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CHEMISTRY · JEE MAIN

p-Block Elements

Previous Year Questions with answers

291 questions · **182** papers · **2002–2026** · newest paper first

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What is in this PDF: every p-Block Elements question we hold from past JEE Main and AIEEE papers, with its options and answer. Where an answer comes from a source other than the official final key, it says so next to the answer.

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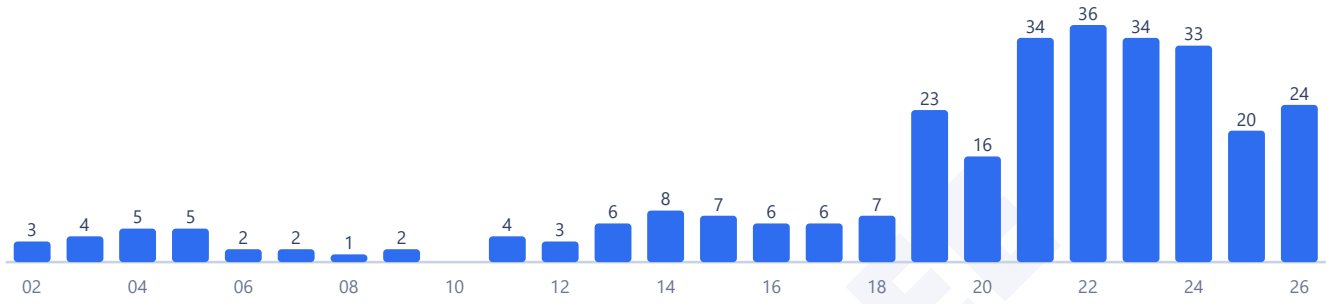
Chapter at a glance

4.8%	291	147 of 162	266 / 25
of Chemistry questions, 2019–2026	questions, 2002–2026	papers asked it, 2019–2026	MCQ / numerical, 2002–2026

Trend. Steady: 1.3 questions per paper in 2024–2026 against 1.4 in 2019–2023.

Questions per year



Counts are the questions we hold: 291 in 182 papers. 2 questions in this chapter came back in more than one paper.

Most-asked topics in this chapter (2002–2026)



How often it comes up

The p-block elements spans groups 13 through 18 under Unit 10: p-Block Elements in the Class 12 curriculum, holding rank 4 of 31 chapters with a 4.8% share of chemistry questions. Across 2019 to 2026, p-Block Elements contributed 220 questions across 162 exam papers, making up 4.8% of the chemistry questions and securing rank 4 of 31 chapters. During the 2002 to 2018 period, it accounted for 71 questions across 38 papers with a 5.3% share. In the recent 2024 to 2026 window, the chapter delivered 77 questions across 58 papers, capturing a 5.0% share. Comparing both earlier windows against 2024 to 2026, its testing share has remained about the same.

The chapter has appeared every year from 2019 to 2026. Across 2019 to 2026, candidates faced an average of 1.4 questions per paper, and 1.3 questions per paper between 2024 and 2026. While largely descriptive, examiners included 25 numerical answer questions between 2019 and 2026, primarily concerning oxidation states, lone pairs, or bond atomicity.

Most-asked topics

Questions distribute across all six p-block families:

- Group 15 (Nitrogen Family): The leading area with 84 total questions (68 in 2019 to 2026), examined continuously through 2026. Focus points include ammonia synthesis, oxides of nitrogen, allotropes of phosphorus, and structures and reducing powers of phosphorus oxoacids.
- Group 13 (Boron Family): Produced 58 total questions (50 in 2019 to 2026), tested through 2026. Major areas involve diborane structure (three-center two-electron bridge bonding), boric acid, borax bead test, and comparative Lewis acidity of boron trihalides.

- Group 17 (Halogens): Generated 45 total questions (31 in 2019 to 2026), evaluated through 2026. Core concepts test bond dissociation energy orders (chlorine exceeding fluorine), oxidizing strengths, interhalogens, and halogen oxoacids.
- Group 14 (Carbon Family): Accounted for 43 total questions (30 in 2019 to 2026), asked up through 2026. Questions explore inert pair stability (such as lead divalent state versus tin tetravalent state), allotropes of carbon (diamond, graphite, and fullerenes), and silicate structures.
- Group 16 (Oxygen Family): Contributed 35 total questions (28 in 2019 to 2026), active through 2026. Areas include allotropes of sulfur, contact process for sulfuric acid, oxoacids of sulfur (peroxodisulfuric acid, thiosulfuric acid), and anomalous properties of oxygen.
- Group 18 (Noble Gases): Provided 26 total questions (13 in 2019 to 2026), tested through 2026. Focus centers entirely on xenon fluorides and oxofluorides (XeF_2, XeF_4, XeF_6, $XeOF_4$, XeO_2F_2), their molecular shapes, hybridization, and hydrolysis reactions.

What the questions look like

Examiners regularly evaluate structure-property correlations. Many questions test phosphorus oxoacids, where candidates must deduce the number of P–H bonds to explain reducing action or count P–OH groups to determine basicity.

In Group 13 and Group 14, the inert pair effect features prominently in questions asking whether higher or lower oxidation states are more stable down the column. In noble gas chemistry, questions demand counting lone pairs and drawing molecular geometries for xenon compounds according to VSEPR theory.

How to practise it

Due to the breadth of factual details, organize revision methodically:

1. Draw oxoacid structures regularly: Master oxoacids of phosphorus (hypophosphorous, phosphorous, and phosphoric acids) and sulfur (Caro's and Marshall's acids) to instantly deduce oxidation states and P–H bond counts. 2. Memorize xenon fluoride reactions: Know complete and partial hydrolysis products of XeF_2, XeF_4, and XeF_6 along with their VSEPR shapes. 3. Understand inert pair effect: Recognize why Tl^{+} is more stable than Tl^{3+} and Pb^{2+} is more stable than Pb^{4+}. 4. Note anomalous second-row properties: Remember that fluorine bond dissociation enthalpy is unusually low due to intense lone pair repulsions. 5. Practise identifying reducing versus non-reducing oxoacids: Any oxoacid bearing a direct P–H bond functions as a strong reducing agent.

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Q1 JEE Main 2026 · 8 Apr · Shift 2 MCQ

Find the **correct** statements related to group 15 hydrides.

A. Reducing nature increases from NH_3 to BiH_3

B. Tendency to donate lone pair of electrons decreases from NH_3 to BiH_3

C. The stability of hydrides decreases from NH_3 to BiH_3

D. HEH bond angle decreases from NH_3 to SbH_3 (E = Elements of group 15)

Choose the **correct** answer from the options given below :

(A) A and B only
(B) B and C only
(C) A, B, C and D
(D) A, C and D Only

Answer: (C) A, B, C and D · Official NTA final key

Q2 JEE Main 2026 · 6 Apr · Shift 1 MCQ

Given below are two statements:

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

(A) Both Statement I and Statement II are true
(B) Both Statement I and Statement II are false
(C) Statement I is true but Statement II is false
(D) Statement I is false but Statement II is true

Answer: (A) Both Statement I and Statement II are true · Official NTA final key

Q3 JEE Main 2026 · 6 Apr · Shift 2 MCQ

Treatment of a gas 'X' with a freshly prepared ferrous sulphate solution gives a compound 'Y' as a brown ring. The compounds X and Y are.

(A) NO and $[Fe(NO)]SO_4$
(B) NO_2 and $[Fe(NO_2)]SO_4$
(C) N_2O and $[Fe(N_2O)]SO_4$
(D) N_2O_4 and $[Fe(N_2O_4)]SO_4$

Answer: (A) NO and $[Fe(NO)]SO_4$ · Official NTA final key

Q4 JEE Main 2026 · 5 Apr · Shift 1 MCQ

Correct statements from the following are:

A. Nitrogen in oxidation states from +1 to +4 disproportionates in acid medium.

B. Nitrogen has the ability to form $d\pi$ - $p\pi$ multiple bonds with itself and other elements with small size and high electronegativity.

C. N-N single bond is stronger than P-P single bond.

D. Nitrogen has highest density in its group due to small size.

E. The maximum covalency of nitrogen is four since it has only four valence orbitals for bonding.

Choose the correct answer from the options given below:

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

Answer: (D) A and E Only · Official NTA final key

Q5 JEE Main 2026 · 5 Apr · Shift 2 MCQ

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 :

(A) Both **Statement I** and **Statement II** are true
(B) Both **Statement I** and **Statement II** are false
(C) **Statement I** is true but **Statement II** is false
(D) **Statement I** is false but **Statement II** is true

Answer: (D) Statement I is false but Statement II is true · Official NTA final key

Q6 JEE Main 2026 · 4 Apr · Shift 1 MCQ

Given below are two statements:

Statement I: The covalency of oxygen is generally two but it can exceed upto four. The oxidation state of oxygen in SO_2 is -2 and in OF_2 it is $+2$.

Statement II: The anomalous behaviour of oxygen when compared to the other elements of group 16 is due to its small size and high electronegativity.

In the light of the above statements, choose the *__correct__* answer from the options given below

(A) Both Statement I and Statement II are true
(B) Both Statement I and Statement II are false
(C) Statement I is true but Statement II is false
(D) Statement I is false but Statement II is true

Answer: (A) Both Statement I and Statement II are true · Official NTA final key

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Q7 JEE Main 2026 · 4 Apr · Shift 1 Numerical

According to Lewis theory, the total number of σ bond-pairs and lone pair of electrons around the central atom of XeO_6^{4-} ion is _____.

Numerical value type: the answer is a number.

Answer: 6. · Official NTA final key

Q8 JEE Main 2026 · 4 Apr · Shift 2 MCQ

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:

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

Answer: (C) B and D Only · Official NTA final key

Q9 JEE Main 2026 · 2 Apr · Shift 1 MCQ

Given below are two statements :

Statement (I) : Oxidising power of halogens decreases in the order $F_2 > Cl_2 > Br_2 > I_2$, which is the basis of "Layer test".

Statement (II) : "Layer test" to identify Br_2 and I_2 in aqueous solution involves the oxidation of bromide or iodide into Br_2 or I_2 respectively with Cl_2, which is a type of displacement redox reaction.

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

(A) Both **Statement I** and **Statement II** are true
(B) Both **Statement I** and **Statement II** are false
(C) **Statement I** is true but **Statement II** is false
(D) **Statement I** is false but **Statement II** is true

Answer: (A) Both **Statement I** and **Statement II** are true · Official NTA final key

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Q10 JEE Main 2026 · 28 Jan · Shift 1 MCQ

Regarding the hydrides of group 15 elements EH_3 (E = N, P, As, Sb), select the correct statement from the following:

A. The stability of hydrides decreases down the group.

B. The basicity of hydrides decreases down the group.

C. The reducing character increases down the group.

D. The boiling point increases down the group.

Choose the *__correct__* answer from the options given below:

(A) A, B, C & D
(B) A, B & C only
(C) B & C only
(D) A & D only

Answer: (B) A, B & C only · Official NTA final key

Q11 JEE Main 2026 · 28 Jan · Shift 2 MCQ

Given below are two statements :

Statement I : The increasing order of boiling point of hydrogen halides is HCl $<$ HBr $<$ HI $<$ HF.

Statement II : The increasing order of melting point of hydrogen halides is HCl $<$ HBr $<$ HF $<$ HI.

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

(A) **Statement I** is true but **Statement II** is false
(B) Both **Statement I** and **Statement II** are false
(C) Both **Statement I** and **Statement II** are true
(D) **Statement I** is false but **Statement II** is true

Answer: (C) Both **Statement I** and **Statement II** are true · Official NTA final key

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Q12 JEE Main 2026 · 28 Jan · Shift 2 MCQ

Match **List - I** with **List - II** according to shape.

List - I		List - II
A. XeO_3	I.	BrF_5

B. XeF_2 II. NH_3

C. XeO_2F_2 III. $[I_3]^-$

D. $XeOF_4$ IV. SF_4

Choose the **correct** answer from the options given below :

(A) A-II, B-III, C-I, D-IV

(B) A-II, B-I, C-III, D-IV

(C) A-II, B-III, C-IV, D-I

(D) A-III, B-II, C-IV, D-I

Answer: (C) A-II, B-III, C-IV, D-I · Official NTA final key

Q13 JEE Main 2026 · 24 Jan · Shift 1 MCQ

Among the following, the **CORRECT** combinations are

A. $IF_3 \rightarrow$ T-shaped (sp^3d)

B. $IF_5 \rightarrow$ Square pyramidal (sp^3d^2)

C. $IF_7 \rightarrow$ Pentagonal bipyramidal (sp^3d^3)

D. $ClO_4^- \rightarrow$ Square planar (sp^2d)

Choose the ***correct*** answer from the options given below:

(A) A, B, C and D

(B) B, C and D Only

(C) A and B Only

(D) A, B and C Only

Answer: (D) A, B and C Only · Official NTA final key

Q14 JEE Main 2026 · 24 Jan · Shift 2 MCQ

Choose the **INCORRECT** statement

(A) Carbon exhibits negative oxidation states along with +4 and +2.

(B) CO_2 is the most acidic oxide among the dioxides of group of 14 elements.

(C) Among the isotopes of carbon, ^{13}C is a radioactive isotope.

(D) Carbon cannot exceed its covalency more than four.

Answer: (C) Among the isotopes of carbon, ^{13}C is a radioactive isotope. · Official NTA final key

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Q15 JEE Main 2026 · 24 Jan · Shift 2 MCQ

One mole of $Cl_2(g)$ was passed into 2 L of cold 2M KOH solution. After the reaction, the concentrations of Cl^-, ClO^- and OH^- are respectively (assume volume remains constant)

(A) 1M, 1M, 1M
(B) 0.5M, 0.5M, 0.5M
(C) 0.5M, 0.5M, 1M
(D) 0.75M, 0.75M, 1M

Answer: (C) 0.5M, 0.5M, 1M · Official NTA final key

Q16 JEE Main 2026 · 23 Jan · Shift 1 MCQ

The correct statements from the following are :

A. Ionic radii of trivalent cations of group 13 elements decreases 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 :

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

Answer: (A) C and D Only · Official NTA final key

Q17 JEE Main 2026 · 23 Jan · Shift 2 MCQ

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.

$PbO_2 + Pb \rightarrow 2PbO$; $\Delta_r G^\circ(1)$

$SnO_2 + Sn \rightarrow 2SnO$; $\Delta_r G^\circ(2)$

Identify the correct set from the following

(A) $\Delta_r G^\circ(1) > 0$; $\Delta_r G^\circ(2) < 0$
(B) $\Delta_r G^\circ(1) < 0$; $\Delta_r G^\circ(2) > 0$
(C) $\Delta_r G^\circ(1) > 0$; $\Delta_r G^\circ(2) > 0$
(D) $\Delta_r G^\circ(1) < 0$; $\Delta_r G^\circ(2) < 0$

Answer: (B) $\Delta_r G^\circ(1) < 0$; $\Delta_r G^\circ(2) > 0$ · Official NTA final key

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Q18 JEE Main 2026 · 23 Jan · Shift 2 MCQ

Which statements are **NOT TRUE** about XeO_2F_2?

A. It has a see-saw shape.

B. Xe has 5 electron pairs in its valence shell in XeO_2F_2.

C. The O−Xe−O bond angle is close to 180°.

D. The F−Xe−F bond angle is close to 180°.

E. Xe has 16 valence electrons in XeO_2F_2.

Choose the **correct** answer from the options given below:

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

Answer: (B) B, C and E Only · Official NTA final key

Q19 JEE Main 2026 · 23 Jan · Shift 2 MCQ

Elements X and Y belong to Group 15. The difference between the electronegativity values of 'X' and phosphorus is higher than that of the difference between phosphorus and 'Y'. 'X' & 'Y' are respectively

(A) As & Bi
(B) Bi & N
(C) As & Sb
(D) N & As

Answer: (D) N & As · Official NTA final key

Q20 JEE Main 2026 · 22 Jan · Shift 1 MCQ

A 'p'-block element (E) and hydrogen form a binary cation $(EH_x)^+$, while EH_3 on treatment with K_2HgI_4 in alkaline medium gives a precipitate of basic mercury(II)amido-iodine. Given below are first ionisation enthalpy values (kJ mol^{-1}) for first element each from group 13, 14, 15 and 16. Identify the correct first ionisation enthalpy value for element E.

