Exercise # 1

Q.1 AgCl dissolves in NH_40H due to the formation of :

[1] $[Ag(NH_4)Cl]$ [2] $[Ag(NH_4)_3]Cl$ [3] $[Ag(NH_3)_2]Cl$ [4] $[Ag(NH_3)_2OH]$

Q.2 Atomic number of the element having ns^1 configuration belong to 3d transition series would be :

[1] Only 24 [2] Only 25 [3] Only 29 [4] 24 & 29

Q.3 In Lanthanide series last electron enter in

[1] 5d orbital [2] 4d orbital [3] 5f orbital [4] 4f orbital

Q.4 Which one is the acidic oxide of chromium

[1] CrO_3 [2] Cr_2O_3 [3] CrO [4] None

Q.5 Out of $[Fe(CN)_6]^{4-}$, $[Ni(CN)_4]^{-2}$ and $[Ni(CO)_4]$

[1] All have identical geometry.

[2] All are paramagnetic.

[3] All are dimagnetic.

[4] $[Fe(CN)_6]^{-4}$ is dimagnetic but $[Ni(CN)_4]^{-2}$ and $[Ni(CO)_4]$ are paramagnetic

Q.6 $\mu = \sqrt{15}$ is true for the pair :

[1] Co^{+2}, Cr^{+3} [2] Fe^{+2}, Cr^{+3} [3] Fe^{+3}, Mn^{+2} [4] Fe^{+2}, Mn^{+2}

Q.7 The electron present in penultimate orbit of coinage metal atom are :

[1] 8 [2] 18 [3] 2 [4] 32

Q.8 The element with highest density is :

[1] Hg [2] Cu [3] Au [4] Ag

Q.9 The pair of ions in which both the ions have zero magnetic moment is :

[1] Sc^{3+} and Zn^{2+} [2] Cu^{+} and Y^{3+} [3] Ag^{+} and Zn^{2+} [4] All of the above

Q.10 $FeCl_3 . 4H_2O$ is actually :-

[1] $[Fe(H_2O)_4]Cl_3$ [2] $[Fe(H_2O)_3Cl]Cl_2 . H_2O$

[3] $[Fe(H_2O)_4Cl_2]Cl$ [4] $[Fe(H_2O)_3Cl_2]Cl . H_2O$

Q.11 Which gives only 25% mole of AgCl, when reacts with $AgNO_3$:

[1] $PtCl_2 . 4NH_3$ [2] $PtCl_4 . 5NH_3$

[3] $PtCl_4 . 4NH_3$ [4] $PtCl_4 . 3NH_3$

Q.12 The compound which does not shows paramagnetism is :

[1] $[Cu(NH_3)_4]Cl_2$ [2] $Fe(CO)_5$ [3] NO [4] NO_2

Q.13 Which of the following compound is paramagnetic :

[1] Tetracyanonickelate (II) ion [2] Tetraamminezinc (II) ion

[3] Hexaamine chromium (III) ion [4] Diammine silver (I) ion

Q.14 What is Incorrect for $K_4[Fe(CN)_6]$

[1] O.N of Iron is +2 [2] It exhibit dimagnetic character

[3] It exhibit paramagnetic character [4] It involved d^2sp^3 hybridisation

Q.15 The solubility of AgBr in hypo solution is due to the formation of

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Q.29 The complex $[Mn(CN)_6]^{4-}$ is :

[1] High spin complex [2] Diamagnetic ion

[3] Having magnetic moment 1. 73 BM [4] Outer orbital complex

Q.30 Which of the following statement is true

[1] $FeCO_3$ and Fe_3C are organometallic compound.

[2] U, Np and Pu exhibits + 6 oxidation states

[3] Pb $(C_2H_5)_4$ is π-bonded OMC [4] IP of La > Lu

Q.31 The chloro-bis (ethylenediamine) nitro cobalt (lll) ion is :

[1] Co $[(NO_2)_2 (en)_2 Cl_2]^+$ [2] $[CoCl (NO_2)_2 (en)_2]^+$

[3] $[Co (NO_2) Cl (en)_2]^+$ [4] $[Co (en) Cl_2 (NO_2)_2]^-$

Q.32 The magnetic moments in the ions $[Fe(CN)_6]^{-3}$ and $[FeF_6]^{-3}$ in Bohr magneton are :

[1] 5.92 and 5.92 [2] 1.73 and 5.92 [3] 1.73 and 1.73 [4] 2.83 and 4.90

Q.33 Which mixed metal is without copper :

[1] Bronze [2] Brass [3] German silver [4] Solder

Q.34 In the 3d-transitional series from Ti^{+2} to which ion paramagnetic character increases :

[1] Fe^{+2} [2] Mn^{+2} [3] Cr^{+2} [4] Ni^{+2}

Q.35 In the first transition series the melting point of Mn is low, because :

[1] Metallic bonds are strong due to d^{10} configuration

[2] Metallic bonds are weak due to d^5 configuration

[3] Metallic bonds are weak due to d^7 configuration

[4] d-orbitals have less unpaired electrons

Q.36 For a catalyst which condition is not essential :

[1] Variable valency [2] High ionisation energy

[3] Empty orbitals. [4] Free valency on the surface

Q.37 From the chromium to nickel number of metalic bonds :

[1] Decreases continuously [2] Increases continuously

[3] Do not change [4] Increases alternately

Q.38 In the normal conditions the most stable oxidation state of Cr and Mn is :

[1] Mn^{+2}, Cr^{+3} [2] Mn^{+6}, Cr^{+6} [3] Mn^{+2}, Cr^{+2} [4] Mn^{+4}, Cr^{+6}

Q.39 $K_3[Fe(CN)_6]$ is :

[a] Potassium hexa cyno ferrate (II) [b] Potassium hexa cyno ferrate (III)

[c] Potassium ferri-cyanide [d] Hexa cyno ferrate (III) potassium

Correct answer is :

[1] Only [a] and [b] [2] Only [b] and [c]

[3] Only [a] and [c] [4] Only [b] and [d]

Q.40 Which one of these ions is coloured :

[1] $[Cu(NH_3)_4]^+$ [2] $[Cu(NH_3)_4]^{+2}$ [3] $[Zn(H_2O)_6]^{+2}$ [4] $[Co(H_2O)_6]^{+3}$

Q.41 An inorganic salt is lemon yellow in colour. It becomes orange in colour like methyl orange when it is acidic and again becomes yellow when it is alkaline. The inorganic salt will be :

[1] Copper nitrate [2] Ferric chloride

[3] Potassium chromate [4] Potassium ferri cyanide

Q.42 In the complex ion $[Fe(EDTA)_2]^{-3}$ the coordination number and oxidation state of central metal ion is:

[1] C. N. = 6 O. N. = +3 [2] C. N. = 1 O. N. = -1

[3] C. N. = 4 O. N. = +2 [4] C. N. = 3 O. N. = +3

Q.43 The IUPAC name of the complex $[CrCl_2(H_2O)_4]NO_3$ is :

[1] Dichlorotetra aqua chromium (III) nitrate [2] Tetra aqua dichloro chromium (III) nitrate

[3] Chromium tetra aqua dichloro nitrate [4] Dichlorotetra aqua chromium nitrate

Q.44 Which of the following complexes exhibits coordination isomerism :

[1] $[Co(en)_2Cl_2]^+$ [2] $[Cr(NH_3)_6]Cl_3$ [3] $[Cr(NH_3)_6]\,[Co(CN)_6]$ [4] $[Pt(NH_3)_2Cl_2]$

