Ultimate KCET Crash Course 2026

CHEMISTRY

DPP: 1

Classification of elements

Q1 Which of the following **correct** match?

A.	Eka silicon	Ge
B.	Eka aluminium	Ga
C.	Eka manganese	Tc

Choose the most appropriate answer from the options given below:

(A) B and C only

(B) A, B and C only

(C) A and C only

(D) None of these

Q2 The incorrect statement among the following is

(A) The first ionisation potential of Al is less than the first ionisation potential of Mg

(B) The second ionisation potential of Mg is greater than the second ionisation potential of Na

(C) The first ionisation potential of Na is less than the first ionisation potential of Mg

(D) The third ionisation potential of Mg is greater than that of Al

Q3 The correct order of decreasing second enthalpy of Ti (22), V (23), Cr (24) and Mn (25) is:

(A) $V > Mn > Cr > Ti$

(B) $Mn > Cr > Ti > V$

(C) $Ti > V > Cr > Mn$

(D) $Cr > Mn > V > Ti$

Q4 Which of the following sets of elements follows Newland's octave rule?

(A) Be, Mg, Ca (B) Na, K, Rb

(C) F, Cl, Br (D) B, Al, Ga

Q5 **Which of the following is the correct order of size of the given species?**

(A) $I > I^- > I^+$

(B) $I^+ > I^- > I$

(C) $I > I^+ > I^-$

(D) $I^- > I > I^+$

Q6 All the s-block elements of the periodic table are placed in the group(s)

(A) IA and IIA

(B) IIIA and IVA

(C) B sub-groups

(D) VA to VIIA.

Q7 Among the following transition elements, pick out the element/elements with highest second ionization energy.

(A) V (At. no = 23)

(B) Cr (At. no = 24)

(C) Mn (At. no = 25)

(D) Cu (At. no = 29)

(E) Zn (At. no = 30)

(A) (A) and (C) (B) (B) and (D)

(C) B and E (D) Only(D)

Q8 The molecular formula of chloride of Eka-Aluminium and Eka-Silicon respectively are

(A) $GaCl_3$ and SiO_4

(B) $GaCl_3$ and $AlCl_3$

(C) $AlCl_3$ and $SiCl_4$

(D) $GaCl_3$ and $GeCl_4$

Q9 Which one of the following arrangements represents the correct order of least negative to most negative electron gain enthalpy for C, Ca, Al, F and O ?
(A) Ca < Al < C < O < F
(B) Al < Ca < O < C < F
(C) Al < O < C < Ca < F
(D) C < F < O < Al < Ca

Q10 Match the Column I with Column II and select the correct option.

Column I (Atomic no.)	**Column II (Position in periodic table)**
(A) 52	(1) s-block
(B) 56	(2) p-block
(C) 57	(3) d-block
(D) 60	(4) f-block

(A) A-2, B-1, C-3, D-4
(B) A-2, B-1, C-4, D-3
(C) A-1, B-2, C-3, D-4
(D) A-1, B-2, C-4, D-3

Q11 Which of the following is not a periodic property for the elements ?
(A) Electronegativity
(B) Atomic size
(C) Occurrence in nature
(D) Ionization energy

Q12 The symbol and IUPAC name for the element with atomic number 120, respectively are
(A) Ubn and unbinilium
(B) Ubn and unbiunium
(C) Ubn and unnibium
(D) Ubn and unnilium

Q13 Which of the following order is correct for the first ionisation potential of B, C and N?
(A) B > C > N
(B) N > C > B
(C) N > C < B
(D) N < C < B

Q14 In a given shell, the order of screening effect is
(A) s > p > d > f
(B) f > d > p > s
(C) p > d > s > f
(D) d > f > s > p

Q15 Assertion: Ionisation potential of Be (atomic no. 4) is less than that of B (atomic no. 5).
Reason: The first electron released from Be is of p-orbital but that from B is of s-orbital.
(A) If both Assertion \& Reason are true and the reason is the correct explanation of the assertion.
(B) If both Assertion \& Reason are true but the reason is not the correct explanation of the assertion.
(C) If Assertion is true statement but Reason is
(D) If both Assertion and Reason are false false statements.

Q16 The statement that is not correct for the periodic classification of elements is
(A) The properties of the elements are the periodic function of their atomic numbers.
(B) Non-metallic elements are lesser in number than the metallic elements.
(C) The first ionisation energies of elements along a period do not vary in a regular manner with increase in atomic number.
(D) For transition elements the d-subshells are filled with the electrons monotonically with increase in atomic number.

Q17 Predict the position of an element has the electronic configuration $1s^2 2s^2 2p^6 3s^2 3p^6 3d^5 4s^1$.
(A) Period 4, group 6
(B) Period 6, group 4
(C) Period 3, group 1
(D) Period 4, group 5

Q18 The following statements concern elements in the periodic table. Which of the following is true?

(A) For group 15 elements, the stability of +5 oxidation state increases down the group.

(B) Elements of group 16 have lower ionization enthalpy values compared to those of group 15 in the corresponding periods.

(C) The group 13 elements are all metals.

(D) All the elements in group 17 are gases

Q19 Which of the given elements A, B, C, D and E with atomic number 2, 3, 7, 10 and 30 respectively belong to the same period?

