CHEMISTRY

BOOKS - MTG CHEMISTRY (HINGLISH)

CLASSIFICATION OF ELEMENTS AND PERIODICITY

Genesis Of Periodic Classification

1. According to the law of triads, when chemically similar elements are arranged in groups of three

in the order of increasing atomic weights, then the_____element has the atomic weight and properties roughly the average of the other two elements.

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 group of six elements

D. Every thrid element resembles the first element in periodic table.

Answer: A

2. Newland's law of octaves seemed to be flawless only for elements up to___u.

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.

Answer: A

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3. The periodic law, as we know it today, owes its development to two chemists.

(i) John Newlands (ii) Dmitri I. Menseleev

(iii) J.Lothar Meyer (iv) $J.\ W.$ Dobereiner

A. Rutherford and Moseley

B. Alexander newlands and doberiner

C. Dmitri mendeleev and lothar meyer

D. De broglir and Neil bohr.

Answer: C

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4. The property used by Mendeleev to classify the elements in his periodic table is _____.

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.

Answer: C

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5. In Mendeleev's periodic table, gaps were left for the elements to be discovered later. Which of the following elements found a place in the periodic table later ?

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.

Answer: D

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6. What were the main demeris of mendeleev's periodic table?

(i)Hydrogen has been places 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)

Answer: B

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Modern Periodic Law And Present Form Of Periodic Table

1. In the modern long form of the periodic table, elements are arranged in the increasing order of

A. Atomic mass

B. Atomic number

C. Mass number

D. Metallic character.

Answer: B

2. The period number in the long form of the periodic table is equal to

A. Atomic mass

B. Atomic number

C. Principal quantum number

D. Azimuthal quantum number

Answer: C

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3. Metals belonging to the same group in the periodic table are

A. Same number of energy levels

B. Same number of valence electrons

C. Same number of electrons

D. Same ionisation enthalphy.

Answer: B

Nomenclature Of Elements

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

A. Ununbium,Uub

B. Unnibium,Unb

C. Ununnillum,Uun

D. Ununtrium,Uut

Answer: A

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2. An element with atomic number 117 is known as

A. Nihonium

B. Flerovium

C. Tennessine

D. Roentgenium

Answer: C

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3. Meitnerium is IUPAC official name of an element with atomic number

A. 113

B. 118

C. 104

D. 109

Answer: D

Electronic Configuration Of Elements And Periodic Table

1. 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

Answer: C

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2. 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

Answer: B

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3. 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) $\rightarrow$ (i),(B) $\rightarrow$,(C) $\rightarrow$ (III),(D) $\rightarrow$ (iv)

B. (A) $\rightarrow$ (ii),(B) $\rightarrow$ (i),(C) $\rightarrow$ (iv),(D) $\rightarrow$ (iii)

C. (A) $\rightarrow$ (iii),(B) $\rightarrow$ (iv),(C) $\rightarrow$ (i),(D) $\rightarrow$ (ii)

D. (A) $\rightarrow$ (iii),(B) $\rightarrow$ (i),(C) $\rightarrow$ (iv),(D) $\rightarrow$ (ii)

Answer: D

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4. To which group,an element with atomic number 88 will belong?

A. Group 12

B. Group 17

C. Group 10

D. Group 2

Answer: D

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5. 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) $\rightarrow$ (i),(B) $\rightarrow$ (ii),(C) $\rightarrow$ (iii),(D) $\rightarrow$ (iv)

B. (A) $\rightarrow$ (ii),(B) $\rightarrow$ (iii),(C) $\rightarrow$ (iv),(D) $\rightarrow$ (i)

C. (A) $\rightarrow$ (iii),(B) $\rightarrow$ (i),(C) $\rightarrow$ (iv),(D) $\rightarrow$ (ii)

D. (A) $\rightarrow$ (iv),(B) $\rightarrow$ (iii),(C) $\rightarrow$ (i),(D) $\rightarrow$ (ii)

Answer: C

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6. 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

Answer: B

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7. 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) $\rightarrow$ (ii),(B) $\rightarrow$ (iv),(C) $\rightarrow$ (iii),(D) $\rightarrow$ (i)

B. (A) $\rightarrow$ (i),(B) $\rightarrow$ (iv),(C) $\rightarrow$ (ii),(D) $\rightarrow$ (iii)

C. (A) $\rightarrow$ (iii),(B) $\rightarrow$ (ii),(C) $\rightarrow$ (i),(D) $\rightarrow$ (iv)

D. (A) $\rightarrow$ (ii),(B) $\rightarrow$ (i),(C) $\rightarrow$ (iii),(D) $\rightarrow$ (iv)

Answer: B

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8. Which of the following statement is correct?

