

PYQs Previous Years Questions

1 Mark Questions

- An element in period 3, whose electron affinity is zero.
(a) Neon (b) Sulphur (c) Sodium (d) Argon *ICSE 2023*
- An element with largest atomic radius among the following is
(a) carbon (b) nitrogen (c) lithium (d) beryllium *ICSE 2023*
- State the terms/process for
The energy released when an atom in the gaseous state accepts an electron to form an anion. *ICSE 2023*
- Define electronegativity. *ICSE 2023*
- Electron affinity is maximum in *ICSE Specimen 2023, 2019*
(a) alkaline earth metals (b) halogens (c) inert gases (d) alkali metals
- An alkali metal found in period 3 and group 1 is
(a) magnesium (b) lithium (c) sodium (d) potassium *ICSE Specimen 2023*
- Identify the following
The energy required to remove an electron from the valence shell of a neutral isolated gaseous atom. *ICSE Specimen 2023, 2019*
- In a periodic table, the element of period 3 are arranged in the increasing order of ionisation potential as
(a) B, N, Cl, Ar (b) Mg, Si, S, Ar (c) Ar, Si, S, Mg (d) Si, Ar, Cl, Mg *ICSE 2021-22 (Sem-I)*
- The tendency of an atom to attract shared pair of electrons to itself when forming a chemical bond is known as
(a) electron affinity (b) electronegativity (c) ionisation potential (d) nuclear charge *ICSE 2021-22 (Sem-I)*
- Alkaline earth metals have the same *ICSE 2021-22 (Sem-I)*
(a) number of valence electrons (b) number of shells (c) metallic property (d) ionisation potential
- Element with an atomic number 19 will
(a) accept an electron and get oxidised (b) accept an electron and get reduced (c) lose an electron and get oxidised (d) lose an electron and get reduced *ICSE 2021-22 (Sem-I)*
- If an element has low ionisation potential, then it is likely to be a
(a) metal (b) metalloid (c) non-metal (d) inert gas *ICSE 2021-22 (Sem-I)*
- The property which decreases from left to right across the periodic table
(a) electron affinity (b) electronegativity (c) ionisation energy (d) metallic character *ICSE Specimen 2021-22 (Sem-I)*
- On the basis of electronic configuration the period and group of B_5^0 is
(a) 2 and IIIA (b) 3 and IIA (c) 4 and VIA (d) 5 and VIIA *ICSE Specimen 2021-22 (Sem-I)*
- The most electronegative element is
(a) sodium (b) aluminium (c) bromine (d) fluorine *ICSE Specimen 2021-22 (Sem-I)*
- Elements with similar valence shell configuration in a periodic table are placed in
(a) different groups (b) same period (c) different period (d) same group *ICSE Specimen 2021-22 (Sem-I)*
- During ionisation, metals lose electrons. This change can be called
(a) oxidation (b) reduction (c) redox (d) displacement *ICSE Specimen 2021-22 (Sem-I)*
- The trend in metallic nature of metals as we go from top to bottom in a group
(a) increases (b) decreases (c) neither increases nor decreases (d) None of the above *ICSE Specimen 2021-22 (Sem-I)*
- The basic oxide which is an alkali.
(a) copper oxide (b) sodium oxide (c) ferric oxide (d) zinc oxide *ICSE Specimen 2021-22 (Sem-I)*
- The non-metallic properties of elements from left to right in a periodic table
(a) increases (b) decreases (c) remains same (d) first increases and then decreases *ICSE 2021-22 (Sem-I)*
- The element with highest ionisation potential is
(a) hydrogen (b) caesium (c) radon (d) helium *ICSE 2020*