(A) A,B,C

(B) B, C, D

(C) A,D,E

(D) B, D, E

Q20 One of the characteristic properties of non-metals is that they

(A) Are reducing agents

(B) Form basic oxides

(C) Form cations by electron gain

(D) Are electronegative.

Q21 For the formation of covalent bond, the difference in the value of should be:

(A) Equal to or less than 1.7

(B) More than 1.7

(C) 1.7 or more

(D) None of the above

Answer Key

Q1	B
Q2	B
Q3	D
Q4	A
Q5	D
Q6	A
Q7	B
Q8	D
Q9	A
Q10	A
Q11	C
Q12	A
Q13	B
Q14	A
Q15	D
Q16	D
Q17	A
Q18	B
Q19	B
Q20	D
Q21	A

Hints & Solutions

Note: scan the QR code to watch video solution

Q1 Text Solution:

Eka Aluminium	-	Gallium (Ga)
Eka Silicon	-	Germanium (Ge)
Eka Manganese	-	Technetium (Tc)

Video Solution:

Q2 Text Solution:

IE (II) of Na is higher than that of Mg because in case of Na, the second e^- has to be removed from the noble gas core while in case of Mg removal of second e^- gives a noble gas core

Mg has high first ionisation potential than Na because of its stable ns^2 configuration

Video Solution:

Q3 Text Solution:

$$_{22}\text{Ti} : 3s^2,\ 4s^2 \xrightarrow{IE_1} 3d^2, 4s^1$$

$$_{23}\text{V} : 3d^3,\ 4s^2 \xrightarrow{IE_1} 3d^3, 4s^1$$

$$_{24}\text{Cr} : 3d^5,\ 4s^1 \xrightarrow{IE_1} 3d^5$$

$$\xrightarrow[\text{half filled}]{IE_2 \text{ from}} \text{maximum}$$

$$_{25}\text{Mn} : 3d^5,\ 4s^2 \xrightarrow{IE_1} 3d^5, 4s^1$$

Video Solution:

Q4 Text Solution:

Newlands Law of Octaves was applicable up to calcium only. Elements after calcium did not obey Newland's Law of Octaves.

Video Solution:

Q5 Text Solution:

Anion is bigger than the parent atom and cation is smaller than the parent atom.

Thus, $I^- > I > I^+$

Video Solution:

Q6 Text Solution:

Modern periodic table is based on electronic configuration. Group I A has elements with ns^1 configuration and IIA has elements with n^2 configuration.

Video Solution:

Q7 Text Solution:

Because of stable configuration in +1 state.

Video Solution:

Q8 Text Solution:

$GaCl_3$ and $GeCl_4$

Video Solution:

Q9 Text Solution:

As the nuclear charge increases, the force of attraction between the nucleus and the incoming electron increases and hence the elecron gain enthalpy becomes more negative, hence the correct order is Ca < Al < C < O < F

Video Solution:

Q10 Text Solution:

Atomic number	E.C.	Block
(A) 52	$[Kr]\ 5s^2\ 4d^{10}\ 5p^4$	p-block; (2)
(B) 56	$[Xe]\ 65^2$	s-block; (1)
(C) 57	$[Xe]\ 6s^2\ 5d^1$	d-block; (3)
(D) 60	$[Xe]\ 6s^2$	f-block; (4)

Video Solution:

Q11 Text Solution:

Occurrence in nature

Video Solution:

Q12 Text Solution:

Atomic number (Z) = 120

IUPAC name = Unbinilium

Symbol = Ubn

Video Solution:

Q13 Text Solution:

Ionisation potential increases from left to right in a period.

Video Solution:

Q14 Text Solution:

Order of screening effect in a given shell is s > p > d > f

Video Solution:

Q15 Text Solution:

$\mathrm{Be}(\mathrm{Z}=4), 1\ \mathrm{s}^2, 2\ \mathrm{s}^2$

$\mathrm{B}(\mathrm{Z}=5), 1\mathrm{s}^2, 2\mathrm{s}^2, 2\mathrm{p}^1$

The ionization potential of Be is greater than that of B as the first electron released from Be is from s-orbital while it is from porbital in B.

Video Solution:

Q16 Text Solution:

For transition elements the d-subshells are not filled with electrons monotonically (one at a time) because of stability associated with half filled (d^5) and completely filled (d^{10}) orbitals.

Video Solution:

Q17 Video Solution:

Q18 Text Solution:

Group 15 elements have stable half-filled (ns^3np^3) configuration hence, their ionization enthalpy is higher than that of group 16 elements

Video Solution:

Q19 Text Solution:

Elements	A.No.	Period
A	2(He)	1
B	3(Li)	2
C	7(N)	2
D	10(Ne)	2
E	30(Zn)	4

Thus, B, C and D belong to the same period.

Video Solution:

Q20 Text Solution:

Nonmetals are placed on the right of the periodic table i.e p-block

Reducing nature decreases from left to right. P block elements form acidic oxides, gain electron and form anions and are electronegetive in nature

Video Solution:

Q21 Text Solution:

If difference in electronegativity in between two atoms is 1.7, the molecule possesses 50% covalent +50% ionic nature.

Video Solution: