PYQSide

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

Max. Marks: 44 **Questions:** 11

Section A (MCQ) — 11 questions

Q.1 Given below are two statements :

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

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Q.2 Given below are two statements :

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

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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

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Q.4 Consider the following reactions

$$Na_2B_4O_7 \xrightarrow{\Delta} 2X + Y$$

$$CuSO_4 + Y \xrightarrow{\text{Non–luminous flame}} Z + SO_3$$

$$2Z + 2X + \text{Carbon} \xrightarrow{\text{Luminous flame}} 2Q + Na_2B_4O_7 + CO$$

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

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Q.5 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

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Q.6 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

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Q.7 Given below are the pairs of group 13 elements showing their relation in terms of atomic radius. (B < Al), (Al < Ga), (Ga < In) and (In < 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

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Q.8 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

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Q.9 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

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Q.10 The correct orders among the following are

A. Atomic radius : B < Al < Ga < In < Tl
B. Electronegativity : Al < Ga < In < Tl < B
C. Density : Tl < In < Ga < Al < B
D. 1st Ionisation Energy : In < Al < Ga < Tl < 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

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Q.11 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

ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9	10	11
Ans.	1	4	3	1	2	1	3	1	3	1	3