A. Elements of 3d and 4d-series are kept separately in periodic table.

B. Elements of 4f and 5f-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.

Answer: B

9. 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 ? It has

A. It has partially filled d-orbitals and completely filled s-orbitals.

B. It has completely filled s-orbitals and half-filled p-orbitals.

C. It has half-filled p-orbitals and completely filled s-orbitals.

D. It has half-filled d-orbitals and completely filled s-orbitals.

Answer: C

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1. 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) $\rightarrow$ (iii),(B) $\rightarrow$ (i),(C) $\rightarrow$ (iv),(D) $\rightarrow$ (ii)

B. (A) $\rightarrow$ (i),(B) $\rightarrow$ (ii),(C) $\rightarrow$ (iii),(D) $\rightarrow$ (iv)

C. (A) $\rightarrow$ (ii),(B) $\rightarrow$ (iv),(C) $\rightarrow$ (i),(D) $\rightarrow$ (iii)

D. (A) $\rightarrow$ (iv),(B) $\rightarrow$ (i),(C) $\rightarrow$ (ii),(D) $\rightarrow$ (iii)

Answer: A

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

A. 7,4

B. 3,20

C. 8,15

D. 9,17

Answer: B

3. Which of the following has the same number of electrons in its outermost shell and penultimate shell ?

A. Elements with atomic numbers 30,48,80

B. Elements with atomic number 14,15,16

C. Elements with atomic numbers 20,30,50

D. Elements with atomic number 10,18,26

Answer: A

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4. 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

Answer: A

5. 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 condition is_____group.Most electropositive elements belongs to____group.

A. 16,8.17,2

B. 18.7,18,1

C. 8,7,0,2

D. 16,8,18,1

Answer: B

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6. 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

Answer: D

7. Examples of elements belonging to s,p,d or 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

Answer: B

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8. Electron 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

Answer: B

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9. 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^2np^2-Chalcogens

Answer: D

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10. 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]$3d^{10} 4s^2$

Answer: C

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11. 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.

Answer: A

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12. Which of the following contains the maximum number of unpaired electrons?

A. Fe^{2+}

B. Fe^{3+}

C. Co^{2+}

D. Co^{3+}

Answer: C

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13. In the long form of periodic table all the non-metals are placed under

A. s-block

B. p-block

C. d-block

D. f-block

Answer: B

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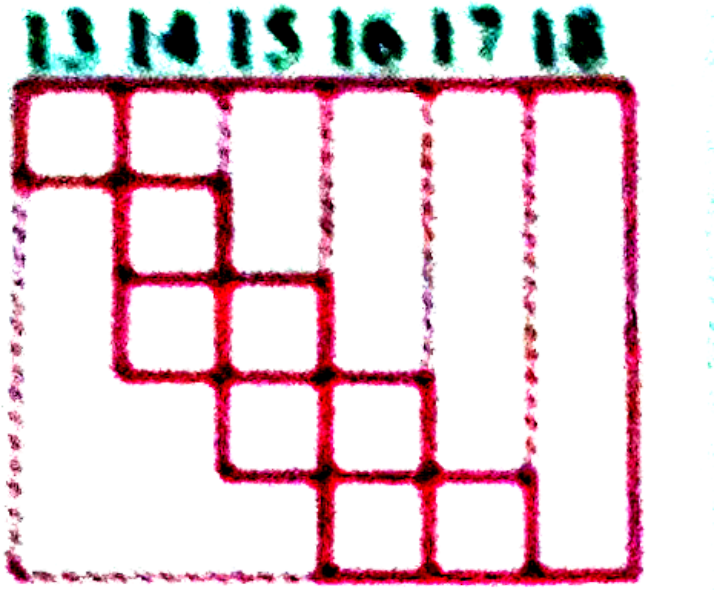
14. Part of the periodic table showing p-block is depicted below.What are the elements shown in the zig-zag boxes called?What is the nature of the elements outside this boundary on the right side of the table?



A. Transition elements,metalloids

B. Metalloids,non-metals

C. Metals,non-metals

D. Non-metals,noble gases

Answer: B

15. The electronic configuration for some neutral atoms are given below :

(i) $1s^2, 2s^2, 2p^6, 3s^2$ (ii) $1s^2, 2s^2 2p^6, 3s^1$

(iii) $1s^2, 2s^2 2p^6, 3s^2 3p^2$ (iv) $1s^2, 2s^2 2p^6, 3s^2 3p^3$

Which of these is expected to have the highest second ionization enthalpy ?

A. Is an alkali metal

B. is a noble metal

C. (i) and (ii)form ionic compounds

D. (iv)has high ionisation enthalpy.

Answer: B

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16. Match the column I,II and III and mark the appropriate choice.