Q.45 Compared to Cu^{2+} having $3d^9$ configuration, Cu^+ having $3d^{10}$ configuration :

[1] Is more stable [2] Is equally stable

[3] Is less stable [4] Stability depends upon nature of copper salt

Q.46 Lw is the member of :

[1] 4f series element [2] 5d series element [3] 4d series element [4] 5f series element

Q.47 V_2O_5 is red or orange in colour. The nature of oxide is :

[1] Acidic [2] Basic [3] Amphoteric [4] Neutral

Q.48 Which element is having lowest melting and boiling point :

[1] Ti [2] Cu [3] Zn [4] Mn

Q.49 Which one of the following is not a condition for complex salt formation :

[1] Small size [2] Higher nuclear charge

[3] Availability of vacant d-orbitals [4] Variable oxidation states

Q.50 Among Sc(III), Ti(IV), Ni (II) and Cu(II) ions :

[1] All paramagnetic [2] All diamagnetic

[3] Sc(III), Ti(IV), paramagnetic and Ni(II), Cu(II) diamagnetic

[4] Ni (II), Cu(II) paramagnetic and Sc(III), Ti(IV) diamagnetic

Q.51 d- block elements form colours ions because these elements :

[1] Cannot absorb the radiation in the visible region

[2] Involve d-d transitions which fall in the visible region

[3] Allows d-s transition

[4] Absorb other colours except those required for d-d transition

Q.52 Amongst TiF_6^{2-} ,CoF_6^{3-} ,Cu_2Cl_2 and $NiCl_4^{2-}$

The colourless species are :

[1] CoF_6^{3-} and $NiCl_4^{2-}$ [2] TiF_6^{2-} and CoF_6^{3-}

[3] Cu_2Cl_2 and $NiCl_4^{2-}$ [4] TiF_6^{2-} and Cu_2Cl_2

Q.53 Which of the following pair is isoelectronic :

[1] Li, Be^{2+} [2] Na, Mg^{2+} [3] H, He^+ [4] None

Q.54 The correct order of size of iodine species I, I,I^+ is:

[1] $I^- > I > I^+$ [2] $I^- > I^+ > I$ [3] $I^+ > I^- > I$ [4] $I^- > I = I^+$

Q.55 Which of the following complex can not exhibit geometrical isomerism :- .

[1] $[Pt(NH_3)_2Cl\,NO_2]$ [2] $[Pt(gly)_2]$ [3] $[Cu(en)_2]^{+2}$ [4] $[Pt(H_2O)(NH_3)BrCl]$

Q.56 If EAN of a central metal ion X^{+2} in a complex is 34 and atomic number of X is 28. The number of monodentet ligands present in complex are:

[1] 3 [2] 4 [3] 6 [4] 2

Q.57 Which of the following f - block elements, will change its group on emmitting α-particle (aIfa particle) :

[a] $_{58}Ce$ [b] $_{70}Lu$ [c] $_{90}Th$ [d] $_{92}U$

Correct answer is :

[1] Only a and c [2] Only band d [3] All [4] None

Q.58 Which of the increasing order of electron affinity is correct:

[1] C < Si < B < Al [2] I < Br < Cl < F [3] Be < Mg < Na < Li [4] N < P < O < S

Q.59 Which of the following statement is/are wrong:

[a] Al_4C_3 is an organometallic compound

[b] Metal carbonyls are organometallic compounds

[c] TEL is π bonded organometallic compound

[d] Frankland reagent is σ - bonded organometallic compound

The answer is:

[1] c and d [2] a and c [3] a and b [4] All are correct

Q.60 Wrong statment for f - block elements is :

[1] Common oxidation state is + 3

[2] Actinides are more reactive than lanthanides

[3] In actinides there are only three natural elements

[4] In lanthanides electrons enters in 5 f orbitals

Q.61 When diamagnetic compounds are placed in magnetic field what happens :

[1] Increase in weight [2] Decrease in weight

[3] Weight reduced to half [4] There is no change in weight

Q.62 Which of the catalyst is used in contact process:

[1] V_2O_5 [2] Fe and Mo [3] Pd [4] Cu

Q.63 In the brass, which element is mixed with copper:

[1] Zn [2] Sb [3] Bi [4] Pb

Q.64 Density of which of the following element is highest :

[1] Pt [2] Hg [3] Mn [4] Cu

Q.65 On oxidation of acidic solution of Cr^{+3}, we get:

[1] CrO_2^- [2] CrO_4^- [3] Cr^{+2} [4] $Cr_2O_7^{-2}$

Q.66 By which of the following ion, a transitional metal can brought in to its highest oxidation state

[1] F [2] Cl [3] Br [4] I

Q.67 $[Cu(H_2O)_4]^{2+}$ absorbs yellow light and the transmitted complementary colour will be :

[1] Green [2] Yellow [3] Blue [4] Violet

Q.68 For a transition metal ion having seven electrons in its d-orbital the effective magnetic moment will be :

[1] 7.982 B. M. [2] 4.90 B. M. [3] 3.87 B. M. [4] 2.83 B. M.

Q.69 Which of two have almost similar size :

[1] Ti_{22} and Zr_{40} [2] Nb_{41} and Ta_{73} [3] Y_{39} and La_{57} [4] Ca_{20} and Ir_{31}

Q.70 The series of elements in which last electron enters in 5f orbitals are called :

[1] Actenones [2] Man made elements [3] Actinides [4] All

Q.71 The actinides showing +7 oxidation states are:

[1] Mn and Os [2] Pu and Am [3] Np and Pu [4] U and Np

Q.72 AgCl precipitate dissolves in NH_3 due to the formation of :

[1] $[Ag(NH_4)_2]OH$ [2] $[Ag(NH_4)_2]Cl$ [3] $[Ag(NH_3)_2]Cl$ [4] $[Ag(NH_3)_2]OH$

Q.73 Which can displace H_2 from its compound :

[1] Hg [2] Zn [3] Cu [4] None

Q.74 The adsorption of hydrogen by platinum black is called :

[1] Hydrogenation [2] Reduction [3] Occlusion [4] Hydration

Q.75 The coordination number and oxidation number of the central metal ion in the complex $[Pt(en)_2]^{+2}$ is :

[1] C. N. = 2, O. N. = +2 [2] C. N. = 6, O. N. = +4

[3] C. N. = 4, O. N. = +4 [4] C. N. = 4, O. N. = +2

Q.76 Which one of the following compounds will exhibit linkage isomerism :

[1] $[Pt(NH_3)_2Cl_2]$ [2] $[Co(NH_3)_2NO_2]Cl_2$ [3] $[Co(NH_3)_4Cl_2]Cl$ [4] $[Co(en)_2Cl_2]Cl$

Q.77 Transuranic elements are :

[1] Elements upto Uranium [2] Heavier than Uranium

[3] Having less atomic weight than Uranium [4] Having properties similar to Uranium

Q.78 Correct increasing order of IP of F, Cl, F^- and Br^- is

[1] $Cl < F < Br^- < F^-$ [2] $Br^- < F^- < Cl < F$ [3] $F^- < Br^- < Cl < F$ [4] $Br^- < Cl < F^- < F$

Q.79 The EAN of cobalt in the complex ion $[Co(en)_2Cl_2]^+$ is :

[1] 27 [2] 36 [3] 33 [4] 35

Q.80 Mercury is transported in the container's madeup of :

[1] Al [2] Fe [3] Ag [4] Pb

Q.81 Pairs of acidic oxides are :