22. Electron affinity is maximum in
 (a) alkali metals (b) alkaline earth metals
 (c) halogens (d) inert gases **ICSE 2020**
23. The most electronegative element from the following elements is
 (a) magnesium (b) chlorine
 (c) aluminium (d) sulphur **ICSE 2019**
24. Fill in the blanks with the correct choice given in the bracket.
 In period 3, the most metallic element is
 (sodium / magnesium / aluminium). **ICSE 2019**
25. Give one word or a phrase for
 'The energy released when an electron is added to a neutral gaseous isolated atom to form a negatively charged ion'. **ICSE 2018**
26. Give a reason for
 'Alkali metals are good reducing agents'. **ICSE 2018**
27. Give a reason for
 'Ionisation potential increases across a period, from left to right'. **ICSE 2018, 2012**
28. Fill in the blank with the correct choice given in bracket.
 The energy required to remove an electron from a neutral isolated gaseous atom and convert it into a positively charged gaseous ion is called (electron affinity, ionisation potential, electronegativity) **ICSE 2017**
29. The element with the highest ionisation potential in the periodic table is
 (a) He (b) Ne (c) Ar (d) Xe **ICSE 2016**
30. Fill in the blanks with the correct choices given in the brackets.
 Metals are good (oxidising agents/reducing agents) because they are electron (acceptors/donors). **ICSE 2016**
31. Among the elements given below, the element with the least electronegativity is
 (a) lithium (b) carbon
 (c) boron (d) fluorine **ICSE 2015**
32. Give one word or phrase for
 "The amount of energy released when an atom in the gaseous state accepts an electron to form an anion". **ICSE 2014**
33. If an element A belongs to period 3 and group-II then it will have
 (a) 3 shells and 2 valence electrons
 (b) 2 shells and 3 valence electrons
 (c) 3 shells and 3 valence electrons
 (d) 2 shells and 2 valence electrons
34. Ionisation potential increases across a period from left to right because the
 (a) atomic radius increases and nuclear charge increases
 (b) atomic radius decreases and nuclear charge decreases
 (c) atomic radius increases and nuclear charge decreases
 (d) atomic radius decreases and nuclear charge increases **ICSE 2014**
35. Identify the following substance which is underlined.
 The element which has the highest ionisation potential. **ICSE 2013**
36. Among the elements of period 2, the element which has high electron affinity is
 (a) lithium (b) carbon
 (c) chlorine (d) fluorine **ICSE 2013, 2009**
37. Name a metal present in period 3 and group 1 of the periodic table. **ICSE 2012**
38. An element in period 3, whose electron affinity is zero.
 (a) Neon (b) Sulphur (c) Sodium (d) Argon **ICSE 2012**
39. Which of the following properties do not match with elements of the halogen family?
 (a) They have seven electrons in their valence shell.
 (b) They are highly reactive chemically.
 (c) They are metallic in nature.
 (d) They are diatomic in their molecular form. **ICSE 2011**
40. Give reason as to why?
 The oxidising nature of elements increases on moving from left to right along a period in the periodic table. **ICSE 2011**
41. Give the number of the group and the period, of the element having three shells with three electrons in valence shell. **ICSE 2011**
42. In a periodic table, alkali metals are placed in the group
 (a) 1 (b) 11 (c) 17 (d) 18 **ICSE 2011**
43. Fill in the blank with the correct choice given in bracket.
 Across a period, the ionisation potential (increases, decreases, remains same). **ICSE 2011**
44. Fill in the blank with the correct choice given in the bracket
 Down the group, electron affinity (increases, decreases, remains same). **ICSE 2011**

45. The number of electrons present in the valence shell of a halogen is ICSE 2010
 (a) 1 (b) 3
 (c) 5 (d) 7
46. With reference to the variation of properties in the periodic table, which of the following is generally true? ICSE 2008
 (a) Atomic size increases from left to right across a period.
 (b) Ionisation potential increases from left to right across a period.
 (c) Electron affinity increases going down a group.
 (d) Electronegativity increases going down a group.
47. Predict the group of an element X , if its atomic number is 16. ICSE 2004

2 Marks Questions

48. Identify the term/substance in each of the following
 (i) The tendency of an atom to attract electrons towards itself when combined with a compound.
 (ii) The electrons present in the outermost shell of an atom. ICSE 2016
49. Rewrite the following sentences by using the correct symbol $>$ (greater than) or $<$ (less than) in the blanks given. ICSE 2016
 (i) The ionisation potential of potassium is that of sodium.
 (ii) The electronegativity of iodine is that of chlorine.
50. Fill in the blanks with the correct choice given in bracket.
 (i) If an element has a low ionisation energy, then it is likely to be (metallic/non-metallic). ICSE 2016
 (ii) If an element has seven electrons in its outermost shell, then it is likely to have the (largest/smallest) atomic size among all the elements in the same period. ICSE 2008
51. Define the following term.
 (i) Ionisation potential (ii) Electron affinity ICSE 2010, 2009
52. (i) If an element is in group 17 (or group-VIIA), it is likely to be metallic or non-metallic in character.
 (ii) Write the missing word from those in brackets. If an element has one electron in its outermost energy level (shell), then it is likely to be (metallic/non-metallic). ICSE 2008