	Column I		Column II		Column 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) $\rightarrow$ (iii,q),(B) $\rightarrow$ (I,r),(C) $\rightarrow$ (iv,p),(D) $\rightarrow$ (ii,s)

B. (A) $\rightarrow$ (ii,p),(B) $\rightarrow$ (I,s),(C) $\rightarrow$ (iii,q),(D) $\rightarrow$ (iv,r)

C. (A) $\rightarrow$ (I,s),(B) $\rightarrow$ (ii,p),(C) $\rightarrow$ (iv,r),(D) $\rightarrow$ (iii,q)

D. (A) $\rightarrow$ (iv,r),(B) $\rightarrow$ (iii,q),(C) $\rightarrow$ (ii,s):(D) $\rightarrow$ (I,p)

Answer: A

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17. Which of the following statements is not correct for the periodic classification of elements?

A. The properties of elements are the periodic functions of their atomic number.

B. Non-merallic elements are less in number than merallic elements.

C. For transition elements,the last electro entres into(n-2)d-subshell.

D. None of these

Answer: C

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18. 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 enthalphy.

Answer: C

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19. Which is the most non-metallic elements amongs the following?

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

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

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

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

Answer: B

20. Which of the following groups contains metals.non-metals and metalliods?

A. Group17

B. Group 14

C. Group 13

D. Group 12

Answer: B

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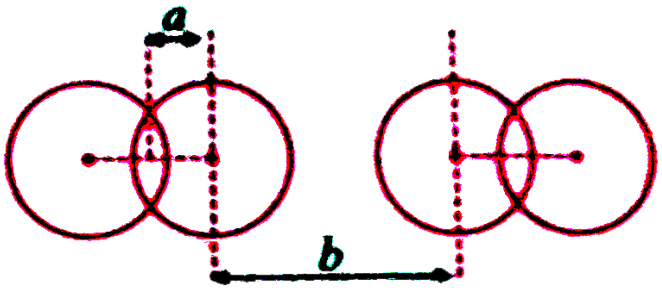
Periodic Trends In Properties Of Elements

1. 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

Answer: B

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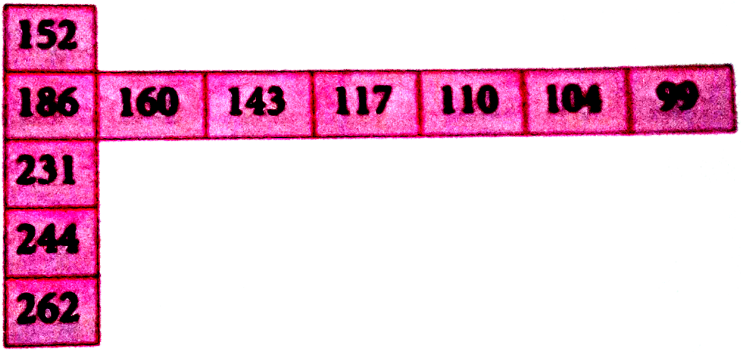
2. Few values are given in the table in the direction from left to right and top to bottom.Predict the property which could be

depicted in the table.



A. Atomic number

B. Ionisation enthalpy

C. Atomic radius

D. Electron gain enthalphy

Answer: C

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3. Which of the following statements regarding the variation of atomic radii in the periodic table is true?

A. In a group,these is continuous decrease in size with icrease in atomic number.

B. The size of inert gases is larger than halogens.

C. The size of inert gases is smaller than halogens.

D. In 3^{rd} period, the size of atoms increase with increase in atomic number.

Answer: B

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4. Ionic radius 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.

Answer: C

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5. K^+ and Cl^- ions are isoelectronic.Which of the statement is not correct?

A. Both K^+ and Cl^- ions have same configuration.

B. Both K^+ and Cl^- ions have different configuration.

C. K^+ ions is bigger than Cl^- ion in ionic size.

D. Cl^- ions is bigger than K^+ ion in size.

Answer: C

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6. Which one of the following groups represent a collection of isolectronic species ? (At.no $Cs = 55, Br = 35$)

A. Na^+, Ca^{2+}, Mg^{2+}

B. N^{3-}, F^{-}, Na^{+}

C. Be, Al^{3+}, Cl^{-}

D. Ca^{2+}, Cs^{+}, Br

Answer: B

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7. Which of the following transitions involves maximum amount of energy?

A. $M \text{to} M^{+} + e^{-}$

B. $M^{-} \text{to} M^{+} + 2e^{-}$

C. M^{2+} to $M^{3+} + e^-$

D. M^{+} to $M^{2+} + e^-$

Answer: C

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8. What is the order of successive ionisation enthalpies?

