

## PERIODIC TABLE

1. The element with  $Z = 120$  (not yet discovered) will be an/a :
  - (1) transition metal
  - (2) inner-transition metal
  - (3) alkaline earth metal
  - (4) alkali metal
2. The correct order of atomic radii is :
  - (1)  $Ce > Eu > Ho > N$
  - (2)  $N > Ce > Eu > Ho$
  - (3)  $Eu > Ce > Ho > N$
  - (4)  $Ho > N > Eu > Ce$
3. The amphoteric hydroxide is :
  - (1)  $Ca(OH)_2$                       (2)  $Be(OH)_2$
  - (3)  $Sr(OH)_2$                       (4)  $Mg(OH)_2$
4. The correct order of the atomic radii of C, Cs, Al and S is :
  - (1)  $S < C < Al < Cs$
  - (2)  $S < C < Cs < Al$
  - (3)  $C < S < Cs < Al$
  - (4)  $C < S < Al < Cs$
5. The correct option with respect to the Pauling electronegativity values of the elements is :-
  - (1)  $Ga < Ge$                       (2)  $Si < Al$
  - (3)  $P > S$                           (4)  $Te > Se$
6. The effect of lanthanoid contraction in the lanthanoid series of elements by and large means :
  - (1) decrease in both atomic and ionic radii
  - (2) increase in atomic radii and decrease in ionic radii
  - (3) increase in both atomic and ionic radii
  - (4) decrease in atomic radii and increase in ionic radii
7. The electronegativity of aluminium is similar to :
  - (1) Boron                              (2) Carbon
  - (3) Lithium                            (4) Beryllium
8. In general, the properties that decrease and increase down a group in the periodic table, respectively, are :
  - (1) electronegativity and electron gain enthalpy.
  - (2) electronegativity and atomic radius.
  - (3) atomic radius and electronegativity.
  - (4) electron gain enthalpy and electronegativity.
9. When the first electron gain enthalpy ( $\Delta_{eg}H$ ) of oxygen is  $-141$  kJ/mol, its second electron gain enthalpy is :
  - (1) almost the same as that of the first
  - (2) negative, but less negative than the first
  - (3) a positive value
  - (4) a more negative value than the first
10. The pair that has similar atomic radii is :
  - (1) Sc and Ni                      (2) Ti and HF
  - (3) Mo and W                      (4) Mn and Re
11. In comparison to boron, beryllium has :
  - (1) lesser nuclear charge and greater first ionisation enthalpy
  - (2) lesser nuclear charge and lesser first ionisation enthalpy
  - (3) greater nuclear charge and greater first ionisation enthalpy
  - (4) greater nuclear charge and lesser first ionisation enthalpy
12. The group number, number of valence electrons, and valency of an element with atomic number 15, respectively, are
  - (1) 16, 5 and 2                      (2) 16, 6 and 3
  - (3) 15, 5 and 3                      (4) 15, 6 and 2
13. The highest possible oxidation states of uranium and plutonium, respectively, are :-
  - (1) 6 and 4                              (2) 7 and 6
  - (3) 4 and 6                              (4) 6 and 7
14. The noble gas that does NOT occur in the atmosphere is:
  - (1) He                      (2) Ra                      (3) Ne                      (4) Kr

15. The correct order of the first ionization enthalpies is:
- (1)  $Mn < Ti < Zn < Ni$
  - (2)  $Ti < Mn < Ni < Zn$
  - (3)  $Zn < Ni < Mn < Ti$
  - (4)  $Ti < Mn < Zn < Ni$
16. The correct order of hydration enthalpies of alkali metal ions is -
- (1)  $Li^+ > Na^+ > K^+ > Rb^+ > Cs^+$
  - (2)  $Li^+ > Na^+ > K^+ > Cs^+ > Rb^+$
  - (3)  $Na^+ > Li^+ > K^+ > Rb^+ > Cs^+$
  - (4)  $Na^+ > Li^+ > K^+ > Cs^+ > Rb^+$
17. The IUPAC symbol for the element with atomic number 119 would be :
- (1) unh
  - (2) uun
  - (3) une
  - (4) uue
18. The size of the iso-electronic species  $Cl^-$ , Ar and  $Ca^{2+}$  is affected by -
- (1) Principal quantum number of valence shell
  - (2) Nuclear charge
  - (3) Azimuthal quantum number of valence shell
  - (4) Electron-electron interaction in the outer orbitals
19. The element having greatest difference between its first and second ionization energies, is :
- (1) Ca
  - (2) K
  - (3) Ba
  - (4) Sc

