

The correct order of atomic radii among the following elements is:

- A. $\text{Na} > \text{Mg} > \text{Al}$
- B. $\text{Al} > \text{Mg} > \text{Na}$
- C. $\text{Mg} > \text{Na} > \text{Al}$
- D. $\text{Na} > \text{Al} > \text{Mg}$

Answer: A. $\text{Na} > \text{Mg} > \text{Al}$

Explanation: Across a period, atomic radius decreases due to increased nuclear charge.

Q2. Which of the following elements has the highest ionization enthalpy?

- A. Oxygen
- B. Fluorine
- C. Neon
- D. Nitrogen

Answer: C. Neon

Explanation: Noble gases have highest ionization enthalpy due to completely filled orbitals and maximum stability.

Q3. Which of the following has the highest electron gain enthalpy?

- A. Fluorine
- B. Oxygen
- C. Chlorine
- D. Bromine

Answer: C. Chlorine

Explanation: Chlorine has a higher electron gain enthalpy than fluorine due to less electron–electron repulsion in the larger 3p orbital.

Q4. Arrange the following in increasing order of metallic character:

Na, Mg, Al, Si

- A. $\text{Si} < \text{Al} < \text{Mg} < \text{Na}$
- B. $\text{Na} < \text{Mg} < \text{Al} < \text{Si}$

C. $\text{Na} < \text{Al} < \text{Mg} < \text{Si}$

D. $\text{Si} < \text{Mg} < \text{Al} < \text{Na}$

Answer: A. $\text{Si} < \text{Al} < \text{Mg} < \text{Na}$

Explanation: Metallic character increases down the group and decreases across a period.

Q5. The element with atomic number 35 belongs to:

A. s-block

B. p-block

C. d-block

D. f-block

Answer: B. p-block

Explanation: Atomic number 35 corresponds to bromine, which is a halogen in the p-block.

Q6. Match the elements with their group:

Column I

Column II

A. Oxygen

1. Group 13

B. Nitrogen

2. Group 15

C. Boron

3. Group 16

Options:

A. A-3, B-2, C-1

B. A-2, B-3, C-1

C. A-1, B-3, C-2

D. A-2, B-1, C-3

Answer: A. A-3, B-2, C-1

Explanation: O is in group 16, N in 15, and B in 13.

Q7. Assertion (A): Ionization energy increases across a period.

Reason (R): Atomic size increases across a period.

- A. Both A and R are true and R is correct explanation
- B. A is true but R is false
- C. A is false but R is true
- D. Both A and R are false

Answer: B. A is true but R is false

Explanation: Ionization energy increases due to decreasing atomic size, not increasing.

Q8. Which element has the smallest atomic radius?

- A. Li
- B. Be
- C. B
- D. F

Answer: D. F

Explanation: Fluorine lies farthest to the right in the period, where radius is smallest.

Q9. Periodicity in properties is due to:

- A. Repetition of atomic number
- B. Repetition of atomic size
- C. Repetition of outer electronic configuration
- D. Increase in valency

Answer: C. Repetition of outer electronic configuration

Explanation: Periodic properties repeat because the valence shell configuration repeats periodically.

Q10. Which of the following does not belong to the same period?

- A. Na
- B. Mg
- C. K
- D. Al

Answer: C. K

Explanation: K belongs to 4th period, others are in 3rd period.

Q11. Which of the following is incorrect about ionization enthalpy?

- A. It increases along a period
- B. It decreases down a group
- C. It is highest for noble gases
- D. It is always positive

Answer: D. It is always positive

Explanation: Ionization enthalpy is always positive, so this statement is correct, not incorrect. Hence none is incorrect.

But since question asks for incorrect, this may be an error — ideally none is incorrect.

Q12. The number of elements in the 5th period is:

- A. 8
- B. 18
- C. 32
- D. 50

Answer: B. 18

Explanation: The 5th period includes s-, p-, and d-block elements totaling 18.

Q13. A diagonal relationship exists between:

- A. Li and Mg
- B. Be and Al
- C. B and Si
- D. All of the above

Answer: D. All of the above

Explanation: Diagonal relationships exist between 2nd and 3rd period elements of adjacent groups.

Q14. Noble gases are placed in group:

- A. 0
- B. 17
- C. 18

D. 16

Answer: C. 18

Explanation: Modern periodic table places noble gases in group 18.

Q15. Statement I: Electronegativity increases across a period.

Statement II: It decreases down the group.