A. $IE_{III} > IE_{II} > IE_1$

B. $IE_1 > IE_{II} > IE_{III}$

C. $IE_{II} > IE_I > IE_{III}$

D. $IE_{III} > IE_I > IE_{II}$

Answer: A

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9. Which group of elements shows lowest ionisation enthalpy?

A. Alkali metals

B. Alkaline earth metals

C. Halogens

D. Noble gases

Answer: A

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10. 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. $P < Si < N < C$

Answer: C

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11. The ionisation energy of nitrogen is more than that of oxygen because

A. Extra stability of half filled orbitals

B. More number of energy levels

C. Less number of valence electrons

D. Smaller size.

Answer: A

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12. which of the following elements has the highest value of second ionization energy?

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

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

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

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

Answer: B

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13. Which of the following can most easily form unipositive gaseous ion?

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

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

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

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

Answer: B

14. Amongst the metal Be, Mg, Ca and Sr of group 2 of the periodic table, the least ionic chloride would be formed by

A. Be

B. Ca

C. Mg

D. Sr

Answer: A

15. Beryllium has higher ionisation enthalpy than boron.This can be explained as,

A. Beryllium has higher size than boron hence its ionisation enthalpy is higher

B. Penetration of 2p-electrons to the nucleus is more than the 2s-electrons

C. It is easier to remove electron from 2p-orbital as compared to 2s-orbital due to more penetration of s-electrons

D. Ionisation energy increases in a period.

Answer: C

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16. A sudden large jump between the values of second and third ionisation energies of an

element would be associated with the electronic configuration

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

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

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

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

Answer: D

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17. 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-A noble gas ,Y-Alkali metal,Z-Alkaline earth metal

B. X-Alkali metal,Y-A noble gas,Z-Alkaline earth metal

C. X-Alkaline earth metal,Y-Alkali metal,Z-A noble gas

D. X-Alkali metal,Y-Alkaline earth metal,Z-A noble gas

Answer: A

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18. First and second ionisation enthalpies(in KJ/mol) of few elements are given below:

Element	IE_1	IE_2
(i)	520	7300
(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)

Answer: C

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19. Ionization enthalpies of transition metals are

A. Intermediate between those of s- and p-block elements

B. more than p-block elements

C. lower than s-block elements.

D. lower than s-block elements

Answer: A

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20. Consider these electronic configurations for neutral atoms:

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

(ii). $1s^2 2s^2 2p^6 4s^1$

Which of the following statements is/are false?

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.

Answer: D

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21. Which of the following element will have highest ionization 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. $1s^2 2s^2 2p^6 3s^2 3p^1$

Answer: B

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22. Few values of enthalpies are given below:

$O = -141 KJmol^{-1}$

$F = -328 KJmol^{-1}$

$S = -200 KJmol^{-1}$

$Cl = -349 KJmol^{-1}$ What do these values show?

A. Ionisation enthalpy

B. Bond enthalpy

C. Electron gain enthalpy

D. Hydration enthalpy

Answer: C

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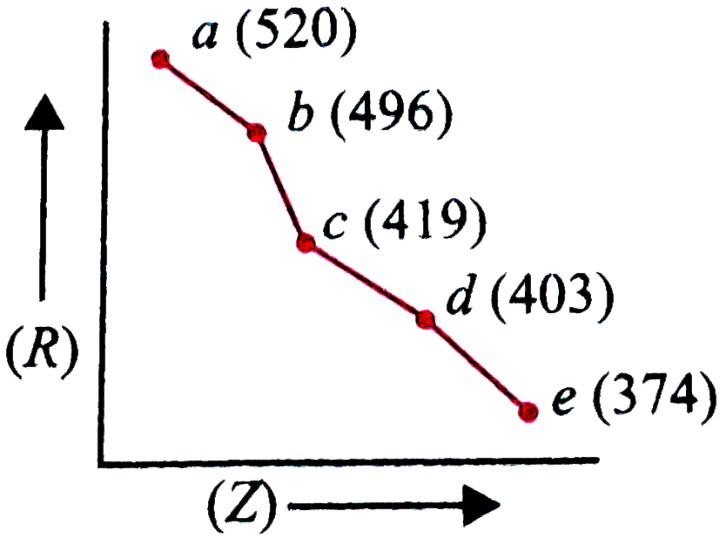
23. In the given graph,a periodic property (R) is plotted against atomic number(Z) of the elements.Which property is shown in the graph and how it is correlated with reactivity of the

elements?



A. Ionisation enthalpy in a group,reactivity decreases from a $\rightarrow$ e.

B. Ionisation enthalpy in a group,reactivity increases

C. Atomic radius in a group reactivity deacreases from a $\rightarrow$ e.

D. Metalliv character in a group,reactivity increases from a $\rightarrow$ e.

Answer: B

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24. Which is correct increasing order of their tendency of the given elements to from M^{3-} ion?

