

JEE MAIN P-BLOCK ELEMENTS (GROUP 13 & 14) — PYQS

Max. Marks: 68

Questions: 17

Section A (MCQ) — 17 questions

Q.1 Given below are two statements :

Statement-I: Aluminium is more electropositive than thallium as the standard electrode potential value of $E^\circ_{\text{Al}^{3+}/\text{Al}}$ is negative and $E^\circ_{\text{Tl}^{3+}/\text{Tl}}$ is positive.

Statement-II: The sum of first three ionization enthalpies of boron is very high when compared to that of aluminium. Due to this reason boron forms covalent compounds only and aluminium forms Al^{3+} ion.

In the light of the above statements, choose the correct answer from the options given below :

[JEE Main 2026 (Online) 6th April Morning Shift]

- (1) Both Statement-I and Statement-II are true
- (2) Both Statement-I and Statement-II are false
- (3) Statement-I is true but Statement-II is false
- (4) Statement-I is false but Statement-II is true

Scan or tap for the full solution



Q.2 Given below are two statements :

Statement-I: Aluminium upon reaction with NaOH forms $[\text{Al}(\text{OH})_6]^{3-}$ ion.

Statement-II: The geometry of ICl_4^- , ClO_3^- and IBr_2^- is square planar, pyramidal and linear respectively.

In the light of the above statements, choose the correct answer from the options given below :

[JEE Main 2026 (Online) 5th April Evening Shift]

- (1) Both Statement-I and Statement-II are true
- (2) Both Statement-I and Statement-II are false
- (3) Statement-I is true but Statement-II is false
- (4) Statement-I is false but Statement-II is true

Scan or tap for the full solution



Q.3 The electronegativity of a group 13 element 'E' is same as that of Ge (on Pauling scale and upto one decimal point). The CORRECT statements about E^{3+} are

- A. It can act as a reducing agent.
- B. It can act as an oxidizing agent.
- C. E^{3+} is more stable than E^+ .
- D. The standard electrode potential value for E^{3+}/E is positive.

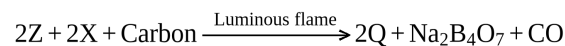
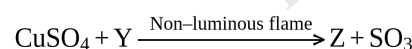
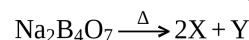
Choose the correct answer from the options given below : [JEE Main 2026 (Online) 4th April Evening Shift]

- (1) A and C Only
- (2) B and C Only
- (3) B and D Only
- (4) A and D Only

Scan or tap for the full solution



Q.4 Consider the following reactions



The oxidation states of Cu in Z and Q, respectively are : [JEE Main 2026 (Online) 28th January Evening Shift]

- (1) +2 and +1
- (2) +1 and +1
- (3) +1 and +2
- (4) +2 and +2

Scan or tap for the full solution



Q.5 Choose the **INCORRECT** statement

[JEE Main 2026 (Online) 24th January Evening Shift]

- (1) Carbon exhibits negative oxidation states along with +4 and +2.
- (2) Carbon cannot exceed its covalency more than four.
- (3) Among the isotopes of carbon, ^{13}C is a radioactive isotope.
- (4) CO_2 is the most acidic oxide among the dioxides of group 14 elements.

Scan or tap for the full solution



Q.6 The correct statements from the following are :

- A. Ionic radii of trivalent cations of group 13 elements decrease down the group.
- B. Electronegativity of group 13 elements decreases down the group.
- C. Among the group 13 elements, Boron has highest first ionisation enthalpy.
- D. The trichloride and triiodide of group 13 elements are covalent in nature.

Choose the correct answer from the options given below :

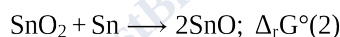
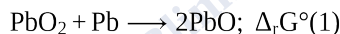
[JEE Main 2026 (Online) 23rd January Morning Shift]

- (1) B and D Only (2) C and D Only
(3) A and D Only (4) A and C Only

Scan or tap for the full solution



Q.7 It is noticed that Pb^{2+} is more stable than Pb^{4+} but Sn^{2+} is less stable than Sn^{4+} . Observe the following reactions.



Identify the correct set from the following

[JEE Main 2026 (Online) 23rd January Evening Shift]

- (1) $\Delta_r G^\circ(1) > 0$; $\Delta_r G^\circ(2) < 0$
(2) $\Delta_r G^\circ(1) < 0$; $\Delta_r G^\circ(2) > 0$
(3) $\Delta_r G^\circ(1) < 0$; $\Delta_r G^\circ(2) < 0$
(4) $\Delta_r G^\circ(1) > 0$; $\Delta_r G^\circ(2) > 0$

Scan or tap for the full solution



Q.8 Given below are two statements :

Statement-I: The number of pairs among $[\text{SiO}_2, \text{CO}_2]$, $[\text{SnO}, \text{SnO}_2]$, $[\text{PbO}, \text{PbO}_2]$ and $[\text{GeO}, \text{GeO}_2]$, which contain oxides that are both amphoteric is 2.

Statement-II: BF_3 is an electron deficient molecule, can act as a Lewis acid, forms adduct with NH_3 and has a trigonal planar geometry.

