**29.** Which of the following ions does **not** liberate hydrogen gas on reaction with dilute acids? **[JEE(Main)-2017 on line]**

(1) $Ti^{2+}$ (2) $Cr^{2+}$

(3) $Mn^{2+}$ (4) $V^{2+}$

**SA0133**

**30.** 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 **[JEE(Main)-2018 off line]**

(1) Ca (2) Al (3) Fe (4) Zn

**SA0134**

**31.** A white sodium salt dissolves readily in water to give a solution which is neutral to litmus. When silver nitrate solution is added to the aforementioned solution, a white precipitate is obtained which does not dissolve in dil. nitric acid. The anion is : **[JEE(Main)-2018 on line]**

(1) $S^{2-}$ (2) $SO_4^{2-}$ (3) $CO_3^{2-}$ (4) $Cl^-$

**SA0135**

**32.** The incorrect statement is :- **[JEE(Main)-2018 on line]**

(1) Ferric ion gives blood red colour with potassium thiocyanate.

(2) $Cu^{2+}$ and $Ni^{2+}$ ions give black precipitate with $H_2S$ in presence of HCl solution.

(3) $Cu^{2+}$ salts give red coloured borax bead test in reducing flame.

(4) $Cu^{2+}$ ion gives chocolate coloured precipitate with potassium ferrocyanide solution.

**SA0136**

**33.** When $XO_2$ is fused with an alkali metal hydroxide in presence of an oxidizing agent such as $KNO_3$; a dark green product is formed which disproportionates in acidic solution to afford a dark purple solution. X is : **[JEE(Main)-2018 on line]**

(1) Ti (2) Cr (3) V (4) Mn

**SA0137**

**34.** Chlorine on reaction with hot and concentrated sodium hydroxide gives : **[JEE MAIN 2019]**

(1) $Cl^-$ and $ClO_2^-$

(2) $Cl^-$ and $ClO_3^-$

(3) $Cl^-$ and $ClO^-$

(4) $ClO_3^-$ and $ClO_2^-$

**35.** Iodine reacts with concentrated $HNO_3$ to yield Y along with other products. The oxidation state of iodine in Y, is :- **[JEE MAIN 2019]**

(1) 5 (2) 3 (3) 1 (4) 7

**36.** An organic compound 'A' is oxidized with $Na_2O_2$ followed by boiling with $HNO_3$.The resultant solution is then treated with ammonium molybdate to yield a yellow precipitate.

Based on above observation, the element present in the given compound is :**[JEE MAIN 2019]**

(1) Sulphur (2) Nitrogen (3) Fluorine (4) Phosphorus

**37.** Which one of the following is likely to give a precipitate with $AgNO_3$ solution ?**[JEE MAIN 2019]**

(1) $(CH_3)_3CCl$ (2) $CHCl_3$ (3) $CH_2=CH-Cl$ (4) $CCl_4$

**38.** Conside the following reactions : **[JEE MAIN 2020]**

$NaCl + K_2Cr_2O_7 + H_2SO_4(Conc.) \rightarrow (A) + Side\ products$

$(A) + NaOH \rightarrow (B) + Side\ product$

$(B) + H_2SO_4(dilute) + H_2O_2 \rightarrow (C) + Side\ product$

The sum of the total number of atoms in one molecule each of (A), (B) and (C) is

**39.** 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 : **[JEE MAIN 2020]**

(1) 4 (2) 1 (3) 2 (4) 3

**40.** 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 _____. **[JEE MAIN 2020]**

**41.** For the following Assertion and Reason, the correct option is **[JEE MAIN 2020]**

**Assertion (A) :** When Cu (II) and sulphide ions are mixed, they react together extremely quickly to give a solid.

**Reason (R) :** The equilibrium constant of $Cu^{2+}(aq) + S^{2-}(aq) \rightleftharpoons CuS(s)$ is high because the solubility product is low.

(1) Both (A) and (R) are true and (R) is the explanation for (A)

(2) Both (A) and (R) are false

(3) (A) is false and (R) is true

(4) Both (A) and (R) are true but (R) is not the explanation for (A)

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

(1) $N_2$ (2) $N_2O_3$ **[JEE MAIN 2020]**

(3) NO (4) $N_2O_5$

**43.** Reaction of an inorganic sulphite X with dilute $H_2SO_4$ generates compound Y. Reaction of Y with NaOH gives X. Further, the reaction of X with Y and water affords compound Z. Y and Z, respectively, are: **[JEE MAIN 2020]**

(1) S and $Na_2SO_3$ (2) $SO_2$ and $NaHSO_3$

(3) $SO_3$ and $NaHSO_3$ (4) $SO_2$ and $Na_2SO_3$

## EXERCISE # J-ADVANCED

**1.** Which of the following statement(s) is (are) correct with reference to the ferrous and ferric ions: **[JEE 1998]**

(A) $Fe^{3+}$ gives brown colour with potassium ferricyanide

(B) $Fe^{2+}$ gives blue precipitate with potassium ferricyanide

(C) $Fe^{3+}$ give red colour with potassium thiocyanate

(D) $Fe^{2+}$ gives brown colour with ammonium thiocyanate

**SA0138**

**2.** Which of the following statement(s) is /are correct. When a mixture of NaCl and $K_2Cr_2O_7$ is gently warmed with conc. $H_2SO_4$? **[JEE 1998]**

(A) A deep red vapours is evolved.

(B) The vapours when passed into NaOH solution gives a yellow solution of $Na_2CrO_4$

(C) Chlorine gas is evolved

(D) Chromyl chloride is formed.

**SA0139**

**3.** An aqueous solution of a substance gives a white precipitate on treatment with dilute hydrochloric acid, which dissolves on heating. When hydrogen sulphide is passed through the hot acidic solution, a black precipitate is obtained. The substance is a : **[JEE 2000]**

(A) $Hg_2^{+}$ salt (B) $Cr^{2+}$ salt (C) $Ag^{+}$ salt (D) $Pb^{2+}$ salt

**SA0140**

**4.** A gas 'X' is passed through water to form a saturated solution. The aqueous solution on treatment with silver nitrate gives a white precipitate. The saturated aqueous solution also dissolves magnesium ribbon with evolution of a colourless gas 'Y'. Identify 'X' and 'Y': **[JEE 2002(Mains)]**

(A) X = $CO_2$, Y = $Cl_2$ (B) X = $Cl_2$, Y = $CO_2$

(C) X = $Cl_2$, Y = $H_2$ (D) X = $H_2$, Y = $Cl_2$

**SA0141**

**5.** [X] + $H_2SO_4 \rightarrow$ [Y] a colourless gas with irritating smell **[JEE 2003]**

[Y] + $K_2Cr_2O_7$ + $H_2SO_4 \longrightarrow$ green solution

[X] and [Y] are:

(A) $SO_3^{2-}$, $SO_2$ (B) $Cl^{-}$, HCl (C) $S^{2-}$, $H_2S$ (D) $CO_3^{2-}$, $CO_2$

**SA0142**

**6.** A sodium salt of an unknown anion when treated with $MgCl_2$ give white precipitate only on boiling. The anion is: **[JEE 2004]**

(A) $SO_4^{2-}$ (B) $HCO_3^-$ (C) $CO_3^{2-}$ (D) $NO_3^-$

**SA0143**

**7.** $(NH_4)_2Cr_2O_7$ on heating gives a gas which is also given by: **[JEE 2004]**

(A) heating $NH_4NO_2$ (B) heating $NH_4NO_3$

(C) $Mg_3N_2 + H_2O$ (D) $NaNO_2 + H_2O_2$

**SA0144**

**8.** A metal nitrate reacts with KI to give a black precipitate which on addition of excess of KI convert into orange colour solution. The cation of metal nitrate is: **[JEE 2005]**

(A) $Hg^{2+}$ (B) $Bi^{3+}$ (C) $Pb^{2+}$ (D) $Cu^+$

**SA0145**

**9.** A solution when diluted with $H_2O$ and boiled, it gives a white precipitate. On addition of excess $NH_4Cl$ / $NH_4OH$, the volume of precipitate decreases leaving behind a white gelatinous precipitate. Identify the precipitate which dissolves in $NH_4OH$ / $NH_4Cl$. **[JEE 2006]**

(A) $Zn(OH)_2$ (B) $Al(OH)_3$ (C) $Mg(OH)_2$ (D) $Ca(OH)_2$

**SA0146**

**10.** $CuSO_4$ decolourises on addition of excess KCN, the product is: **[JEE 2006]**

(A) $[Cu(CN)_4]^{2-}$ (B) $Cu^{2+}$ get reduced to form $[Cu(CN)_4]^{3-}$

(C) $Cu(CN)_2$ (D) CuCN

**SA0147**

**11.** Consider a titration of potassium dichromate solution with acidified Mohr's salt solution using diphenylamine as indicator. The number of moles of Mohr's salt required per mole of dichromate is: **[JEE 2007]**

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

**SA0148**

**12.** The species present in solution when $CO_2$ is dissolved in water are **[JEE 2007]**

(A) $CO_2, H_2CO_3, HCO_3^-, CO_3^{2-}$ (B) $H_2CO_3, CO_3^{2-}$

(C) $CO_3^{2-}, HCO_3^-$ (D) $CO_2, H_2CO_3$

**SA0149**

**13.** Sodium fusion extract, obtained from aniline, on treatment with iron (II) sulphate and $H_2SO_4$ in presence of air gives a Prussian blue precipitate. The blue colour is due to the formation of :

**[JEE 2007]**

(A) $Fe_4[Fe(CN)_6]_3$ (B) $Fe_3[Fe(CN)_6]_2$

(C) $Fe_4[Fe(CN)_6]_2$ (D) $Fe_3[Fe(CN)_6]_3$

**SA0150**

**14.**

| **Column I** | **Column II** |
|---|---|
| (A) $O_2^- \rightarrow O_2 + O_2^{2-}$ | (P) Redox reaction |
| (B) $CrO_4^{2-} + H^+ \rightarrow$ | (Q) One of the products has trigonal planar structure |
| (C) $MnO_4^- + NO_2^- + H^+ \rightarrow$ | (R) Dimeric bridged tetrahedral metal ion |
| (D) $NO_3^- + H_2SO_4 + Fe^{2+} \rightarrow$ | (S) Disproportionation |

**[JEE 2007]**

**SA0151**

**15.** A solution of a metal ion when treated with KI gives a red precipitate which dissolves in excess KI to give a colourless solution. Moreover, the solution of metal ion on treatment with a solution of cobalt (II) thiocyanate gives rise to a deep blue crystalline precipitate. The metal ion is

**[JEE 2007]**

(A) $Pb^{2+}$ (B) $Hg^{2+}$ (C) $Cu^{2+}$ (D) $Co^{2+}$

**SA0152**

**16.** A solution of colourless salt H on boiling with excess NaOH produces a non-flammable gas. The gas evolution ceases after sometime. Upon addition of Zn dust to the same solution, the gas evolution restarts. The colourless salt(s) H is (are) **[JEE 2008]**

(A) $NH_4NO_3$ (B) $NH_4NO_2$ (C) $NH_4Cl$ (D) $(NH_4)_2SO_4$

**SA0153**

**Paragraph for Question Nos. 17 to 19**

p-Amino-N, N-dimethylaniline is added to a strongly acidic solution of **X**. The resulting solution is treated with a few drops of aqueous solution of **Y** to yield blue coloration due to the formation of methylene blue. Treatment of the aqueous solution of **Y** with the reagent potassium hexacyanoferrate(II) leads to the formation of an intense blue precipitate. The precipitate dissolves on excess addition of the reagent. Similarly, treatment of the solution of **Y** with the solution of potassium hexacyanoferrate(III) leads to a brown coloration due to the formation of **Z**. **[JEE 2009]**

**17.** The compound **X** is

(A) $NaNO_3$ (B) NaCl (C) $Na_2SO_4$ (D) $Na_2S$

**SA0154**

**18.** The compound **Y** is

(A) $MgCl_2$ (B) $FeCl_2$ (C) $FeCl_3$ (D) $ZnCl_2$

**SA0154**

**19.** The compound Z is

(A) $Mg_2[Fe(CN)_6]$ (B) $Fe[Fe(CN)_6]$ (C) $Fe_4[Fe(CN)_6]_3$ (D) $K_2Zn_3[Fe(CN)_6]_2$

**SA0154**

**20.** Match each of the reactions given in Column I with the corresponding product(s) given in Column II.

| **Column I** | **Column II** |
|---|---|
| (A) Cu + dil. $HNO_3$ | (P) NO |
| (B) Cu + conc. $HNO_3$ | (Q) $NO_2$ |
| (C) Zn + dil. $HNO_3$ | (R) $N_2O$ |
| (D) Zn + conc. $HNO_3$ | (S) $Cu(NO_3)_2$ |
| | (T) $Zn(NO_3)_2$ |

**[JEE 2009]**

**SA0155**

**21.** Passing $H_2S$ gas into a mixture of $Mn^{2+}$, $Ni^{2+}$, $Cu^{2+}$ and $Hg^{2+}$ ions in an acidified aqueous solution precipitates **[JEE 2011]**

(A) CuS and HgS (B) MnS and CuS (C) MnS and NiS (D) NiS and HgS

**SA0156**

**22.** Reduction of the metal centre in aqueous permanganate ion involves - **[JEE 2011]**

(A) 3 electrons in neutral medium (B) 5 electrons in neutral medium

(C) 3 electrons in weak alkaline medium (D) 5 electrons in acidic medium

**SA0157**

**23.** The equilibrium **[JEE 2011]**

$$2Cu^{I} \rightleftharpoons Cu^{o} + Cu^{II}$$

in aqueous medium at 25°C shifts towards the left in the presence of

(A) $NO_3^-$ (B) $Cl^-$ (C) $SCN^-$ (D) $CN^-$

**SA0158**

**Paragraph for Questions Nos. 24 to 26**

When a metal rod M is dipped into an aqueous colourless concentrated solution of compound N, the solution turns light blue. Addition of aqueous NaCl to the blue solution gives a white precipitate O. Addition of aqueous $NH_3$ dissolves O and gives are intense blue solution. **[JEE 2011]**

**24.** The metal rod M is -

(A) Fe (B) Cu (C) Ni (D) Co

**SA0159**

**25.** The compound N is -

(A) $AgNO_3$ (B) $Zn(NO_3)_2$ (C) $Al(NO_3)_3$ (D) $Pb(NO_3)_2$

**SA0159**

**26.** The final solution contains -

(A) $[Pb(NH_3)_4]^{2+}$ and $[CoCl_4]^{2-}$ (B) $[Al(NH_3)_4]^{3+}$ and $[Cu(NH_3)_4]^{2+}$

(C) $[Ag(NH_3)_2]^{+}$ and $[Cu(NH_3)_4]^{2+}$ (D) $[Ag(NH_3)_2]^{+}$ and $[Ni(NH_3)_6]^{2+}$

**SA0159**

**27.** Which of the following hydrogen halides react(s) with $AgNO_3(aq)$ to give a precipitate that dissolves in $Na_2S_2O_3(aq)$: **[JEE 2012]**

(A) HCl (B) HF (C) HBr (D) HI

**SA0160**

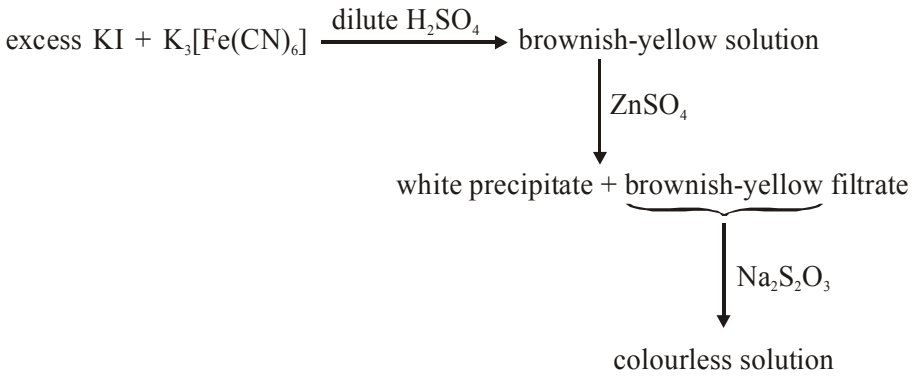
**28.** The reaction of white phosphorus with aqueous NaOH gives phosphine along with another phosphorus containing compound. The reaction type ; the oxidation states of phosphorus in phosphine and the other product are respectively **[JEE 2012]**

(A) redox reaction ; –3 and –5 (B) redox reaction ; +3 and +5

(C) disproportionation reaction ; –3 and +1 (D) disproportionation reaction ; –3 and +3

**SA0161**

**29.** For the given aqueous reactions, which of the statement(s) is (are) true ? **[JEE 2012]**




(A) The first reaction is a redox reaction.

(B) White precipitate is $Zn_3[Fe(CN)_6]_2$.

(C) Addition of filtrate to starch solution gives blue colour.

(D) White precipitate is soluble in NaOH solution.

**SA0162**

**30.** Upon treatment with ammonical $H_2S$ , the metal ion that precipitates as a sulfide is -

(A) Fe(III) (B) Al(III) (C) Mg(II) (D) Zn (II) **[JEE 2013]**

**SA0163**

**Paragraph for Question 31 and 32**

An aqueous solution of a mixture of two inorganic salts, when treated with dilute HCl, gave a precipitate **(P)** and a filtrate **(Q)**. The precipitate **(P)** was found to dissolve in hot water. The filtrate **(Q)** remained unchanged, when treated with $H_2S$ in a dilute mineral acid medium. However, it gave a precipitate **(R)** with $H_2S$ in an ammoniacal medium. The precipitate R gave a coloured solution **(S)**, when treated with $H_2O_2$ in an aqueous NaOH medium. **[JEE 2013]**

**31.** The coloured solution **(S)** contains

(A) $Fe_2(SO_4)_3$ (B) $CuSO_4$ (C) $ZnSO_4$ (D) $Na_2CrO_4$

**SA0164**

**32.** The precipitate **(P)** contains

(A) $Pb^{2+}$ (B) $Hg_2^{2+}$ (C) $Ag^+$ (D) $Hg^{2+}$

**SA0164**

**33.** Consider the following list of reagents : **[JEE Adv. 2014]**

Acidified $K_2Cr_2O_7$, alkaline $KMnO_4$, $CuSO_4$, $H_2O_2$, $Cl_2$, $O_3$, $FeCl_3$, $HNO_3$ and $Na_2S_2O_3$.

The total number of reagents that can oxidise aqueous iodide to iodine is

**SA0165**

**34.** Among PbS, CuS, HgS, MnS, $Ag_2S$, NiS, CoS, $Bi_2S_3$, and $SnS_2$ the total number of **BLACK** coloured sulphides is **[JEE Adv. 2014]**

**SA0166**

**Paragraph for Q.No. 35 and 36**

An aqueous solution of metal ion $\mathbf{M_1}$ reacts separately with reagents **Q** and **R** in excess to give tetrahedral and square planar complexes, respectively. An aqueous solution of another metal ion $\mathbf{M_2}$ always forms tetrahedral complexes with these reagents. Aqueous solution of $\mathbf{M_2}$ on reaction with reagent **S** gives white precipitate which dissolves in excess of **S**. The reactions are summarized in the scheme given below. **[JEE Adv. 2014]**

**SCHEME:**

$$\text{Tetrahedral} \xleftarrow[\text{excess}]{\mathbf{Q}} \mathbf{M_1} \xrightarrow[\text{excess}]{\mathbf{R}} \text{Square planar}$$

$$\text{Tetrahedral} \xleftarrow[\text{excess}]{\mathbf{Q}} \mathbf{M_2} \xrightarrow[\text{excess}]{\mathbf{R}} \text{Tetrahedral}$$

$$\mathbf{M_2} \xrightarrow{\mathbf{S},\ \text{stoichiometric amount}} \text{White precipitate} \xrightarrow[\text{excess}]{\mathbf{S}} \text{precipitate dissolves}$$

**35.** $\mathbf{M_1}$, **Q** and **R**, respectively are

(A) $Zn^{2+}$, KCN and HCl (B) $Ni^{2+}$, HCl and KCN

(C) $Cd^{2+}$, KCN and HCl (D) $Co^{2+}$, HCl and KCN

**SA0167**

**36.** Reagent **S** is

(A) $K_4[Fe(CN)_6]$ (B) $Na_2HPO_4$ (C) $K_2CrO_4$ (D) KOH

**SA0167**

**37.** $Fe^{3+}$ is reduced to $Fe^{2+}$ by using - **[JEE Adv. 2015]**

(A) $H_2O_2$ in presence of NaOH (B) $Na_2O_2$ in water

(C) $H_2O_2$ in presence of $H_2SO_4$ (D) $Na_2O_2$ in presence of $H_2SO_4$

**SA0168**

**38.** The pair(s) of ions where BOTH the ions are precipitated upon passing $H_2S$ gas in presence of dilute HCl, is(are) **[JEE Adv. 2015]**

(A) $Ba^{2+}$, $Zn^{2+}$ (B) $Bi^{3+}$, $Fe^{3+}$ (C) $Cu^{2+}$, $Pb^{2+}$ (D) $Hg^{2+}$, $Bi^{3+}$

**SA0169**

**39.** The reagent(s) that can selectively precipiate $S^{2-}$ from a mixture of $S^{2-}$ and $SO_4^{2-}$ in aqueous soltuion is(are) : **[JEE(Adv.)-2016]**

(A) $CuCl_2$ (B) $BaCl_2$ (C) $Pb(OOCCH_3)_2$ (D) $Na_2[Fe(CN)_5NO]$

**SA0170**

**40.** In the following reaction sequence in aqueous soluiton, the species **X**, **Y** and **Z** respectively, are - **[JEE(Adv.)-2016]**

$$S_2O_3^{2-} \xrightarrow{Ag^+} \underset{\text{clear solution}}{X} \xrightarrow{Ag^+} \underset{\text{white precipitate}}{Y} \xrightarrow{\text{With time}} \underset{\text{black precipitate}}{Z}$$

(A) $[Ag(S_2O_3)_2]^{3-}$, $Ag_2S_2O_3$, $Ag_2S$ (B) $[Ag(S_2O_3)_3]^{5-}$, $Ag_2SO_3$, $Ag_2S$

(C) $[Ag(SO_3)_2]^{3-}$, $Ag_2S_2O_3$, Ag (D) $[Ag(SO_3)_3]^{3-}$, $Ag_2SO_4$, Ag

**SA0171**

**41.** Which of the following combination will produce $H_2$ gas ? **[JEE(Adv.)-2017]**

(A) Zn metal and NaOH(aq) (B) Au metal and NaCN(aq) in the presence of air

(C) Cu metal and conc. $HNO_3$ (D) Fe metal and conc. $HNO_3$

**SA0172**

**42.** Addition of excess aqueous ammonia to a pink coloured aqueous solution of $MCl_2 . 6H_2O$ (X) and $NH_4Cl$ gives an octahedral complex Y in the presence of air. In aqueous solution, complex Y behaves as 1 : 3 electrolyte. The reaction of X with excess HCl at room temperature results in the formation of a blue coloured complex Z. The calculated spin only magnetic moment of X and Z is 3.87 B.M., whereas it is zero for complex Y. **JEE(Adv.)-2017]**

Among the following options, which statements is(are) correct ?

(A) The hybridization of the central metal ion in Y is $d^2sp^3$

(B) Z is tetrahedral complex

(C) Addition of silver nitrate to Y gives only two equivalents of silver chloride

(D) When X and Z are in equilibrium at 0°C, the colour of the solution is pink

**SA0173**

**43.** The correct option(s) to distinguish nitrate salts of $Mn^{2+}$ and $Cu^{2+}$ taken separately is (are) :-
(A) $Mn^{2+}$ shows the characteristic green colour in the flame test **JEE(Adv.)-2018]**
(B) Only $Cu^{2+}$ shows the formation of precipitate by passing $H_2S$ in acidic medium
(C) Only $Mn^{2+}$ shows the formation of precipitate by passing $H_2S$ in faintly basic medium
(D) $Cu^{2+}/Cu$ has higher reduction potential than $Mn^{2+}/Mn$ (measured under similar conditions)

**SA0174**

**44.** The green colour produced in the borax bead test of a chromium(III) salt is due to-

**[JEE(Adv.)-2019]**

(1) $Cr(BO_2)_3$ (2) CrB (3) $Cr_2(B_4O_7)_3$ (4) $Cr_2O_3$

**SA0175**

**45.** A colorless aqueous solution contains nitrates of two metals, **X** and **Y**. When it was added to an aqueous solution of NaCl, a white precipitate was formed. This precipitate was found to be partly soluble in hot water to give a residue **P** and a solution **Q**. The residue P was soluble in aq. $NH_3$ and also in excess sodium thiosulfate. The hot solution **Q** gave a yellow precipitate with KI. The metals **X** and **Y**, respectively, are **[JEE(Adv.)-2020]**
(A) Ag and Pb (B) Ag and Cd (C) Cd and Pb (D) Cd and Zn

**46.** An acidified solution of potassium chromate was layered with an equal volume of amyl alcohol. When it was shaken after the addition of 1 mL of 3% $H_2O_2$, a blue alcohol layer was obtained. The blue color is due to the formation of a chromium (VI) compound **'X'** . What is the number of oxygen atoms bonded to chromium through only single bonds in a molecule of **X**?

**[JEE(Adv.)-2020]**

# ANSWER KEY

## EXERCISE # I

1. (A) 2. (C) 3. (C) 4. (D) 5. (D) 6. (A,B)
7. (A) → R,S; (B) → Q; (C) → P,Q,S,T; (D) → P,Q,S,T 8. (1)
9. (D) 10. (D) 11. (C) 12. (D) 13. (B) 14. (C) 15. (B)
16. (A) 17. (C) 18. (B) 19. (B) 20. (D) 21. (C) 22. (A)
23. (B) 24. (B) 25. (D) 26. (B) 27. (C) 28. (A,B) 29. (A)
30. (C) 31. (2) 32. (4) 33. (2) 34. (D) 35. (B) 36. (D)
37. (C) 38. (C) 39. (C,D) 40. (B) 41. (B) 42. (D) 43. (D)

## EXERCISE # II

1. (B) 2. (C) 3. (C) 4. (A) 5. (B) 6. (B) 7. (B)
8. (B) 9. (B) 10. (D) 11. (B) 12. (B) 13. (A,B,C,D) 14. (C)
15. (C) 16. (C) 17. (B) 18. (B) 19. (B) 20. (D) 21. (C)
22. (B) 23. (B) 24. (D) 25. (C) 26. (B) 27. (C) 28. (C)
29. (C) 30. (B) 31. (A) 32. (B) 33. (D) 34. (D) 35. (C)
36. (B) 37. (D) 38. (C) 39. (D) 40. (A) 41. (C) 42. (A,C,D)
43. (C) 44. (A) 45. (A,B,C) 46. (B,C,D) 47. (A,C,D) 48. (B,D) 49. (D)
50. (A) 51. (D) 52. (D) 53. (A,C) 54. (D) 55. (B) 56. (C)
57. (B) 58. (A,B) 59. (D) 60. (B) 61. (B) 62. (B) 63. (A)
64. (A) 65. (C) 66. (B) 67. (C) 68. (D)
69. (A) → Q , R; (B) → Q ; (C) → P ; (D) → S , T 70. (A) → P ; (B) → S ; (C) → R ; (D) → Q, R
71. (B) 72. (D) 73. (C) 74. (3) 75. (2)

## EXERCISE # JEE MAINS

1. (4) 2. (4) 3. (4) 4. (2) 5. (2) 6. (2) 7. (1)
8. (2) 9. (2) 10. (3) 11. (4) 12. (4) 13. (3) 14. (4)
15. (3) 16. (1) 17. (4) 18. (2) 19. (3) 20. (4) 21. (1)
22. (4) 23. (3) 24. (1) 25. (4) 26. (3) 27. (4) 28. (2)
29. (3) 30. (2) 31. (4) 32. (2) 33. (4)
34. (2) 35. (1) 36. (4) 37. (1) 38. (18.00) 39. (2)
40. (1.66 to 1.67) 41. (4) 42. (3) 43. (2)

## EXERCISE # J-ADVANCED

1. (A, B, C) 2. (A, B, D) 3. (D) 4. (C) 5. (A) 6. (B) 7. (A)
8. (B) 9. (A) 10. (B) 11. (D) 12. (A) 13. (A)
14. (A) → P , S ; (B) → R ; (C) → P , Q ; (D) → P 15. (B) 16. (A),(B) 17. (D)
18. (C) 19. (B) 20. (A) → P,S; (B) → Q,S; (C) → R,T; (D) → Q, T 21. (A)
22. (A,C,D) 23. (B,C,D) 24. (B) 25. (A) 26. (C) 27. (A,C,D) 28. (C)
29. (A,C,D) 30. (D) 31. (D) 32. (A) 33. (7) 34. (6) / (7) 35. (B)
36. (D) 37. (A, B) 38. (C,D) 39. (A OR A, C) 40. (A) 41. (A)
42. (A,B,D) 43. (B,D) 44. (1) 45. (A) 46. (4)