A. $Bi > Sb > As > P > N$

B. $Bi < Sb < As < P < N$

C. $N < P < Sb < Bi < As$

D. $Ni > Sb\text{~}N\text{~}P > As$

Answer: B

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25. Which of the following have least electron affinity?

A. Nitrogen

B. Oxygen

C. Argon

D. Boron

Answer: C

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26. Which one of the following arrangements represents the correct order of electron gain enthalpy of the given atomic species?

A. $O < S < F < Cl$

B. $Cl < F < S < O$

C. $S < O < Ci < F$

D. $F < Cl < O < S$

Answer: A

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27. Which of the following statements is not correct about the electron gain enthalpy?

A. In genral,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.

Answer: B

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28. 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 S and Cl.

B. When an electron is added to O or F,it goe 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 rpulsion than 2p-orbital.

D. Electron gain enthalpy depends upon the electron affinity of the atom.

Answer: B

29. 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.

Answer: C

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30. Which of the following properties of isotopes of an element is different?

A. First ionisation enthalpy

B. Effective nuclear charge

C. Electron affinity

D. Melting point and noiling point

Answer: D

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31. Given below are the names of new 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

Answer: B

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32. Which of the following noble gases has the maximum 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.

Answer: C

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33. An atom with high electronegativity has

A. Large size

B. low electron affinity

C. High ionisation enthalpy

D. Low chemical reactivity.

Answer: C

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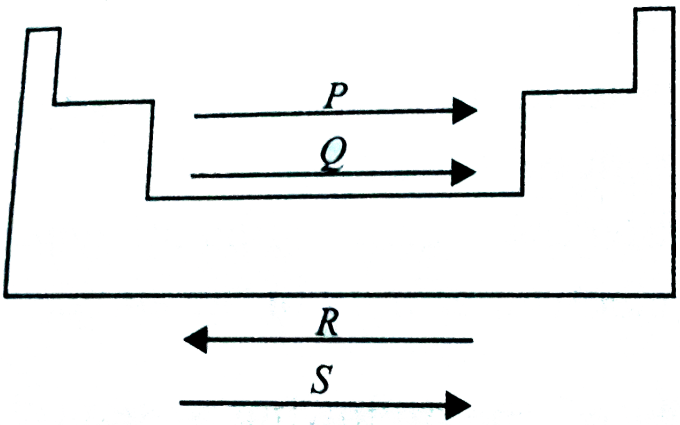
34. Study the given diagram of the periodic table and fill the blanks with appropriate choice.



A. P-Ionisation enthalpy,Q-Electron gain enthalpy,R-Atomic radius,S-Electronegativity

B. P-Atomic radius,Q-Ionisation enthalpy,R-Electronegativity,S-Electron gain enthalpy

C. P-Ionisation enthalpy,Q-Atomic radius,R-Electronegatvity,S-Electron gain enthalpy

D. P-Electronegativity,Q-Electron gain enthalpy,R-Ionisation enthalpy,S-Atomic radius

Answer: A

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35. Which of the following is not a periodi0c property for the elements?

A. Electronegativity

B. Atomic size

C. Occurrence n nature

D. Ionization energy

Answer: C

36. 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. Polarity,Pauling,2.0,Decreases,increases

B. Electonegativity,pauling,4.0,increases,decreases

C. Valency,Mulliken,1.0,decreases,increases

D. electron affinity,mulliken,2.0,increases,increases

Answer: B

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37. Which of the following options are not in accordance with the property mentioned against them ?

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

Answer: D

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38. Choose the incorrect statement.

A. Chemical reactivity tends to be high in group 1 metals,lower in elementns in middle and increase 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.

Answer: D

39. Following statements regarding the periodic trends of chemical reactivity of the alkali metals and the halogens are given. Which of these statements gives the correct picture: A)In alkali

metals the reactivity increases but in the halogens it decreases with increase in atomic number down the group B)The reactivity decreases in the alkali metals but increases in the halogens with increases in atomic number down the group. C)In both the alkali metals and the halogen the chemical reactivity decreases with increases in atomic number down the group D)Chemical reactivity increases with increases in atomic number down the group in both the alkali metals and halogens.

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

B. Non-merallic 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.

Answer: A

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40. 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

Answer: A

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41. An element 'P' has atomic number 56. What will be the formula of its halide?