In the light of the above statements, choose the correct answer from the options given below :

[JEE Main 2026 (Online) 21st January Morning Shift]

- (1) Both Statement-I and Statement-II are false
(2) Statement-I is false but Statement-II is true
(3) Both Statement-I and Statement-II are true
(4) Statement-I is true but Statement-II is false

Scan or tap for the full solution



Q.9 The group 14 elements A and B have the first ionisation enthalpy values of 708 and 715 kJ mol^{-1} respectively. The above values are lowest among their group members. The nature of their ions A^{2+} and B^{4+} respectively is

[JEE Main 2025 (Online) 7th April Morning Shift]

- (1) both reducing (2) oxidising and reducing
(3) both oxidising (4) reducing and oxidising

Scan or tap for the full solution



Q.10 The correct statements from the following are :

- A. Tl^{3+} is a powerful oxidising agent
B. Al^{3+} does not get reduced easily
C. Both Al^{3+} and Tl^{3+} are very stable in solution
D. Tl^{1+} is more stable than Tl^{3+}
E. Al^{3+} and Tl^{1+} are highly stable

Choose the **correct** answer from the options given below : [JEE Main 2025 (Online) 7th April Evening Shift]

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

Scan or tap for the full solution



Q.11 Given below are the pairs of group 13 elements showing their relation in terms of atomic radius. ($\text{B} < \text{Al}$), ($\text{Al} < \text{Ga}$), ($\text{Ga} < \text{In}$) and ($\text{In} < \text{Tl}$). Identify the elements present in the incorrect pair and in that pair find out the element (X) that has higher ionic radius (M^{3+}) than the other one. The atomic number of the element (X) is

[JEE Main 2025 (Online) 4th April Morning Shift]

- (1) 49 (2) 81 (3) 31 (4) 13

Scan or tap for the full solution



Q.12 Given below are two statements :

Statement-I: The first ionisation enthalpy of group 14 elements is higher than the corresponding elements of group 13.

Statement-II: Melting points and boiling points of group 13 elements are in general much higher than those of corresponding elements of group 14.

In the light of the above statements, choose the most appropriate answer from the options given below :

[JEE Main 2025 (Online) 4th April Evening Shift]

- (1) Statement-I is correct but Statement-II is incorrect
(2) Both Statement-I and Statement-II are incorrect
(3) Statement-I is incorrect but Statement-II is correct
(4) Both Statement-I and Statement-II are correct

Scan or tap for the full solution



Q.13 The elements of Group 13 with highest and lowest first ionisation enthalpies are respectively :

[JEE Main 2025 (Online) 4th April Evening Shift]

- (1) B & Tl (2) Tl & B (3) B & In (4) B & Ga

Scan or tap for the full solution



Q.14 The correct orders among the following are

- A. Atomic radius : $\text{B} < \text{Al} < \text{Ga} < \text{In} < \text{Tl}$
B. Electronegativity : $\text{Al} < \text{Ga} < \text{In} < \text{Tl} < \text{B}$
C. Density : $\text{Tl} < \text{In} < \text{Ga} < \text{Al} < \text{B}$

D. 1st Ionisation Energy : $\text{In} < \text{Al} < \text{Ga} < \text{Tl} < \text{B}$

Choose the correct answer from the options given below: [JEE Main 2025 (Online) 3rd April Evening Shift]

- (1) B and D Only (2) A and B Only
(3) C and D Only (4) A and C Only

Scan or tap for the full solution



Q.15 Given below are two statements :

Statement-I: The metallic radius of Al is less than that of Ga.

Statement-II: The ionic radius of Al^{3+} is less than that of Ga^{3+} .

In the light of the above statements, choose the most appropriate answer from the options given below :

[JEE Main 2025 (Online) 2nd April Morning Shift]

- (1) Statement-I is correct but Statement-II is incorrect
- (2) Both Statement-I and Statement-II are correct
- (3) Statement-I is incorrect but Statement-II is correct
- (4) Both Statement-I and Statement-II are incorrect

Scan or tap for the full solution



Q.16 The standard reduction potential values of some of the p-block ions are given below. Predict the one with the strongest oxidising capacity.

[JEE Main 2025 (Online) 29th January Morning Shift]

- (1) $E^\circ_{\text{Sn}^{4+}/\text{Sn}^{2+}} = +0.15 \text{ V}$
- (2) $E^\circ_{\text{Al}^{3+}/\text{Al}} = -1.66 \text{ V}$
- (3) $E^\circ_{\text{Pb}^{4+}/\text{Pb}^{2+}} = +1.67 \text{ V}$
- (4) $E^\circ_{\text{Tl}^{3+}/\text{Tl}} = +1.26 \text{ V}$

Scan or tap for the full solution



Q.17 Consider the following elements In, Tl, Al, Pb, Sn and Ge. The most stable oxidation states of elements with highest and lowest first ionisation enthalpies, respectively, are

[JEE Main 2025 (Online) 28th January Morning Shift]

- (1) +4 and +1
- (2) +4 and +3
- (3) +1 and +4
- (4) +2 and +3

Scan or tap for the full solution



ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9	10	11
Ans.	1	4	3	1	3	2	2	3	4	1	3
Ques.	12	13	14	15	16	17					
Ans.	1	3	1	3	3	2					