CHEMISTRY

BOOKS - SURA CHEMISTRY (TAMIL ENGLISH)

PERIODIC CLASSIFICATION OF ELEMENTS

I Evaluation Choose The Best Answer

1. What would be the IUPAC name for an element with atomic number 222 ?

A. bibibiium

B. bididium

C. didibium

D. bibibium

Answer: d

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2. The electronic configuration of the elements A and B are $1s^2, 2s^2, 2p^6, 3s^2$ and $1s^2, 2s^2, 2p^5$ respectively . The formula of the ionic compound that can be formed between these elements is

A. AB

B. AB_2

C. A_2B

D. none of the above.

Answer: b

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3. The group of elements in which the differentiating electron enters the anti penultimate shell of atoms are called

A. p- block elements

B. d- block elements

C. s- block elements

D. f- block elements

Answer: d

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4. In which of the follwing options the orders of arrangement does not agree with the variation of property indicated against it ?

A. $I < Br < Cl < F$ (increasing electron gain enthalpy)

B. $Li < Na < K < Rb$ (increasing metaillic radius)

C. $F^- < Na^+ < Mg^{2+} < Al^{3+}$

(increasing ionic size)

D. $B < C < O < N$ (increasing first ionisation enthalpy)

Answer: a

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5. Which of the following elements will have the highest electronegativity ?

A. Chlorine

B. Nitrogen

C. Cesium

D. Fluorine

Answer: d

6. In the third period the first ionization potential is of the order.

A. $Na > Al > Mg > Si > P$

B. $Na < Al < Mg < Si < P$

C. $Mg > Na > Si > P > Al$

D. $Na > Al > Mg < Si < P$

Answer: b

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7. Identify the wrong statement.

A. Amongst the isoelectronic species , smaller the positive charge on cation , smaller is the ionic radius

B. Amongst isoelectric 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.

Answer: a

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8. Which one of the following arrangements represent the correct order of least negative to most negative electron gain enthalpy

A. $Al < O < C < Ca < F$

B. $Al < Ca < O < C < F$

C. $C < F < O < Al < Ca$

D. $Ca < Al < C < O < F$

Answer: d

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9. The correct order of electron gain enthalphy with negative sigh of F, Cl , Br and I having atomic number 9,17 ,35 and 53 respectively is

A. $I > Br > Cl > F$

B. $F > Cl > Br > I$

C. $Cl > F > Br > I$

D. $Br > I > Cl > F$

Answer: c

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10. Which one of the following is the least electronegative element ?

A. Bromine

B. Chlorine

C. Iodine

D. Hydrogen

Answer: d

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11. The element with positive electron gain enthalphy is

A. Hydrogen

B. Sodium

C. Argon

D. Fluorine

Answer: c

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12. The correct order of decreasing electronegativity values among the elements

X,Y,Z and A with atomic numbers 4,8,7 and 12 respectively

A. $Y > Z > X > A$

B. $Z > A > Y > X$

C. $X > Y > Z > A$

D. $X > Y > A > Z$

Answer: a

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13. Assertion : Helium has the highest value of ionisation energy among all the elements known

Reason : Helium has the highest value of electron affinity among all the elements known

A. Both assertion - and reason are true and reason is correct eplanation for the assertion

B. Both assertion and reason are true but the reason is not the correct explanation for the assertion

C. Assertion is true and the reason is false

D. Both assertion and the reason are false

Answer: c

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14. The electronic configuration of the atom having maximum difference in first and second ionisation energies is

A. $1s^2, 2s^2, 2p^6, 3s^1$

B. $1s^2, 2s^2, 2p^6, 3s^2$

C. $1s^2, 2s^2, 2p^6, 3s^2, 3p^6 4s^1$

D. $1s^2, 2s^2, 2p^6, 3s^2, 3p^1$

Answer: a

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15. Which of the following is second most electronegative element ?

A. Chlorine

B. Fluorine

C. Oxygen

D. Sulphur

Answer: c

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16. IE_1 and IE_2 of Mg are 179 and 348 kcal mol^{-1} respectively . The energy required for the reaction $\text{Mg} \rightarrow \text{Mg}^{2+} + 2e^-$ is

A. $+169 \text{ kcal mol}^{-1}$

B. $-169 \text{ kcal mol}^{-1}$

C. $+527 \text{ kcal mol}^{-1}$

D. $-527 \text{ kcal mol}^{-1}$

Answer: c

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17. In a given shell the order of screening effect is

A. $s > p > d > f$

B. $s > p > f > d$

C. $f > d > p > s$

D. $f > p > s > d$

Answer: a

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18. Which of the following orders of ionic radii is correct ?

A. $H^+ > H^- > H$

B. $Na^+ > F^- > O^{2-}$

C. $F^- > O^{2-} > Na^+$

D. None of these

Answer: d

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19. The First ionisation potential of Na ,Mg and Si are 496 , 737 and 786 $\mathrm{kj\ mol^{-1}}$ respectively . The ionisation potential of Al will be closer to

A. $760\mathrm{kj\ mol^{-1}}$

B. $575\mathrm{kJ\ mol^{-}}$

C. $801\mathrm{kJ\ mol^{-1}}$

D. $419\mathrm{kJ\ mol^{-1}}$

Answer: b

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20. Which one of the following is true about metallic character when we move from left to right in a period and top to bottom in a group?

A. Decreases in a period and increases along the group

B. Increases in a period and decreases in a group

C. Increases both in the period and the group

D. Decreases both in the period and in the group

Answer: a

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21. How does electron affinity change when we move from left to right in a period in the periodic table ?

A. Generally increases

B. Generally decreases

C. Remains unchanged

D. First increases and then decreases

Answer: a

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22. Which of the following pairs of elements exhibit diagonal relationship ?

A. Be and Mg

B. Li and Be

C. Be and B

D. Be and Al

Answer: d

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Ii Write Brief Answer To The Following Questions

1. Define modern periodic law.

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2. What are isoelectronic ions ? Give examples.

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3. What is effective nuclear charge ?

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4. Is the definition given below for ionisation enthalphy correct ?

Ionisation enthalpy is defined as the energy required to remove the most loosely bound electron from the valence shell of an atom

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5. Magnesium loses electrons successively to form Mg^{+}, Mg^{2+} and Mg^{3+} ions . Which step will have the highest ionisation energy and why ?

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6. Define electronegativity .

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7. How would you explain the fact that the second ionisation potential is always higher than first ionisation potential ?

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8. Successive ionization energy values increase Why ?

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9. Energy of an electron in the ground state of the hydrogen atom is $-2.18 \times 10 \times 10^{-18}$J. Calculate the ionisation enthalpy of atomic hydrogen in terms of $kJ\text{mol}^{-1}$,

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10. The electronic configuration of atom is one of the important factor which affects the value of ionisation potential and electron gain enthalpy.

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11. In what period and group will an element with Z=118 will be present?

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12. Justify that the fifth period of the periodic table should have 18 elements on the basis of quantum numbers.

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13. Elements a,b,c and d have the following electronic configurations:

$a: 1s^2, 2s^2, 2p^6$

$b: 1s^2, 2s^2, 2p^6, 3s^2, 3p^1$

$c: 1s^2, 2s^2, 2p^6, 3s^2, 3p^6$

$d: 1s^2, 2s^2, 2s^1$

Which elements among these will belong to the same group of periodic table.

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14. Give the general electronic configuration of lanthanides and actides?

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15. Why halogens act as oxidising agents?

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16. Mention any two anomalous properties of second period elements.

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17. Explain the pauling method for the determination os ionic radius.

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18. Explain the periodic trend of ionisation potential.

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19. Explain the diagonal relationship

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20. Why the first ionisation enthalphy of sodium is lower than that of magnesium while

its second ionisation enthlpy is higher than that of magnesium ?

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21. By using paulings method calculate the ionic radii of K^+ and Cl^- ions in the potassium chloride crystal . Given that $d_{K^+ - Cl^-} = 3.14\text{Å}.$

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22. Explain the following give appropriate reasons.

(i) Ionisation potential of N is greater than that of O

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23. First ionisation potential of C- atom is greater than that of B atom , where as the revers is true is for second ionisation potential.

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24. The electron affinity values of Be, Mg are zero and those of N (0.02 eV) and P(0.80eV) are very low

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25. The formation of $F^-(g)$ from F(g) is exothermic while that of $O^{2-}(g)$ from O(g) is endothermic.

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26. What is screening effect ?

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27. Briefly give the basis for pauling's scale of electronegativity.

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Additional Choose The Correct Answer

1. The first list of 23 chemical elements was published by _____ in the year 1789.

A. Berzelius

B. Dobereiner

C. Lavoisier

D. John Dalton

Answer: c

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2. Ionic radius of alkali metals are in the following order

A. $Li < Na < K < Rb < Cs$

B. $Na < Li < K < Rb < Cs$

C. $Li > Na > K > Rb > Cs$

D. $Na < Li < Rb < K < Cs$

Answer: a

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3. He is placced in _____ group.

A. 1

B. 2

C. 17

D. 18

Answer: d

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4. Period of an element is represented by _____ quantum number .

A. Principal

B. Azimuthal

C. Magnetic

D. Spin

Answer: A

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5. Which of the following statement (s) about the Modern Periodic Table is are incorrect

(i) The elements in the Modern Periodic Table are arranged on the basis of their decreasing atomic number

(ii) The elements in the Modern Periodic Table are arranged on the basis of their increasing atomic masses

(iii) Isotopes are placed in adjoining group (s) in the Periodic Table

(iv) The elements in the Modern Periodic Table are arranged on the basis of their increasing atomic number

A. (i) only

B. (i),(ii) and (iii)

C. (i),(ii) and (iv)

D. (iv) only

Answer: b

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6. Which of the following is Dobereiner 's triad ?

A. Ne, Ca, Na

B. H_2, N_2, O_2

C. Li, Na, K

D. Na, Br, K

Answer: c

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7. Pick the metalloid among the following elements

A. P

B. S

C. Si

D. Al

Answer: c

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8. An element M combines with Cl . What would be the formula of the compound obtained if M has a valence of 2?

A. MCl

B. MCl_2

C. M_2Cl

D. M_2Cl_2

Answer:

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9. Law of triad was unable to explain for the element

A. Ca ,Sr and Ba

B. Fe ,Co .Ni

C. Li ,Na ,K

D. Cl , Br,I

Answer: b

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10. What would be the formula of the compound formed by A and B, where A has the valence 3 and B has the valence 3?

A. AB

B. AB_3

C. A_3B

D. $3AB_3$

Answer: a

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11. Law of octaves was proposed by _____

A. Lothar Meyer

B. Johann Dobereiner

C. Newland

D. Mendeleev

Answer: c

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12. The statement that is not correct for modern classification of element is

(1) The properties of elements are periodic function of these aromic numbers.

(2) The ionisation enthalphy of the elements generally increase with increase in atomic number .

(3) For transition elemens the 3d orbitals are filled after 3p-orbitals and befire 4s orbitals .

(4)Fifth period contain 18 elements

A. 1 and 2

B. 2 and 3

C. 4 only

D. 3 only

Answer: d

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13. _____ proposed modern periodic law

A. Henry Moseley

B. Mendeleev

C. Newland

D. Doebereiner

Answer: a

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14. The atomic weight of Au is_____

A. 195

B. 197

C. 198

D. 196

Answer: b

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15. The horizontal rows in the periodic table are called as_____

A. group

B. family

C. period

D. column

Answer: c

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16. Consider the following statements according to modern periodic table.

(i) Modern periodic table contains 18 vertical columns and 7 horizontal rows.

The elements after uranium are called transuranium elements

(iii) The 17 th group elements are called chalcogens

(iv) The elements of Groups 13 to 18 are called p- block elements. which of the following statement (s) given above is /are correct.