A. PX

B. PX_2

C. PH_3

D. P_2X_3

Answer: B

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42. 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

Answer: D

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

A. Al_2S_2

B. Al_3S_2

C. Al_2S_3

D. AlS

Answer: C

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44. There are many elements in the periodic table which exhibit variable valency.This is a particular characteristic of

A. Respresentative elements

B. Transition elements

C. Noble gases

D. Non-metals.

Answer: B

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45. Predict the formula of the stable binary compounds that would be formed by the combination of the following pairs of elements.

a.Lithium and oxygen

b. Magnesium and nitrogen

c. Aluminium and iodine

d. Silicon and oxygen

e. Phosphorus and fluorine

f. Element 71 and fluorine

A. MgN_2, SiO_2

B. Mg_3N_2, SiO_2

C. Mg_2N_3, Si_2O_3

D. MgN, SiO_2

Answer: B

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46. The oxidation state of an element in a particular compound can be defined as

A. The charge aquired 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 electronagative 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.

Answer: A

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47. The first element of the group 1 and 2 are different from other members of the respective group.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

Answer: C

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48. 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.

Answer: A

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49. 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 electronrgativity and diferent configurations

C. Small size,'large charge/radius ratio

D. Tendency to form multiple bonds.

Answer: C

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50. When we move from left to right in a period electropositive charcter

A. The basic nature of the oxides increase

B. The basic nature of the oxides decreases

C. There is no regular trend in the nature of oxides

D. Oxides of ony first two group are basic in nature.

Answer: B

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51. Which one of the following oxides is neutral ?

A)CO B)SnO_2 C)ZnO D)SiO_2

A. SrO

B. AI_2O_3

C. CO_2

D. CO

Answer: D

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52. What is the common property of the oxides CO,NO and N_2O?

A. All are acidic oxides

B. All are basic oxides

C. All are neutral oxides

D. All are amphoteric oxides.

Answer: C

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

A. $SiO_2 < P_4O_{10} < SO_3 < CI_2O_7$

B. $Cl_2O_7 < SO_3 < P_4O_{10} < SiO_2$

C. $SO_3 < CI_2O_7 < P_4O_{10} < SiO_2$

D. $SiO_2 < CI_2O_7 < P_4O_{10} < SO_3$

Answer: A

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54. Which of the following oxides is amphoteric is nature ?

A. $AI_2O_3As_2O_3ZnO$

B. CO, NO, N_2O

C. SO_3, SO_2, Cl_2O_7

D. Na_2O, MgO, BaO

Answer: A

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55. (a),(b) and (c) are elements in the second short period. Oxide of (a) is ionic, that of (b) is amphoteric and of (c) of gaint molecule. (a),(b) and (c) have atomic number in the order-

A. (A)lt(B)lt(C)

B. (C)lt(B)lt(A)

C. (A)lt(B)lt(B)

D. (B)lt(A)lt(C)

Answer: A

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56. Consider the following species:

$N^{3-}, O^{2-}, F^{\ominus}, Na^{\oplus}, Mg^{2+}$ and Al^{3+}

a. What is common in them?

b. Arrange them in the order of increasing ionic radii.

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.

Answer: B

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57. 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. $P < Si < Be < Mg < Na$

Answer: D

58. The most electropositive element is

A. NA

B. Cu

C. Cs

D. Ca

Answer: C

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59. Among the elements with atomic number 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

Answer: B

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Higher Order Thinking Skills

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

A. Na_2O, MgO, Al_2O_3, CuO

B. CuO, Al_2O_3, MgO, Na_2O

C. Al_2O_3, CuP, MgO, Na_2O

D. `CuO,MgO,Na_(2)O_(3)

Answer: D

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2. 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

Answer: A

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3. The first (IE_1) and second (IE_2) ionisation energies $\left(kJmol^{-1}\right)$ of a new elements designated by roman numerals are shown below:

	IE_1	IE_2
I	2370	5250
II	520	7300
III	900	1800
IV	1700	3400

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 ($X =$ the halogen).

A. I,2372,5251

B. II,520,7300

C. III,900,1760

D. IV,1680,3380

Answer: B

4. The ionization energies of Li and Na are $520kJmol^{-1}$ and $495kJmol^{-1}$ respectively. The energy required to convert all the atoms present

in 7 mg of Li vapours and 23 mg of sodium vapours to their respective gaseous captions respectively are :

A. 52 J,49.5 J

B. 520 J,495 J

C. 49.5 J,52 J

D. 495 J,520 J

Answer: B

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5. Three elements X , Y and Z have atomic numbers 19 , 37 and 55 respectively . Then the correct statements (s) is / are

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.

