

Periodic Table and Periodicity

Question1

Which of the following elements has highest electronegativity?

MHT CET 2025 26th April Evening Shift

Options:

A.

Li

B.

Na

C.

K

D.

Rb

Answer: A

Solution:

Electronegativity decreases down the group. Hence, the decreasing order of electronegativity is $\text{Li} > \text{Na} > \text{K} > \text{Rb}$.

Question2

Which of the following elements has highest electronegativity?



MHT CET 2025 23rd April Evening Shift

Options:

- A. Sr
- B. Ca
- C. Mg
- D. Be

Answer: D

Solution:

Electronegativity decreases down the group. Hence, Be has the highest electronegativity.

Question3

Which is the correct increasing order of atomic radii of Na, K, Mg, Rb ?

MHT CET 2025 22nd April Evening Shift

Options:

- A. $Mg < K < Na < Rb$
- B. $Mg < Na < K < Rb$
- C. $Mg < Na < Rb < K$
- D. $Na < K < Rb < Mg$

Answer: B

Solution:

Atomic radius decreases across a period and increases down a group. Greater the effective nuclear charge stronger is attraction of the nucleus for the outer electrons and smaller is the atomic radius.

Therefore, the correct increasing order of atomic radii: $\text{Mg} < \text{Na} < \text{K} < \text{Rb}$

Question4

Identify isoelectronic pair from following.

MHT CET 2025 22nd April Evening Shift

Options:

- A. Ne and O^{2-}
- B. Cl^- and Ca
- C. Ar and F^-
- D. K^+ and Al^{+3}

Answer: A

Solution:

Step 1: Recall

Isoelectronic species have the **same number of electrons**.

Step 2: Analyze each option

Option A: Ne and O^{2-}

- Neon ($Z = 10$): 10 electrons.
- Oxygen ($Z = 8$) with **2- charge**: $8 + 2 = 10$ electrons.

Isoelectronic (both 10 electrons).

Option B: Cl^- and Ca

- Chlorine ($Z = 17$), add one electron $\rightarrow 18$.
- Calcium ($Z = 20$) neutral $\rightarrow 20$ electrons.

Not isoelectronic.

Option C: Ar and F⁻

- Argon ($Z = 18$): 18 electrons.
- Fluorine ($Z = 9$), add one electron $\rightarrow 10$.

✗ Not isoelectronic.

Option D: K⁺ and Al³⁺

- Potassium ($Z = 19$), remove 1 electron $\rightarrow 18$.
- Aluminum ($Z = 13$), remove 3 electrons $\rightarrow 10$.

✗ Not isoelectronic.

✓ **Final Answer:**

The correct isoelectronic pair is

Option A: Ne and O²⁻

Question5

Which of the following elements belongs to second group and fifth period of periodic table?

MHT CET 2024 16th May Morning Shift

Options:

- A. Rubidium
- B. Strontium
- C. Caesium
- D. Barium

Answer: B

Solution:

The element that belongs to the second group and fifth period of the periodic table is Strontium.

Strontium is represented by the chemical symbol Sr. It is an alkaline earth metal, which places it in group 2 of the periodic table. Being in the fifth period indicates that it is located among the elements whose highest principal quantum number is 5.

Characteristics of Strontium:

Atomic Number: 38

Electronic Configuration: $[Kr]5s^2$

Properties: Strontium is a soft, silver-white, metallic element that is highly reactive with water and oxidizes quickly in air. It is similar to calcium and barium but is more chemically active than calcium.

Uses: Strontium compounds are used in fireworks and flares due to their bright red flame. It's also used in producing glass for color television cathode ray tubes and refining zinc.

Strontium's position in the second group highlights its similarities with other alkaline earth metals, such as magnesium and calcium.

Question6

Which element from following has largest atomic size as compared to other three?

MHT CET 2024 11th May Evening Shift

Options:

A. S

B. Se

C. Cl

D. Br

Answer: B

Solution:

The atomic size increases down the group, as a result of increase in the number of quantum shells and decreases along the period from left to right. Therefore, the increasing order of atomic size is $Cl < S < Br < Se$.

Question 7

If four different elements A, B, C and D having electronic configuration as $A = [\text{Ne}]3s^23p^4$, $B = [\text{Ne}]3s^23p^5$, $C = [\text{Ar}]3d^{10}4s^24p^4$ and $D = [\text{Ar}]3d^{10}4s^24p^5$.

Identify the element with largest atomic radius.