3 Marks Questions

53. Arrange the following as per the instructions given in the brackets. ICSE 2023
 (i) Al, K, Mg, Ca (decreasing order of its reactivity)
 (ii) N, Be, O, C (increasing order of non-metallic character)
 (iii) P, Si, F, Be (decreasing order of valence electrons)
54. Arrange the following as per the instruction given in the brackets. ICSE Specimen 2023
 (i) Na, K, Cl, Si, S (increasing order of electro negativity).
 (ii) Be, Li, F, C, B, N, O (increasing order of metallic character).
 (iii) Br, F, I, Cl (increasing order of atomic size).
55. An element X has atomic number 17. Answer the following questions. ICSE Specimen 2023
 (i) State the period and group to which it belongs.
 (ii) Is it a metal or non-metal?
 (iii) Write the formula between X and hydrogen.
56. Arrange the following as per the instruction given in the brackets. ICSE Specimen 2019
 (i) Li, F, N [increasing order of electronegativity]
 (ii) Na, Al, Cl [increasing order of number of covalent bonds]
 (iii) Br, F, Cl [decreasing order of atomic radius]
57. Arrange the following according to the instructions given in brackets. ICSE 2019
 (i) K, Pb, Ca, Zn (In the increasing order of the reactivity)
- KEY IDEA**
 In reactivity series of metals, different metals are arranged in their decreasing reactivity order.
- (ii) Li, K, Na, H (In the decreasing order of their ionisation potential)
 (iii) F, B, N, O (In the increasing order of electron affinity)
58. In period 3 of the periodic table, element B is placed to the left of element A . On the basis of this information, choose the correct word from the brackets to complete the following statements.
 (i) The element B would have (lower/higher) metallic character than A .
 (ii) The element A would probably have (lesser/ higher) electron affinity than B .
 (iii) The element A would have (greater/smaller) atomic size than B . ICSE 2018

59. The metals of group 2 from top to bottom are Be, Mg, Ca, Sr and Ba.
 (i) Which one of these elements will form ions most readily and why?
 (ii) State the common feature in the electronic configuration of all these elements. **ICSE 2015**
60. An element Z has atomic number 16. Answer the following questions on Z.
 (i) State the period and group to which Z belongs.
 (ii) Is Z metal or a non-metal? **ICSE 2014, 2010**
61. There are three elements E, F, G with atomic number 19, 8 and 17 respectively. Classify the elements as metals and non-metals. **ICSE 2012**

KEY IDEA

First write the electronic configuration of the given elements then classify them into metals and non-metals.

62. (i) The metals of group 2 from top to bottom are Be, Mg, Ca, Sr, Ba. Which of these metals will form ions most readily and why?
 (ii) What property of an element is measured by electronegativity? **ICSE 2008**
63. What is the common feature of the electronic configurations of the elements at the end of period 2 and period 3? **ICSE 2000**
64. (i) State the number of elements in period 1, period 2, and period 3 of the periodic table.
 (ii) Name the elements in period 1.
 (iii) What happens to atomic size of elements on moving from left to right in a period? **ICSE 2000**

4 Marks Questions

65. The table below shows the electronic arrangements of six atoms, A to F.

| Atom | A | B | C | D | E | F |
|--------------------------|------|---|------|---------|---------|---------|
| Electronic configuration | 2, 5 | 2 | 2, 6 | 2, 8, 6 | 2, 8, 8 | 2, 8, 3 |

- With respect to the table select the following. **ICSE 2021-22 (Sem-I)**
- (i) Two atoms from the same group of the periodic table.
 (a) D and E (b) C and D
 (c) E and F (d) C and E
- (ii) Two noble gases
 (a) A and B (b) E and F (c) B and E (d) D and E
- (iii) The atom which is the most electronegative
 (a) A (b) B (c) C (d) F

- (iv) The atom which has the highest ionisation potential.
 (a) A (b) B
 (c) E (d) F
66. Arrange the following as per the instruction given in the brackets.
 (i) He, Ar, Ne (Increasing order of the number of electron shells)
 (ii) Na, Li, K (Increasing ionisation energy)
 (iii) F, Cl, Br (Increasing electronegativity)
 (iv) Na, K, Li (Increasing atomic size) **ICSE 2017**
67. Use the letters only written in the periodic table given below to answer the questions that follow:

| Periods | Groups | | | | | | | | | | | | | | | | | |
|---------|--------|-----|--|--|--|--|--|--|--|--|--|--|-----|----|---|----|-----|---|
| | 1 | IIA | | | | | | | | | | | III | IV | V | VI | VII | 0 |
| 1 | | | | | | | | | | | | | | | | | | L |
| 2 | Q | | | | | | | | | | | | E | G | J | Z | M | |
| 3 | R | | | | | | | | | | | | | | | | | |
| 4 | I | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | |

- (i) State the number of valence electrons in atom J.
 (ii) Which element forms ions with a single negative charge?
 (iii) Which metallic element is more reactive than R?
 (iv) Which element has its electrons arranged in four shells? **ICSE 2016**
68. Arrange the following as per the instructions given in the brackets. **ICSE 2015**
 (i) Cs, Na, Li, K, Rb (increasing order of metallic character)
 (ii) Mg, Cl, Na, S, Si (decreasing order of atomic size)
 (iii) Na, K, Cl, S, Si (increasing order of ionisation energy)
 (iv) Cl, F, Br, I (increasing order of electron affinity)
69. Choose the most appropriate answer from the following list of oxides which fit the description. Each answer may be used only once.
 [SO₂, SiO₂, Al₂O₃, MgO, CO, Na₂O] **ICSE 2015**
 (i) A basic oxide.
 (ii) An oxide which dissolves in water forming an acid.
 (iii) An amphoteric oxide.
 (iv) A covalent oxide of a metalloid.
70. Copy and complete the following sentences choosing the correct word or words from those given in brackets at the end of each sentence.
 (i) The properties of the elements are a periodic function of their (atomic number, mass number, relative atomic mass).

- (ii) Moving across a of the periodic table the element show increasing character (group, period, metallic, non-metallic).
- (iii) The element at the bottom of a group would be expected to show metallic character than the element at the top (less, more).
- (iv) The similarities in the properties of a group of elements is because they have the similar (electronic configuration, number of outer electrons atomic numbers). ICSE 2001

5 Marks Questions

71. The following questions refer to the periodic table. ICSE Specimen 2017

- (i) Name the second last element of the period 3.
- (ii) How many elements are in the second period?
- (iii) Name the element which has the highest electron affinity.
- (iv) Name the element which has the highest electronegativity.
- (v) Name the element which may be placed on group 1 but is not a metal.

72. Fill in the blanks using the correct options. ICSE Specimen 2017

- (i) Metals have ionisation potential. (low/high)
- (ii) Group 18 elements have valence electrons (4/8) with the exception of (He/Ne) with electrons (2/8) in valence shell.
- (iii) Group 2 elements are called metals. (alkali/alkaline earth)

73. Match the atomic number 2, 4, 8, 15 and 19 with each of the following. ICSE 2017

- (i) A solid non-metal belonging to the third period.
- (ii) A metal of valency 1.
- (iii) A gaseous element with valency 2.
- (iv) An element belonging to group 2.
- (v) A rare gas.

74. Answer any 5 questions

| Group number | IA | IIA | IIIA | IVA | VA | VIA | VIIA | 0 |
|--------------|----|-----|------|-----|----|-----|------|----|
| Period | 1 | 2 | 13 | 14 | 15 | 16 | 17 | 18 |
| Second | Li | | D | | | O | J | Ne |
| Third | A | Mg | E | Si | | H | M | |
| Fourth | R | T | I | | Q | U | | Y |

Note In this table, H does not represent hydrogen. Some elements are given in their own symbol and position in the periodic table. While others are shown with a letter.

With reference to the above table answer the following questions.

- (i) Identify the most electronegative element.