Answer: B

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6. The amount of energy when million atoms of iodine are completely converted into I^- ions in the vapour state according to the equation, $I_{(g)} + e^-$ toI^- _ $((g))$ is $4.9X10^{-13}$ 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. $-356, -7.08$

Answer: B

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7. The first $(\Delta_i H_1$ and second $(\Delta_i H_2$ ionization enthalpies (in kJ/mol) and electron gain enthalpy (in kJ/mol) of few elements are given below:

Elements	$\Delta_i H_1$	$\Delta_i H_2$	$\Delta_{eg} H$
I	520	7300	-60
II	1681	3374	-328
III	899	1757	$+48$
IV	2372	5251	$+48$

Which of the following is likely to be an alkali metal?

A. I and IV

B. V and II

C. II and V

D. IV and V

Answer: C

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8. Aqueous solution of two compounds $M_1 - O - H$ and $M_2 - O - H$ are prepared in two different beakers . If electronegativity of $M_1 = 3.4, M_2 = 1.2, 0 = 3.5$ and $H = 2.1,$ then the nature of two solution will be respectively

A. Acidic,acidic

B. acidic,basic

C. basic,basic

D. basic,acidic.

Answer: B

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9. In which of the following options order of arrangement does not agree with the variation of property indicated against it?

A. $Al^{3+} < Mg^{2} < Na^{+} < F^{-}$ (increasing ionic size)

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

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

D. $Li < Na < K < Rb$ (Increasing metallic radius)

Answer: B

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10. 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 are

A. Cs and Li

B. Rb and Na

C. Li and Cu

D. Ag and Au

Answer: C

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Ncert Exemplar

1. 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. $O^{2-} < F^- < Mg^{2+} < Na^+$

Answer: B

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2. Which of the following is not an actinoid?

A. Curium (Z=96)

B. Californium(Z=98)

C. Uranium (Z=92)

D. Terbium(Z=65)

Answer: D

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3. The order of screeing effect of electrons of s, p, d and f orbitals of a given shell of an atom on its outer shell electrons is:

A. Sgtpgtdgtf

B. Fgtdgtpgts

C. PltdltsgtF

D. Fgtpgtsgtd

Answer: A

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4. The first ionisation potential of Na, Mg, Al and Si are in the order

A. NaltMggtAlltSi

B. NagtMggtAlgtSi

C. NaltMgltAlltSi

D. NagtMggtAlltSi

Answer: A

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5. Gadolinium belongsd to 4f series. It's atomic number is 64. which of the following is the correct electronic configuration of gadolinium ?

A. [Xe] $4f^3 5d^5 6s^2$

B. $[Xe] 4f^7 5d^2 6s^1$

C. $[Xe] 4f^7 5d^1 5s^2$

D. $[Xe] 4f^8 5d^6 5s^2$

Answer: C

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6. 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 3p orbitals and before 4 s orbitals

D. The first ionization enthalpies of elements generally increase with increase in atomic number as we go along a period.

Answer: C

7. Among halogens, the correct order of amount of energy released in electron gain (electron gain enthalpy) is:

A. FgtClgtBrgtI

B. FltCl|tBrl|tI

C. FltClgtBrgtI

D. FltCl|tBrgtI

Answer: C

8. 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 principak quantum number of any element of the period

D. Maximum azimuthal quantum number of any element of the period

Answer: C

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9. The elements in which electrons are progressively filled in 4f-orbitals are calleD:

A. Actinoids

B. Transition elements

C. Lanthanoids

D. halogens.

Answer: C

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10. Which one of the following is correct order of the size of iodine species ?

A. $I > I^- > I^+$

B. $I^+ > I^- > I$

C. $I > I^+ > I^-$

D. $I^- > I > I^+$

Answer: D

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11. The formation of oxide ion $O^{2-}(g)$ from oxygen atom requires first an exothermic and then an endothermic step as shown below

$O(g) + e^- \rightarrow O^-(g), \Delta H^- = -141 kjmol^{-1}$

$O^-(g) + e^- \rightarrow O^{2-}(g), \Delta H^- = +780 kjmol^{-1}$

Thus, process of formation of O^{2-} in gas phase is unfavourable even through O^{2-} is isoelectronic with neon. It is due to the fact that

A) oxygen is more electronegative B) addition of electron in oxygen results in larget size of the ion C) electron repulsion outweights the stability gained by achieving noble gas configuration D)

O^- ion has comparatively smaller size than oxygen atom

A. Oxygen is more electronegative

B. Addition of electron in oxygen results in larger size of the ion

C. Electron repulsion outweights the stability gained by achieving noble gas configuration

D. O^- ion has comparatively smaller size than oxygen atom.

Answer: C

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12. Electronic configuratios of four elements A, B, C and D are given below:

(i) $1s^2 2s^2 2p^6$ (ii) $1s^2 2s^2 2p^4$ (iii) $1s^2 2s^2 2p^6 3s^1$ (iv) $1s^2 2s^2 2p^5$

Which of the following is the correct order of increasing tendency of gain electron:

A. AltCltBltD

B. AltBltCltD

C. DltBltCltA

D. DltAltBltC

Answer: A

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Assertion And Reason

1. 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 and reason is false.

D. both are false

Answer: B

2. 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 is the correct explanation of assertion.

B. If both assertion and reason is the correct explanation of assertion.

C. If both assertion and reason is the correct explanation of assertion.

D. If both assertion and reason is the correct explanation of assertion.

Answer: B

3. 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 respectvely.

A. If both assertion and reason is the correct explanation of assertion.

B. If both assertion and reason is the correct explanation of assertion.

C. If both assertion and reason is the correct explanation of assertion.

D. If both assertion and reason is the correct explanation of assertion.

Answer: A

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4. 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

configuration in their atoms belongs to same period.

A. If both assertion and reason is the correct explanation of assertion.

B. If both assertion and reason is the correct explanation of assertion.

C. If both assertion and reason is the correct explanation of assertion.

D. If both assertion and reason is the correct explanation of assertion.

Answer: C

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5. Assertion:The chemistry of the early actinoids is more comlicated 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 is the correct explanation of assertion.

B. If both assertion and reason is the correct explanation of assertion.

C. If both assertion and reason is the correct explanation of assertion.

D. If both assertion and reason is the correct explanation of assertion.

Answer: B

6. 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 is the correct explanation of assertion.

B. If both assertion and reason is the correct explanation of assertion.

C. If both assertion and reason is the correct explanation of assertion.

D. If both assertion and reason is the correct explanation of assertion.

Answer: D

7. 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,samller is the size of atom/ion.

A. If both assertion and reason is the correct explanation of assertion.

B. If both assertion and reason is the correct explanation of assertion.

C. If both assertion and reason is the correct explanation of assertion.

D. If both assertion and reason is the correct explanation of assertion.

Answer: A

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8. Assertion:On moving down the group the group,ionization enthalpy decreases.

Reason:With decreases in size of the atom,the force of attraction between the nucleus and valence electrons decreases.

A. If both assertion and reason is the correct explanation of assertion.

B. If both assertion and reason is the correct explanation of assertion.

C. If both assertion and reason is the correct explanation of assertion.

D. If both assertion and reason is the correct explanation of assertion.

Answer: C

9. Assertion:For the elements 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 is the correct explanation of assertion.

B. If both assertion and reason is the correct explanation of assertion.

C. If both assertion and reason is the correct explanation of assertion.

D. If both assertion and reason is the correct explanation of assertion.

Answer: B

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10. Assertion: Shielding effect increases as we go down the group.

Reason: More is the number of electrons in the penultimate shell, more is shielding.

A. If both assertion and reason is the correct explanation of assertion.

B. If both assertion and reason is the correct explanation of assertion.

C. If both assertion and reason is the correct explanation of assertion.

D. If both assertion and reason is the correct explanation of assertion.

Answer: A

11. Assertion:Electronegativity is not a measurable quantity.

Reason:The electronegativity of any given element is not constant,itvaries depending on the element to which it bound.

A. If both assertion and reason is the correct explanation of assertion.

B. If both assertion and reason is the correct explanation of assertion.

C. If both assertion and reason is the correct explanation of assertion.

D. If both assertion and reason is the correct explanation of assertion.

Answer: A

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12. Assertion:Oxidation state of oxygen in OF_2 and Na_2O is +2 and -2 respectively.

A. If both assertion and reason is the correct explanation of assertion.

B. If both assertion and reason is the correct explanation of assertion.

C. If both assertion and reason is the correct explanation of assertion.

D. If both assertion and reason is the correct explanation of assertion.

Answer: B

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13. Assertion:Boron can only form $[BF_4]^-$,whereas aluminium forms $[AlF_6]^{3-}$.

Reason:Ionization enthalpy increases across a period.

A. If both assertion and reason is the correct explanation of assertion.

B. If both assertion and reason is the correct explanation of assertion.

C. If both assertion and reason is the correct explanation of assertion.

D. If both assertion and reason is the correct explanation of assertion.

Answer: B

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14. Assertion:Metallic character is highest at the extremely left side of the periodic table.

Reason:Ionization enthalpy increases across a period.

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

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

C. If A is true but R is false

D. If A is true but R is false

Answer: B

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15. Assertion:Na_2O is basic whereas Cl_2O_7 is acidic oxide.

Reason:Elements on extreme left form basic oxide whereas elements on extreme right form acidic oxides.

A. If both assertion and reason is the correct explanation of assertion.

B. If both assertion and reason is the correct explanation of assertion.

C. If both assertion and reason is the correct explanation of assertion.

D. If both assertion and reason is the correct explanation of assertion.

Answer: B

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