 113 has recently been discovered. Its electronic configuration is similar to that of

a) Si b) Ga c) Bi d) At

Q.22 An element with atomic number 106 has been discovered recently. Which of the following electronic configurations will it possess ?

a) $[Rn]\ 5f^{14}\ 6d^4\ 7s^2$ b) $[Rn]\ 5f^{14}\ 6d^4\ 7s^1$ c) $[Rn]\ 5f^{14}\ 6d^4\ 7s^0$ d) $[Rn]\ 5f^{14}\ 6d^4\ 7s^2\ 7p^3$

Q.23 Atoms of the elements belonging to the same group of periodic table will have

a) same number of protons b) same number of electrons in the valence shell

c) same number of neutrons d) same number of electrons

Integer Type Questions [1 x 6 = 6]

DIRECTIONS : The answer to each of the following questions in a single digit integer, ranging from 0 to 9. If the correct answers to the question numbers A, B, C and D (say) are 4, 0, 9 and 2 respectively, then the correct darkening of bubbles should be as shown on the side :

A	B	C	D	E	F
①	①	①	①	①	①
②	②	②	②	②	②
③	③	③	③	③	③
④	④	④	④	④	④
⑤	⑤	⑤	⑤	⑤	⑤
⑥	⑥	⑥	⑥	⑥	⑥
⑦	⑦	⑦	⑦	⑦	⑦
⑧	⑧	⑧	⑧	⑧	⑧
⑨	⑨	⑨	⑨	⑨	⑨

Q.1 How many periods are present in the long form of the periodic table?

Q.2 The number of groups which constitute p-block elements is/are.

Q.3 How many of the following elements are s-block elements?
Rb , Al , B , K , S, Cd , Zn , Th , Sr.

Q.4 How many series of elements constitute of f-block elements?

Q.5 On the Pauling scale, the electronegativity of fluorine is.

Q.6 Total number of elements present in the 2nd short period is.

Comprehension Type Questions [1 x 6 = 6]

Comprehension: Periodic properties show a regular gradation on moving from left to right in a period or from top to bottom in a group. Down a group, the atomic/ionic radii, metallic character and reducing character increase while ionization enthalpy and electronegativity decrease. Along a period from left to right, atomic/ionic radii, metallic character decrease while ionization enthalpy, electronegativity, non-metallic character and oxidizing power increase. However, electron gain enthalpy become less negative down the group but more negative along a period. In contrast, inert gases have positive electron gain enthalpies which do not show any regular trend.

Q.1 If the ionic radii of K^+ and F^- are about 1.34 Å each, then the expected values of atomic radii of K and F should be respectively :

a) 2.31 & 0.64 Å b) 2.31 & 1.34 Å c) 0.64 & 2.31 Å d) 1.34 & 1.34 Å

Q.2 Which of the following isoelectronic ions has the lowest first ionization enthalpy ?

a) K^+ b) Ca^{2+} c) Cl^- d) S^{2-}

Q.3 The outermost electronic configuration of the most electronegative element is

a) $ns^2\ np^3$ b) $ns^2\ np^4$ c) $ns^2\ np^5$ d) $ns^2\ np^6$

Q.4 Amongst the following elements (whose electronic configurations are given below), the one having the highest ionization enthalpy is :

a) $[Ne]\ 3s^2\ 3p^1$ b) $[Ne]\ 3s^2\ 3p^3$ c) $[Ne]\ 3s^2\ 3p^2$ d) $[Ar]\ 3d^{10}\ 4s^2\ 4p^3$

Q.5 Tick the correct order of second ionization enthalpy in the following :

a) F > O > N > C b) O > F > N > C c) O > N > F > C d) C > N > O > F

Q.6 The incorrect statement among the following is :

a) The first ionization potential of Al is less than the first ionization potential of Mg.

b) The second ionization potential of Mg is greater than the second ionization potential of Na.

c) The first ionization potential of Na is less than the first ionization potential of Mg.

d) The third ionization potential of Mg is greater than the third ionization potential of Al.

Section – B [2 X 4 = 8]

Q.1 What will be the wavelength of a ball of mass 0.1 kg by moving with a velocity of 10 m/s?

Q.2 Write two points of difference between orbit and orbital.

Q.3 Define Molarity and Normality?

Q.4 Define isoelectronic with example.

Section – C [3 X 4 = 12]

Q.1 Explain electronegativity and write two factors on which it depends.

Q.2 The kinetic energy of an electron is 5×10^{-5} ev. Calculate the wavelength of the wave associated with the electrons. The mass of the electrons may be taken as 10^{-30} kg.

Q.3 Calculate the mass of (i) 0.1 mole of KNO_3 (ii) 1×10^{23} molecules of methane (iii) 112 cm^3 of hydrogen at STP.

Q.4 Give the electronic configuration of the following elements :

(a) Cu^{2+} (b) Cr^{3+} (c) Fe^{2+} (d) H^- (e) Fe^{3+} (f) S^{2-}

Or

Which atoms are indicates by the following configurations : (a) [He] $2s^1$ (b) [Ne] $3s^2\ 3p^3$ (c) [Ar] $4s^2\ 3d^1$

Section – D [5 X 3 = 15]

Q.1 (a) Calculate the wave length of an electron moving with velocity of 2.05×10^7 m/s.

(b) An ion with mass number 37 possesses one unit of negative charge. If the ion contains 11.1 % more neutrons than the electrons, find the symbol of the ion.

Q.2 (a) Explain Ionisation enthalpy and write 2 factors on which it depends.

(b) The first ($\Delta_i H_1$) and the second ($\Delta_i H_2$) ionization enthalpies (KJ mol^{-1}) of a few elements designated by Roman numerals are shown below:

Elements	$\Delta_i H_1$	$\Delta_i H_2$
I	2372	3251
II	520	7300
III	900	1760
IV	1680	3380

Which of the above elements is likely to be: (a) a reactive metal (b) a reactive non – metal

(c) a noble gas (d) a metal that forms a stable binary halide of the formula AX_2 (X = halogen).

Q.3 (a) A compound containing sodium, sulphur, hydrogen and oxygen gave the following results on analysis:

Na = 14.28% S = 9.92% and H = 6.20%

Calculate the molecular formula of the anhydrous compound. If all the atoms of hydrogen in the compound are present in combination with oxygen as water of crystallization, what is the structure of the crystalline salt? The molecular mass of the crystalline salt is 322.

(b) Calculate the mass of iron which will be converted into its oxide (Fe_3O_4) by the action of 18 g steam on it.