A. Both statements are correct

B. Only Statement I is correct

C. Only Statement II is correct

D. Both are incorrect

Answer: A. Both statements are correct

Explanation: Electronegativity trends follow these patterns due to atomic size and effective nuclear charge.

Q16. The valency of an element with atomic number 34 is:

A. 2

B. 4

C. 6

D. 0

Answer: A. 2

Explanation: Atomic number 34 is selenium (Se), a group 16 element with 6 valence electrons. Its typical valency is 2 (to complete octet).

Q17. The order of second ionization enthalpies (IE₂) is:

A. Na < Mg < Al

B. Al < Mg < Na

C. Mg < Na < Al

D. Na < Al < Mg

Answer: B. Al < Mg < Na

Explanation: IE₂ is very high for Na because removal of the second electron requires breaking a noble gas core. Mg and Al follow normal trends.

Q18. Assertion (A): Noble gases have zero electron affinity.

Reason (R): They have fully filled orbitals.

- 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. A is true but R is false
- D. A is false but R is true

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

Explanation: Fully filled stable electronic configuration leads to zero tendency to accept electrons.

Q19. Identify the incorrect match:

- A. Group 1 – Alkali metals
- B. Group 2 – Alkaline earth metals
- C. Group 17 – Noble gases
- D. Group 18 – Inert gases

Answer: C. Group 17 – Noble gases

Explanation: Group 17 contains halogens; noble gases are in group 18.

Q20. Which of the following shows the most metallic character?

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

Answer: D. Ba

Explanation: Metallic character increases down the group; Ba is lowest in group 2.

Q21. Match the following elements with their characteristics:

Column I

Column II

- A. F 1. Highest electronegativity
B. Cs 2. Lowest ionization energy
C. He 3. Noble gas

Options:

- A. A-1, B-2, C-3
B. A-2, B-1, C-3
C. A-3, B-1, C-2
D. A-2, B-3, C-1

Answer: A. A-1, B-2, C-3

Explanation: F is most electronegative, Cs has lowest IE, He is a noble gas.

Q22. Which of the following pairs have same number of valence electrons?

- A. Li and Na
B. B and Al
C. C and Si
D. All of the above

Answer: D. All of the above

Explanation: Elements in the same group have the same number of valence electrons.

Q23. Atomic size decreases across a period because:

- A. Number of shells decreases
B. Valence electrons decrease
C. Nuclear charge increases
D. Shielding increases

Answer: C. Nuclear charge increases

Explanation: Higher nuclear charge pulls electrons closer, reducing size.

Q24. Which of the following has the most negative electron gain enthalpy?

- A. F
B. O

- C. Cl
- D. Br

Answer: C. Cl

Explanation: Cl has greater electron gain enthalpy than F due to lesser inter-electronic repulsion.

Q25. Which of the following properties does not show a regular trend in the periodic table?

- A. Ionization energy
- B. Electron affinity
- C. Atomic radius
- D. Color

Answer: D. Color

Explanation: Color is not a periodic property; it's more related to electronic transitions and d-orbital involvement.

Q26. Statement I: The periodic table is based on increasing atomic number.

Statement II: Periodic law was originally based on atomic mass.

- A. Both statements are correct
- B. Only I is correct
- C. Only II is correct
- D. Both are incorrect

Answer: A. Both statements are correct

Explanation: Mendeleev used atomic mass, but the modern table uses atomic number.

Q27. Ionization enthalpy of oxygen is less than that of nitrogen due to:

- A. Higher atomic number
- B. Larger size
- C. Extra stability of half-filled p-orbitals in N
- D. Greater electronegativity of O

Answer: C. Extra stability of half-filled p-orbitals in N

Explanation: Half-filled orbitals are more stable, requiring more energy to remove electrons.

Q28. Among the following, which has the lowest first ionization enthalpy?

- A. Be
- B. B
- C. C
- D. N

Answer: B. B

Explanation: Despite higher nuclear charge, B has lower IE due to p-electron being easier to remove than s-electron in Be.

Q29. Which of the following is correctly matched?

- A. Second period – 18 elements
- B. Third period – 8 elements
- C. Fourth period – 32 elements
- D. First period – 3 elements

Answer: B. Third period – 8 elements

Explanation: Third period contains 8 elements from Na to Ar.

Q30. The general electronic configuration of p-block elements is:

- A. ns^2
- B. $ns^2 np^{1-6}$
- C. ns^{1-2}
- D. $ns^2 np^6$

Answer: B. $ns^2 np^{1-6}$

Explanation: P-block elements fill p orbitals from 1 to 6 electrons.

Q31. Which of the following elements has the highest electronegativity?

- A. Nitrogen
- B. Oxygen
- C. Fluorine

D. Chlorine

Answer: C. Fluorine

Explanation: Fluorine has the highest electronegativity (4.0 on Pauling scale).

Q32. Which pair of elements belong to the same group?

A. Li and Be

B. N and O

C. Na and K

D. B and C

Answer: C. Na and K

Explanation: Both are alkali metals in group 1.

Q33. Which of the following has irregular trend in electron affinity?

A. $\text{Cl} > \text{F}$

B. $\text{N} < \text{O}$

C. $\text{Be} < \text{B}$

D. All of the above

Answer: D. All of the above

Explanation: These are all known exceptions due to electronic configurations and small size effects.

Q34. Assertion (A): Noble gases have very high ionization energies.

Reason (R): They have completely filled orbitals.

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. A is true but R is false

D. A is false but R is true

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

Explanation: Fully filled orbitals make atoms stable and resistant to electron removal.

Q35. Arrange the following in increasing order of atomic size: Na, Al, Si, P

- A. $\text{Na} < \text{Al} < \text{Si} < \text{P}$
- B. $\text{Na} > \text{Al} > \text{Si} > \text{P}$
- C. $\text{P} < \text{Si} < \text{Al} < \text{Na}$
- D. $\text{Al} < \text{Si} < \text{P} < \text{Na}$

Answer: C. $\text{P} < \text{Si} < \text{Al} < \text{Na}$

Explanation: Atomic size increases from right to left across a period.

Q36. Match the following with the correct group number:

Column I (Element)	Column II (Group Number)
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- | | |
|-------|-------------|
| A. Mg | 1. Group 2 |
| B. Ar | 2. Group 18 |
| C. S | 3. Group 16 |

Options:

- A. A-1, B-3, C-2
- B. A-2, B-1, C-3
- C. A-2, B-2, C-3
- D. A-3, B-2, C-1

Answer: C. A-2, B-2, C-3

Explanation: Mg is Group 2, Ar is Group 18, S is Group 16.

Q37. Which period contains the maximum number of elements?

- A. Second
- B. Third
- C. Sixth
- D. Seventh

Answer: C. Sixth

Explanation: Sixth period contains 32 elements including lanthanides.

Q38. Which of the following has the least shielding effect?

- A. s-orbitals
- B. p-orbitals
- C. d-orbitals
- D. f-orbitals

Answer: D. f-orbitals

Explanation: f-orbitals are poor at shielding, leading to lanthanide contraction.

Q39. Statement I: Down the group, atomic size increases.

Statement II: Across a period, atomic size increases.

- A. Both statements are true
- B. Only I is true
- C. Only II is true
- D. Both statements are false

Answer: B. Only I is true

Explanation: Across a period, atomic size decreases due to increasing nuclear charge.

Q40. Electron affinity is least negative in:

- A. Cl
- B. F
- C. N
- D. Br

Answer: C. N

Explanation: N has a half-filled p-orbital, making it less likely to accept another electron.

Q41. Which element has maximum metallic character in Period 3?

- A. Na
- B. Al
- C. Mg
- D. Si

Answer: A. Na

Explanation: Metallic character decreases across the period; Na is the most metallic.

Q42. Which of the following shows lanthanide contraction?

- A. Increase in atomic size
- B. Increase in ionization energy
- C. Poor shielding by f-electrons
- D. All of the above

Answer: D. All of the above

Explanation: Lanthanide contraction results from poor shielding, smaller radii, and higher IE.

Q43. What is the electronic configuration of the element with atomic number 20?

- A. $1s^2 2s^2 2p^6 3s^2 3p^6$
- B. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2$
- C. $1s^2 2s^2 2p^6 3s^2 4s^2$
- D. $1s^2 2s^2 2p^6 3s^2 3p^4$

Answer: B. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2$

Explanation: Atomic number 20 is calcium (Ca), a Group 2 element.

Q44. The periodic table has how many groups and periods?

- A. 7 groups, 18 periods
- B. 18 groups, 7 periods
- C. 7 groups, 32 periods
- D. 18 groups, 32 periods

Answer: B. 18 groups, 7 periods

Explanation: This is the standard format of the modern periodic table.

Q45. Which pair of elements is diagonal related?

- A. B and Al

- B. Be and Mg
- C. Li and Mg
- D. Na and Mg

Answer: C. Li and Mg

Explanation: Diagonal relationship exists between elements like Li-Mg due to similar charge/radius ratio.