A. (i),(iii)& (iv)

B. (i),(ii)& (iii)

C. (i),(ii) & (iv)

D. all the 4 statements

Answer: c

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17. The vertical column in the periodic table are called as

A. family

B. group

C. period

D. both (a) and (c)

Answer: b

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18. There are _____ periods in the periodic table

A. 18

B. 7

C. 6

D. 5

Answer: b

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19. The number of groups in the periodic table is

A. 7

B. 18

C. 5

D. 6

Answer: b

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20. The element with atomic number 57 belong _____

A. s- block

B. p- block

C. d- block

D. f-block

Answer: d

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21. Lithium shows diagonal relationship with _____

A. Mg

B. Al

C. Na

D. Si

Answer: a

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22. The electronic configuration of nitrogen is_____

A. $1s^2 2s^2 2p^3$

B. $1s^2 2s^2 2p_x^1 2p_y^1 2p_2^1$

C. $1s^2 2s^1 2p^4$

D. both (a) and (b)

Answer: d

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23. The first translation series is from_____

A. Sc to Zn

B. Hf to Hg

C. Y to Cd

D. Ac to Lr

Answer: a

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24. The element with Z= 24 is placed in the _____ period

A. 5

B. 2

C. 3

D. 4

Answer: d

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25. _____ is the lightest metal known.

A. Na

B. Li

C. Mg

D. Al

Answer: b

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26. Pd has exceptional electronic configuration of $4d^{10}5s^{0}$. It belongs to period____ and group_____.

A. 4,11

B. 5,10

C. 6,9

D. 3,16

Answer: b

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27. The electrons at the extreme left of periodic table has strong behaviour_____

A. Oxidizing

B. Reducing

C. both oxidisation and reducing

D. electro negative

Answer: b

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28. On moving diagonally across the periodic table, the second and third period elements show certain similarities .Pick out the which shows such a property.

A. Be & Na

B. Be & Al

C. Be & Mg

D. B & Al

Answer: b

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29. d- block elements form _____ compounds.

A. ionic

B. covalent

C. Coordinate

D. both (a) and (b)

Answer: a

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30. X,Y and Z are three members of a Doboreiner's triad . If the atomic mass of X is 7 and that of Z is 39 , what in the atomic mass of Y?

A. 23

B. 7

C. 46

D. 39

Answer: a

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31. Characteristic of transition elements is incomplete

A. d- orbitals

B. f- orbitals

C. p- orbitals

D. s- orbitals

Answer: a

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32. The oxidation state of alkali metal is _____

A. $+2$

B. $+1$

C. $+3$

D. 0

Answer: b

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33. Modern periodic law is .

A. The physical and chemical properties of the elements are preiodic functions of their atomic numbers.

B. The physical and chemical properties of the elements depend upon the energy of the electrons

C. The physical and chemical properties of the elements depend upon atomic weight.

D. None of these.

Answer: a

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34. Elements which generally exhibit multiple oxidation states and whose ions are usually coloured are

A. metalliods

B. transition elements

C. non - metals

D. gases

Answer: b

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35. The elements eka aluminum and eka sillicon named by Mendeleev known today as

A. gallium and germanium

B. germanium and silicon

C. aluminium and silicon

D. indium and thallium

Answer: a

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36. Find the incorrect statement.

A. Smallest atom of periodic table is He

B. p- block elements are metals nonmetals and metalloids

C. Noble gases have 8 valence electrons except He

D. Valence electron and valency is same for group 1

Answer: a

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37. Valence electrons in the atom of elements A is 4 and in the element B is 2. Most probale compund from A and B is

A. AB_3

B. AB_2

C. A_2B_3

D. A_2B

Answer: B

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38. Which of the following set has atomic numbers of only representative elements ?

A. 2,10,17,35

B. 2,12,22,32

C. 3,15,35,45

D. 4,20,36,79

Answer: a

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39. Which one among the following exhibits a valency greater than 4?

A. Na

B. P

C. H

D. Ar

Answer: b

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40. Halogens belong to the

A. s- block

B. p- block

C. d- block

D. Zero group of the periodic table.

Answer: b

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41. In the first translation series the incoming electron enters the

A. 4 d- orbital

B. 3d- orbital

C. 5d -orbital

D. 6d -orbital

Answer: b

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42. The number of elements in the first periods of the modern periodic table is _____

A. 2

B. 8

C. 18

D. 32

Answer: a

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43. Group 16 of the periodic table is called as _____

A. oxygen family

B. chalcogen family

C. both a and b

D. halogen family

Answer: c

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44. The metal which is a liquid at room temperature is _____

A. Gallium

B. Mercury

C. Germanium

D. Tellurium

Answer: b

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45. Representative elements are those which belong to

A. s and d- blocks

B. s and p- blocks

C. p and d- blocks

D. d and f- blocks

Answer: b

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46. The element with atomic number 103 is _____

A. lawrencium

B. Mendelevium

C. fermium

D. nobelium

Answer: a

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47. Elements whose atoms have their s and p-sublevels complete are the_____

A. Normal elements

B. transition elements

C. Halogens

D. Inert gases

Answer: d

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48. Excluding hydrogen and helium , the smallest element in the periodic table is _____

A. Lithium

B. Oxygen

C. Fluorine

D. Chlorine

Answer: c

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49. The general electronic configuration of s-block element is _____

A. ns^1

B. ns^2

C. ns^1 and ns^2

D. ns^{1-2}

Answer: d

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50. The p- bloks elements comprise of group

A. 1,2

B. 13 to 18

C. 3 to 12

D. 12 to 18

Answer: b

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51. The general electronic configuration of p-block element is _____

A. ns^{1-2}

B. np^{1-6}

C. np^{6}

D. ns^2np^6

Answer: d

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52. The general electronic configuration of d-block element is _____

A. ns^2np^6

B. $(n-1)d^{1-10}ns^{0-2}$

C. $(n-1)d^1ns^{0-2}$

D. $(n-1)d^{0-10}ns^2$

Answer: b

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53. d- block elements form _____ compounds.

A. ionic

B. covalent

C. metallic

D. both (a) and (b)

Answer: d

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54. The elements in which extra electrons enters into (n-2) f-orbitals are called____ elements

A. p- block

B. d- block

C. f- block

D. s- bloks

Answer: c

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55. The element with atomic number 31 belongs to _____

A. s- block

B. p- bloks

C. d- block

D. f-block

Answer: b

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56. All the elements in a group in the periodic table have the same

A. electronic configuration

B. number of electrons in the valence shell

C. atomic number

D. atomic weight

Answer: b

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57. Which pair of elements has the same characteristic chemical properties?

A. Z=13,Z =22

B. Z=2,Z=4

C. Z=4,Z=24

D. Z=3,Z=11

Answer: d

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58. The IUPAC name of element having atomic number 108 is

A. Unnilocatium

B. Ununoctium

C. Nilniloctium

D. Ununoctinium

Answer: a

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59. Which among the following has the highest ionisation energy.

A. Ne

B. Na

C. K

D. Kr

Answer: A

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60. Arrange the following ions in order of decreasing ionic radii He, Li^{2+}, Be^{3+}

A. $He > Li^{2+} > Be^{3+}$

B. $Li^{2+} > Be^{3+} > He$

C. $Li^{2+} > He > Be^{3+}$

D. $Be^{3+} > Li^{2+} > He$

Answer: a

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61. Assertion (A) : He and Be have similar outer shell electronic configuration of type ns^2.

Reason (R) : Both are chemically inert.

A. A and R are true and R is the correct explanation of A

B. A and R are true but R is not the correct explanation of A

C. A is true R is false

D. Both A and R are false

Answer: c

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62. Which one among the following species has the largest atomic radius ?

A. Na

B. Mg

C. Al

D. Si

Answer: a

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63. The correct order of size among Br^+, Br, Br^-

A. $Br^+ < Br^+ < Br^-$

B. $Br^+ < Br < Br^-$

C. $Br < Br^- < Br^+$

D. $Br^- < Br^+ < Br^-$

Answer: b

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64. The elements having highest ionization energies within their periods are called_____

A. Halogens

B. Noble gases

C. Alkali metals

D. Transition elements

Answer: b

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65. Across the period , Ionisation energy _____

A. increases

B. decreases

C. does not very

D. First decreases and then increases

Answer: a

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66. Statements I : Ionisation energy of fluorine is greater than oxygen.

Statement II : On moving across a period ,nuclear charge increases

A. Both the Statements are individually true and II is the correct explanation of I.

B. Both the statements are individually true and II is not the correct explanation of I.

C. Statement I is correct and II is false

D. Statement I is false and II is true

Answer: a

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67. Which of the following statements are correct?

(i) Helium has the highest first ionisation enthalphy

(ii) Chlorine has less electron affinity than fluorine

(iii) Ne has more ionisation energy than Boron.

(iv) The ionisation energy noble gases of zero

A. (i) , (ii) and (iii)

B. (i) and (iii)

C. (i),(iii) and (iv)

D. (i),(ii) , (iii) and (iv)

Answer: b

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68. Which of the following factor decreases across the period ?

A. Ionisation energy

B. electron affinity

C. atomic radius

D. electronegativity

Answer: c

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69. Ionisation enthalpy is an _____ process

A. exothermic

B. endothermic

C. reversible

D. both (a) and (b)

Answer: B

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70. The effective nuclear charge across the period (from left to right)

A. Decreases

B. Increases

C. First decreases and then increases

D. First increases and then decreases

Answer: b

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71. Which of the following N^{3-}, O^{2-}, F^{-} is largest in size?

A. N^{3-}

B. O^{2-}

C. F^{-}

D. All of these

Answer: a

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72. The radii of F, F^-, O and O^{2-} are in the order

A. $O^{2-} > O > F^- > F$

B. $F^- > O^{2-} > F > O$

C. $O^{2-} > F^- > O >^+ F$

D. $O^2 > F^- > F > O$

Answer: c

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73. Which of the following atom has the lowest ionization enthalpy?

A. $1s^2 2s^2 2p^3$

B. $1s^2 2s^2 2p^6 3s^1$

C. $1s^2 2s^2 2p^6$

D. $1s^2 2s^2 2p^5$

Answer: b

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74. Which of the following has the highest positive electron gain enthalpy ?

A. F

B. O^-

C. Na^+

D. Mg^{2+}

Answer: B

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75. Which of the following statements is incorrect ?

A. The ionization potential of nitrogen is greater than that of oxygen.

B. The electron affinity of F is greater than that of Cl

C. The ionization potential of Mg is greater than aluminium.

D. The electronegativity of F is greater than that of Cl.

Answer: b

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76. Correct order of 1st ionization potential among 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. $Be < B < C < O < N$

Answer: b

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77. The most electronegative element of the periodic table is _____

A. Iodine

B. Flourine

C. Chlorine

D. Oxygen

Answer: b

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78. Assertion (A) : The first ionization energy of Al is lower than Mg.

Reason (R) : Atomic radius of Al is smaller than Mg.

A. Both (A) and (R) are true and R is correct explanation of R

B. Both (A) and (R) are true but R is not the correct explanation of A

C. (A) is true R is false

D. Both (A) and (R) are false .

Answer: b

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79. Ionic radii are

A. Inversly proportional to effective nuclear charge.

B. Inversely proportional to square of effective nuclear charge.

C. Directly proportional effective nuclear charge.

D. Directly proportional to square of effective nuclear charge.

Answer: a

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80. Which of the following sets contain only isoelectionic ions?

A. $Zn^{2+}, Ca^{2+}, Ga^{3+}, Al^{3+}$

B. $K^{+}, Ca^{2+}, Sc^{3+}, Cl^{-}$

C. $P^{3-}, S^{2-}, Cl^{-}, Al^{3+}$

D. $Ti^{4+}, Ar, Cr^{3+}, V^{5+}$

Answer: b

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81. With repect to chlorine ,hydrogen will be

A. Electropositive

B. Electronegative

C. Neutral

D. None of these.

Answer: a

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82. Which orbital diagram gives an insight to the highest ionization energy ?

A. 

B. 

C. 

D. 

Answer: c

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83. Among the elements given below_____ has the highest value of electronegativity.

A. Lithium

B. Ne

C. F

D. Be

Answer: c

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84. Pick the incorrect statement about the factors affecting ionization energy

A. More is the shielding of valence electrons more is the ionization energy

B. Ionization enthaply $\propto$ effective nuclear charge

C. Half filled or full filled atomic orbitals have high ionization energy

D. Larger is the atomic radii lower is ionization energy

Answer: a

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85. Statements I : Noble gases have zero electron gain enthlpy.

Statement II : An atom with stable electronic configuration has greater tendency to gain electron.

A. Both the statements are individually correct and II is the correct explanation of I

B. Both the statements are individually correct and II is not the correct

explanation of I

C. Statement I is correct and II is wrong

D. Statement I is wrong and II is correct

Answer: c

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86. The relative tendency of a bonded atom in a molecule to attract the shared pair of electrons towards itself is termed as _____

A. electron gain enthalpy

B. electronegativity

C. electron affinity

D. ionisation energy

Answer: b

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87. Which of the following property has no unit ?

A. Ionisation energy

B. electronegativity

C. electron affinity

D. atomic radius

Answer: b

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88. In a group with decrease in electronegativity the metallic character

(a) decreases across a period

(b) ncreases down the group

(c) does not very

A. a only

B. b only

C. both (a) and (b)

D. c only

Answer: b

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89. Which of the following processes involves absorption of energy?

A. $Cl_{(g)} + e^- \rightarrow Cl^-_{(g)}$

B. $O^-_{(g)} + e^- \rightarrow O^-_{(g)}$

C. $O_{(g)} + e^- \rightarrow O^-_{(g)}$

D. $S_{(g)} + e^- \rightarrow S^-_{(g)}$

Answer: b

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90. Which set of elements shows positive electron gain enthapy?

A. He ,Ne O

B. Ne, N,Cl

C. O,Cl,F

D. N,He,Ne

Answer: d

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91. Char Coal is a _____ element.

A. Acid -making

B. Base -making

C. Salf - making

D. Neutral

Answer: a

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92. Odd one out the following among elements in the triad.

A. Li,Na ,K

B. Cl,Br,I

C. Ca,Sr Ba

D. Fe,Co,Ni

Answer: a

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93. Which was the first reasonable attempt towards the creation of periodic table?

A. Newland's Octaves

B. Lother mayer classification

C. A.E.B. de charcourtois report

D. Mosley's modern classification

Answer: c

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94. Which las holds good for lighter elements up to calcium?

A. Newland's Octaves

B. Lother mayer classification

C. A.E.B. de charcourtois report

D. Mosley's modern classification

Answer: a

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95. The repetition of physical and chemical properties at regular intervals is called_____.

A. Atomic radii

B. Periodicity

C. Colligative properties

D. electronegativity

Answer: b

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96. The element with atomic number 215 has not been discovered so far . What would be the IUPAC name of this element ?

A. bibipentium

B. biunpentium

C. unbipentium

D. Ununoctinium

Answer: b

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97. The placement of element in the periodic table is closely related to its_____

A. Outer Shell electronic configuration

B. Physical properties

C. Chemical properties

D. Reactivity.

Answer: a

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98. Covalent radius of RB is _____

A. 1.54Å

B. 1.98Å

C. 2.11Å

D. 2.34Å

Answer: c

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99. The variation of electron affinity is not as systematic as in the case of _____.

A. Ionisation energy

B. Atomic radius

C. Ionic radius

D. Electronegativity

Answer: a

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100. As we move down the group , the electro positive character of elements _____.

A. Increases

B. Decreases

C. Gradutly decreases at regular intervals

D. Remains same

Answer: a

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Additional Short Answers

1. Calculate the Effective nuclear charge of helium.

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2. Write the name and deduce the atomic number of the following element

(i) The second alkali metal

(ii) The fourth noble gas

(iii) The third halogen

(iv) The first transilation element

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3. Lanthanoids and actinoids are placed in separate rows at the bottom of the periodic table .Explain.

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4. Describe in drief Lother Meyer's classification of elements.

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5. Explain classification of elements based on Newland 's law of Octaves.

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6. Justify the given statement with suitable examples the properties of the elements are a periodic function of their atomic numbers".

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7. State the findings of modern periodic law.

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8. State Mendeleev's period law.

Watch Video Solution

9. What are the demerties of long form periodic table.

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10. What are transuranium elements?

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11. What are transfermium elements?

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12. How many elements can be accommodated in the long form of the periodic table ? Explain.

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13. Name the p block elements that exist as liquids at room temperature.

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14. What are representative elements?

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15. What are metalloids ? Give example.

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16. The number of elements in the first period is only 2. Give reason.

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17. The elements Z=117 and 120 have not yet been discovered. In which family / group would you place these elements and also give the electronic configuration in each case.

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18. Arrange the following elements in the increasing order of metallic character: Si, Be, Mg, Na, P

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19. Predict the periods and blocks to which each of the following elements belongs ?

(i) _ $(13)Al$

(ii) _ $(24)Cr$

(iii) _ $(29)Cu$

(iv) _ $(11)Na$

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20. Why are noble gases chemically inert?

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21. Why d- block elements are known as transition element ?

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22. Rn (Z=86) is the last noble gas discovered . Predict what will be the atomic number of the next noble gas to be discovered . Write its symbol.

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23. What are inner transition elements ?

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24. In terms of electronic configuration what does elements of given period and a group have in common?

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25. Write the name and atomic number of the following elements

(i) The first halogen

(ii) The third alkali metal

(iii) The fourth alkaline earth metals

(iv) The sixth element of the second transition

series

(v) The second inner transition element

(vi) The fifth noble gas.

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26. First ionisation potential of C- atom is greater than that of B atom , where as the revers is true is for second ionisation potential.

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27. Atomic number of elements X,Y,Z and A are 4,8,7 and 12 respectivity . Arrange them in the decreasing order of their electronegativity.

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28. Which has the stable electronic configuration : Ni^{2+} or Fe^{+3}. Why ?

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29. Define covalent radius.

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30. Define periodicity.

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31. Out of Na and Mg , which has higher second ionisation energy?

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32. Noble gases have maximum ionisation energy. Justify.

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33. Which of the following species will have the largest and smallest size Mg, Mg^{2+}, Al, Al^{3+}? Give reason.

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34. The size of $Cl^- = 1.81\text{Å}$ and $Cl = 0.99\text{Å}$. Explain.

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35. How does the shielding effect caused by inner electrons affect the ionisation energy?

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36. Larger the size of the atom ,lesser is the ionisation energy . Explain.

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37. Define lonization enthalpy.

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38. Noble gases have almost zero electron affinity give reason.

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39. Which among the halogens would you expect to have the least electronegativity and why?

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40. Arrange the following elements in the increasing order of non - metallic character. B,C,Si,N,F

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41. Give reason for the following statement.

Halogens act as good oxidising agents.

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42. Write notes on triads and periods.

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43. Write a note about chancourtois classification .

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44. Mention the names of the elements with atomic number 101 ,102,109 and 110.

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45. Write any two characteristic properties of alkali metals.

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46. Account for the fact that noble gases exhibit low chemical reactivity.

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47. What are semi - metal ? Give example.

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48. What are periodic properties ? Give example.

Watch Video Solution

49. Define ionic radius.

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50. Electron gain enthalpy values

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51. Electron gain enthalpy is F is less negative than Cl Why ?

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52. Define valency . How is it determined ?

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53. Why there is a need for classification of elements?

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54. What are the reasons behind the Moseley's attempt in finding atomic number?

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55. Explain about the salient features of metals.

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56. Explain about the characteristic of non - metals.

Watch Video Solution

57. What is covalent radius ? . How would you determine the covalent radius of chlorine atom .

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58. Mention some characteristics of ionization energy.

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Additional Long Answers

1. 

(i) Explain the above variations of electron affinity.

(ii) Define electronegativity.

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2. Give the structural features of modern periodic law.

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3. Mention Anomalies of Mendeleev 's periodic table.

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4. Give the characteristics of p- block elements.

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5. Give any five characteristic properties of inner transition elements.

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6. What are the factors influencing ionization enthalpy.

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7. What are factors which influence the electron gain enthalpy ?

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8. State Mendeleev's period law.

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9. Explain the merits of Moseley's long form of periodic table.

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10. Explain the classification of elements based on chemical behavior and on physical

properties.

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11. How do you classify of elements into blocks ? Give their electronic configuration .

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12. List out and compare the chemical properties of metals and non - metals.

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Numerical Problems

1. Calculate the effective nuclear charge experienced by the 4s electron in potassium atom .

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2. Calculate the effective nuclear charge of the last electron in an atom whose configuration

is $1s^2 2s^2 2p^6 3s^2 3p^5$

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