MHT CET 2024 10th May Evening Shift

Options:

A. A

B. B

C. C

D. D

Answer: C

Solution:

Answer: C

Explanation:

To determine which element has the largest atomic radius, let's first identify the elements based on their given electronic configurations:



The noble gas [Ne] corresponds to Neon (atomic number 10).

After Neon, we have $3s^2 3p^4$, which places the element in the third period and p-block.

The element with configuration ending in $3p^4$ in the third period is **Sulfur (S)**.



Similarly, this is one electron more in the p-orbital than Sulfur.

In the third period, $3p^5$ corresponds to **Chlorine (Cl)**.



The noble gas [Ar] is Argon (atomic number 18).

After Ar, filling $4s^2$ then $3d^{10}$ and $4p^4$ places the element in the fourth period, p-block.

This corresponds to **Selenium (Se)**.



Similar to Selenium but with one more electron in the p-orbital.

This configuration corresponds to **Bromine (Br)**.

So the elements are:

A: Sulfur (S)

B: Chlorine (Cl)

C: Selenium (Se)

D: Bromine (Br)

Trend in Atomic Radius:

Atomic radius increases as we move down a group (from top to bottom).

Atomic radius decreases as we move from left to right across a period.

Comparing the given elements:

S and Cl are in the 3rd period, while Se and Br are in the 4th period.

Elements in the 4th period (Se, Br) generally have larger atomic radii than those in the 3rd period (S, Cl) because they have an additional energy shell.

Between Se and Br, both are in the same period (4th), but Selenium (Group 16) is to the left of Bromine (Group 17). Atomic radius decreases from left to right, so Se is larger than Br.

Hence, **Selenium (Se)** has the largest atomic radius among the given options.

Final Answer: C

Question8

Which from following elements has highest value of ionization enthalpy ($\Delta_I H_1$) ?

MHT CET 2024 9th May Evening Shift

Options:

A. He

B. Ar

C. Cl

D. I

Answer: A

Solution:

The ionization enthalpy (I.E.) is highest for the inert gases. Therefore I.E of Ar and He will be higher than the halogens Cl and I.

Down the group, I.E decreases due to increase in the atomic size.

Therefore, ionization enthalpy of He > Ar. varies as: I < Cl and Ar < He.

Across a period, I.E increases with increase in atomic number.

Therefore, I.E of Cl and Ar is in the order: Cl < Ar.

Hence, the correct increasing order of ionization enthalpy for the given elements is:

$I < Cl < Ar < He$

He has the highest I.E.

Question9

Which among the following elements has highest electronegativity?

MHT CET 2024 9th May Morning Shift

Options:

A. K

B. Na

C. Li

D. Cs

Answer: C

Solution:

The electronegativity of Group 1 elements decreases down the group. Hence, the decreasing order of electronegativity is

$\text{Li} > \text{Na} > \text{K} > \text{Cs}$

Question10

Which of the following elements belongs to first group and fifth period of periodic table?

MHT CET 2024 4th May Evening Shift

Options:

A. Rubidium

B. Strontium

C. Caesium

D. Barium

Answer: A

Solution:

Rubidium belongs to the first group and fifth period of the periodic table. This element is an alkali metal. In the periodic table, groups are the vertical columns, and periods are the horizontal rows. The first group elements are also known as alkali metals, and they typically have one valence electron, which makes them highly reactive. Rubidium is located in the fifth period, indicating that it has five electron shells.

Here is a breakdown of Rubidium's position:

Group: 1 (Alkali metals)

Period: 5

This configuration contributes to its properties, such as being a soft, highly reactive metal at standard conditions.

Question11

Identify the element having lowest first ionization enthalpy.



MHT CET 2024 4th May Morning Shift

Options:

- A. Po
- B. Te
- C. Br
- D. Kr

Answer: A

Solution:

The ionization enthalpy (I.E) decreases down the group due to increase in the atomic size. Therefore, I.E of Te is more than that of Po. Across a period, I.E increases with increase of atomic number.

Therefore, I.E of Br and Kr is in the order: $\text{Br} < \text{Kr}$.

Hence, the correct decreasing order of I.E for the given elements is: $\text{Kr} > \text{Br} > \text{Te} > \text{Po}$

Question12

What is the value of electronegativity of oxygen?

MHT CET 2024 4th May Morning Shift

Options:

- A. 4.0
- B. 3.5
- C. 2.48
- D. 3.2

Answer: B

Solution:

The value of electronegativity for oxygen is 3.5.

Electronegativity is a measure of an atom's ability to attract and hold onto electrons in a chemical bond. Oxygen is one of the most electronegative elements due to its high affinity for electrons, allowing it to form polar covalent bonds with other elements. This property is essential in various chemical reactions and biological processes involving oxygen.

Question13

Identify the element with lowest electronegativity.

MHT CET 2024 3rd May Morning Shift

Options:

- A. O
- B. S
- C. F
- D. Cl

Answer: B

Solution:

The element with the lowest electronegativity among the given options is sulfur (S).

In the periodic table, electronegativity generally increases across a period from left to right and decreases down a group. Here is a breakdown of the given options:

Oxygen (O): Oxygen is highly electronegative, second only to fluorine, with an electronegativity value of approximately 3.44 on the Pauling scale.

Sulfur (S): Sulfur, which is located below oxygen in group 16, has a lower electronegativity of about 2.58.

Fluorine (F): Fluorine is the most electronegative element on the periodic table, with an electronegativity value of 3.98.

Chlorine (Cl): Chlorine is also highly electronegative, with a value of approximately 3.16, but it is significantly more electronegative than sulfur.

Thus, sulfur has the lowest electronegativity compared to the other given elements.

Question14

Identify the element having positive electron gain enthalpy.

MHT CET 2023 14th May Evening Shift

Options:

A. Ne

B. I

C. S

D. O

Answer: A

Solution:

Electron gain enthalpy, sometimes called electron affinity, refers to the amount of energy released or spent when an electron is added to a neutral atom in the gas phase to form a negative ion. If the energy is released during the process, the electron gain enthalpy is negative, indicating that the process is exothermic and the element tends to gain an electron more readily. Conversely, when the energy is required to add an electron, the electron gain enthalpy is positive, and the process is endothermic, meaning that the element does not favor gaining an electron.

Generally, nonmetals have more negative electron gain enthalpies because they are more likely to accept electrons to complete their valence electron shells. However, there are exceptions, particularly among the noble gases.

In the context of noble gases like neon (Ne), they already have a complete valence shell and are quite stable. Therefore, adding an electron would require forcing it into an already complete electron shell, which is an unfavorable process requiring energy. Hence, noble gases generally have positive electron gain enthalpies despite being nonmetals.

Let's analyze the options given:

Option A: Ne (Neon) - Neon is a noble gas with a stable electronic configuration of $2s^2 2p^6$. Therefore, it does not tend to gain electrons, and the process of adding an electron to a neon atom is endothermic, requiring energy. Therefore, neon has a positive electron gain enthalpy.

Option B: I (Iodine) - Iodine is a nonmetal and has a high tendency to gain an electron to complete its valence shell, hence it has large negative electron gain enthalpy.

Option C: S (Sulfur) - Sulfur is another nonmetal which prefers to gain electrons to achieve a stable electron configuration, hence it also has negative electron gain enthalpy.



Option D: O (Oxygen) - Oxygen is highly electronegative and readily gains electrons, resulting in negative electron gain enthalpy.

The element among the options provided that has positive electron gain enthalpy is Ne (Neon), so the correct answer is:

Option A: Ne (Neon)

Question15

Which from following is a correct decreasing order of ionisation enthalpy for different elements?

MHT CET 2023 13th May Evening Shift

Options:

A. $\text{Ar} > \text{Ne} > \text{S} > \text{Cl}$

B. $\text{Ne} > \text{Ar} > \text{Cl} > \text{S}$

C. $\text{Ne} > \text{S} > \text{Cl} > \text{Ar}$

D. $\text{Cl} > \text{S} > \text{Ne} > \text{Ar}$

Answer: B

Solution:

Ionisation enthalpy decreases on moving down the group while it increases along the period. So, the correct order of ionization enthalpy for the given elements is $\text{Ne} > \text{Ar} > \text{Cl} > \text{S}$.

Question16

Which from following series of elements is correctly arranged according to their decreasing order of ionisation enthalpy (IE_1) ?

MHT CET 2023 13th May Evening Shift



Options:

A. $Zn > Fe > Cr > Sc$

B. $Cr > Fe > Zn > Sc$

C. $Sc > Fe > Cr > Zn$

D. $Cr > Zn > Sc > Fe$

Answer: A

Solution:

In general ionisation enthalpy increases along the period and decreases on moving down the group. So, the correct order for ionisation enthalpy is as follows :

$Zn > Fe > Cr > Sc$

Question17

Identify FALSE statement from following.

MHT CET 2023 13th May Morning Shift

Options:

A. Boiling point of sulfur is lower than oxygen.

B. Ionization enthalpy of group 16 elements gradually decreases from top to bottom.

C. Group 16 elements have lower ionization enthalpy than group 15 elements in corresponding periods.

D. Oxygen has highest electronegativity next to fluorine amongst all the elements.

Answer: A

Solution:

Melting and boiling points of elements of group 16 increase with increasing atomic number. Therefore, oxygen has low melting and boiling points as compared to sulfur.

Question18

Which from following elements belongs to group 17 of periodic table?

MHT CET 2023 12th May Evening Shift

Options:

A. At

B. Zn

C. As

D. Te

Answer: A

Solution:

Group 17 of the periodic table consists of elements known as halogens. The elements in Group 17 are fluorine (F), chlorine (Cl), bromine (Br), iodine (I), and astatine (At). They are located in the penultimate (second to last) column of the periodic table. Each of these elements has seven electrons in its outermost shell, which is the characteristic electron configuration of halogens.

Based on the options provided:

Option A: At (Astatine) - Astatine is indeed a halogen and belongs to Group 17 of the periodic table.

Option B: Zn (Zinc) - Zinc is a transition metal and belongs to Group 12, not Group 17.

Option C: As (Arsenic) - Arsenic is a metalloid and is located in Group 15, not Group 17.

Option D: Te (Tellurium) - Tellurium is a metalloid and is located in Group 16, just before the halogens.

Therefore, the correct answer is:

Option A: At (Astatine)

Question19

What is the position of copper in long form of periodic table?



MHT CET 2023 12th May Evening Shift

Options:

- A. Group -12, period-3
- B. Group-11, period-4
- C. Group-8, period-4
- D. Group-11, period-5

Answer: B

Solution:

The correct position of copper in the long form of the periodic table is given by Option B: Group-11, period-4.

In the periodic table, copper has the atomic number 29. It belongs to the group of elements known as the transition metals. Specifically, copper is in the 11th group, which is sometimes referred to as group IB in older notations. It is in the 4th period, which indicates that it has four electron shells or energy levels. Thus, when properly identifying copper's place in the periodic table, we should say it is located in Group 11, Period 4.

The other options can be dismissed as follows:

Option A (Group-12, period-3) - This is incorrect because Group 12 elements include zinc (Zn), cadmium (Cd), and mercury (Hg), and Period 3 elements do not include transition metals.

Option C (Group-8, period-4) - This is incorrect because Group 8 elements include iron (Fe), ruthenium (Ru), and osmium (Os).

Option D (Group-11, period-5) - This is incorrect because Period 5 of Group 11 contains silver (Ag), while copper is in Period 4.

Question20

Which from following is a CORRECT decreasing order of ionization enthalpies of different elements?

MHT CET 2023 10th May Evening Shift



Options:

A. $S > Se > Te > Po$

B.

$Te > Po > S > Se$

C. $S > Te > Po > Se$

D. $Te > Po > Se > S$

Answer: A

Solution:

The ionization enthalpy decreases down the group due to increase in the atomic size. The correct decreasing order of ionization enthalpies is:

$S > Se > Te > Po$

Question21

What is the position of transition elements from Sc to Zn in long form of periodic table?

MHT CET 2023 10th May Evening Shift

Options:

A. Group 4 to 13, period-3

B. Group 3 to 12, period-4

C. Group 5 to 14, period-4

D. Group 3 to 12, period-5

Answer: B

Solution:

The transition elements from Scandium (Sc) to Zinc (Zn) in the periodic table are found in the d-block. These elements specifically fall within the groups 3 to 12. In terms of periods, Scandium (Sc), which is the first element in this series, starts at atomic number 21, and this places it in the 4th period of the periodic table. Zinc (Zn), with atomic number 30, is also in the same period.

Therefore, the position of the transition elements from Scandium (Sc) to Zinc (Zn) in the long form of the periodic table is :

Option B : Group 3 to 12, period-4

Question22

Which group elements from following are called as chalcogens?

MHT CET 2023 9th May Evening Shift

Options:

- A. group 13
- B. group 15
- C. group 16
- D. group 17

Answer: C

Solution:

Chalcogens are the elements in group 16 of the periodic table. This group includes oxygen (O), sulfur (S), selenium (Se), tellurium (Te), and polonium (Po). Therefore, the correct answer is :

Option C : group 16

Question23

Identify the element having general electronic configuration ns^2np^4 from following.

MHT CET 2023 9th May Morning Shift

Options:

A. Se

B. Br

C. Xe

D. Kr

Answer: A

Solution:

The general electronic configuration of the group 16 elements is ns^2np^4 . Among the given options, Se is a group 16 element.

Question24

Which element from following is a soft element?

MHT CET 2021 24th September Morning Shift

Options:

A. Mn

B. Zn

C. Co

D. Ni

Answer: B

Solution:

The element that is considered soft among the given options is Zinc (Zn).

Elements can be classified as hard or soft based on their physical properties. Soft elements are typically more malleable and less dense, and they can often be cut with a knife. Zinc is known to be a relatively soft metal compared to the other options listed which are Manganese (Mn), Cobalt (Co), and Nickel (Ni).

Here is a brief comparison:

- **Mn (Manganese):** It is a hard and brittle metal used in steel production.
- **Zn (Zinc):** It is a relatively soft metal that is highly malleable under certain conditions.
- **Co (Cobalt):** It is a hard and brittle metal with magnetic properties.
- **Ni (Nickel):** It is a hard, ductile, and corrosion-resistant metal.

Therefore, the correct answer is:

Option B: Zn

Question25

Identify the use of mixture of Ar and N₂ from following.

MHT CET 2021 23rd September Evening Shift

Options:

- A. For magnetic resonance imaging
- B. For production of lasers
- C. To fill in electric bulbs
- D. To produce low temperature for research work

Answer: C

Solution:

The mixture of Ar (Argon) and N₂ (Nitrogen) is commonly used to fill electric bulbs. This combination is chosen because it helps to reduce the rate of tungsten filament evaporation, thereby extending the life of the



bulb. Argon provides an inert atmosphere that prevents oxidation, while nitrogen serves to reduce the heat loss through convection. Therefore, the correct option is:

Option C: To fill in electric bulbs

Question26

Which among the following oxides is acidic in nature?

MHT CET 2021 23rd September Evening Shift

Options:

A. N_2O_5

B. NO

C. Na_2O

D. CO

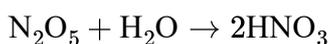
Answer: A

Solution:

To determine which among the given oxides is acidic in nature, we need to consider the chemical properties of each oxide:

Option A: N_2O_5

Dinitrogen pentoxide (N_2O_5) is a well-known acidic oxide. When it reacts with water, it forms nitric acid (HNO_3), demonstrating its acidic behavior:



Option B: NO

Nitric oxide (NO) is a neutral oxide. It does not exhibit basic or acidic properties significantly. It does not react with water to form an acidic or basic solution.

Option C: Na_2O

Sodium oxide (Na_2O) is a basic oxide. When it reacts with water, it forms sodium hydroxide (NaOH), which is a strong base:



Option D: CO

Carbon monoxide (CO) is generally considered a neutral oxide. It does not react with water to form an acidic or basic solution.

Based on the above analysis, **Option A: N₂O₅** is the oxide that is acidic in nature.

Question27

Which among the following formulae is correctly represented according to stock notation?

MHT CET 2021 23th September Morning Shift

Options:

A. Fe (II) Cl₃

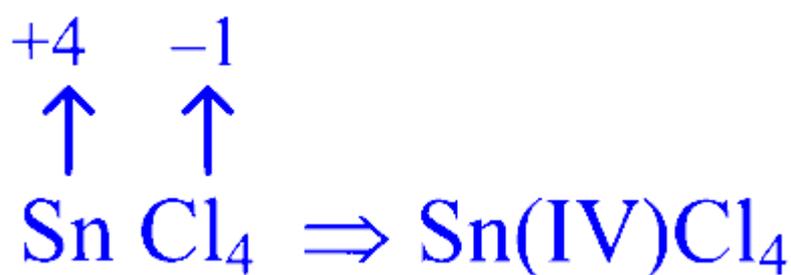
B. Mn(II)O₂

C. Au (III)Cl

D. Sn(IV)Cl₄

Answer: D

Solution:



Question28

Identify amphoteric oxide from following.

MHT CET 2021 21th September Morning Shift

Options:

A. SO_3

B. Na_2O

C. N_2O

D. Al_2O_3

Answer: D

Solution:

SO_3 - Acidic, Na_2O - Basic, N_2O - Neutral, Al_2O_3 - Amphoteric