- (ii) Identify the most reactive element of group 1.
- (iii) Identify the element from period 3 with least atomic size.
- (iv) How many valence electrons are present in Q?
- (v) Which element from group 2 would have the least ionisation energy?
- (vi) Identify the noble gas of the fourth period. ICSE 2013

75. Consider the section of the periodic table given below.

| Group number | IA | IIA | IIIA | IVA | VA | VIA | VIIA | 0 |
|--------------|----|-----|------|-----|----|-----|------|----|
| Period | 1 | 2 | 13 | 14 | 15 | 16 | 17 | 18 |
| Second | Li | | D | | | O | J | Ne |
| Third | A | Mg | E | Si | | H | K | |
| Fourth | B | C | | F | G | | | L |

Note In this table B does not represent boron
C does not represent carbon F does not represent fluorine
H does not represent hydrogen K does not represent potassium

You must see the position of the element in the periodic table.

Some element are given in their own symbol and position in the periodic table, while others are shown with a letter. With reference to the table

- (i) Which is the most electronegative element?
- (ii) How many valence electrons are present in G?
- (iii) Write the formula of the compound between B and H.
- (iv) In the compound between F and J, what type of bond will be formed?
- (v) Draw the electron dot structure for the compound formed between C and K. ICSE 2009

76. A group of elements in the periodic table are given below (boron is the first member of the group and thallium is the last)

Boron, aluminium, gallium, indium, thallium

Answer the following questions in relation to the above group of elements.

- (i) Which element has the most metallic character?
- (ii) Which element would be expected to have the highest electronegativity?
- (iii) If the electronic configuration of aluminium is 2, 8, 3, how many electrons are there in the outer shell of thallium?
- (iv) The atomic number of boron is 5. Write the chemical formula of the compound formed when boron reacts with chlorine.
- (v) Will the elements in the group to the right of this boron group be more metallic or less metallic in character? Justify your answer. ICSE 2007

77. The elements of one short period of the periodic table are given below in the order from left to right.

Li, Be, B, C, O, F, Ne

- To which period do these elements belong?
- One element of this period is missing. Which is the missing element and where should it be placed?
- Which one of the elements in this period show the property of catenation?
- Place the three elements fluorine, beryllium and nitrogen in the order of increasing electronegativity.
- Which one of the above elements belongs to the halogen series?

ICSE 2006

78. Parts (i) to (v) refer to changes in the properties of elements on moving from left to right across a period of the periodic table. For each property, choose the correct answer.

- The non-metallic character of the elements
 - decreases
 - increases
 - remains the same
 - depends on the period
- The electronegativity
 - depends on the number of valence electrons
 - remains the same
 - decreases
 - increases
- The ionisation potential
 - goes up and down
 - decreases
 - increases
 - remains the same
- The atomic size
 - decreases
 - increases
 - remains the same
 - sometimes increases and sometimes decreases
- The electron affinity of the elements in groups 1 to 7
 - goes up and then down
 - decreases and then increases
 - increases
 - decreases

ICSE 2005

79. The electronegativities (according to Pauling) of the elements in period 3 of the periodic table are as follows with the elements arranged in alphabetical order.

| Al | Cl | Mg | Na | P | S | Si |
|-----|-----|-----|-----|-----|-----|-----|
| 1.5 | 3.0 | 1.2 | 0.9 | 2.1 | 2.5 | 1.8 |

- Arrange the elements in the order, in which they occur in the periodic table from left to right. (The group 1 element first, followed by the group 2 elements and so on, up to group 7).
- Choose the word or phrase from the brackets which correctly completes each of the following statements.

(a) The element below sodium in the same group would be expected to have a (lower/higher) electronegativity than sodium and the Y element above chlorine would be expected to have a (lower/higher) ionisation potential than chlorine.

(b) On moving from left to right in a given period, the number of shells.....(remains the same /increases/ decreases).

(c) On moving down a group, the number of valence electrons (remains the same/increases/decreases).

ICSE 2004

80. (i) What is meant by a group in the periodic table?

(ii) Within a group, where would you expect to find the element with

- the greatest metallic character?
- the largest atomic size?

(iii) State whether the ionisation potential increases or decreases on going down a group.

(iv) How many elements are there in period 2? ICSE 2003