(A) 1402
(B) 801
(C) 1312
(D) 1086

Answer: (A) 1402 · Official NTA final key

Q21 JEE Main 2026 · 22 Jan · Shift 1 MCQ

Given below are two statements:

Statement I: The halogen that makes longest bond with hydrogen in HX, has the smallest covalent radius in its group.

Statement II: A group 15 element's hydride EH_3 has the lowest boiling point among corresponding hydrides of other group 15 elements. The maximum covalency of that element E is 4.

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

(A) Both Statement I and Statement II are false
(B) Statement I is false but Statement II is true
(C) Both Statement I and Statement II are true
(D) Statement I is true but Statement II is false

Answer: (A) Both Statement I and Statement II are false · Official NTA final key

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Q22 JEE Main 2026 · 22 Jan · Shift 2 MCQ

Given below are two statements :

Statement I : Elements 'X' and 'Y' are the most and least electronegative elements, respectively among N, As, Sb and P. The nature of the oxides X_2O_3 and Y_2O_3 is acidic and amphoteric, respectively.

Statement II : BCl_3 is covalent in nature and gets hydrolysed in water. It produces $[B(OH)_4]^-$ and $[B(H_2O)_6]^{3+}$ in aqueous medium.

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

(A) **Statement I** is true but **Statement II** is false
(B) Both **Statement I** and **Statement II** are true
(C) **Statement I** is false but **Statement II** is true
(D) Both **Statement I** and **Statement II** are false

Answer: (A) Statement I is true but Statement II is false · Official NTA final key

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Q23 JEE Main 2026 · 21 Jan · Shift 1 MCQ

Given below are two statements :

Statement I : The number of pairs among $[SiO_2, CO_2]$, $[SnO, SnO_2]$, $[PbO, PbO_2]$ and $[GeO, GeO_2]$, 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 :

(A) Both **Statement I** and **Statement II** are false
(B) **Statement I** is true but **Statement II** is false
(C) Both **Statement I** and **Statement II** are true
(D) **Statement I** is false but **Statement II** is true

Answer: (C) Both Statement I and Statement II are true · Official NTA final key

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Q24 JEE Main 2026 · 21 Jan · Shift 2 MCQ

Given below are two statements :

Statement I : The correct order in terms of bond dissociation enthalpy is $\mathrm{Cl_2 > Br_2 > F_2 > I_2}$.

Statement II : The correct trend in the covalent character of the metal halides is $[\mathrm{SnCl_4 > SnCl_2}]$, $[\mathrm{PbCl_4 > PbCl_2}]$ and $[\mathrm{UF_4 > UF_6}]$.

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

(A) Both **Statement I** and **Statement II** are true

(B) **Statement I** is false but **Statement II** is true

(C) **Statement I** is true but **Statement II** is false

(D) Both **Statement I** and **Statement II** are false

Answer: (C) Statement I is true but **Statement II** is false · Official NTA final key

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Q25 JEE Main 2025 · 8 Apr · Shift 2 MCQ

Given below are two statements:

Statement I : H_2Se is more acidic than H_2Te

Statement II : H_2 Se has higher bond enthalpy for dissociation than H_2Te

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

(A) Statement I is false but Statement II is true

(B) Both Statement I and Statement II are true

(C) Statement I is true but Statement II is false

(D) Both Statement I and Statement II are false

Answer: (A) Statement I is false but Statement II is true · Key from source paper

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Q26 JEE Main 2025 · 7 Apr · Shift 1 MCQ

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

(A) oxidising and reducing

(B) both reducing

(C) reducing and oxidising

(D) both oxidising

Answer: (C) reducing and oxidising · Key from source paper

Q27 JEE Main 2025 · 7 Apr · Shift 2 MCQ

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^{+} is more stable than Tl^{3+}

(E) Al^{3+} and Tl^{+} are highly stable

Choose the correct answer from the options given below :

(A) (A), (B), (C), (D) and (E)

(B) (B), (D) and (E) only

(C) (A), (C) and (D) only

(D) (A), (B), (D) and (E) only

Answer: (D) (A), (B), (D) and (E) only · Key from source paper

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Q28 JEE Main 2025 · 4 Apr · Shift 1 MCQ

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 $\left(M^{3+}\right)$ than the other one. The atomic number of the element (X) is

(A) 81

(B) 31

(C) 13

(D) 49

Answer: (B) 31 · Key from source paper

Q29 JEE Main 2025 · 4 Apr · Shift 1 MCQ

Given below are two statements:

Statement I: Nitrogen forms oxides with +1 to +5 oxidation states due to the formation of $p\pi - p\pi$ bond with oxygen.

Statement II: Nitrogen does not form halides with +5 oxidation state due to the absence of d-orbital in it.

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

(A) Both Statement I and Statement II are False

(B) Statement I is false but Statement II are true

(C) Statement I is true but Statement II is false

(D) Both Statement I and Statement II are true

Answer: (D) Both Statement I and Statement II are true · Key from source paper

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Q30 JEE Main 2025 · 4 Apr · Shift 2 MCQ

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 :

(A) Both Statement I and Statement II are incorrect
(B) Both Statement I and Statement II are correct
(C) Statement I is correct but Statement II is incorrect
(D) Statement I is incorrect but Statement II is correct

Answer: (C) Statement I is correct but Statement II is incorrect · Key from source paper

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Q31 JEE Main 2025 · 4 Apr · Shift 2 MCQ

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

(A) B & In
(B) B & Ga
(C) Tl & B
(D) B & Tl

Answer: (A) B & In · Key from source paper

Q32 JEE Main 2025 · 3 Apr · Shift 1 MCQ

Given below are two statements:

Statement I : The N - N single bond is weaker and longer than that of P - P single bond.

Statement II : Compounds of group 15 elements in +3 oxidation states readily undergo disproportionation reactions.

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

(A) Statement I is true but Statement II is false
(B) Statement I is false but Statement II is true
(C) Both Statement I and Statement II are false
(D) Both Statement I and Statement II are true

Answer: (C) Both Statement I and Statement II are false · Key from source paper

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Q33 JEE Main 2025 · 3 Apr · Shift 2 MCQ

The correct orders among the following are

Atomic radius : B < Al < Ga < In < Tl

Electronegativity: Al < Ga < In < Tl < B

Density: Tl < In < Ga < Al < B

1st Ionisation Energy : In < Al < Ga < Tl < B

Choose the correct answer from the options given below:

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

Answer: (D) B and D Only · Key from source paper

Q34 JEE Main 2025 · 2 Apr · Shift 1 MCQ

A molecule with the formula AX_4Y has all it's elements from p-block. Element A is rarest, monoatomic, non-radioactive from its group and has the lowest ionization enthalpy value among A, X and Y. Elements X and Y have first and second highest electronegativity values respectively among all the known elements. The shape of the molecule is:

(A) Pentagonal planar
(B) Octahedral
(C) Trigonal bipyramidal
(D) Square pyramidal

Answer: (D) Square pyramidal · Key from source paper

Q35 JEE Main 2025 · 2 Apr · Shift 1 MCQ

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 :

(A) Statement I is incorrect but Statement II is correct
(B) Statement I is correct but Statement II is incorrect
(C) Both Statement I and Statement II are incorrect
(D) Both Statement I and Statement II are correct

Answer: (A) Statement I is incorrect but Statement II is correct · Key from source paper

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Q36 JEE Main 2025 · 2 Apr · Shift 2 MCQ

The nature of oxide (TeO_2) and hydride (TeH_2) formed by Te, respectively are :

(A) Oxidising and basic
(B) Reducing and basic
(C) Reducing and acidic
(D) Oxidising and acidic

Answer: (D) Oxidising and acidic · Key from source paper

Q37 JEE Main 2025 · 29 Jan · Shift 1 MCQ

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

(A) $E^{\ominus}_{Pb^{4+}/Pb^{2+}}$ = +1.67 V
(B) $E^{\ominus}_{Sn^{4+}/Sn^{2+}}$ = +1.15 V
(C) $E^{\ominus}_{Al^{3+}/Al}$ = -1.66 V
(D) $E^{\ominus}_{Tl/Tl}$/2.26 V

Answer: (A) $E^{\ominus}_{Pb^{4+}/Pb^{2+}}$ = +1.67 V · Key from source paper

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Q38 JEE Main 2025 · 29 Jan · Shift 2 MCQ

First ionisation enthalpy values of first four group 15 elements are given below. Choose the correct value for the element that is a main component of apatite family :

(A) 1402 kJ mol^{-1}
(B) 834 kJ mol^{-1}
(C) 1012 kJ mol^{-1}
(D) 947 kJ mol^{-1}

Answer: (C) 1012 kJ mol^{-1} · Key from source paper

Q39 JEE Main 2025 · 28 Jan · Shift 2 Numerical

A group 15 element forms dπ – dπ bond with transition metals. It also forms hydride, which is a strongest base among the hydrides of other group members that form dπ – dπ bond. The atomic number of the element is _____ .

Numerical value type: the answer is a number.

Answer: 15. · Key from source paper

Q40 JEE Main 2025 · 24 Jan · Shift 1 MCQ

The large difference between the melting and boiling points of oxygen and sulphur may be explained on the basis of

(A) Atomicity
(B) Electron gain enthalpy
(C) Electronegativity
(D) Atomic size

Answer: (A) Atomicity · Key from source paper

Q41 JEE Main 2025 · 23 Jan · Shift 1 MCQ

The incorrect statement among the following is options $_1$.

(A) PH_3 shows lower proton affinity than NH_3.
(B) SO_2 can act as an oxidizing agent, but not as a reducing agent.
(C) PF_3 exists but NF_5 does not.
(D) NO_2 can dimerise easily.

Answer: (B) SO_2 can act as an oxidizing agent, but not as a reducing agent. · Key from source paper

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Q42 JEE Main 2025 · 23 Jan · Shift 2 MCQ

Given below are the atomic numbers of some group 14 elements. The atomic number of the element with lowest melting point is :

(A) 6
(B) 82
(C) 14
(D) 50

Answer: (D) 50 · Key from source paper

Q43 JEE Main 2025 · 22 Jan · Shift 1 MCQ

Which of the following electrolyte can be used to obtain $H_2S_2O_8$ by the process of electrolysis?

(A) Dilute solution of sodium sulphate.
(B) Acidified dilute solution of sodium sulphate.
(C) Dilute solution of sulphuric acid
(D) Concentrated solution of sulphuric acid

Answer: (D) Concentrated solution of sulphuric acid · Key from source paper

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Q44 JEE Main 2025 · 22 Jan · Shift 2 MCQ

The maximum covalency of a non-metallic group 15 element ' E ' with weakest $E-E$ bond is :

(A) 4
(B) 6
(C) 3
(D) 5

Answer: (A) 4 · Key from source paper

Q45 JEE Main 2024 · 9 Apr · Shift 1 MCQ

Given below are two statements : one is labelled as Assertion (A) and the other is labelled as Reason (R). Assertion (A) : Both rhombic and monoclinic sulphur exist as S_8 while oxygen exists as O_2. Reason (R) : Oxygen forms $p\pi-p\pi$ multiple bonds with itself and other elements having small size and high electronegativity like C, N, which is not possible for sulphur. In the light of the above statements, choose the most appropriate answer from the options given below :

(A) (A) is correct but (R) is not correct
(B) (A) is not correct but (R) is correct
(C) Both (A) and (R) are correct and (R) is the correct explanation of (A)
(D) Both (A) and (R) are correct but (R) is not the correct explanation of (A)

Answer: (A) (A) is correct but (R) is not correct · Key from source paper

Q46 JEE Main 2024 · 9 Apr · Shift 1 MCQ

On reaction of Lead Sulphide with dilute nitric acid which of the following is not formed?

(A) Nitric oxide
(B) Nitrous oxide
(C) Lead nitrate
(D) Sulphur

Answer: (B) Nitrous oxide · Key from source paper

Q47 JEE Main 2024 · 9 Apr · Shift 2 MCQ

Match List I with List II

List - I	List - II
A. Melting Point [K]	I. Tl > In > Ga > Al > B
B. Ionic Radius $[M^{+3}/pm]$	II. B > Tl > Al ≈ Ga > In
C. $\Delta_i H_1$ [kJ mol^{-1}]	III. Tl > In > Al > Ga > B
D. Atomic Radius [pm]	IV. B > Al > Tl > In > Ga

Choose the correct answer from the options given below:

(A) A-II, B-III, C-IV, D-I
(B) A-IV, B-I, C-II, D-III
(C) A-I, B-II, C-III, D-IV
(D) A-III, B-IV, C-I, D-II

Answer: (B) A-IV, B-I, C-II, D-III · Key from source paper

Q48 JEE Main 2024 · 9 Apr · Shift 2 Numerical

Number of oxygen atoms present in chemical formula of fuming sulphuric acid is _____.

Numerical value type: the answer is a number.

Answer: 7. · Key from source paper

Q49 JEE Main 2024 · 8 Apr · Shift 1 MCQ

Among the following halogens F_2, Cl_2, Br_2 and I_2 Which can undergo disproportionation reactions?

(A) F_2, Cl_2 and Br_2
(B) F_2 and Cl_2
(C) Only I_2
(D) Cl_2, Br_2 and I_2

Answer: (D) Cl_2, Br_2 and I_2 · Key from source paper

Q50 JEE Main 2024 · 8 Apr · Shift 1 MCQ

Give below are two statements: One is labelled as Assertion A and the other is labelled as Reason R: Assertion A: The stability order of +1 oxidation state of Ga, In and Tl is Ga < In < Tl. Reason R: The inert pair effect stabilizes the lower oxidation state down the group. In the light of the above statements, choose the correct answer from the options given below:

(A) A is true but R is false.
(B) A is false but R is true.
(C) Both A and R are true and R is the correct explanation of A.
(D) Both A and R are true but R is NOT the correct explanation of A.

Answer: (C) Both A and R are true and R is the correct explanation of A. · Key from source paper

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Q51 JEE Main 2024 · 8 Apr · Shift 2 MCQ

Identify the incorrect statements about group 15 elements : (A) Dinitrogen is a diatomic gas which acts like an inert gas at room temperature. (B) The common oxidation states of these elements are -3 , $+3$ and $+5$. (C) Nitrogen has unique ability to form $p\pi - p\pi$ multiple bonds. (D) The stability of +5 oxidation states increases down the group. (E) Nitrogen shows a maximum covalency of 6. Choose the correct answer from the options given below :

A (A), (C), (E) only
B (B), (D), (E) only
C (D) and (E) only
D (A), (B), (D) only

Answer: (C) (D) and (E) only · Key from source paper

Q52 JEE Main 2024 · 6 Apr · Shift 1 MCQ

Given below are two statements: Statement I : Gallium is used in the manufacturing of thermometers. Statement II : A thermometer containing gallium is useful for measuring the freezing point (256 K) of brine solution. In the light of the above statements, choose the correct answer from the options given below :

A Both Statement I and Statement II are true
B Statement I is false but Statement II is true
C Both Statement I and Statement II are false
D Statement I is true but Statement II is false

Answer: (D) Statement I is true but Statement II is false · Key from source paper

Q53 JEE Main 2024 · 6 Apr · Shift 2 MCQ

The number of ions from the following that are expected to behave as oxidising agent is :

$Sn^{4+}, Sn^{2+}, Pb^{2+}, Tl^{3+}, Pb^{4+}, Tl^{+}$

A 3
B 2
C 1
D 4

Answer: (B) 2 · Key from source paper

Q54 JEE Main 2024 · 6 Apr · Shift 2 MCQ

Evaluate the following statements related to group 14 elements for their correctness. (A) Covalent radius decreases down the group from C to Pb in a regular manner. (B) Electronegativity decreases from C to Pb down the group gradually. (C) Maximum covalance of C is 4 whereas other elements can expand their covalance due to presence of d orbitals. (D) Heavier elements do not form $p\pi - p\pi$ bonds. (E) Carbon can exhibit negative oxidation states. Choose the correct answer from the options given below :

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

Answer: (B) (C), (D) and (E) Only · Key from source paper

Q55 JEE Main 2024 · 5 Apr · Shift 1 MCQ

Given below are two statements : Statement I : In group 13, the stability of +1 oxidation state increases down the group. Statement II : The atomic size of gallium is greater than that of aluminium. In the light of the above statements, choose the most appropriate answer from the options given below :

(A) Both Statement I and Statement II are correct
(B) Statement I is incorrect but Statement II is correct
(C) Both Statement I and Statement II are incorrect
(D) Statement I is correct but Statement II is incorrect

Answer: (D) Statement I is correct but Statement II is incorrect · Key from source paper

Q56 JEE Main 2024 · 5 Apr · Shift 1 MCQ

The number of neutrons present in the more abundant isotope of boron is ' x '. Amorphous boron upon heating with air forms a product, in which the oxidation state of boron is ' y '. The value of $x+y$ is _____

(A) 3
(B) 9
(C) 4
(D) 6

Answer: (B) 9 · Key from source paper

Q57 JEE Main 2024 · 5 Apr · Shift 2 MCQ

The correct statements from the following are : (A) The decreasing order of atomic radii of group 13 elements is Tl > In > Ga > Al > B. (B) Down the group 13 electronegativity decreases from top to bottom. (C) Al dissolves in dil. HCl and liberates H_2 but conc. HNO_3 renders Al passive by forming a protective oxide layer on the surface. (D) All elements of group 13 exhibits highly stable +1 oxidation state. (E) Hybridisation of Al in $[Al(H_2O)_6]^{3+}$ ion is $sp^3 d^2$. Choose the correct answer from the options given below :

(A) (A), (C) and (E) only
(B) (A) and (C) only
(C) (C) and (E) only
(D) (A), (B), (C) and (E) only

Answer: (C) (C) and (E) only · Key from source paper

Q58 JEE Main 2024 · 4 Apr · Shift 2 MCQ

The correct order of the first ionization enthalpy is

(A) Al > Ga > Tl
(B) Ga > Al > B
(C) Tl > Ga > Al
(D) B > Al > Ga

Answer: (C) Tl > Ga > Al · Key from source paper

Q59 JEE Main 2024 · 4 Apr · Shift 2 MCQ

When MnO_2 and H_2SO_4 is added to a salt (A), the greenish yellow gas liberated as salt (A) is :

(A) CaI_2
(B) NaBr
(C) KNO_3
(D) NH_4Cl

Answer: (D) NH_4Cl · Key from source paper

Q60 JEE Main 2024 · 1 Feb · Shift 2 MCQ

Given below are two statements:

Statement (I) : SiO_2 and GeO_2 are acidic while SnO and PbO are amphoteric in nature.

Statement (II) : Allotropic forms of carbon are due to property of catenation and $p\pi$ - $d\pi$ bond formation.

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

(A) Both Statement I and Statement II are false
(B) Both Statement I and Statement II are true
(C) Statement I is true but Statement II is false
(D) Statement I is true but Statement II is true

Answer: (C) Statement I is true but Statement II is false · Key from source paper

Q61 JEE Main 2024 · 1 Feb · Shift 2 MCQ

The strongest reducing agent among the following is:

(A) NH_3
(B) SbH_3
(C) BiH_3
(D) PH_3

Answer: (C) BiH_3 · Key from source paper

Q62 JEE Main 2024 · 31 Jan · Shift 1 MCQ

Consider the oxides of group 14 elements SiO_2, GeO_2, SnO_2, PbO_2, CO and GeO. The amphoteric oxides are

(A) GeO, GeO_2
(B) SiO_2, GeO_2
(C) SnO_2, PbO_2
(D) SnO_2, CO

Answer: (C) SnO_2, PbO_2 · Key from source paper

Q63 JEE Main 2024 · 31 Jan · Shift 1 MCQ

Give below are two statements:

Statement-I : Noble gases have very high boiling points.

Statement-II: Noble gases are monoatomic gases. They are held together by strong dispersion forces. Because of this they are liquefied at very low temperature. Hence, they have very high boiling points.

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

(A) Statement I is false but Statement II is true
(B) Both Statement I and Statement II are true
(C) Statement I is true but Statement II is false
(D) Both Statement I and Statement II are false

Answer: (D) Both Statement I and Statement II are false · Key from source paper

Q64 JEE Main 2024 · 31 Jan · Shift 2 MCQ

Given below are two statements :

Statement I: Group 13 trivalent halides get easily hydrolysed by water due to their covalent nature.

Statement II: $AlCl_3$ upon hydrolysis in acidified aqueous solution forms octahedral $AlH_2O_6^{3+}$ ion.

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

(A) Statement I is true but statement II is false
(B) Statement I is false but statement II is true
(C) Both statement I and statement II are false
(D) Both statement I and statement II are true

Answer: (D) Both statement I and statement II are true · Key from source paper

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Q65 JEE Main 2024 · 31 Jan · Shift 2 MCQ

Choose the correct statements from the following

A. All group 16 elements form oxides of general formula EO_2 and EO_3 where $E = S,\ Se,\ Te$ and Po. Both the types of oxides are acidic in nature.

B. TeO_2 is an oxidising agent while SO_2 is reducing in nature.

C. The reducing property decreases from H_2S to H_2Te down the group.

D. The ozone molecule contains five lone pairs of electrons.

Choose the correct answer from the options given below:

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

Answer: (D) A and B only · Key from source paper

Q66 JEE Main 2024 · 30 Jan · Shift 1 MCQ

Given below are the two statements: one is labeled as Assertion (A) and the other is labeled as Reason (R).

Assertion (A): There is a considerable increase in covalent radius from N to P. However from As to Bi only a small increase in covalent radius is observed.

Reason (R): covalent and ionic radii in a particular oxidation state increases down the group.

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

(A) (A) is false but (R) is true
(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) Both (A) and (R) are true and (R) is the correct explanation of (A)

Answer: (B) Both (A) and (R) are true but (R) is not the correct explanation of (A) · Key from source paper

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Q67 JEE Main 2024 · 30 Jan · Shift 1 MCQ

Aluminium chloride in acidified aqueous solution forms an ion having geometry

(A) Octahedral
(B) Square Planar
(C) Tetrahedral
(D) Trigonal bipyramidal

Answer: (A) Octahedral · Key from source paper

Q68 JEE Main 2024 · 30 Jan · Shift 2 MCQ

Given below are two statements: One is labelled as Assertion A and the other is labelled as Reason R.

Assertion A : H_2Te is more acidic than H_2S.

Reason R: Bond dissociation enthalpy of H_2Te is lower than H_2S.

In the light of the above statements. Choose the most appropriate from the options given below.

(A) Both A and R are true but R is NOT the correct explanation of A.
(B) Both A and R are true and R is the correct explanation of A.
(C) A is false but R is true.
(D) A is true but R is false.

Answer: (B) Both A and R are true and R is the correct explanation of A. · Key from source paper

Q69 JEE Main 2024 · 30 Jan · Shift 2 MCQ

Choose the correct statements about the hydrides of group 15 elements.

A. The stability of the hydrides decreases in the order $NH_3 > PH_3 > AsH_3 > SbH_3 > BiH_3$

B. The reducing ability of the hydrides increases in the order $NH_3 < PH_3 < AsH_3 < SbH_3 < BiH_3$

C. Among the hydrides, NH_3 is strong reducing agent while BiH_3 is mild reducing agent.

D. The basicity of the hydrides increases in the order $NH_3 < PH_3 < AsH_3 < SbH_3 < BiH_3$

Choose the most appropriate from the option given below:

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

Answer: (C) A and B only · Key from source paper

Q70 JEE Main 2024 · 29 Jan · Shift 1 MCQ

Given below are two statements :

Statement I : The electronegativity of group 14 elements from Si to Pb gradually decreases.

Statement II : Group 14 contains non-metallic, metallic, as well as metalloid elements.

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

(A) Statement I is false but Statement II is true
(B) Statement I is true but Statement II is false
(C) Both Statement I and Statement II are true
(D) Both Statement I and Statement II are false

Answer: (A) Statement I is false but Statement II is true · Key from source paper

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Q71 JEE Main 2024 · 29 Jan · Shift 1 MCQ

Identify the incorrect pair from the following :

(A) Fluorspar- BF_3
(B) Cryolite- Na_3AlF_6
(C) Fluoroapatite- $3\,Ca_3(PO_4)_2 \cdot CaF_2$
(D) Carnallite- $KCl \cdot MgCl_2 \cdot 6H_2O$

Answer: (A) Fluorspar- BF_3 · Key from source paper

Q72 JEE Main 2024 · 29 Jan · Shift 2 MCQ

Anomalous behaviour of oxygen is due to its

(A) Large size and high electronegativity
(B) Small size and low electronegativity
(C) Small size and high electronegativity
(D) Large size and low electronegativity

Answer: (C) Small size and high electronegativity · Key from source paper

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Q73 JEE Main 2024 · 27 Jan · Shift 1 MCQ

Given below are two statements : one is labelled as Assertion (A) and the other is labelled as Reason (R).

Assertion (A) : Melting point of Boron (2453 K) is unusually high in group 13 elements.

Reason (R) : Solid Boron has very strong crystalline lattice.

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

(A) Both (A) and (R) are correct but (R) Is not the correct explanation of (A)
(B) Both (A) and (R) are correct and (R) is the correct explanation of (A)
(C) (A) is true but (R) is false
(D) (A) is false but (R) is true

Answer: (B) Both (A) and (R) are correct and (R) is the correct explanation of (A) · Key from source paper

Q74 JEE Main 2024 · 27 Jan · Shift 1 MCQ

Element not showing variable oxidation state is :

(A) Bromine
(B) Iodine
(C) Chlorine
(D) Fluorine

Answer: (D) Fluorine · Key from source paper

Q75 JEE Main 2024 · 27 Jan · Shift 1 MCQ

Yellow compound of lead chromate gets dissolved on treatment with hot NaOH solution. The product of lead formed is a :

(A) Tetraanionic complex with coordination number six
(B) Neutral complex with coordination number four
(C) Dianionic complex with coordination number six
(D) Dianionic complex with coordination number four

Answer: (D) Dianionic complex with coordination number four · Key from source paper

Q76 JEE Main 2024 · 27 Jan · Shift 2 MCQ

Given below are two statements:

Statement (I) : Oxygen being the first member of group 16 exhibits only -2 oxidation state.

Statement (II) : Down the group 16 stability of $+4$ oxidation state decreases and $+6$ oxidation state increases.

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

(A) Statement I is correct but Statement II is incorrect
(B) Both Statement I and Statement II are correct
(C) Both Statement I and Statement II are incorrect
(D) Statement I is incorrect but Statement II is correct

Answer: (C) Both Statement I and Statement II are incorrect · Key from source paper

Q77 JEE Main 2024 · 27 Jan · Shift 2 Numerical

1 mole of PbS is oxidised by X moles of O_3 to get Y moles of O_2. $X + Y =$

Numerical value type: the answer is a number.

Answer: 8. · Key from source paper

Q78 JEE Main 2023 · 15 Apr · Shift 1 MCQ

The number of P - O - P bonds in $H_4P_2O_7$, $(HPO_3)_3$, and P_4O_{10} are respectively

(A) 0, 3, 6
(B) 0, 3, 4
(C) 1, 2, 4
(D) 1, 3, 6

Answer: (D) 1, 3, 6 · Key from source paper

Q79 JEE Main 2023 · 13 Apr · Shift 1 MCQ

ClF_5 at room temperature is a

(A) Colourless liquid with trigonal bipyramidal geometry
(B) Colourless gas with square pyramidal geometry
(C) Colourless gas with trigonal bipyramidal geometry
(D) Colourless liquid with square pyramidal geometry

Answer: (D) Colourless liquid with square pyramidal geometry · Key from source paper

Q80 JEE Main 2023 · 13 Apr · Shift 1 MCQ

The incorrect statement from the following for borazine is:

(A) It contains banana bonds
(B) It can react with water
(C) It is a cyclic compound
(D) It has electronic delocalization

Answer: (A) It contains banana bonds · Key from source paper

Q81 JEE Main 2023 · 13 Apr · Shift 2 MCQ

The correct group of halide ions which can be oxidised by oxygen in acidic medium is

(A) Br^- and I^- only
(B) Br^- only
(C) I^- only
(D) Cl^-, Br^- and I^- only

Answer: (C) I^- only · Key from source paper

Q82 JEE Main 2023 · 13 Apr · Shift 2 MCQ

The covalency and oxidation state respectively of boron in BF_4^-, are

(A) 3 and 5
(B) 3 and 4
(C) 4 and 4
(D) 4 and 3

Answer: (D) 4 and 3 · Key from source paper

Q83 JEE Main 2023 · 13 Apr · Shift 2 Numerical

If the formula of Borax is $Na_2B_4O_x(OH)_y \cdot zH_2O$, then x + y + z = _____

Numerical value type: the answer is a number.

Answer: 17. · Key from source paper

Q84 JEE Main 2023 · 12 Apr · Shift 1 MCQ

Given below are two statements:
Statement I: $SbCl_5$ is more covalent than $SbCl_3$
Statement II: The higher oxides of halogens also tend to be more stable than the lower ones.
In the light of the above statements, choose the most appropriate answer from the options given below.

(A) Statement I is incorrect but statement II is correct
(B) Both Statement I and Statement II are incorrect
(C) Both Statement I and Statement II are correct
(D) Statement I is correct but statement II is incorrect

Answer: (C) Both Statement I and Statement II are correct · Key from source paper

Q85 JEE Main 2023 · 12 Apr · Shift 1 MCQ

Given below are two statements:
Statement I: Boron is extremely hard indicating its high lattice energy.
Statement II: Boron has highest melting and boiling point compared to its other group members.
In the light of the above statements, choose the most appropriate answer from the options given below

(A) Both Statement I and Statement II are incorrect
(B) Statement I is correct but Statement II is incorrect
(C) Both statement I and Statement II are correct
(D) Statement I is incorrect but Statement II is correct

Answer: (C) Both statement I and Statement II are correct · Key from source paper

Q86 JEE Main 2023 · 11 Apr · Shift 1 MCQ

For compound having the formula $GaAlCl_4$, the correct option from the following is

(A) Ga is coordinated with Cl in $GaAlCl_4$

(B) Ga is more electronegative than Al and is present as a cationic part of the salt $GaAlCl_4$

(C) Cl forms bond with both Al and Ga in $GaAlCl_4$

(D) Oxidation state of Ga in the salt $GaAlCl_4$ is $+3$

Answer: (B) Ga is more electronegative than Al and is present as a cationic part of the salt $GaAlCl_4$ · Key from source paper

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Q87 JEE Main 2023 · 11 Apr · Shift 1 MCQ

Given below are two statements :
Statement-I : Methane and steam passed over a heated Ni catalyst produces hydrogen gas.
Statement-II : Sodium nitrite reacts with NH_4Cl to give H_2O, N_2 and NaCl.
In the light of the above statements, choose the most appropriate answer from the options given below :

(A) Statement I is incorrect but Statement II is correct

(B) Both the statements I and II are incorrect

(C) Statement I is correct but Statement II is incorrect

(D) Both the statements I and II are correct

Answer: (D) Both the statements I and II are correct · Key from source paper

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Q88 JEE Main 2023 · 11 Apr · Shift 2 MCQ

One mole of P_4 reacts with 8 moles of $SOCl_2$ to give 4 moles of A, x mole of SO_2 and 2 moles of B. A, B and x respectively are

(A) $POCl_3$, S_2Cl_2 and 2

(B) PCl_3, S_2Cl_2 and 4

(C) PCl_3, S_2Cl_2 and 2

(D) $POCl_3$, S_2Cl_2 and 4

Answer: (B) PCl_3, S_2Cl_2 and 4 · Key from source paper

Q89 JEE Main 2023 · 10 Apr · Shift 1 Numerical

The sum of lone pairs present on the central atom of the interhalogen IF_5 and IF_7 is _____

Numerical value type: the answer is a number.

Answer: 1. · Key from source paper

Q90 JEE Main 2023 · 10 Apr · Shift 2 Numerical

The difference in the oxidation state of Xe between the oxidised product of Xe formed on complete hydrolysis of XeF_4 and XeF_4 is

Numerical value type: the answer is a number.

Answer: 2. · Key from source paper

Q91 JEE Main 2023 · 8 Apr · Shift 1 Numerical

XeF_4 reacts with SbF_5 to form $[XeF_m]^{n+}[SbF_y]^{2-}$ m + n + y + z = ?

Numerical value type: the answer is a number.

Answer: 11. · Key from source paper

Q92 JEE Main 2023 · 8 Apr · Shift 1 MCQ

Which halogen is known to cause the reaction given below?

$2Cu^{2+} + 4X^- \rightarrow Cu_2X_2(s) + X_2$

(A) All halogens

(B) Only Bromine

(C) Only Iodine

(D) Only Chlorine

Answer: (C) Only Iodine · Key from source paper

Q93 JEE Main 2023 · 8 Apr · Shift 2 Numerical

The number of species from the following carrying a single lone pair on central atom Xenon is

XeF_5^+, XeO_3, XeO_2F_2, XeF_5^-, XeO_3F_2, $XeOF_4$, XeF_4

Numerical value type: the answer is a number.

Answer: 4. · Key from source paper

Q94 JEE Main 2023 · 8 Apr · Shift 2 Numerical

The ratio of sigma and π bonds present in pyrophosphoric acid is

Numerical value type: the answer is a number.

Answer: 6. · Key from source paper

Q95 JEE Main 2023 · 6 Apr · Shift 1 MCQ

Match List I with List II

List I Oxide	List II Type of bond
A N_2O_4	I 1 N = O bond
B NO_2	II 1 N - O - N bond
C N_2O_5	III 1 N - N bond
D N_2O	IV 1 N = N / N $\equiv$ N bond

Choose the correct answer from the options given below :

(A) A - III, B - I, C - II, D - IV
(B) A - II, B - IV, C - III, D - I
(C) A - III, B - I, C - IV, D - II
(D) A - II, B - I, C - III, D - IV

Answer: (A) A - III, B - I, C - II, D - IV · Key from source paper

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Q96 JEE Main 2023 · 6 Apr · Shift 2 MCQ

Which one of the following elements will remain as liquid inside pure boiling water?

(A) Ga
(B) Br
(C) Li
(D) Cs

Answer: (A) Ga · Key from source paper

Q97 JEE Main 2023 · 6 Apr · Shift 2 MCQ

Group-13 elements react with O_2 in amorphous form to form oxides of type M_2O_3 (M = element). Which among the following is the most basic oxide?

(A) Al_2O_3
(B) B_2O_3
(C) Tl_2O_3
(D) Ga_2O_3

Answer: (C) Tl_2O_3 · Key from source paper

Q98 JEE Main 2023 · 1 Feb · Shift 1 Numerical

Sum of oxidation states of bromine in bromic acid and perbromic acid is

Numerical value type: the answer is a number.

Answer: 12. · Key from source paper

Q99 JEE Main 2023 · 1 Feb · Shift 2 MCQ

The correct order of bond enthalpy ($kJ\ mol^{-1}$) is:

(A) Si – Si > C – C > Sn – Sn > Ge – Ge
(B) Si – Si > C – C > Ge – Ge > Sn – Sn
(C) C – C > Si – Si > Sn – Sn > Ge – Ge
(D) C – C > Si – Si > Ge – Ge > Sn – Sn

Answer: (D) C – C > Si – Si > Ge – Ge > Sn – Sn · Key from source paper

Q100 JEE Main 2023 · 31 Jan · Shift 1 Numerical

The oxidation sate of phosphorus in hypophosphoric acid is

Numerical value type: the answer is a number.

Answer: 4. · Key from source paper

Q101 JEE Main 2023 · 31 Jan · Shift 2 MCQ

The Lewis acid character of boron tri halides follows the order:

(A) $BCl_3 > BF_3 > BBr_3 > BI_3$

(B) $BI_3 > BBr_3 > BCl_3 > BF_3$

(C) $BBr_3 > BI_3 > BCl_3 > BF_3$

(D) $BF_3 > BCl_3 > BBr_3 > BI_3$

Answer: (B) $BI_3 > BBr_3 > BCl_3 > BF_3$ · Key from source paper

Q102 JEE Main 2023 · 30 Jan · Shift 1 MCQ

Lithium aluminium hydride can be prepared from the reaction of

(A) $LiCl$ and Al_2H_6

(B) LiH and Al_2Cl_6

(C) $LiCl$, Al and H_2

(D) LiH and $AlOH_3$

Answer: (B) LiH and Al_2Cl_6 · Key from source paper

Q103 JEE Main 2023 · 30 Jan · Shift 2 MCQ

Bond dissociation energy of E $-$ H bond of the "H_2E" hydrides of group 16 elements (given below), follows order.

(A) O

(B) S

(C) Se

(D) Te

(A) A > B > C > D

(B) A > B > D > C

(C) B > A > C > D

(D) D > C > B > A

Answer: (A) A > B > C > D · Key from source paper

Q104 JEE Main 2023 · 30 Jan · Shift 2 MCQ

Boric acid in solid, whereas BF_3 is gas at room temperature because of

(A) Strong ionic bond in Boric acid
(B) Strong van der Waal's interaction in Boric acid
(C) Strong hydrogen bond in Boric acid
(D) Strong covalent bond in BF_3

Answer: (C) Strong hydrogen bond in Boric acid · Key from source paper

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Q105 JEE Main 2023 · 29 Jan · Shift 1 MCQ

The bond dissociation energy is highest for

(A) Cl_2
(B) I_2
(C) Br_2
(D) F_2

Answer: (A) Cl_2 · Key from source paper

Q106 JEE Main 2023 · 29 Jan · Shift 1 MCQ

"A" obtained by Ostwald's method involving air oxidation of NH_3, upon further air oxidation produces "B". "B" on hydration forms an oxoacid of Nitrogen along with evolution of "A". The oxoacid also produces "A" and gives positive brown ring test

(A) $NO_2,\ N_2O_5$
(B) $NO_2,\ N_2O_4$
(C) $NO,\ NO_2$
(D) $N_2O_3,\ NO_2$

Answer: (C) $NO,\ NO_2$ · Key from source paper

Q107 JEE Main 2023 · 29 Jan · Shift 2 MCQ

Given below are two statements:
Statement I: The decrease in first ionization enthalpy from B to Al is much larger than that from Al to Ga.
Statement II: The d orbitals in Ga are completely filled.
In the light of the above statements, choose the most appropriate answer from the options given below

(A) Statement I is incorrect but statement II is correct.
(B) Both the statements I and II are correct
(C) Statement I is correct but statement II is incorrect
(D) Both the statements I and II are incorrect

Answer: (B) Both the statements I and II are correct · Key from source paper

Q108 JEE Main 2023 · 25 Jan · Shift 1 MCQ

Reaction of thionyl chloride with white phosphorus forms a compound [A], which on hydrolysis gives [B], a dibasic acid. [A] and [B] are respectively

(A) P_4O_6 and H_3PO_3
(B) PCl_3 and H_3PO_3
(C) PCl_5 and H_3PO_4
(D) $POCl_3$ and H_3PO_4

Answer: (B) PCl_3 and H_3PO_3 · Key from source paper

Q109 JEE Main 2023 · 25 Jan · Shift 2 MCQ

Given below are two statements, one is labelled as **Assertion A** and the other is labelled as **Reason R**

Assertion A :- Carbon forms two important oxides CO and CO_2. CO is neutral whereas CO_2 is acidic in nature.

Reason R : CO_2 can combine with water in a limited way to form carbonic acid, while CO is sparingly soluble in water.

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

(A) Both A and R are correct but R is NOT the correct explanation of A.
(B) Both A and R are correct and R is the correct explanation of A.
(C) A is not correct but R is correct.
(D) A is correct but R is not correct.

Answer: (B) Both A and R are correct and R is the correct explanation of A. · Key from source paper

Q110 JEE Main 2023 · 24 Jan · Shift 1 MCQ

Which of the Phosphorus oxoacid can create silver mirror from $AgNO_3$ solution?

(A) HPO_{3n}
(B) $H_4P_2O_5$
(C) $H_4P_2O_6$
(D) $H_4P_2O_7$

Answer: (B) $H_4P_2O_5$ · Key from source paper

Q111 JEE Main 2023 · 24 Jan · Shift 2 Numerical

Sum of π-bonds present in peroxodisulphuric acid and pyrosulphuric acid is

Numerical value type: the answer is a number.

Answer: 8. · Key from source paper

Q112 JEE Main 2022 · 29 Jul · Shift 2 Numerical

Consider the following sulphure based oxoacids. H_2SO_3, H_2SO_4, $H_2S_2O_8$ and $H_2S_2O_7$. Amongst these oxoacids, the number of those with peroxo O - O bond is

Numerical value type: the answer is a number.

Answer: 1. · Key from source paper

Q113 JEE Main 2022 · 28 Jul · Shift 1 MCQ

Match List-I with List-II, match the gas evolved during each reaction.

List-I

A. $(NH_4)_2Cr_2O_7 \xrightarrow{\Delta}$

B. $KMnO_4 + HCl \rightarrow$

C. $Al + NaOH + H_2O \rightarrow$

D. $NaNO_3 \xrightarrow{\Delta}$

List-II

I. H_2

II. N_2

III. O_2

IV. Cl_2

Choose the correct answer from the options given below

(A) A - II, B - III, C - I, D - IV

(B) A - III, B - I, C - IV, D - II

(C) A - II, B - IV, C - I, D - III

(D) A - III, B - IV, C - I, D - II

Answer: (C) A - II, B - IV, C - I, D - III · Key from source paper

Q114 JEE Main 2022 · 28 Jul · Shift 1 Numerical

The number of inter halogens from the following having square pyramidal structure is

ClF_3, IF_7, BrF_5, BrF_3, I_2Cl_6, IF_5, ClF, ClF_5

Numerical value type: the answer is a number.

Answer: 3. · Key from source paper

Q115 JEE Main 2022 · 28 Jul · Shift 2 MCQ

White phosphorus reacts with thionyl chloride to give

(A) PCl_5, SO_2 and S_2Cl_2
(B) PCl_3, SO_2 and S_2Cl_2
(C) PCl_3, SO_2 and Cl_2
(D) PCl_5, SO_2 and Cl_2

Answer: (B) PCl_3, SO_2 and S_2Cl_2 · Key from source paper

Q116 JEE Main 2022 · 28 Jul · Shift 2 MCQ

Concentrated HNO_3 reacts with Iodine to give

(A) HI, NO_2 and H_2O
(B) HIO_2, N_2O and H_2O
(C) HIO_3, NO_2 and H_2O
(D) HIO_4, N_2O and H_2O

Answer: (C) HIO_3, NO_2 and H_2O · Key from source paper

Q117 JEE Main 2022 · 28 Jul · Shift 2 MCQ

Dinitrogen and dioxygen the main constituents of air do not react with each other in atmosphere to form oxides of nitrogen because

(A) N_2 is unreactive in the condition of atmosphere.
(B) Oxides of nitrogen are unstable.
(C) Reaction between them can occur in the presence of a catalyst.
(D) The reaction is endothermic and require very high temperature.

Answer: (D) The reaction is endothermic and require very high temperature. · Key from source paper

Q118 JEE Main 2022 · 27 Jul · Shift 1 MCQ

Which oxoacid of phosphorous has the highest number of oxygen atoms present in its chemical formula?

(A) Pyrophosphorous acid
(B) Hypophosphoric acid
(C) Phosphoric acid
(D) Pyrophosphoric acid

Answer: (D) Pyrophosphoric acid · Key from source paper

Q119 JEE Main 2022 · 27 Jul · Shift 2 MCQ

Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R
Assertion A: Boron is unable to form BF_6^{3-}
Reason R: Size of B is very small.
In the light of the above statements, choose the correct answer from the options given below

(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: (B) Both A and R are true but R is not the correct explanation of A · Key from source paper

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Q120 JEE Main 2022 · 26 Jul · Shift 1 MCQ

Borazine, also known as inorganic benzene, can be prepared by the reaction of 3-equivalents of "X" with 6-equivalents of "Y". "X" and "Y", respectively are

(A) $B(OH)_3$ and NH_3
(B) B_2H_6 and NH_3
(C) B_2H_6 and HN_3
(D) NH_3 and B_2O_3

Answer: (B) B_2H_6 **and** NH_3 · Key from source paper

Q121 JEE Main 2022 · 26 Jul · Shift 2 MCQ

The metal that has very low melting point and its periodic position is closer to a metalloid is

(A) Al
(B) Ga
(C) Se
(D) In

Answer: (B) Ga · Key from source paper

Q122 JEE Main 2022 · 26 Jul · Shift 2 MCQ

Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R.
Assertion A : Boric acid is a weak acid
Reason R : Boric acid is not able to release H^+ ion on its own. It receives OH^- ion from water and releases H^+ ion.
In the light of the above statements, choose the most appropriate answer from the options given below.

(A) Both A and R are correct and R is the correct explanation of A
(B) Both A and R are correct but R is NOT the correct explanation of A
(C) A is correct but R is not correct
(D) A is not correct but R is correct

Answer: (A) Both A and R are correct and R is the correct explanation of A · Key from source paper

Q123 JEE Main 2022 · 26 Jul · Shift 2 Numerical

The number of non-ionisable protons present in the product B obtained from the following reaction is_____

$C_2H_5OH + PCl_3 \rightarrow C_2H_5Cl + A$

$A + PCl_3 \rightarrow B$

Numerical value type: the answer is a number.

Answer: 2. · Key from source paper

Q124 JEE Main 2022 · 25 Jul · Shift 1 MCQ

The geometry around boron in the product 'B' formed from the following reaction is

$BF_3 + NaH \xrightarrow{450\ K} A + NaF$

$A + NMe_3 \rightarrow B$

(A) trigonal planar
(B) tetrahedral
(C) pyramidal
(D) square planar

Answer: (B) tetrahedral · Key from source paper

Q125 JEE Main 2022 · 25 Jul · Shift 1 MCQ

The interhalogen compound formed from the reaction of bromine with excess of fluorine is a

(A) hypohalite
(B) halate
(C) perhalate
(D) halite

Answer: (B) halate · Key from source paper

Q126 JEE Main 2022 · 25 Jul · Shift 2 MCQ

Match List I with List II

List-I

A XeO_3

B XeF_2

C $XeOF_4$

D XeF_6

List-II

I $sp^3\ d$; linear

II sp^3; pyramidal

III $sp^3\ d^3$; distorted octahedral
IV $sp^3\ d^2$; square pyramidal

Choose the correct answer from the options given below

(A) A – II, B – IV, C – III, D – I
(B) A – IV, B – II, C – III, D – I
(C) A – II, B – I, C – IV, D – III
(D) A – IV, B – II, C – I, D – III

Answer: (C) A – II, B – I, C – IV, D – III · Key from source paper

Q127 JEE Main 2022 · 25 Jul · Shift 2 Numerical

The sum of number of lone pairs of electrons present on the central atoms of XeO_3, $XeOF_4$ and XeF_6 is

Numerical value type: the answer is a number.

Answer: 3. · Key from source paper

Q128 JEE Main 2022 · 29 Jun · Shift 1 MCQ

Match List-I with Match List-II
List-I (Metal)
List-II (Application)
(A) Cs
(B) Ga
(C) B
(D) Si
(I) High temperature thermometer
(II) Water repellent sprays
(III) Photoelectric cells
(IV) Bullet proof vest
Choose the most appropriate answer from the options given below

(A) (A) – (III), (B) – (I), (C) – (IV), (D) – (II)
(B) (A) – (II), (B) – (III), (C) – (IV), (D) – (I)
(C) (A) – (IV), (B) – (III), (C) – (II), (D) – (I)
(D) (A) – (I), (B) – (IV), (C) – (II), (D) – (II)

Answer: (A) (A) – (III), (B) – (I), (C) – (IV), (D) – (II) · Key from source paper

Q129 JEE Main 2022 · 29 Jun · Shift 1 MCQ

The oxoacid of phosphorus that is easily obtained from a reaction of alkali and white phosphorus and has two P – H bonds, is

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(A) Phosphonic acid
(B) Phosphinic acid
(C) Hypophosphoric acid
(D) Pyrophosphorus acid

Answer: (B) Phosphinic acid · Key from source paper

Q130 JEE Main 2022 · 29 Jun · Shift 2 MCQ

Aqueous solution of which of the following boron compounds will be strongly basic in nature?

(A) $NaBH_4$
(B) $LiBH_4$
(C) B_2H_6
(D) $Na_2B_4O_7$

Answer: (D) $Na_2B_4O_7$ · Key from source paper

Q131 JEE Main 2022 · 28 Jun · Shift 1 MCQ

Nitrogen gas is obtained by thermal decomposition of:

(A) $NaNO_2$
(B) $NaNO_3$
(C) $Ba(N_3)_2$
(D) $Ba(NO_3)_2$

Answer: (C) $Ba(N_3)_2$ · Key from source paper

Q132 JEE Main 2022 · 28 Jun · Shift 1 MCQ

Given below are two statements :
Statement I: The pentavalent oxide of group-15 element, E_2O_5, is less acidic than trivalent oxide, E_2O_3, of the same element.
Statement II : The acidic character of trivalent oxide of group 15 elements, E_2O_3, decreases down the group.
In light of the above statements, choose most appropriate answer from the options given below

(A) Both Statement I and Statement II are true.
(B) Both Statement I and Statement II are false.
(C) Statement I is false but statement II is true.
(D) Statement I true, but statement II is false.

Answer: (C) Statement I is false but statement II is true. · Key from source paper

Q133 JEE Main 2022 · 28 Jun · Shift 2 MCQ

Among the given oxides of nitrogen ; N_2O, N_2O_3, N_2O_4 and N_2O_5, the number of compound/(s) having $N-N$ bond is

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

Answer: (C) 3 · Key from source paper

Q134 JEE Main 2022 · 28 Jun · Shift 2 MCQ

Which of the following oxoacids of sulphur contains "S" in two different oxidation states?

(A) $H_2S_2O_3$
(B) $H_2S_2O_6$
(C) $H_2S_2O_7$
(D) $H_2S_2O_8$

Answer: (A) $H_2S_2O_3$ · Key from source paper

Q135 JEE Main 2022 · 27 Jun · Shift 1 MCQ

Match List - I with List - II.
List-I (Si-Compounds)
A $(CH_3)_4Si$
B $(CH_3)Si(OH)_3$
C $(CH_3)_2Si(OH)_2$
D $(CH_3)_3Si(OH)$
List-II (Si-Polymeric/Other Products)
I Chain Silicone
II Dimeric Silicone
III Silane
IV 2 D- Silicone
Choose the correct answer from the options given below

(A) (A) – (III), (B) – (II), (C) – (I), (D) – (IV)
(B) (A) – (IV), (B) – (I), (C) – (II), (D) – (III)
(C) (A) – (II), (B) – (I), (C) – (IV), (D) – (III)
(D) (A) – (III), (B) – (IV), (C) – (I), (D) – (II)

Answer: (D) (A) – (III), (B) – (IV), (C) – (I), (D) – (II) · Key from source paper

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Q136 JEE Main 2022 · 27 Jun · Shift 1 MCQ

Heating white phosphorus with conc. NaOH solution gives mainly

(A) Na_3P and H_2O
(B) H_3PO and NaH
(C) $P(OH)_3$ and NaH_2PO_4
(D) PH_3 and NaH_2PO_2

Answer: (D) PH_3 **and** NaH_2PO_2 · Key from source paper

Q137 JEE Main 2022 · 27 Jun · Shift 2 MCQ

The gas produced by treating an aqueous solution of ammonium chloride with sodium nitrite is

(A) NH_3
(B) N_2
(C) N_2O
(D) Cl_2

Answer: (B) N_2 · Key from source paper

Q138 JEE Main 2022 · 27 Jun · Shift 2 MCQ

Given below are two statements: one is labelled as Assertion and the other is labelled as Reason.
Assertion: Flourine forms one oxoacid.
Reason: Flourine has smallest size amongst all halogens and is highly electronegative.
In the light of the above statements, choose the most appropriate answer from the Question: options given below.

(A) Both assertion and reason are correct and reason is the correct explanation of assertion.
(B) Both assertion and reason are correct and but reason is not the correct explanation of assertion.
(C) Assertion is correct and reason is incorrect
(D) Assertion is incorrect and reason is correct

Answer: (A) Both assertion and reason are correct and reason is the correct explanation of assertion. · Key from source paper

Q139 JEE Main 2022 · 26 Jun · Shift 1 MCQ

The correct order of melting points of hydrides of group 16 elements is

(A) $H_2S < H_2Se < H_2Te < H_2O$
(B) $H_2O < H_2S < H_2Se < H_2Te$
(C) $H_2S < H_2Te < H_2Se < H_2O$
(D) $H_2Se < H_2S < H_2Te < H_2O$

Answer: (A) $H_2S < H_2Se < H_2Te < H_2O$ · Key from source paper

Q140 JEE Main 2022 · 26 Jun · Shift 1 MCQ

Consider the following reaction :
A + alkali $\rightarrow$ B (Major Product)
If B is an oxoacid of phosphorus with no $\mathrm{P-H}$ bond, then A is

(A) White $\mathrm{P_4}$
(B) Red P
(C) $\mathrm{H_3PO_3}$
(D) $\mathrm{P_2O_3}$

Answer: (B) Red P · Key from source paper

Q141 JEE Main 2022 · 26 Jun · Shift 1 MCQ

Choose the correct stability order of group 13 elements in their $+1$ oxidation state.

(A) $\mathrm{Al < Ga < In < Tl}$
(B) $\mathrm{Tl < In < Ga < Al}$
(C) $\mathrm{In < Tl < Ga < Al}$
(D) $\mathrm{Ga < In < Al < Tl}$

Answer: (A) $\mathrm{Al < Ga < In < Tl}$ · Key from source paper

Q142 JEE Main 2022 · 26 Jun · Shift 2 MCQ

The oxide which contains an odd electron at the nitrogen atom is

(A) $\mathrm{N_2O}$
(B) $\mathrm{NO_2}$
(C) $\mathrm{N_2O_3}$
(D) $\mathrm{N_2O_5}$

Answer: (B) $\mathrm{NO_2}$ · Key from source paper

Q143 JEE Main 2022 · 25 Jun · Shift 2 MCQ

The number of bridged oxygen atoms present in compound B formed from the following reactions is
$\mathrm{PbNO_{32}} \xrightarrow{673\ \mathrm{K}} \mathrm{A + PbO + O_2}$
$\mathrm{A} \xrightarrow{\text{Dimerise}} \mathrm{B}$

(A) 0
(B) 1
(C) 2
(D) 3

Answer: (A) 0 · Key from source paper

Q144 JEE Main 2022 · 25 Jun · Shift 2 Numerical

$PCl_5 + H_2O \rightarrow A + HCl$

$A + H_2O \rightarrow B + HCl$

Find number of ionisable hydrogen in B

Numerical value type: the answer is a number.

Answer: 3. · Key from source paper

Q145 JEE Main 2022 · 24 Jun · Shift 1 MCQ

Identify the correct statement for B_2H_6 from those below.

(A) In B_2H_6, all B $-$ H bonds are equivalent.

(B) In B_2H_6, there are four 3-centre- 2-electron bonds.

(C) B_2H_6 is a Lewis acid.

(D) B_2H_6 can be synthesized from both BF_3 and $NaBH_4$.

(E) B_2H_6 is a planar molecule.

Choose the most appropriate answer from the options given below :

(A) (A) and (E) only

(B) (B), (C) and (E) only

(C) (C) and (D) only

(D) (C) and (E) only

Answer: (C) (C) and (D) only · Key from source paper

Q146 JEE Main 2022 · 24 Jun · Shift 1 MCQ

The most stable trihalide of nitrogen is.

(A) NF_3

(B) NCl_3

(C) NBr_3

(D) NI_3

Answer: (A) NF_3 · Key from source paper

Q147 JEE Main 2022 · 24 Jun · Shift 2 MCQ

PCl_5 is well known but NCl_5 is not.Because,

(A) N - does not have vacant d-orbital

(B) P - does not have 2d orbitals

(C) Back bonding in NCl_5 is not possible

(D) N atom is more electronegative so does not forms 5 bonds

Answer: (A) N - does not have vacant d-orbital · Key from source paper

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Q148 JEE Main 2021 · 1 Sep · Shift 2 MCQ

The oxide without nitrogen-nitrogen bond is :

(A) N_2O_4
(B) N_2O
(C) N_2O_5
(D) N_2O_3

Answer: (C) N_2O_5 · Key from source paper

Q149 JEE Main 2021 · 31 Aug · Shift 1 Numerical

The number of halogen/(s) forming halic (V) acid is _____.

Numerical value type: the answer is a number.

Answer: 3. · Key from source paper

Q150 JEE Main 2021 · 31 Aug · Shift 2 MCQ

The number of $S = O$ bonds present in sulphurous acid, peroxodisulphuric acid and pyrosulphuric acid, respectively are :

(A) $1, 4$ and 3
(B) $1, 4$ and 4
(C) $2, 3$ and 4
(D) $2, 4$ and 3

Answer: (B) $1, 4$ and 4 · Key from source paper

Q151 JEE Main 2021 · 31 Aug · Shift 2 MCQ

Which one of the following correctly represents the order of stability of oxides, X_2O; (X = halogen) ?

(A) $Cl > I > Br$
(B) $Br > Cl > I$
(C) $I > Cl > Br$
(D) $Br > I > Cl$

Answer: (C) $I > Cl > Br$ · Key from source paper

Q152 JEE Main 2021 · 27 Aug · Shift 1 MCQ

In polythionic acid, $H_2S_xO_6 (x = 3 \text{ to } 5)$ the oxidation state(s) of sulphur is/are:

(A) $+6$ only
(B) $+5$ only
(C) 0 and $+5$ only
(D) $+3$ and $+5$ only

Answer: (C) 0 and $+5$ only · Key from source paper

Q153 JEE Main 2021 · 27 Aug · Shift 1 MCQ

In which one of the following molecules strongest back donation of an electron pair from halide to boron is expected?

(A) BI_3
(B) BBr_3
(C) BCl_3
(D) BF_3

Answer: (D) BF_3 · Key from source paper

Q154 JEE Main 2021 · 27 Aug · Shift 2 MCQ

Which one of the following is formed (mainly) when red phosphorus is heated in a sealed tube at $803\ K$?

(A) α-Black phosphorus
(B) White phosphorus
(C) Yellow phosphorus
(D) β-Black phosphorus

Answer: (A) α-Black phosphorus · Key from source paper

Q155 JEE Main 2021 · 27 Aug · Shift 2 MCQ

Which one of the following is used to remove most of plutonium from spent nuclear fuel?

(A) BrO_3
(B) I_2O_5
(C) ClF_3
(D) O_2F_2

Answer: (D) O_2F_2 · Key from source paper

Q156 JEE Main 2021 · 26 Aug · Shift 1 MCQ

The incorrect statement is:

(A) F_2 is a stronger oxidizing agent than Cl_2 in aqueous solution.
(B) On hydrolysis ClF forms $HOCl$ and HF.
(C) Cl_2 is more reactive than ClF.
(D) F_2 is more reactive than ClF.

Answer: (C) Cl_2 **is more reactive than** ClF. · Key from source paper

Q157 JEE Main 2021 · 26 Aug · Shift 2 MCQ

The number of non-ionisable hydrogen atoms present in the final product obtained from the hydrolysis of PCl_5 is :

(A) 0
(B) 1
(C) 2
(D) 3

Answer: (A) 0 · Key from source paper

Q158 JEE Main 2021 · 26 Aug · Shift 2 MCQ

Chalcogen group elements are :

(A) Se, Te and Po.
(B) O, Ti and Po.
(C) Se, Tb and Pu.
(D) S, Te and Pm.

Answer: (A) Se, Te and Po. · Key from source paper

Q159 JEE Main 2021 · 27 Jul · Shift 1 MCQ

The oxidation states of 'P' in $H_4P_2O_7$, $H_4P_2O_5$ and $H_4P_2O_6$, respectively, are :

(A) 7, 5 and 6
(B) 5, 4 and 3
(C) 5, 3 and 4
(D) 6, 4 and 5

Answer: (C) 5, 3 and 4 · Key from source paper

Q160 JEE Main 2021 · 27 Jul · Shift 1 MCQ

The product obtained from the electrolytic oxidation of acidified sulphate solutions, is :

(A) HSO_4^-

(B) HO_3SOOSO_3H

(C) HO_2SOSO_2H

(D) HO_3SOSO_3H

Answer: (B) HO_3SOOSO_3H · Key from source paper

Q161 JEE Main 2021 · 27 Jul · Shift 2 MCQ

Number of $Cl=O$ bonds in chlorous acid, chloric acid and perchloric acid respectively are:

(A) 3, 1 and 1

(B) 4, 1 and 0

(C) 1, 1 and 3

(D) 1, 2 and 3

Answer: (D) 1, 2 and 3 · Key from source paper

Q162 JEE Main 2021 · 25 Jul · Shift 1 MCQ

Which one of the following compounds of Group-14 elements is not known?

(A) $GeCl_6^{2-}$

(B) $SnOH_6^{2-}$

(C) $SiCl_6^{2-}$

(D) SiF_6^{2-}

Answer: (C) $SiCl_6^{2-}$ · Key from source paper

Q163 JEE Main 2021 · 22 Jul · Shift 1 MCQ

Given below are the statements about diborane

(a) Diborane is prepared by the oxidation of $NaBH_4$ with I_2

(b) Each boron atom is in sp^2 hybridized state

(c) Diborane has one bridged 3 centre-2-electron bond

(d) Diborane is a planar molecule

The option with correct statement(s) is

(A) (c) and (d) only

(B) (a) only

(C) (c) only

(D) (a) and (b) only

Answer: (B) (a) only · Key from source paper

Q164 JEE Main 2021 · 22 Jul · Shift 1 MCQ

Which one of the following group-15 hydride is the strongest reducing agent ?

(A) AsH_3
(B) BiH_3
(C) PH_3
(D) SbH_3

Answer: (B) BiH_3 · Key from source paper

Q165 JEE Main 2021 · 20 Jul · Shift 1 MCQ

Chemical nature of the nitrogen oxide compound obtained from a reaction of concentrated nitric acid and P_4O_{10} (in 4 : 1 ratio) is:

(A) acidic
(B) basic
(C) amphoteric
(D) neutral

Answer: (A) acidic · Key from source paper

Q166 JEE Main 2021 · 18 Mar · Shift 1 MCQ

The number of ionisable hydrogens present in the product obtained from a reaction of phosphorus trichloride and phosphonic acid is:

(A) 3
(B) 0
(C) 2
(D) 1

Answer: (C) 2 · Key from source paper

Q167 JEE Main 2021 · 18 Mar · Shift 2 Numerical

A xenon compound A upon partial hydrolysis gives XeO_2F_2. The number of lone pair of electrons present in compound A is _____ (Round off to the Nearest integer)

Numerical value type: the answer is a number.

Answer: 19. · Key from source paper

Q168 JEE Main 2021 · 17 Mar · Shift 1 Numerical

The reaction of white phosphorus on boiling with alkali in inert atmosphere resulted in the formation of product A. The reaction 1 mol of A with excess of $AgNO_3$ in aqueous medium gives _____ mole(s) of Ag. (Round off to the Nearest Integer).

Numerical value type: the answer is a number.

Answer: 4. · Key from source paper

Q169 JEE Main 2021 · 17 Mar · Shift 2 MCQ

The set that represents the pair of neutral oxides of nitrogen is:

(A) NO and N_2O
(B) N_2O and N_2O_3
(C) N_2O and NO_2
(D) NO and NO_2

Answer: (A) NO and N_2O · Key from source paper

Q170 JEE Main 2021 · 16 Mar · Shift 1 MCQ

A group 15 element, which is a metal and forms a hydride with strongest reducing power among group 15 hydrides. The element is :

(A) Sb
(B) P
(C) As
(D) Bi

Answer: (D) Bi · Key from source paper

Q171 JEE Main 2021 · 16 Mar · Shift 1 MCQ

Match List-I with List-II :
List-I (Industrial process) : (a) Haber's process, (b) Ostwald's process, (c) Contact process, (d) Hall-Heroult process
List-II (Application) : (i) HNO_3 synthesis, (ii) Aluminium extraction, (iii) NH_3 synthesis, (iv) H_2SO_4 synthesis
Choose the correct answer from the options below:

(A) (a) – (ii), (b) – (iii), (c) – (iv), (d) – (i)
(B) (a) – (iii), (b) – (iv), (c) – (i), (d) – (ii)
(C) (a) – (iii), (b) – (i), (c) – (iv), (d) – (ii)
(D) (a) – (iv), (b) – (i), (c) – (ii), (d) – (iii)

Answer: (C) (a) – (iii), (b) – (i), (c) – (iv), (d) – (ii) · Key from source paper

Q172 JEE Main 2021 · 16 Mar · Shift 1 MCQ

Match List-I with List-II
List-I (Name of oxo acid) : (a) Hypophosphorous acid, (b) Orthophosphoric acid, (c) Hypophosphoric acid, (d) Orthophosphorous acid
List-II (Oxidation state of 'P) : (i) $+5$, (ii) $+4$, (iii) $+3$, (iv) $+2$, (v) $+1$
Choose the correct answer from the options given below :

(A) (a) – (v), (b) – (i), (c) – (ii), (d) – (iii)
(B) (a) – (iv), (b) – (i), (c) – (ii), (d) – (iii)
(C) (a) – (iv), (b) – (v), (c) – (ii), (d) – (iii)
(D) (a) – (v), (b) – (iv), (c) – (ii), (d) – (iii)

Answer: (A) (a) – (v), (b) – (i), (c) – (ii), (d) – (iii) · Key from source paper

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Q173 JEE Main 2021 · 16 Mar · Shift 2 MCQ

The exact volumes of $1\ \mathrm{M}\ \mathrm{NaOH}$ solution required to neutralise $50\ \mathrm{mL}$ of $1\ \mathrm{M}\ \mathrm{H_3PO_3}$ solution and $100\ \mathrm{mL}$ of $2\ \mathrm{M}\ \mathrm{H_3PO_2}$ solution, respectively, are :

(A) $100\ \mathrm{mL}$and $100\ \mathrm{mL}$
(B) $100\ \mathrm{mL}$ and $50\ \mathrm{mL}$
(C) $100\ \mathrm{mL}$ and $200\ \mathrm{mL}$
(D) $50\ \mathrm{mL}$ and $50\ \mathrm{mL}$

Answer: (C) $100\ \mathrm{mL}$ **and** $200\ \mathrm{mL}$ · Key from source paper

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Q174 JEE Main 2021 · 16 Mar · Shift 2 MCQ

The INCORRECT statement regarding the structure of $\mathrm{C_{60}}$ is :

(A) The six-membered rings are fused to both six and five-membered rings.
(B) Each carbon atom forms three sigma bonds.
(C) The five-membered rings are fused only to six-membered rings.
(D) It contains 12 six-membered rings and 24 five-membered rings.

Answer: (D) It contains 12 six-membered rings and 24 five-membered rings. · Key from source paper

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Q175 JEE Main 2021 · 26 Feb · Shift 1 MCQ

Compound A used as a strong oxidizing agent is amphoteric in nature. It is the part of lead storage batteries. Compound A is:

(A) PbO
(B) $\mathrm{Pb_3O_4}$
(C) $\mathrm{PbO_2}$
(D) $\mathrm{PbSO_4}$

Answer: (C) $\mathrm{PbO_2}$ · Key from source paper

Q176 JEE Main 2021 · 26 Feb · Shift 2 MCQ

Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R.
Assertion A : In $\mathrm{TlI_3}$, isomorphous to $\mathrm{CsI_3}$, the metal is present in $+1$ oxidation state.
Reason R : Tl metal has fourteen f electrons in its electronic configuration.

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

(A) A is correct but R is not correct
(B) Both A and R are correct and R is the correct explanation of A
(C) A is not correct but R is correct
(D) Both A and R are correct but R is NOT the correct explanation of A

Answer: (D) Both A and R are correct but R is NOT the correct explanation of A · Key from source paper

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Q177 JEE Main 2021 · 25 Feb · Shift 1 MCQ

The incorrect statement about B_2H_6 is :

(A) All $B-H-B$ angles are of 120°
(B) The two $B-H-B$ bonds (bridged and terminal) are not of same length.
(C) Terminal $B-H$ bonds have less p -character when compared to bridging bonds.
(D) Its fragment, BH_3, behaves as a Lewis acid.

Answer: (A) All $B-H-B$ angles are of 120° · Key from source paper

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Q178 JEE Main 2021 · 25 Feb · Shift 1 Numerical

Among the following, the number of halide(s) which is/ are inert to hydrolysis is
(A) BF_3
(B) $SiCl_4$
(C) PCl_5
(D) SF_6

Numerical value type: the answer is a number.

Answer: 1. · Key from source paper

Q179 JEE Main 2021 · 25 Feb · Shift 2 MCQ

The correct order of bond dissociation enthalpy of halogens is:

(A) $F_2 > Cl_2 > Br_2 > I_2$
(B) $Cl_2 > F_2 > Br_2 > I_2$
(C) $I_2 > Br_2 > Cl_2 > F_2$
(D) $Cl_2 > Br_2 > F_2 > I_2$

Answer: (D) $Cl_2 > Br_2 > F_2 > I_2$ · Key from source paper

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Q180 JEE Main 2021 · 25 Feb · Shift 2 MCQ

Given below are two statements:
Statement I : α and β forms of sulphur can change reversibly between themselves with slow heating or slow cooling.

Statement II : At room temperature the stable crystalline form of sulphur is monoclinic sulphur.
In the light of the above statements, choose the correct answer from the options given below:

(A) Both Statement I and Statement II are true.
(B) Statement I is true but Statement II is false.
(C) Statement I is false but Statement II is true.
(D) Both Statement I and Statement II are false.

Answer: (B) Statement I is true but Statement II is false. · Key from source paper

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Q181 JEE Main 2021 · 24 Feb · Shift 2 Numerical

Among the following allotropic forms of sulphur, the number of allotropic forms, which will show paramagnetism is _____.
(A) α-sulphur
(B) β-sulphur
(C) S_2-form

Numerical value type: the answer is a number.

Answer: 1. · Key from source paper

Q182 JEE Main 2020 · 6 Sep · Shift 1 MCQ

The correct statement with respect to dinitrogen is:

(A) N_2 is paramagnetic in nature.
(B) it can combine with dioxygen at $25^{\circ}C$
(C) liquid dinitrogen is not used in cryosurgery.
(D) it can be used as an inert diluent for reactive chemicals

Answer: (D) it can be used as an inert diluent for reactive chemicals · Key from source paper

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Q183 JEE Main 2020 · 6 Sep · Shift 1 Numerical

The number of Cl = O bonds in perchloric acid is, _____

Numerical value type: the answer is a number.

Answer: 3. · Key from source paper

Q184 JEE Main 2020 · 6 Sep · Shift 2 MCQ

The reaction of NO with N_2O_4 at 250 K gives :

(A) N_2O
(B) NO_2
(C) N_2O_3
(D) N_2O_5

Answer: (C) N_2O_3 · Key from source paper

Q185 JEE Main 2020 · 6 Sep · Shift 2 MCQ

Reaction of an inorganic sulphite X with dilute $H_2\ SO_4$ generated compound Y. Reaction of Y with NaOH gives X. Further, the reaction of X with Y and water affords compound Z, Y and X, respectively, are :

(A) SO_2 and $Na_2\ SO_3$
(B) SO_3 and $NaHSO_3$
(C) SO_2 and $NaHSO_3$
(D) S and $Na_2\ SO_3$

Answer: (A) SO_2 **and** $Na_2\ SO_3$ · Checked by our team

Q186 JEE Main 2020 · 5 Sep · Shift 1 MCQ

The structure of PCl_5 in the solid state is :

(A) tetrahedral $[PC_4]^+$ and octahedral $[PCl_6]^-$
(B) square planar $[PCl_4]^+$ and octahedral $[PCl_6]^-$
(C) square pyramidal
(D) trigonal bipyramidal

Answer: (A) tetrahedral $[PC_4]^+$ **and octahedral** $[PCl_6]^-$ · Key from source paper

Q187 JEE Main 2020 · 5 Sep · Shift 2 MCQ

Reaction of ammonia with excess Cl_2 gives :

(A) NH_4Cl and N_2
(B) NH_4Cl and HCl
(C) NCl_3 and NH_4Cl
(D) NCl_3 and HCl

Answer: (D) NCl_3 **and** HCl · Key from source paper

Q188 JEE Main 2020 · 4 Sep · Shift 1 MCQ

On heating, lead (ll) nitrate gives a brown gas (A). The gas (A) on cooling changes to a colourless solid/liquid (B). (B) on heating with NO changes to ablue solid (C). The oxidation number of nitrogen in solid (C) is:

(A) +5
(B) +2
(C) +3
(D) +4

Answer: (C) +3 · Key from source paper

Q189 JEE Main 2020 · 3 Sep · Shift 1 MCQ

Aqua regia is used for dissolving noble metals (Au, Pt, etc.). The gas evolved in this process is

(A) NO
(B) N_2O_5
(C) N_2
(D) N_2O_3

Answer: (A) NO · Key from source paper

Q190 JEE Main 2020 · 3 Sep · Shift 1 MCQ

In a molecule of pyrophosphoric acid, the number of $P-OH$, $P=0$ and $P-O-P$ bonds/moiety(ies) respectively are :

(A) 2, 4 and 1
(B) 3, 3 and 3
(C) 4, 2 and 0
(D) 4, 2 and 1

Answer: (D) 4, 2 and 1 · Key from source paper

Q191 JEE Main 2020 · 2 Sep · Shift 1 MCQ

On heating compound (A) gives a gas (B) which is constituent of air. This gas when treated with H_2 in the presence of a catalyst gives another gas (C) which is basic in nature. (A) should not be :

(A) NaN_3
(B) $Pb\ (NO_3)_2$
(C) $(NH_4)_2\ Cr_2\ O_7$
(D) $NH_4\ NO_2$

Answer: (B) $Pb\ (NO_3)_2$ · Key from source paper

Q192 JEE Main 2020 · 2 Sep · Shift 2 MCQ

The shape/structure of $[XeF_5]^-$ and $XeO_3\ F_2$, respectively are :

(A) pentagonal planar and trigonal bipyramidal
(B) octahedral and square pyramidal
(C) trigonal bipyramidal and pentagonal planar
(D) trigonal bipyramidal and trigonal bipyramidal

Answer: (A) pentagonal planar and trigonal bipyramidal · Key from source paper

Q193 JEE Main 2020 · 9 Jan · Shift 2 MCQ

The reaction of $H_3N_3B_3Cl_3$(A) with $LiBH_4$ in tetrahydrofuran gives inorganic benzene (B) . Further, the reaction of (A) with (C) leads to $H_3N_3B_3(Me)_3$. Compounds (B) and (C) respectively, are:

(A) Bogging god MeBr
(B) Diborane and MeMgBr
(C) Boron nitride and MeBr
(D) Borazine and MeMgBr

Answer: (D) Borazine and MeMgBr · Key from source paper

Q194 JEE Main 2020 · 8 Jan · Shift 1 MCQ

The number of bonds between sulphur and oxygen atoms in $S_2O_8^{2-}$ and the number of bonds between sulphur and sulphur atoms in rhombic sulphur, respectively are:

(A) 4 and 6
(B) 8 and 8
(C) 8 and 6
(D) 4 and 8

Answer: (B) 8 and 8 · Key from source paper

Q195 JEE Main 2020 · 8 Jan · Shift 2 MCQ

White phosphorus on reaction with concentrated $NaOH$ solution in an inert atmosphere of CO_2 gives phosphine and compound (X). (X) on acidification with HCl gives compound (Y). The basicity of compound (Y) is:

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

Answer: (B) 1 · Key from source paper

Q196 JEE Main 2020 · 7 Jan · Shift 1 Numerical

Chlorine reacts with hot and concentrated $NaOH$ and produces compounds (X) and (Y). Compound (X) gives white precipitate with silver nitrate solution. The average bond order between Cl and O

atoms in (Y) is _____ .

Numerical value type: the answer is a number.

Answer: 1.67. · Key from source paper

Q197 JEE Main 2020 · 7 Jan · Shift 2 MCQ

In the following reactions, products (A) and (B), respectively, are:
$NaOH + Cl_2 \rightarrow$ (A) + side products
(hot and conc.)
$Ca(OH)_2 + Cl_2 \rightarrow$ (B) + side products
(dry)

(A) $NaClO_3$ and $Ca(OCl)_2$
(B) $NaClO_3$ and $Ca(ClO_3)_2$
(C) $NaOCl$ and $Ca(OCl)_2$
(D) $NaOCl$ and $Ca(ClO_3)_2$

Answer: (A) $NaClO_3$ **and** $Ca(OCl)_2$ · Key from source paper

Q198 JEE Main 2019 · 12 Apr · Shift 1 MCQ

The correct statement among the following is:

(A) $SiH_{33}N$ is planar and less basic than $CH_{33}N$
(B) $SiH_{33}N$ is pyramidal and more basic than $CH_{33}N$
(C) $SiH_{33}N$ is pyramidal and less basic than $CH_{33}N$
(D) $SiH_{33}N$ is planar and more basic than $CH_{33}N$

Answer: (A) $SiH_{33}N$ **is planar and less basic than** $CH_{33}N$ · Key from source paper

Q199 JEE Main 2019 · 12 Apr · Shift 1 MCQ

The basic structural unit of feldspar, zeolites mica, and asbestos is:

Q41. The basic structural unit of feldspar, zeolites mica, and asbestos is:

(1) SiO_4^{4-}

(2) $-\left(\begin{matrix} R \\ | \\ Si - O \\ | \\ R \end{matrix}\right)_n$ (R = Me)

(3) SiO_3^{2-}

(4) SiO_2

(A) SiO_4^{4-}
(B) *see figure*
(C) SiO_3^{2-}
(D) SiO_2

Answer: (A) SiO_4^{4-} · Key from source paper

Q200 JEE Main 2019 · 12 Apr · Shift 2 MCQ

The $C-C$ bond length is maximum in:

(A) C_{70}
(B) C_{60}
(C) graphite
(D) diamond

Answer: (D) diamond · Key from source paper

Q201 JEE Main 2019 · 10 Apr · Shift 1 MCQ

The correct order of catenation is:

(A) $Ge > Sn > Si > C$
(B) $C > Sn > Si \approx Ge$
(C) $C > Si > Ge \approx Sn$
(D) $Si > Sn > C > Ge$

Answer: (C) $C > Si > Ge \approx Sn$ · Key from source paper

Q202 JEE Main 2019 · 10 Apr · Shift 1 MCQ

The oxoacid of sulphur that does not contain bond between sulphur atom is:

(A) $H_2S_2O_7$
(B) $H_2S_2O_4$
(C) $H_2S_4O_6$
(D) $H_2S_2O_3$

Answer: (A) $H_2S_2O_7$ · Key from source paper

Q203 JEE Main 2019 · 10 Apr · Shift 2 MCQ

The number of pentagons in C_{60} and trigons (triangles) in white phosphorus, are;

(A) 12 and 3
(B) 20 and 4
(C) 20 and 3
(D) 12 and 4

Answer: (D) 12 and 4 · Key from source paper

Q204 JEE Main 2019 · 10 Apr · Shift 2 MCQ

The noble gas that does not occur in the atmosphere is;

(A) Kr
(B) Ne
(C) Ra
(D) He

Answer: (C) Ra · Key from source paper

Q205 JEE Main 2019 · 9 Apr · Shift 1 MCQ

C_{60}, an allotrope of carbon contains

(A) 12 hexagons and 20 pentagons.
(B) 16 hexagons and 16 pentagons.
(C) 18 hexagons and 14 pentagons.
(D) 20 hexagons and 12 pentagons.

Answer: (D) 20 hexagons and 12 pentagons. · Key from source paper

Q206 JEE Main 2019 · 9 Apr · Shift 2 MCQ

The correct statements among I to III regrading group 13 element oxides are,
(I) Boron trioxide is acidic.
(II) Oxides of aluminum and gallium are amphoteric.
(III) Oxides of indium and thallium are basic.

(A) (I) and (III) only
(B) (I) and (II) only
(C) (I), (II) and (III)
(D) (II) and (III) only

Answer: (C) (I), (II) and (III) · Key from source paper

Q207 JEE Main 2019 · 9 Apr · Shift 2 MCQ

The amorphous form of silica is:

(A) quartz
(B) kieselguhr
(C) tridymite
(D) cristobalite

Answer: (B) kieselguhr · Key from source paper

Q208 JEE Main 2019 · 8 Apr · Shift 1 MCQ

Diborane B_2H_6 reacts independently with O_2 and H_2O to produce, respectively:

(A) HBO_2 and H_3BO_3
(B) H_3BO_3 and B_2O_3
(C) B_2O_3 and $[BH_4]^-$
(D) B_2O_3 and H_3BO_3

Answer: (D) B_2O_3 and H_3BO_3 · Key from source paper

Q209 JEE Main 2019 · 12 Jan · Shift 1 MCQ

Iodine reacts with concentrated HNO_3 to yield Y along with other products. The oxidation state of iodine in Y , is:

(A) 1
(B) 5
(C) 3
(D) 7

Answer: (B) 5 · Key from source paper

Q210 JEE Main 2019 · 12 Jan · Shift 2 MCQ

The element that does not show catenation is

(A) Sn
(B) Si
(C) Ge
(D) Pb

Answer: (D) Pb · Key from source paper

Q211 JEE Main 2019 · 12 Jan · Shift 2 MCQ

The element that shows greater ability to form $p\pi - p\pi$ multiple bonds is:

(A) Sn
(B) C
(C) Si
(D) Ge

Answer: (B) C · Key from source paper

Q212 JEE Main 2019 · 12 Jan · Shift 2 MCQ

Chlorine on reaction with hot and concentrated sodium hydroxide gives.

(A) Cl^- and ClO_2^-
(B) Cl^- and ClO_3^-
(C) Cl^- and ClO^-
(D) ClO_3^- and ClO_2^-

Answer: (B) Cl^- and ClO_3^- · Key from source paper

Q213 JEE Main 2019 · 11 Jan · Shift 1 MCQ

The chloride that CANNOT get hydrolysed is:

(A) $PbCl_4$
(B) CCl_4
(C) $SnCl_4$
(D) $SiCl_2$

Answer: (B) CCl_4 · Key from source paper

Q214 JEE Main 2019 · 11 Jan · Shift 2 MCQ

The hydride that is NOT electron deficient is:

(A) SiH_4
(B) B_2H_6
(C) GaH_3
(D) AlH_3

Answer: (A) SiH_4 · Key from source paper

Q215 JEE Main 2019 · 11 Jan · Shift 2 MCQ

The relative stability of +1 oxidation state of group 13 elements follows the order

(A) Al < Ga < Tl < In
(B) Tl < In < Ga < Al
(C) Ga < Al < In < Tl
(D) Al < Ga < In < Tl

Answer: (D) Al < Ga < In < Tl · Key from source paper

Q216 JEE Main 2019 · 10 Jan · Shift 2 MCQ

The number of 2-centre-2-electron and 3-centre-2-electron bonds in B_2H_6, respectively, are:

(A) 4 and 2
(B) 2 and 4
(C) 2 and 2
(D) 2 and 1

Answer: (A) 4 and 2 · Key from source paper

Q217 JEE Main 2019 · 10 Jan · Shift 2 MCQ

The pair that contains two $P-H$ bonds in each of the oxoacids is:

(A) H_3PO_3 and H_3PO_2
(B) $H_4P_2O_5$ and H_3PO_3
(C) $H_4P_2O_5$ and $H_4P_2O_6$
(D) H_3PO_2 and $H_4P_2O_5$

Answer: (D) H_3PO_2 and $H_4P_2O_5$ · Key from source paper

Q218 JEE Main 2019 · 9 Jan · Shift 1 MCQ

Aluminium is usually found in $+3$ oxidation state. In contrast, thallium exists in $+1$ and $+3$ oxidation states. This is due to:

(A) Diagonal relationship
(B) Lattice effect
(C) Lanthanoid contraction
(D) Inert pair effect

Answer: (D) Inert pair effect · Key from source paper

Q219 JEE Main 2019 · 9 Jan · Shift 1 MCQ

Correct statements among regarding silicones are:
(a) They are polymers with hydrophobic character.
(b) They are biocompatible.
(c) In general, they have high thermal stability and low dielectric strength.
(d) Usually, they are resistant to oxidation and used as greases.

(A) $(a), (b)$ and (c) only
(B) (a) and (b) only
(C) $(a), (b), (c)$ and (d)
(D) $(a), (b)$ and (d) only

Answer: (D) $(a), (b)$ and (d) only · Checked by our team

Q220 JEE Main 2019 · 9 Jan · Shift 2 MCQ

Good reducing nature of H_3PO_2 is attributed to the presence of:

(A) One $P-H$ bond
(B) Two $P-OH$ bonds
(C) Two $P-H$ bond
(D) One $P-OH$ bond

Answer: (C) Two $P-H$ bond · Key from source paper

Q221 JEE Main 2018 · 16 Apr · Online MCQ

A group 13 element 'X' reacts with chlorine gas to produce a compound XCl_3. XCl_3 is electron deficient and easily reacts with NH_3 to form $Cl_3X \leftarrow NH_3$ adduct; however, XCl_3 does not dimerize. X is:

(A) B
(B) Al
(C) In
(D) Ga

Answer: (A) B · Key from source paper

Q222 JEE Main 2018 · 16 Apr · Online MCQ

Among the oxides of nitrogen:
N_2O_3, N_2O_4 and N_2O_5; the molecule(s) having nitrogen - nitrogen bond is/are:

(A) N_2O_3 and N_2O_4
(B) N_2O_4 and N_2O_5
(C) N_2O_3 and N_2O_5
(D) Only N_2O_5

Answer: (A) N_2O_3 and N_2O_4 · Key from source paper

Q223 JEE Main 2018 · 15 Apr · Shift 1 MCQ

Xenon hexafluoride on partial hydrolysis produces compounds ' X ' and ' Y '. Compounds ' X ' and ' Y ' and oxidation state of Xe are respectively :

(A) $XeOF_4(+6)$ and $XeO_3(+6)$
(B) $XeO_2(+4)$ and $XeO_3(+6)$
(C) $XeOF_4(+6)$ and $XeO_2F_2(+6)$
(D) $XeO_2F_2(+6)$ and $XeO_2(+4)$

Answer: (C) $XeOF_4(+6)$ **and** $XeO_2F_2(+6)$ · Key from source paper

Q224 JEE Main 2018 · 15 Apr · Shift 2 MCQ

In XeO_3F_2, the number of bond pair(s), π-bond(s) and lone pair(s) on Xe atom respectively are:

(A) $5, 3, 0$
(B) $5, 2, 0$
(C) $4, 2, 2$
(D) $4, 4, 0$

Answer: (A) $5, 3, 0$ · Key from source paper

Q225 JEE Main 2018 · 15 Apr · Shift 2 MCQ

The number of $P-O$ bonds in P_4O_6 is:

(A) 9
(B) 6
(C) 12
(D) 18

Answer: (C) 12 · Key from source paper

Q226 JEE Main 2018 · 8 Apr · Offline MCQ

When metal M is treated with NaOH, a white gelatinous precipitate X is obtained, which is soluble in excess of NaOH. Compound X when heated strongly gives an oxide which is used in chromatography as an adsorbent. The metal M is

(A) Fe
(B) Zn
(C) Ca
(D) Al

Answer: (D) Al · Key from source paper

Q227 JEE Main 2018 · 8 Apr · Offline MCQ

The compound that does not produce nitrogen gas by thermal decomposition is:

(A) $(NH_4)_2SO_4$
(B) $Ba(N_3)_2$
(C) $(NH_4)_2Cr_2O_7$
(D) NH_4NO_2

Answer: (A) $(NH_4)_2SO_4$ · Key from source paper

Q228 JEE Main 2017 · 9 Apr · Online MCQ

The number of $P-OH$ bonds and the oxidation state of phosphorus atom in pyrophosphoric acid ($H_4P_2O_7$), respectively are:

(A) Five and four.
(B) Four and five.
(C) Five and five.
(D) Four and four.

Answer: (B) Four and five. · Key from source paper

Q229 JEE Main 2017 · 9 Apr · Online MCQ

The correct sequence of decreasing number of π-bonds in the structure of H_2SO_3, H_2SO_4 and $H_2S_2O_7$ is:

(A) $H_2S_2O_7 > H_2SO_3 > H_2SO_4$
(B) $H_2S_2O_7 > H_2SO_4 > H_2SO_3$
(C) $H_2SO_4 > H_2S_2O_7 > H_2SO_3$
(D) $H_2SO_3 > H_2SO_4 > H_2S_2O_7$

Answer: (B) $H_2S_2O_7 > H_2SO_4 > H_2SO_3$ · Key from source paper

Q230 JEE Main 2017 · 9 Apr · Online MCQ

XeF_6 on partial hydrolysis with water, produces a compound X. The same compound X is formed when XeF_6 reacts with silica. The compound X is:

(A) XeF_4
(B) XeF_2
(C) XeO_3
(D) $XeOF_4$

Answer: (D) $XeOF_4$ · Key from source paper

Q231 JEE Main 2017 · 8 Apr · Online MCQ

Consider the following standard electrode potentials (E^o in volts) in aqueous solution:
Element | M^{3+}/M | M^{+}/M
Al | -1.66 | $+0.55$

Tl | $+1.26$ | -0.34

Based on these data, which of the following statements is correct?

(A) Tl^{+} is more stable than Al^{3+}

(B) Al^{+} is more stable than Al^{3+}

(C) Tl^{3+} is more stable than Al^{3+}

(D) Tl^{+} is more stable than Al^{+}

Answer: (D) Tl^{+} **is more stable than** Al^{+} · Key from source paper

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Q232 JEE Main 2017 · 8 Apr · Online MCQ

The number of $S=O$ and $S-OH$ bonds present in peroxodisulphuric acid and pyrosulphuric acid respectively are:

(A) (2 and 2) and (2 and 4).

(B) (4 and 2) and (4 and 2).

(C) (4 and 2) and (2 and 4).

(D) (2 and 2) and (2 and 2).

Answer: (B) (4 and 2) and (4 and 2). · Key from source paper

Q233 JEE Main 2017 · 2 Apr · Offline MCQ

The products obtained when chlorine gas reacts with cold and dilute aqueous NaOH are

(A) ClO_2^- and ClO_3^-

(B) Cl^- and ClO^-

(C) Cl^- and ClO_2^-

(D) ClO^- and ClO_3^-

Answer: (B) Cl^- **and** ClO^- · Key from source paper

Q234 JEE Main 2016 · 10 Apr · Online MCQ

Assertion: Among the carbon allotropes, diamond is an insulator, whereas, graphite is a good conductor of electricity.

Reason: Hybridization of carbon in diamond and graphite are sp^3 and sp^2 respectively.

(A) Both assertion and reason are correct, but the reason is not the correct explanation for the assertion.

(B) Both assertion and reason are correct, but the reason is the correct explanation for the assertion.

(C) Both assertion and reason are incorrect.

(D) Assertion is incorrect statement, but the reason is correct.

Answer: (A) Both assertion and reason are correct, but the reason is not the correct explanation for the assertion. · Key from source paper

Q235 JEE Main 2016 · 10 Apr · Online MCQ

Identify the incorrect statement :

(A) The S-S-S bond angles in the S_8 and S_6 rings are the same.

(B) Rhombic and monoclinic Sulphur have S_8 molecules.

(C) S_2 is paramagnetic like oxygen.

(D) S_8 ring has a crown shape.

Answer: (A) The S-S-S bond angles in the S_8 and S_6 rings are the same. · Key from source paper

Q236 JEE Main 2016 · 9 Apr · Online MCQ

Match the items in Column I with its main use listed in Column II:

Column I | Column II

A Silica gel | i. Transistor

B Silicon | ii. Ion-exchanger

C Silicone | iii. Drying agent

D Silicate | iv. Sealant

(A) A - iii, B - i, C - iv, D - ii

(B) A - iv, B - i, C - ii, D - iii

(C) A - ii, B - i, C - iv, D - iii

(D) A - ii, B - iv, C - i, D - iii

Answer: (A) A - iii, B - i, C - iv, D - ii · Key from source paper

Q237 JEE Main 2016 · 9 Apr · Online MCQ

The non-metal that does not exhibit positive oxidation state is:

(A) Chlorine

(B) Iodine

(C) Fluorine

(D) Oxygen

Answer: (C) Fluorine · Key from source paper

Q238 JEE Main 2016 · 3 Apr · Offline MCQ

The pair in which phosphorous atoms have a formal oxidation state of + 3 is:

(A) Orthophosphorous and hypophospheric acids

(B) Pyrophosphorous and pyrophosphoric acids

(C) Orthophosphorous and pyrophosphorous acids

(D) Pyrophosphorous and hypophosphoric acids

Answer: (C) Orthophosphorous and pyrophosphorous acids · Key from source paper

Q239 JEE Main 2016 · 3 Apr · Offline MCQ

The reaction of zinc with dilute and concentrated nitric acid, respectively, produces:

(A) NO and N_2O
(B) NO_2 and N_2O
(C) N_2O and NO_2
(D) NO_2 and NO

Answer: (C) N_2O and NO_2 · Key from source paper

Q240 JEE Main 2015 · 11 Apr · Online MCQ

Chlorine water on standing loses its color and forms:

(A) HOCl and $HOCl_2$
(B) HCl only
(C) HCl and $HClO_2$
(D) HCl and HOCl

Answer: (D) HCl and HOCl · Key from source paper

Q241 JEE Main 2015 · 11 Apr · Online MCQ

Which of the following compounds has a P — P Bond?

(A) $(HPO_3)_3$
(B) $H_4P_2O_6$
(C) $H_4P_2O_7$
(D) $H_4P_2O_5$

Answer: (B) $H_4P_2O_6$ · Key from source paper

Q242 JEE Main 2015 · 10 Apr · Online MCQ

The shape of $XeOF_4$ by VSEPR theory is:

(A) Trigonal bipyramidal
(B) Square pyramidal
(C) Pentagonal planar
(D) Octahedral

Answer: (B) Square pyramidal · Key from source paper

Q243 JEE Main 2015 · 10 Apr · Online MCQ

The least number of oxyacids are formed by:

(A) Chlorine
(B) Fluorine
(C) Sulphur
(D) Nitrogen

Answer: (B) Fluorine · Key from source paper

Q244 JEE Main 2015 · 4 Apr · Offline MCQ

Assertion: Nitrogen and Oxygen are the main components in the atmosphere but these do not react to form oxides of nitrogen.
Reason: The reaction between nitrogen and oxygen requires high temperature.

(A) Both the Assertion and Reason are incorrect.
(B) Both Assertion and Reason are correct and the Reason is the correct explanation for the Assertion.
(C) Both Assertion and Reason are correct, but the Reason is not the correct explanation for the Assertion.
(D) The Assertion is incorrect but the Reason is correct.

Answer: (B) Both Assertion and Reason are correct and the Reason is the correct explanation for the Assertion. · Key from source paper

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Q245 JEE Main 2015 · 4 Apr · Offline MCQ

Which among the following is the most reactive?

(A) ICl
(B) $\mathrm{Cl_2}$
(C) $\mathrm{Br_2}$
(D) $\mathrm{I_2}$

Answer: (A) ICl · Key from source paper

Q246 JEE Main 2015 · 4 Apr · Offline MCQ

Which one has the highest boiling point?

(A) Xe
(B) He
(C) Ne
(D) Kr

Answer: (A) Xe · Key from source paper

Q247 JEE Main 2014 · 19 Apr · Online MCQ

Example of a three-dimensional silicate is :

(A) Ultramarines
(B) Feldspars
(C) Zeolites
(D) All of these

Answer: (D) All of these · Key from source paper

Q248 JEE Main 2014 · 19 Apr · Online MCQ

Which of these statements is not true ?

(A) $LiAlH_4$ is versatile reducing agent in organic synthesis.
(B) NO^+ is isoelectronic with O_2
(C) Boron is always covalent in its compounds
(D) In aqueous solution, the Tl^+ ion is much more stable than Tl (III)

Answer: (B) NO^+ is isoelectronic with O_2 · Key from source paper

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Q249 JEE Main 2014 · 12 Apr · Online MCQ

Which of the following xenon-oxo compounds may not be obtained by hydrolysis of xenon fluorides?

(A) XeO_2F_2
(B) $XeOF_4$
(C) XeO_3
(D) XeO_4

Answer: (D) XeO_4 · Key from source paper

Q250 JEE Main 2014 · 11 Apr · Online MCQ

Which one of the following does not have a pyramidal shape?

(A) $(CH_3)_3N$
(B) $(SiH_3)_3N$
(C) $P(CH_3)_3$
(D) $P(SiH_3)_3$

Answer: (B) $(SiH_3)_3N$ · Key from source paper

Q251 JEE Main 2014 · 11 Apr · Online MCQ

Shapes of certain interhalogen compounds are stated below. Which one of them is not correctly stated?

(A) IF_7 : pentagonal bipyramid
(B) BrF_5 : trigonal bipyramid
(C) BrF_3 : planar T-shaped
(D) ICl_3 : planar dimeric

Answer: (B) BrF_5 : trigonal bipyramid · Key from source paper

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Q252 JEE Main 2014 · 9 Apr · Online MCQ

The gas evolved on heating CaF_2 and SiO_2 with concentrated H_2SO_4, on hydrolysis gives a white gelatinous precipitate. The precipitate is:

(A) Silicic acid
(B) Calcium fluorosilicate
(C) Hydrofluorosilicic acid
(D) Silica gel

Answer: (A) Silicic acid · Checked by our team

Q253 JEE Main 2014 · 6 Apr · Offline MCQ

Among the following oxoacids, the correct decreasing order of acid strength is :

(A) $HOCl > HClO_2 > HClO_3 > HClO_4$
(B) $HClO_4 > HOCl > HClO_2 > HClO_3$
(C) $HClO_4 > HClO_3 > HClO_2 > HOCl$
(D) $HClO_2 > HClO_4 > HClO_3 > HOCl$

Answer: (C) $HClO_4 > HClO_3 > HClO_2 > HOCl$ · Key from source paper

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Q254 JEE Main 2014 · 6 Apr · Offline MCQ

The correct statement for the molecule CsI_3, is :

(A) It is a covalent molecule.
(B) It contains Cs^+ and I_3^- ions.
(C) It contains Cs^{3+} and I^- ions.
(D) It contains Cs^+ , I^- and lattice I_2 molecule.

Answer: (B) It contains Cs^+ and I_3^- ions. · Key from source paper

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Q255 JEE Main 2013 · 25 Apr · Online MCQ

The catenation tendency of C, Si and Ge is in the order Ge < Si < C. The bond energies (in $kJ\ mol^{-1}$) of C $-$ C, Si $-$ Si and Ge $-$ Ge bonds are respectively ;

(A) 348, 297, 260
(B) 297, 348, 260
(C) 348, 260, 297
(D) 260, 297, 348

Answer: (A) 348, 297, 260 · Key from source paper

Q256 JEE Main 2013 · 23 Apr · Online MCQ

Which has trigonal bipyramidal shape ?

(A) $XeOF_4$
(B) XeO_3
(C) XeO_3F_2
(D) $XeOF_2$

Answer: (C) XeO_3F_2 · Key from source paper

Q257 JEE Main 2013 · 23 Apr · Online MCQ

Identify the incorrect statement:

(A) In $(Si_3O_9)^{6-}$, tetrahedral SiO_4 units share two oxygen atoms.
(B) Trialkylchlorosilane on hydrolysis gives R_3SiOH
(C) $SiCl_4$ undergoes hydrolysis to give H_4SiO_4.
(D) $(Si_3O_9)^{6-}$ has cyclic structure.

Answer: (B) Trialkylchlorosilane on hydrolysis gives R_3SiOH · Key from source paper

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Q258 JEE Main 2013 · 22 Apr · Online MCQ

XeO_4 molecule is tetrahedral having:

(A) Two $p\pi - d\pi$ bonds
(B) One $p\pi - d\pi$ bonds
(C) Four $p\pi - d\pi$ bonds
(D) Three $p\pi - d\pi$ bonds

Answer: (C) Four $p\pi - d\pi$ **bonds** · Key from source paper

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Q259 JEE Main 2013 · 9 Apr · Online MCQ

Trigonal bipyramidal geometry is shown by:

(A) $XeOF_2$
(B) XeO_3F_2
(C) $FXeOSO_2F$
(D) $[XeF_8]^{2-}$

Answer: (B) XeO_3F_2 · Key from source paper

Q260 JEE Main 2013 · 7 Apr · Offline MCQ

Which of the following is wrong statement?

(A) Ozone is violet-black in solid state
(B) Ozone is diamagnetic gas
(C) ONCl and ONO^- are isoelectronic
(D) O_3 molecule is bent

Answer: (C) ONCl and ONO^- are isoelectronic · Key from source paper

Q261 AIEEE 2012 · 26 May · Online MCQ

The number of S $-$ S bonds in SO_3, $S_2O_3^{2-}$ $S_2O_6^{2-}$ and $S_2O_8^{2-}$ respectively are

(A) 1, 0, 0, 1
(B) 1,0,1,0
(C) 0, 1, 1, 0
(D) 0, 1, 0, 1

Answer: (C) 0, 1, 1, 0 · Key from source paper

Q262 AIEEE 2012 · 19 May · Online MCQ

The compound of xenon with zero dipole moment is

(A) XeO_3
(B) XeF_4
(C) $XeOF_4$
(D) XeO_2

Answer: (B) XeF_4 · Key from source paper

Q263 AIEEE 2012 · 7 May · Online MCQ

In which of the following arrangements, the sequence is not strictly according to the property written against it?

(A) $CO_2 < SiO_2 < SnO_2 < PbO_2$: increasing oxidising power

(B) $NH_3 < PH_3 < AsH_3 < SbH_3$: increasing basic strength

(C) $HF < HCl < HBr < HI$: increasing acid strength

(D) $B < C < O < N$: increasing first ionisation enthalpy.

Answer: (B) $NH_3 < PH_3 < AsH_3 < SbH_3$: increasing basic strength · Key from source paper

Q264 AIEEE 2011 MCQ

Which of the following statement is wrong?

(A) Nitrogen cannot form $d\pi - p\pi$ bond.

(B) Single $N - N$ bond is weaker than the single $P - P$ bond,

(C) N_2O_4 has two resonance structures

(D) The stability of hydrides increases from NH_3 to BiH_3 in group 15 of the periodic table

Answer: (D) The stability of hydrides increases from NH_3 to BiH_3 in group 15 of the periodic table · Key from source paper

Q265 AIEEE 2011 MCQ

Boron cannot form which one of the following anions?

(A) BH_4^-

(B) $B(OH)_4^-$

(C) BO_2^-

(D) BF_6^{3-}

Answer: (D) BF_6^{3-} · Key from source paper

Q266 AIEEE 2011 MCQ

Which of the following statements regarding sulphur is incorrect?

(A) The vapour at $200^\circ C$ consists mostly of S_8 rings

(B) At $600^\circ C$ the gas mainly consists of S_2 molecules

(C) The oxidation state of sulphur is never less than $+4$ in its compounds

(D) S_2 molecule is paramagnetic.

Answer: (C) The oxidation state of sulphur is never less than $+4$ in its compounds · Key from source paper

Q267 AIEEE 2011 MCQ

The structure of IF_7 is :

(A) trigonal bipyramid
(B) octahedral
(C) pentagonal bipyramid
(D) square pyramid

Answer: (C) pentagonal bipyramid · Key from source paper

Q268 AIEEE 2009 MCQ

In which of the following arrangements, the sequence is not strictly according to the property written against it ?

(A) $CO_2 < SiO_2 < SnO_2 < PbO_2$: increasing oxidising power
(B) $HF < HCl < HBr < HI$: increasing acid strength
(C) $NH_3 < PH_3 < AsH_3 < SbH_3$: increasing basic strength
(D) $B < C < O < N$: increasing first ionization enthalpy.

Answer: (C) $NH_3 < PH_3 < AsH_3 < SbH_3$ **: increasing basic strength** · Key from source paper

Q269 AIEEE 2009 MCQ

Which one of the following reactions of Xenon compounds is not feasible ?

(A) $XeO_3 + 6HF \rightarrow XeF_6 + 3H_2O$
(B) $3XeF_4 + 6H_2O \rightarrow 2Xe + XeO_3 + 12HF + 1.5O_2$
(C) $2XeF_2 + 2H_2O \rightarrow 2Xe + 4HF + O_2$
(D) $XeF_6 + RbF \rightarrow Rb\,[XeF_7]$

Answer: (A) $XeO_3 + 6HF \rightarrow XeF_6 + 3H_2O$ · Key from source paper

Q270 AIEEE 2008 MCQ

Among the following substituted silanes the one which will give rise to cross linked silicone polymer on hydrolysis is

(A) R_4Si
(B) $RSiCl_3$
(C) R_2SiCl_2
(D) R_3SiCl

Answer: (B) $RSiCl_3$ · Key from source paper

Q271 AIEEE 2007 MCQ

The stability of dihalides of Si, Ge, Sn and Pb increases steadily in the sequence

(A) $GeX_2 \ll SiX_2 \ll SnX_2 \ll PbX_2$
(B) $SiX_2 \ll GeX_2 \ll PbX_2 \ll SnX_2$
(C) $SiX_2 \ll GeX_2 \ll SnX_2 \ll PbX_2$
(D) $PbX_2 \ll SnX_2 \ll GeX_2 \ll SiX_2$

Answer: (C) $SiX_2 \ll GeX_2 \ll SnX_2 \ll PbX_2$ · Key from source paper

Q272 AIEEE 2007 MCQ

Identify the incorrect statement among the following

(A) Ozone reacts with SO_2 to give SO_3
(B) Silicon reacts with $NaOH_{(aq)}$ in the presence of air to give Na_2SiO_3 and H_2O
(C) Cl_2 reacts with excess of NH_3 to give N_2 and HCl
(D) Br_2 reacts with hot and strong NaOH solution to give $NaBr, NaBrO_4$ and H_2O

Answer: (D) Br_2 **reacts with hot and strong NaOH solution to give** $NaBr, NaBrO_4$ **and** H_2O · Key from source paper

Q273 AIEEE 2006 MCQ

Which of the following chemical reactions depicts the oxidizing behaviour of H_2SO_4 ?

(A) $2HI + H_2SO_4 \longrightarrow I_2 + SO_2 + 2H_2O$
(B) $Ca(OH)_2 + H_2SO_4 \longrightarrow CaSO_4 + 2H_2O$
(C) $NaCl + H_2SO_4 \longrightarrow NaHSO_4 + HCl$
(D) $2PCl_5 + H_2SO_4 \longrightarrow 2POCl_3 + 2HCl + SO_2Cl_2$

Answer: (A) $2HI + H_2SO_4 \longrightarrow I_2 + SO_2 + 2H_2O$ · Key from source paper

Q274 AIEEE 2006 MCQ

What products are expected from the disproportionation reaction of hypochlorous acid?

(A) $HClO_3$ and Cl_2O
(B) $HClO_2$ and $HClO_4$
(C) HCl and Cl_2O
(D) HCl and $HClO_3$

Answer: (D) HCl and $HClO_3$ · Key from source paper

Q275 AIEEE 2005 MCQ

Heating an aqueous solution of aluminium chloride to dryness will give

(A) $AlCl_3$
(B) Al_2Cl_6
(C) Al_2O_3
(D) $Al(OH)Cl_2$

Answer: (C) Al_2O_3 · Key from source paper

Q276 AIEEE 2005 MCQ

In silicon dioxide

(A) Each silicon atom is surrounded by four oxygen atoms and each oxygen atom is bonded to two silicon atoms
(B) Each silicon atom is surrounded by two oxygen atoms and each oxygen atom is bonded to two silicon atoms
(C) Silicon atoms is bonded to two oxygen atoms
(D) There are double bonds between silicon and oxygen atoms

Answer: (A) Each silicon atom is surrounded by four oxygen atoms and each oxygen atom is bonded to two silicon atoms · Key from source paper

Q277 AIEEE 2005 MCQ

The structure of diborane (B_2H_6) contains

(A) four 2c-2e bonds and two 3c-2e bonds
(B) two 2c-2e bonds and four 3c-2e bonds
(C) two 2c-2e bonds and two 3c-3e bonds
(D) four 2c-2e bonds and four 3c-2e bonds

Answer: (A) four 2c-2e bonds and two 3c-2e bonds · Key from source paper

Q278 AIEEE 2005 MCQ

The number of hydrogen atom(s) attached to phosphorus atom in hypophosphorous acid is

(A) zero
(B) two
(C) one
(D) three

Answer: (B) two · Key from source paper

Q279 AIEEE 2005 MCQ

The correct order of the thermal stability of hydrogen halides $(H-X)$ is

(A) $HI > HBr > HCl > HF$
(B) $HF > HCl > HBr > HI$
(C) $HCl < HF > HBr < HI$
(D) $HI > HCl < HF < HBr$

Answer: (B) $HF > HCl > HBr > HI$ · Key from source paper

Q280 AIEEE 2004 MCQ

Aluminium chloride exists as dimer, Al_2Cl_6 in solid state as well as in solution of non-polar solvents such as benzene. When dissolved in water, it gives

(A) $Al^{3+} + 3Cl^-$
(B) $Al_2O_3 + 6HCl$
(C) $[Al(OH)_6]^{3-}$
(D) $[Al(H_2O)_6]^{3+} + 3Cl^-$

Answer: (D) $[Al(H_2O)_6]^{3+} + 3Cl^-$ · Key from source paper

Q281 AIEEE 2004 MCQ

The soldiers of Napolean army while at Alps during freezing winter suffered a serious problem as regards to the tin buttons of their uniforms. White metallic tin buttons got converted to grey powder. This transformation is related to

(A) an interaction with nitrogen of the air at very low temperatures
(B) an interaction with water vapour contained in the humid air
(C) a change in the partial pressure of oxygen in the air
(D) a change in the crystalline structure of tin

Answer: (D) a change in the crystalline structure of tin · Key from source paper

Q282 AIEEE 2004 MCQ

Which among the following factors is the most important in making fluorine the strongest oxidizing halogen?

(A) Electron affinity
(B) Bond dissociation energy
(C) Hydration enthalpy
(D) Ionization enthalpy

Answer: (C) Hydration enthalpy · Checked by our team

Q283 AIEEE 2004 MCQ

Which one the following statement regarding helium is incorrect?

(A) It is used to fill gas balloons instead of hydrogen because it is lighter and non inflammable
(B) It is used in gas - cooled nuclear reactors
(C) It is used to produce and sustain powerful superconducting reagents
(D) It is used as cryogenic agent for carrying out experiments at low temperatures

Answer: (A) It is used to fill gas balloons instead of hydrogen because it is lighter and non inflammable · Key from source paper

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Q284 AIEEE 2004 MCQ

One mole of magnesium nitride on the reaction with an excess of water gives

(A) one mole of ammonia
(B) two moles of nitric acid
(C) two moles of ammonia
(D) one mole of nitric acid

Answer: (C) two moles of ammonia · Key from source paper

Q285 AIEEE 2003 MCQ

Graphite is a soft solid lubricant extremely difficult to melt. The reason for this anomalous behaviour is that graphite

(A) is an allotropic form of diamond
(B) has molecules of variable molecular masses like polymers
(C) has carbon atoms arranged in large plates of rings of strongly bound carbon atoms with weak interplate bonds
(D) is a non-crystalline substance

Answer: (C) has carbon atoms arranged in large plates of rings of strongly bound carbon atoms with weak interplate bonds · Key from source paper

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Q286 AIEEE 2003 MCQ

For making good quality mirrors, plates of float glass are used. These are obtained by floating molten glass over a liquid metal which does not solidify before glass. The metal used can be

(A) tin
(B) sodium
(C) magnesium
(D) mercury

Answer: (A) tin · Checked by our team

Q287 AIEEE 2003 MCQ

What may be expected to happen when phosphine gas is mixed with chlorine gas?

(A) PCl_3 and HCl are formed and the mixture warms up
(B) PCl_5 and HCl are formed and the mixture cools down
(C) $PH_3.Cl_2$ is formed with warming up
(D) The mixture only cools down

Answer: (A) PCl_3 and HCl are formed and the mixture warms up · Checked by our team

Q288 AIEEE 2003 MCQ

Concentrated hydrochloric acid when kept in open air sometimes produces a cloud of white fumes. The explanation for it is that

(A) oxygen in air reacts with the emitted HCl gas to form a cloud of chlorine gas
(B) strong affinity of HCl gas for miosture in air results in forming of droplets of liquid solution which appears like a cloudy smoke.
(C) due to strong affinity for water, concentrated hydrochloric acid pulls moisture of air towards it self. This moisture forms droplets of water and hence the cloud.
(D) concentrated hydrochloric acid emits strongly smelling HCl gas all the time.

Answer: (B) strong affinity of HCl gas for miosture in air results in forming of droplets of liquid solution which appears like a cloudy smoke. · Checked by our team

Q289 AIEEE 2002 MCQ

In XeF_2, XeF_4, XeF_6 the numebr of lone pairs of Xe are respectively

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

Answer: (D) 3, 2, 1 · Key from source paper

Q290 AIEEE 2002 MCQ

In case of nitrogen, NCl_3 is possible but not NCl_5 while in case of phosphorous, PCl_3 as well as PCl_5 are possible. It is due to

(A) availability of vacant d orbitals in P but not in N
(B) lower electronegativity of P than N
(C) lower tendency of H - bond formation in P than N
(D) occurrence of P in solid while N in gaseous state at room temperature

Answer: (A) availability of vacant d orbitals in P but not in N · Key from source paper

Q291 AIEEE 2002 MCQ

Number of sigma bonds in P_4O_{10} is

(A) 6
(B) 7
(C) 17
(D) 16

Answer: (D) 16 · Key from source paper

EdLoop JEE