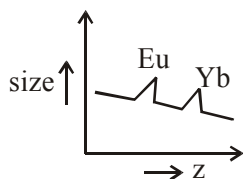
SOLUTION

1. Ans. (3)

$$Z = 120$$

Its general electronic configuration may be represented as [Nobal gas]  $ns^2$ , like other alkaline earth metals.

2. Ans. (3)

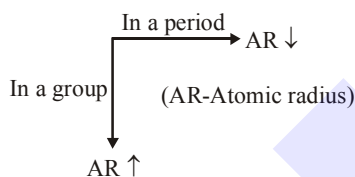


$$Eu > Ce > Ho > N.$$

3. Ans. (2)

$Be(OH)_2$  is amphoteric in nature while rest all alkaline earth metal hydroxide are basic in nature.

4. Ans. (4)



Atomic radii order :  $C < S < Al < Cs$

Atomic radius of C : 170 pm

Atomic radius of S : 180 pm

Atomic radius of Al : 184 pm

Atomic radius of Cs : 300 pm

5. Ans. (1)

B C  
Al Si

Ga < Ge

Along the period electronegativity increases

6. Ans. (1)

Due to Lanthanoid contraction both atomic radii and ionic radii decreases gradually in the lanthanoid series.

7. Ans. (4)

$$E.N. \text{ of Al} = (1.5) \approx \text{Be} (1.5)$$

8. Ans. (2)

Electronegativity decreases as we go down the group and atomic radius increases as we go down the group.

9. Ans. (3)

Second electron gain enthalpy is always positive for every element.



10. Ans.(3)

Mo and W has nearly similar atomic radius due to lanthanoid contraction.

11. Ans.(1)

In case of 'Be' electron remove from '2s' orbital while in case of 'B' electron remove from '2p' orbital. '2s' orbital have greater penetration effect then '2p' orbitals. So 'Be' having more I.E. then 'B'

12. Ans.(3)

$$\text{Atomic number } (Z) = 15 \Rightarrow P \rightarrow [Ne] 3s^2 3p^3$$

Phosphorus belongs to 15<sup>th</sup> group

number of valence electrons = 5

and valency = 3 in ground state.

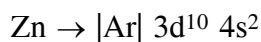
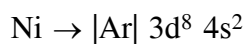
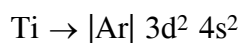
13. Ans.(4)

The highest oxidation state of U and Pu is 6+ and 7+ respectively

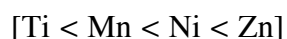
14. Ans.(Bonus)

In question noble gas asked, which does not exist in the atmosphere and answer is given Ra.

Ra is a alkaline earth metal not noble gas it should be Rn. It is printing error in JEE Main paper

**15. Ans.(2)**

Correct order of I.P. is

**16. Ans.(1)**

Hydration enthalpy depends upon ionic potential (charge / size). As ionic potential increases hydration enthalpy increases.

Correct option : (1)

**17. Ans.(4)**

Symbol	Atomic number
unh	106
uun	110
une	109
uue	119

**18. Ans.(2)**

For isoelectronic species the size is compared by nuclear charge.

Correct option: (2)

**19. Ans.(2)**

$$K = 2, 8, 8, 1$$

After removal of one electron, second electron we have to remove from another shell, hence there is large difference between first and second ionization energies.