[1] Cr_2O_3, MnO_2 [2] Li_2O. Al_2O_3 [3] Al_2O_3, MnO [4] CrO_3, Mn_2O_7

Q.82 Magnetic moment $\sqrt{35}$ is true for which of the following pair :

[1] Co^{+2}, Fe^{+2} [2] Fe^{+3} , Mn^{+2} [3] Co^{+3} , Cr^{+2} [4] Fe^{+2} , Mn^{+2}

Q.83 Which of the following sets of elements exhibits decreasing order of atomic radii :

[a] Sc, Y, La [b] Ti, V, Cr [c] Ni, Cu, Zn [d] K, Ca, Sc

Correct answer is :

[1] Only b [2] b and c [3] b and d [4] All

Q.84 Which of the following configuration belongs to f-block:

[1] ns^2 $(n-1)d^3$, $(n-2)$ f^{14} [2] ns^2 np^6 $(n-1)d^1$ $(n-2)f^{14}$

[3] $(n-2)$ f^{14} $(n-1)d^0$ ns^2 . [4] $(n-2)$ f^3 $(n-1)d^{10}$ ns^2

Q.85 Fe^{+3} is more stable than Fe^{+2}, the reason is are :

[a] 1^{st} and 2nd I.P. difference is less than 11.0 eV

[b] Core of Fe^{+3} is more stable

[c] 2^{nd} and 3^{rd} IP difference is less than 11.0 eV

[d] IP of Fe^{+3} is high

The correct answer is :

[1] Only a [2] Only b [3] a, b and d [4] c and d

Q.86 Magnetic moment of Co^{+2} is :

[1] $\sqrt{3}$ [2] $\sqrt{8}$ [3] $\sqrt{15}$ [4] $\sqrt{35}$

Q.87 Name of $Na_3[AlF_6]$ is :

[a] Cryolite [b] Tri sodium hexa fluoroaluminium

[c] Sodium hexafluoro aluminium(I) [d] Sodium hexa fluoro aluminate (III)

The correct answer is :

[1] Only a [2] a and d both [3] Only d [4] a and c both

Q.88 Which of the following set of metals can form alloy

[1] Pb - Zn [2] Cu - Au [3] Li - Na [4] Fe - Hg

Q.89 Which of the following pair of elements belong to second transition series:

[1] Fe & Pd [2] V & Y [3] Cu & Au [4] Ag & Zr

Q.90 Among the following outermost configurations of transition metals, which shows the highest oxidation state:

[1] $3d^3\ 4s^2$ [2] $3d^5\ 4s^1$ [3] $3d^5\ 4s^2$ [4] $3d^6 4s^2$

Q.91 The number of d-electrons in Fe^{2+}(At. no. of iron = 26) is not equal to that of:

[1] p - electrons in Neon (At no = 10) [2] s - electrons in Mg (At no. = 12)

[3] d-electrons in Fe [4] p - electron in Cr (At no = 17)

Q.92 Which of the following compounds is expected to be coloured:

[1] AgCl [2] CuCl [3] MgF_2 [4] CuF_2

Q.93 The highest magnetic moment is shown by the transition metal ion with outermost electronic configuration is:

[1] $3d^6$ [2] $3d^2$ [3] $3d^7$ [4] $3d^9$

Q.94 Nb and Ta have almost equal atomic and ionic radii because:

(I) Of diagonal relationship [2] Of lanthanide contraction

[3] Of actinide contraction [4] Both belong to same transition series

Q.95 Transition metals :

[a] Exhibits inert pair effect [b] Exhibits variable oxidation state

[c] Do not show catalyticactivity [d] Are paramagnetic

The correct answer is

[1] a, b, d [2] a, c [3] Only b [4] b, d

Q.96 An alloy which does not contain copper is :

[1] Bronze [2] Brass [3] Magnelium [4] Bell metal

Q.97 Transition metals form complexes in their zero oxidation state. The example is

[1] $[Mn_2(CO]_{10}]$ [2] $[Cu(NH_3)_4]Cl_3$ [3] $Zn_2[Fe(CN)_6]$ [4] $Ag(NH_3)_2]OH$

Q.98 Which of the following is ferromagnetic

[1] Cu, Ag, Au [2] Fe, Co, Ni [3] Zn, Cd, Hg [4] Ca, Sr, Ba

Q.99 Which of the following contains the maximum number of unpaired electrons

[1] $TiCl_3$ [2] $MnCl_2$ [3] $FeSO_4$ [4] $CuSO_4$

Q.100 Scandium in +3 oxidation state acquires the configuration of which inert gas?

[1] Neon [2] Argon [3] Krypton [4] Xenon

Answer Key - 1

Qus.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Ans.	3	4	4	1	3	1	2	3	4	3	4	2	3	3	3	1	3	1	3	3	3	3	4
Qus.	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
Ans.	1	2	4	3	2	3	2	4	2	2	2	1	1	2	2	3	1	2	3	3	4	1	3
Qus.	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73
Ans.	2	4	3	1	3	2	1	4	2	4	2	1	1	1	4	1	3	3	2	4	3	3	2
Qus.	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98
Ans.	2	2	2	2	2	4	2	3	3	4	3	2	2	4	3	4	4	1	2	4	3	1	2

Exercise # 2

Q.1 All transition metals exhibit a general electronic configuration of

[1] (n - 1) $s^2p^6ns^1$ [2] (n-1)$s^2p^6d^5ns^1$ [3] (n-1)$s^2p^6ns^2np^1$ [4] (n-1)$s^2p^6d^{1-10}ns^{0-2}$

Q.2 Which of the following atoms does not form interstitial compounds with transition elements?

[1] C [2] Pb [3] H [4] N

Q.3 To which of the following series the transition elements from Z = 39 to Z = 48 belong?

[1] 3d series [2] 4d series [3] 5d series [4] 6d series

Q.4 Which oxide of manganese is acidic in nature.

[1] MnO [2] Mn_2O_7 [3] Mn_2O_3 [4] MnO_2

Q.5 Which of the following shows maximum +8 oxidation state?

[1] Re [2] Os [3] W [4] Ir

Q.6 Which has the lowest melting point?

[1] Cs [2] Na [3] Hg [4] Sn

Q.7 A magnetic moment of 1.73 BM will be shown by one among of the following compounds.

[1] $[Cu(NH_3)_4]^{2+}$ [2] $[Ni(CN)_4]^{2-}$ [3] $TiCl_4$ [4] $[CoCl_6]^{-}$

Q.8 Transition elements are frequently used as catalyst because.

[1] Of paired d-electrons [2] Of high ionic charge

[3] Free valency on the surface [4] Of their specific nature

Q.9 Which of the following is not a property of transition elements?

[1] Colour [2] Paramagnetic [3] Fixed valency [4] Catalytic

Q.10 Coinage metals show the properties of

[1] Typical elements [2] Normal elements [3] Transitional elements [4] Inert elements

Q.11 What is wrong about transition metals?

[1] Diamagnetic [2] Paramagnetic

[3] Form complexes [4] Show variable oxidation states

Q.12 For the same transition metal ion, the colour of its compound will depend upon the

[1] Temperature of the reaction [2] Pressure of the reaction

[3] Nature of ligands or Lewis bases attached to the metal ion.

[4] Concentration of the ligands

Q.13 Which is the first man made element.

[1] Sc [2] Os [3] Tc [4] Zr

Q.14 Which one of the following is not a complex compound?

[1] $[Cu(NH_3)_4]SO_4H_2O$ [2] $[K_2PtCl_6]$

[3] $[K_2SO_4.Al_2(SO_4)_3.24H_2O$ [4] $[Co(NH_3)_6]Cl_3$

Q.15 The addition compounds which retain their indentity in solution are called.

[1] Double salts [2] Complex compounds

[3] Coordination compounds [4] [2] and [3] both

Q.16 The total number of ligands attached to the central metal ion through coordination (sigma) bond is called.

[1] Valency of the metal ion [2] Oxidation state of the metal ion

[3] Coordination number of metal ion [4] None of the above

Q.17 Select bidentate or didentate ligand from the following.

[1] CO [2] SCN^- [3] CH_3COO^- [4] $C_2O_4^{2-}$

Q.18 In the nomenclatures of coordination compounds the ligand H_2O is named according to new rules as.

[1] aquo [2] aqua [3] Aqueous [4] None of the above

Q.19 In the nomenclature of coordination compounds the ligand NO^+ is named as.

[1] Nitrosonium [2] Nitronium [3] Nitrosylium [4] Nitrosyl

Q.20 Give the name of the complex compound $K_3[Fe(C_2O_4)_3]$ according to IUPAC system.

[1] Potassium Ferric oxalate [2] Potassium trioxalato (III)

[3] Potassium trioxalatoferate (III) [4] None of the above

Q.21 Give the IUPAC name of the complex compound $[Co(NH_3)_4(H_2O)Br](NO_3)_2$

[1] Bromoaquotetraamine Cobalt (III) nitrate [2] Bromoauqotetraaminocobalt (III) nitrate

[3] Bromoaquatetraammine cobalt (III) nitrate [4] Tetraammine aquabromo cobalt (III) nitrate

Q.22 Which of the following compounds will exhibit linkage isomerism?

[1] $[Pt(NH_3)_2Cl_2]$ [2] $[Co(NH_3)_5 NO_2]Cl_2$

[3] $[Co(NH_3)_4Cl_2]Cl$ [4] $[Co(en)_2Cl_2]Cl$

Q.23 Which of the following complexes exhibits coordination isomerism?

[1] $[Co(en)_2Cl_2]^+$ [2] $[Cr(NH_3)_6]Cl_3$

[3] $[Cr(NH_3)_6][Co(CN)_6]$ [4] $[Pt(NH_3)_2Cl_2]$

Q.24 Out of the following which complex will show geometrical isomerism?

[1] $[Pt(NH_3)_2Cl_2]$ [2] $Ni(CO)_4$ [3] $Na_3[Ni(CN)_4]$ [4] $K[Ag(CN)_2]$

Q.25 Which of the following complexes will show optical isomerism?

[1] $[Cr(NH_3)_2]Cl_2]$ [2] $[Ni(H_2O)_6]^{2+}$ [3] $[Pt(NH_3)_3Br]NO_3$ [4] $[Cr(en)_3]Cl_3$

Q.26 The oxidation state of Ag in Tollen's reagent is

[1] 0 [2] +1 [3] +1.5 [4] +2

Q.27 The magnetic property and the shape of $[Cr(NH_3)]^+$ complex ions are:

[1] Paramagnetic, Octahedral [2] Diamagnetic, square planer

[3] Paramagnetic, tetrahedral [4] None of the above

Q.28 Compounds which contain one or more metal carbon bonds are called:

[1] Organic compounds [2] Complex ccmpounds

[3] Metal carbides [4] Organometallic compounds

Q.29 Which one of the following is used as a heterogeneous catalyst?

[1] Wilkinson's catalyst [2] Tetraethyllead

[3] Zeigler Natta catalyst [4] Grignard's reagent

Q.30 The compound $[Cr(H_2O)]_6 Cl_3$ and $[Cr(H_2O)_4Cl_2]Cl$. H_2O respresent

[1] Linkage isomerism [2] Hydration isomerism

[3] Ligand isomerism. [4] None of these

Q.31 Amongest the following ions which one has the highest paramagnetism

[1] $[Cr(H_2O)_6]^{2+}$ [2] $[Fe(H_2O)_6]^{3+}$ [3] $[Cu(H_2O)_6]^{2+}$ [4] $[Zn(H_2O)_6]^{2+}$

Q.32 The effective atomic number of Cr (atomic no. 24) in $[Cr(NH_3)_6]Cl_3$ is

[1] 35 [2] 27 [3] 33 [4] 36

Q.33 Which one of the following will give a white precipitate with $AgNO_3$ in aqueous medium?

[1] $Co[(NH_3)_5Cl] (NO_3)_2$ [2] $[Pt(NH_3)_2 Cl_2]$ [3] $[Pt(en)Cl_2]$ [4] $[Pt(NH_3)_4]Cl_2$

Q.34 The co-ordination number of a metal in co-ordination compound is

[1] Same as primary valency [2] Sum of primary and secondary valencies

[3] Same as secondary valency [4] None of the above

Q.35 Oxidation number of Ni in $Ni(CO)_4$ is

[1] 2 [2] 3 [3] 1 [4] 0

Q.36 Metal present in blood is

[1] Al [2] Mg [3] Cu [4] Fe

Q.37 Which of the following is an organometallic compound?

[1] Lithium methoxide [2] Lithium acetate

[3] Lithium dimethylamide [4] Methyl lithium

Q.38 Inner orbital complexes are formed when ligand is

[1] Weak [2] Strong [3] F^- [4] H_2O

Q.39 Which of the following complexes is an inner orbital complex?

[1] $[CoF_6]^{3-}$ [2] $[FeF_6]^{3+}$ [3] $[Cr(NH_3)_6]^{3+}$ [4] $[Fe(H_2O)_6]^{2+}$

Q.40 The maximum magnetic moment is shown by the ion with electronic configuration of

[1] $3d^8$ [2] $3d^5$ [3] $3d^7$ [4] $3d^9$

Q.41 The most stable oxidation state of iron is :

[1] –2 [2] –3 [3] +2 [4] +3

Q.42 Copper showing +2 oxidation state uses:

[1] One electron from 4s and one from 3d orbitals

[2] Both the electrons from 4s orbitals

[3] Both the electrons from 3d-orbitals

[4] None of these

Q.43 Chemical formula of pyrolusite is

[1] Mn_2O_3 [2] MnO_3 [3] MnO_2 [4] Mn_2O_7

Q.44 Which one of the following ions is coloured ?

[1] Sc^{3+}. [2] Ti^{4+} [3] Zn^{2+} [4] V^{2+}

Q.45 The most abundant transition metal is :

[1] Cr [2] Fe [3] W [4] Zn

Q.46 Iron (III)

[1] Has a d^6 configuration [2] Has a d^7 configuration

[3] Is isoelectronic with Co(ll) [4] Is isoelectronic with Mn(II)

Q.47 In the hydrogenation of oils, the c.atalyst used is :

[1] Co [2] Ni [3] Pd [4] Pt

Q.48 Permanent magnets are generally made of alloys of

[1] Co [2] Zn [3] Mn [4] Pb

Q.49 Which of the following oxide of chromium is amphoteric in nature

[1] CrO [2] Cr_2O_3 [3] CrO_3 [4] CrO_5

Q.50 Which metal has highest density ?

[1] Pt [2] Hg [3] Os [4] Fe

Q.51 Chemical Name of 'Turn bull's blue" is :

[1] Ferrous ferricyanide [2] Potassium ferrocyanide

[3] Potassium cyanide [4] Potassium ferricyanide

Q.52 Hexafluoro cobaltate (III) ion is found to be high spin complex, the probable hybrid state of cobalt in it, is:

[1] dsp^2 [2] d^2sp^3 [3] sp^3d^2 [4] sp^3d

Q.53 In the complex $[Ni(H_2O)_2(NH_3)_4]^{+2}$ the magnetic moment (μ) of Ni is :

[1] Zero [2] 2.83 BM [3] 1.73 BM [4] 3.87 BM

Q.54 From the stability constant K (Hypothetical values) given below, predict which is strongest ligand:

[1] $Cu^{+2} + 2C_2O_4^{-2} \rightarrow [Cu(C_2O_4)_2]^{-2}$ $K = 4.5 \times 10^{11}$

[2] $Cu + 4CN^- \rightarrow [Cu(CN)_4]^{-2}$ $K = 2.0 \times 10^{27}$

[3] $Cu^{2+} + 2en \rightarrow [Cu(en)_2]^{2+}$ $K = 3.0 \times 10^{15}$

[4] $Cu^{2+} + 4F^- \rightarrow [CuF_4]^{-2}$ $K = 9.5 \times 10^{6}$

Q.55 The brown ring test for nitrites and hitrates is due to the formation of a complex ion with formula :

[1] $[Fe(H_2O)_5NO]^{2+}$ [2] $[Fe(H_2O)_6]^{2+}$ [3] $[Fe(H_2O)(NO)_5]^{2-}$ [4] $[Fe(NO)(CN)_5]^{2+}$

Q.56 In a ferric salt on adding KCN a prussian blue is obtained which is :

[1] $K_3[Fe(CN)_6]$ [2] $KFe[Fe(CN)_6]$ [3] $FeSO_4[Fe(CN)_6]$ [4] $Fe_4[Fe(CN)_6]_3$

Q.57 The formula of sodium nitropruside is :

[1] $Na_4[Fe(CN)_5NO_5]$ [2] $Na_2[Fe(CN)_5NO]$ [3] $NaFe[Fe(CN)_6]$ [4] $Na_2[Fe(CN)_6NO_2]$

Q.58 Which of the following system has maximum number of unpaired electrones :

[1] d^5 (Oetahedral, low spin) [2] d^8 (Tetrahedral)

[3] d^6 (Octahedral, low spin) [4] d^3 (Octahedral)

Q.59 The oxidation and coordination number of Pt in $[Pt(C_2H_4)Cl_3]^-$ is respectively :

[1] + 1, 3 [2] + 2, 4 [3] + 3, 6 [4] + 2, 5

Q.60 Which of the following complex is anion :

[1] Fluoro pentaammine cobalt (III) [2] Trioxalato ferrate (III)

[3] Penta Carbonyl iron (o) [4] Dichloro diammine platinum

Q.61 Oxidation state of Fe in haemoglobin is :

[1] 0 [2] + 1 [3] + 2 [4] + 3

Q.62 For which of the d^n Configuration, both low and high spin complexes are possible:

[1] d^9 [2] d^3 [3] d^5 [4] d^2

Q.63 In brown ring complex compond $[Fe(H_2O)_5NO]SO_4$, the oxidation state of Fe is :

[1] + 2 [2] + 3 [3] + 4 [4] + 1

Q.64 The wrong statement is :

[1] Halide ligands forms high spin complex [2] Strong ligands from low spin complex

[3] $[FeF_6]^{-3}$ is inner orbital complex [4] $[NiCl_4]^{-2}$ is outer orbital complex

Q.65 Tollen's reagent is :

[1] $[Ag(NH_3)_2]^+$ [2] Ag_2O [3] $Al(OH)_2$ [4] $[Au(CN)_2]^-$

Q.66 Nessler's reagent is :

[1] K_2HgI_4 [2] $K_2HgI_4 + KOH$ [3] $K_2HgI_2 + KOH$ [4] $K_2HgI_4 + Hg$

Q.67 A blue colouration is not obtained when :

[1] NH_4OH is added to $CuSO_4$ [2] $CuSO_4$ solution reacts with $K_4[Fe(CN)_6]$

[3] $FeCl_3$ reacts with $K_4[Fe(CN)_6]$ [4] Anhydrous white $CuSO_4$ is dissolved in water

Q.68 Which of the following will be able to show Cis-trans isomerism :

[1] Ma_3b [2] $M_{(AA)_2}$ [3] $M_{a_2b_2}$ [4] $M_{(AB)_2}$

The Correct answer is

[1] All [2] None [3] a and c [4] c and d

Q.69 One among the following complex ions will not show optical activity

[1] $[Ph(Br)(Cl)(I)(NO_2)(C_2H_5N)(NH_3)]$ [2] Cis-$[CO(en)_2Cl_2]^+$

[3] $[Co(en)(NH_3)_2Cl_2]^+$ [4] $Cr(NH_3)_4Cl_2$

Q.70 A Planar Complex (Mabcd) gives :

[1] Two Optical isomer [2] Two geometrical isomer

[3] Three optical isomer [4] Three geometrical isomers

Q.71 Out of the following which will not show geometrical isomerism :

[1] $[Pt(NH_3)_2(H_2O)_2]^{+2}$ [2] $[Cr(NH_3)_5Cl]Cl_2$

[3] $[Co(en)_2Cl_2]Cl$ [4] $[Co(NH_3)_4Cl_2]Cl$

Q.72 $[Co(NH_3)_4Cl_2]NO_2$ and $[Co(NH_3)_4ClNO_2]Cl$ are

[1] Geometrical isomers [2] Optical isomers

[3] Linkage isomers [4] Ionisation isomers

Q.73 Theoritically the No. of geometrical isomers expected for octahedral complex [Mabcdef] is :

[1] Zero [2] 30 [3] 15 [4] 9

Q.74 Which of the following has two geometrical isomers, and is also non ionisable :

[1] $Pt(NH_3)_2Cl_4$ [2] $Pt(NH_3)_3Cl_4$ [3] $Pt(NH_3)_4Cl_4$ [4] $Pt(NH_3)_6Cl_4$

Q.75 Hypo is used in photography because it is :

[1] A strong reducing agent [2] A strong oxidising agent

[3] A strong Complexing agent [4] Photo sensitive Compound

Q.76 The image on an exposed and developed photography film is due to :

[1] AgBr [2] $[Ag(S_2O_3)_2]^{3+}$ [3] Ag [4] Ag_2O

Q.77 The solubility of AgBr in hypo solution is due to the formation of :

[1] Ag_2SO_3 [2] $Ag_2S_2O_3$ [3] $[Ag(S_2O_3)]^-$ [4] $Ag(S_2O_3)_2]^{3-}$

Q.78 A compound which is used in photography is :

[1] AgCl [2] AgBr [3] $AgNO_3$ [4] Ag_2CO_3

Q.79 $Na_2S_2O_3.5H_2O$ is used in photography to :

[1] Reduce AgBr to metallic Ag [2] Remove reduced Ag

[3] Remove undecomposed AgBr as a soluble complex

[4] Converts metallic Ag to silver salt

Q.80 Photo graphic films or plates have as an essential ingredient :

[1] Silver oxide [2] Silver bromide

[3] Silver thio sulphate [4] Silver nitrate

Q.81 Oxidation state of Ag in $Na_3[Ag(S_2O_3)_2]$ is :

[1] + 2 [2] -2 [3] 0 [4] +1

Q.82 Hypo is the aqueous solution of :

[1] Sodium sulphate [2] Sodium argentate

[3] Sodium thiosulphate . [4] Silver bromide

Q.83 Silver halides are used in photography because they are :

[1] Photosensetive [2] Soluble in hypo solution

[3] Soluble in NH_4OH [4] Insoluble in acids

Q.84 Which of the following ion in aqueous medium has orange colour :

[1] $Cr_2O_7^{-2}$ [2] Cr^{+3} [3] MnO_4^- [4] MnO_4^{2-}

Q.85 $K_2Cr_2O_7 \xrightarrow{Heat} 4K_2Cr_2O_4 + 3O_2 + X$ In the above reaction X is :

[1] Cr_2O_3 [2] CrO_3 [3] Cr_2O_7 [4] CrO_5.

Q.86 When a mixture of $K_2Cr_2O_7$ and KCl is heated with conc.H_2SO_4,which of the following is produced in the form of red vapours :- .

[1] CrO_3 [2] CrO_2Cl_2 [3] $CrCl_3$ [4] Cr_2O_3

Q.87 When acidified solution of $K_2Cr_2O_7$ is shaken with aqueous solution of $FeSO_4$ then :

[1] $Cr_2O_7^{2-}$ ion reduced to Cr^{+3} ions [2] $Cr_2O_7^{2-}$ ion reduced to CrO_7^{2-} ions

[3] $Cr_2O_7^{2-}$ ion oxidised to Cr [4] $Cr_2O_7^{2-}$ ion is oxidised to CrO_3

Q.88 The equilibrium $Cr_2O_7^{2-}$ □ $2CrO_4^{2-}$.

[1] Exists in acidic medium [2] Exists in basic medium

[3] Exists in neutral medium [4] It does not exists.

Q.89 Which of the following compound is used as the starting material for the preparation of potassium dichromates:

[1] $K_2SO_4Cr_2(SO_4)_3.24H_2O$ (Chrome alum) [2] $PbCrO_4$ (Chrome yellow)

[3] $FeCr_2O_4$ (Chromite) [4] $PbCrO_4PbO$(Chrome red)

Q.90 The blue colour produced on adding H_2O_2 to acidified $K_2Cr_2O_7$ is due to the formation of ;

[1] CrO_5 [2] Cr_2O_3 [3] CrO_7^{2-} [4] CrO_3

Q.91 Which of the following oxide of chromium is amphoteric in nature :

[1] CrO_3 [2] Cr_2O_3 [3] CrO_3 [4] CrO_5

Q.92 The yellow colour of chromates changes to orange on acidification due to the formation of :

[1] Cr^{+3} [2] Cr_2O_3 [3] $Cr_2O_7^{2-}$ [4] CrO_4^{-}

Q.93 CrO_3 dissolves in aqueous NaOH to give :

[1] CrO_4^{2-} [2] $Cr(OH)_2$ [3] $Cr_2O_7^{2-}$ [4] $Cr(OH)_3$

Q.94 The equilibrium $Cr_2O_7^{2-}$ □ $2CrO_4^{2-}$ is shified to back is :

[1] An acidic medium [2] A basic medium [3] A neutral medium [4] It does not exists.

Q.95 Which of the following statement is wrong :

[1] An acidified solution of $K_2Cr_2O_7$ liberates iodine from iodides.

[2] In acidic solution dichromates ions are converted to Chromate ions.

[3] Ammonium dichromate on heating undergo exothermic decomposition to give Cr_2O_3

[4] Potassium dichromate is used as a titrant for Fe^{+2} ions.

Q.96 Chromium has most stable oxidation state is :

[1] + 5 [2] + 3 [3] + 4 [4] + 2

Q.97 Acidified $K_2Cr_2O_7$ is treated with H_2S. In the reaction the oxidation number of chromium :

[1] Increases from + 3 to + 6 [2] Decreases from + 6 to + 3

[3] Remains unchanged [4] Decreased from + 6 to + 2

Q.98 Acidified solution of chromic acid on treatment with H_2O_2 yeilds :

[1] $CrO_3 + H_2O + O_2$ [2] $Cr_2O_3 + H_2O + O_2$

[3] $CrOs + H_2O$ [4] $H_2Cr_2O_7 + H_2O + O_2$

Q.99 The formula of blue perchromate is :

[1] CrO_3 [2] Cr_2O_3 [3] CrO_5 [4] None

Q.100 The elements from thorium (At.No. 90) to lawrencium (At No. 103) in which 5f energy levels are filled up are called

[1] lanthanides [2] rare earths [3] actinides [4] transuranics

Q.101 Which of the two have almost similar size:

[1] $_{22}Ti$, $_{40}Zr$ [2] $_{41}Nb$, $_{73}Ta$ [3] $_{39}Y$, $_{57}La$ [4] $_{20}Ca$, $_{38}Sr$

Q.102 Select the element in the following which does not show +4 oxidation state:

[1] Ti [2] Zr [3] La [4] Pt

Q.103 With increase in atomic number the ionic radii or actinides:
[1] contract slightly [2] increase gradually [3] show no change [4] change irregularly

Q.104 The general electronic confuguration of lathanide is :
[1] [Xe] $4f^{1-14}\ 5d^{0-1}\ 6s^2$ [2] [Xe] $4f^{0-14}\ 5d^{1-2}\ 6s^1$
[3] [Xe] $4f^{0-14}\ 5d^{0-1}\ 6s^{1-2}$ [4] None of these

Q.105 Cerium can show the oxidation state of +4 because:
[1] it resemble alkali metals
[2] it has very low value of I.E.
[3] of its tendency to attain noble gas configuration of xenon
[4] of its tendency to attain $4f^7$ configuration

Q.106 The elements from cerium (At No. 58) to lutetium (At No. 71) in which 4f energy levels are filled up are called:
[1] lanthanides [2] rare earths [3] lanthanones [4] all the above

Q.107 The actinides showing + 7 oxidation state are :
[1] U, Np [2] Pu, Am [3] Np, Pu [4] None of these

Q.108 In aqueus solution Eu^{+2} acts as :
[1] an oxidising agent [2] reducing agent
[3] can act either ot these [4] can act as redox agent

Q.109 Give the ions having $4f^{14}5d^o6s^o$ outer electronic configuration:
[1] Yb^{2+} [2] Lu^{3+} [3] Yb^{3+} [4] Both [1] and [2]

Q.110 The maximum oxidation state shown by actinides is :
[1] +6 [2] +7 [3] +5 [4] +4

Q.111 Which of the following is a lanthanide:
[1] Ta [2] Rh [3] Th [4] Gd

Q.112 The outer electronic configuration of gadolinium (At. No. 64) is :
[1] $4f^75d^16s^2$ [2] $4f^85d^06s^2$ [3] $4f^85d^16s^1$ [4] $4f^75d^06s^2$

Q.113 The outer electronic configuration of the element No (Nobelium. At. No. 102) is
[1] $5f^{14}6d^07s^2$ [2] $5f^{13}6d^17s^2$ [3] $5f^{14}6d^17s^1$ [4] none of the above

Q.114 The element with the electronic configura ion $[Xe]^{54}\ 4f^{14}\ 5d^16s^2$ is a
[1] representative element [2] transition element
[3] lanthanide [4] actinide

Q.115 The most characteristic oxidation state of lanthanides is :
[1] +2 [2] +3 [3] +4 [4] None of these

Answer Key - 2

Qus.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Ans.	4	2	2	2	2	3	1	3	3	3	1	3	3	3	4	3	4	2	1	3	4	2	3	1	4
Qus.	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Ans.	2	1	4	3	2	2	3	4	3	4	4	4	2	3	2	4	1	3	4	2	4	2	1	2	3
Qus.	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
Ans.	1	3	2	2	1	4	2	4	2	2	3	3	2	3	1	2	2	4	4	4	2	4	3	1	3
Qus.	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Ans.	3	4	2	3	2	4	3	1	1	1	2	1	2	3	1	2	3	1	1	2	2	2	3	3	3
Qus.	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115										
Ans.	2	3	1	1	3	4	3	2	4	2	4	1	1	3	2										

Exercise # 3

Q.1 Which of the following statements is not correct about the electronic configuration of gaseous chromium atom **[MP PET 1994]**

[1] It has 5 electrons in 3d and one electron in 4s orbitals

[2] The principal quantum numbers of its valence electrons are 3 and 4

[3] It has 6 electrons in 3d orbital

[4] Its valance electrons have azimuthal quantum number 0 and 2

Q.2 Which of the following statements is correct about equivalent weight of $KMnO_4$ **[MP PET 1994]**

[1] It is one third of its molecular weight in alkaline medium

[2] It is one fifth of its molecular weight in alkaline medium

[3] It is equal to its molecular weight in acidic medium

[4] It is one third ofits molecularweightin acidic medium

Q.3 The reaction of $K_2Cr_2O_7$ with NaCl and conc.H_2SO_4 gives **[MP PET 1994]**

[1] $CrCl_3$ [2] $CrOCl_2$ [3] CrO_2Cl_2 [4] Cr_2O_3

Q.4 The electroplating of chromium is undertaken because **[MP PMT 1994]**

[1] Electrolysis of chromium is easier

[2] Chromium can form alloys with other metals

[3] Chromium gives protective and decorative coating to the base metal

[4] Of the high reactivity of metallic chromium

Q.5 Which of the following metals make the most efficient catalyst **[BHU 1995]**

[1] Transition [2] Alkali [3] Alkaline earth [4] Coloured metals

Q.6 Which oxide of manganese is amphoteric **[AFMC 1995]**

[1] MnO_2 [2] Mn_2O_3 [3] Mn_2O_7 [4] MnO

Q.7 Which one of the following oxides is ionic **[IIT 1995]**

[1] MnO [2] Mn_2O_7 [3] CrO_3 [4] P_2O_5

Q.8 Correct formula of calomal is **[CPMT 1994; AFMC 1998]**

[1] Hg_2Cl_2 [2] $HgCl_2$ [3] $HgCl_2.H_2O$ [4] $HgSO_4$

Q.9 Mercury is the only metal which is liquid at 0°C. This is due to its **[CBSE 1995]**

[1] Very high ionisation energy and weak metallic bond [2] Low ionisation potential

[3] High atomic weight [4] High vapour pressure

Q.10 Which of the following imparts green colour to the glass **[CPMT 1993]**

[1] Cu_2O [2] CdS [3] MnO_2 [4] Cr_2O_3

Q.11 Which of the following oxides is white but becomes yellow on heating **[MP PET 1995]**

[1] AgO [2] Ag_2O [3] FeO [4] ZnO

Q.12 On heating $Mn(OH)_2$ with PbO_2 and conc.HNO_3 pink colour is obtained due to the formation of **[MP PET 1995]**

[1] $KMnO_4$ [2] $HMnO_4$ [3] $Pb(MnO_4)_2$ [4] $PbMnO_4$

Q.13 Which of the following elements does not belong to first transition series **[MP PMT 1995]**

[1] Fe [2] V [3] Ag [4] Cu

Q.14 Number of unpaired electrons in Fe^{+++} (Z = 26) is **[MP PMT 1995; Rajasthan PET 2003]**

[1] 4 [2] 5 [3] 6 [4] 3

Q.15 Of the ions Zn^{2+}, Ni^{2+} and Cr^{3+} [atomic number of Zn = 30, Ni = 28, Cr = 24] **[MP PET 1996]**

[1] Only Zn^{2+} is colourless and Ni^{2+} and Cr^{3+} are coloured

[2] All three are colourless

[3] All three are coloured

[4] Only Ni^{2+} is coloured and Zn^{2+} and Cr^{3+} are colourless

Q.16 Common oxidation state of scandium, a transition element is/are [atomic number of Sc = 21] **[MP PET 1996]**

[1] + 4 [2] + 1 [3] + 2 and + 3 [4] + 4 and + 1

Q.17 Which of the following is not correct about transition metals **[MP PET 1996]**

[1] Their melting and boiling points are high [2] Their compounds are generally coloured

[3] They can form ionic or covalent compounds [4] They do not exhibit variable valency

Q.18 When $KMnO_4$ reacts with acidified $FeSO_4$ **[MP PET 1996]**

[1] Only $FeSO_4$ is oxidised [2] Only $KMnO_4$ is oxidised

[3] $FeSO_4$ is oxidised and $KMnO_4$ is reduced [4] None of the above

Q.19 The atomic number of an element is 22. The highest oxidation state exhibited by it in its compounds is **[MP PMT 1996]**

[1] 1 [2] 2 [3] 3 [4] 4

Q.20 By passing H_2S gas in acidified $KMnO_4$ solution, we get **[MP PET 1997]**

[1] K_2S [2] S [3] K_2SO_3 [4] MnO_2

Q.21 When calomal reacts with NH_4OH. we get **[CBSE 1996]**

[1] $HgNH_2Cl$ [2] NH_2-Hg-Hg-Cl [3] Hg_2O [4] HgO

Q.22 The 3d-elements show variable oxidation states. What is the maximum oxidation state shown by the element Mn **[MP PMT 1997; JIPMER 2002]**

[1] + 4 [2] + 5 [3] + 6 [4] + 7

Q.23 The 3d-metal ions are paramagnetic in nature because **[MP PMT 1997]**

[1] They are reducing agents [2] They form coloured salts

[3] They have one or more paired s-electrons [4] They have one or more unpaired d-electrons

Q.24 The correct formula of permanganic acid is **[MP PET 1999]**

[1] $HMnO_4$ [2] $HMnO_5$ [3] H_2MnO_4 [4] H_2MnO_3

Q.25 Which one of the following properties is not of transition elements **[MP PET 1999; CPMT 2002]**

[1] Colour [2] Paramagnetism [3] Fixed valency [4] None of the above

Q.26 In which of the following, tendency towards for mation of coloured ions is maximum **[MP PET 1999]**

[1] s-block elements [2] d-block elements [3] p-block elements [4] f-block elements

Q.27 Which one of the following ions is colourless **[MP PET 1999; Rajasthan PET/PMT 1999]**

[1] Cu^+ [2] Co^{2+} [3] Ni^{2+} [4] Fe^{3+}

Q.28 Acidified solution of chromic acid on treatment with hydrogen peroxide yields **[MP PET 1999; AFMC 2000]**

[1] $CrO_3 + H_2O + O_2$ [2] $Cr_2O_3 + H_2O + O_2$ [3] $CrO_5 + H_2O$ [4] $H_2Cr_2O_7 + H_2O + O_2$

Q.29 Chloride of which of the following elements will be coloured **[MP PMT 1999]**

[1] Silver [2] Mercury [3] Zinc [4] Cobalt

Q.30 Which one of the following is not a transition metal **[MP PMT 1999]**

[1] Chromium [2] Titanium [3] Lead [4] Tungsten

Q.31 Which of the following ions has the highest magnetic moment **[JIPMER 1997; AIEEE 2002]**

[1] Ti^{3+} [2] Sc^{3+} [3] Mn^{2+} [4] Zn^{2+}

Q.32 Which of the following ions is coloured **[BHU 1997]**

[1] Cu^{+} [2] Cu^{2+} [3] Ti^{4+} [4] V^{5+}

Q.33 In nitroprusside ion. the iron and NO exist as Fe^{II} and NO^{+} rather than Fe^{III} and NO. These forms can be differentiated by **[IIT 1998]**

[1] Estimating the concentration of iron [2] Measuring the concentration of CN^{-}

[3] Measuring the solid state magnetic moment [4] Thermally decomposing the compound

Q.34 Which of the following is/are insoluble in ethanol **[Roorkee Qualifying 1998]**

[1] HgF_2 [2] $HgCl_2$ [3] $HgBr_2$ [4] HgI_2

Q.35 Which one of the following compounds is not coloured **[AIIMS 1997]**

[1] Na_2CuCl_4 [2] Na_2CdCl_4 [3] $K_4Fe(CN)_6$ [4] $K_3Fe(CN)_6$

Q.36 Number of unpaired electrons in Mn^{2+} is **[CPMT 1997; Pb. PET/PMT 1999]**

[1] 3 [2] 5 [3] 4 [4] 1

Q.37 The formula of corrosive sublimate is **[CPMT 1997]**

[1] $HgCl_2$ [2] Hg_2Cl_2 [3] Hg_2O [4] Hg

Q.38 $yMnO_4^{-} + xH^{+} + C_2O_4^{-} \rightarrow yMn^{++} + 2CO_2 + \frac{x}{2} H_2O$ x and y are **[CPMT 1997]**

[1] 2 and 16 [2] 16 and 2 [3] 8 and 16 [4] 5 and 2

Q.39 $K_2Cr_2O_7$ on heating with aqueous NaOH gives **[CBSE 1997]**

[1] CrO_4^{2-} [2] $Cr(OH)_3$ [3] $Cr_2O_7^{2-}$ [4] $Cr(OH)_2$

Q.40 Which of thefollowing forms colourless compound

[1] Sc^{+3} [2] V^{3+} [3] Ti^{3+} [4] Cr^{3+}

Q.41 Fe^{2+} shows **[Rajasthan PET 2000]**

[1] Ferromagnetism [2] Paramagnetism [3] Diamagnetism [4] None of these

Q.42 Zinc and mercury do not show variable valency like d-block elements because **[Rajasthan PMT 2000; MP PMT 2000]**

[1] They are soft

[2] Their d-subshells are complete

[3] They have only two electrons in the outermost subshell

[4] Their d-shells are incomplete

Q.43 Railway wagon axles are made by heating iron rods embeded in charcol powder. the process is known as **[UPSEAT 2001]**

[1] Sherardizing [2] Annealing [3] Tempering [4] Case hardening

Q.44 Complex ion is shown by **[CPMT 2001]**

[1] Ag [2] Au [3] Cu [4] All of these

Q.45 Which of the following transition metal is used as a catalyst **[CPMT 2001]**

[1] Nickel [2] Cobalt [3] Gold [4] Both [1] and [2]

Q.46 Oxidation number of As in $H_2AsO_4^{-}$ is **[CPMT 2001]**

[1] 6 [2] 7 [3] 5 [4] 9

Q.47 Most common oxidation states of Cs (cesium) are **[AIEEE 2002]**

[1] + 2. + 3 [2] + 2. + 4 [3] + 3. + 4 [4] + 3 + 5

Q.48 **Assertion [1]:** cuprous ion (Cu^{+}) has unpaired electrons while cupric ion (Cu^{++}) does not

Reason (R): Cuprous ion (Cu^{+}) is colourless where as cupric ion (Cu^{++}) is blue in the aqueous solution

[1] Both A and R are true and R is a correct explanation of A

[2] Both A and R are true but R is not a correct explanation of A

[3] A is true but R is false

[4] A is false but R is true

Q.49 Atomic number of Cr and Fe are 24 and 26 respectively. Which of the following is paramagnetic with the spin of electron **[CBSE 2002]**

[1] $[Cr(NH_3)_6]^{+3}$ [2] $[Fe(CO)_5]$ [3] $[Fe(CN)_6]^{-4}$ [4] $[Cr(CO)_6]$

Q.50 Which of the following does not have electron in 3d-subshell **[AIIMS 2002]**

[1] Fe (III) [2] Mn (II) [3] Cr (I) [4] P (0)

Q.51 Collin's reagent is **[Rajasthan PMT 2002]**

[1] MNO_2/HCl [2] MNO_4/C_5H_5N [3] $K_2Cr_2O_7/H_2SO_4$ [4] $Cr_2O_3/2C_5H_5N$

Q.52 Which compound has coloured aqueous solution **[Rajasthan PMT 2002]**

[1] $Zn(NO_3)_2$ [2] $LiNO_3$ [3] $Co(NO_3)_2$ [4] $Ba(NO_3)_2$

Q.53 Arrange Ce^{+3}, La^{+3} ,Pm^{+3} and Yb^{+3} in increasing order of their ionic radii **[AIEEE 2002]**

[1] $Yb^{+3} < Pm^{+3} < Ce^{+3} < La^{+3}$ [2] $Ce^{+3} < Yb^{+3} < Pm^{+3} < La^{+3}$

[3] $Yb^{+3} < Pm^{+3} < La^{+3} < Ce^{+3}$ [4] $Pm^{+3} < La^{+3} < Ce^{+3} < Yb^{+3}$

Q.54 The type of isomerism present in nitropentamine chromium (III) chloride is **[AIEEE 2002]**

[1] Optical [2] Linkage

[3] Ionization [4] Polymerisation

Q.55 The most stable ion is **[AIEEE 2002]**

[1] $[Fe(OH)]^{3-}$ [2] $[Fe(Cl)_6]^{3-}$ [3] $[Fe(CN)_6]^{3-}$ [4] $[Fe(H_2O)_6]^{3+}$

Q.56 The complex chlorocompound diaquatriammine cobalt (III) chloride is represented as **[CBSE 2002]**

[1] $[Co(NH_3)_3(H_2O)_3]Cl_2$ [2] $[Co(NH_2)_3(H_2O)_2]Cl_2$

[3] $[CoCl(NH_3)_3(H_2O)_2]Cl_3$ [4] $[CoCl(NH_3)_3(H_2O)_2]Cl_2$

Q.57 Lanthanide for which + II and + III oxidation states are common is **[AIIMS 2003]**

[1] La [2] Nd [3] Ce [4] Eu

Q.58 The method of zone refining of metals is based on the principle of **[CBSE 2003]**

[1] Greater solubility of the impurity in the molten state than in the solid

[2] Greater mobility of the pure metal than that of the impurity

[3] Higher melting point of the impurity than that of the pure metal

[4] Greater noble character of the solid metal than that of the impurity

Q.59 The basic character of the transition metal monoxides follows the order **[CBSE 2003]**

[1] TiO > VO > CrO > FeO [2] VO > CrO > TiO > FeO

[3] CrO > VO > FeO > TiO [4] TiO > FeO > VO > CrO

(Atomic no. Ti = 22, V = 23, Cr = 24, Fe = 26)

Q.60 Which one of the following characteristics of the transition metals is associated with their catalytic activity **[CBSE 2003]**

[1] Variable oxidation states [2] High enthalpy of atomization

[3] Paramagnetic behaviour [4] Colour of hydrated ions

Q.61 The correct order of ionic radii of Y^{3-} , La^{3+} . Eu^{3+} and Lu^{3+} is **[CBSE 2003]**

[1] $La^{3+} < Eu^{3+} < Lu^{3+} < Y^{3+}$ [2] $Y^{3-} < La^{3+} < Eu^{3+} < Lu^{3+}$

[3] $Lu^{3+} < Y^{3+} < Eu^{3+} < La^{3+}$ [4] $Lu^{3+} < Eu^{3+} < La^{3+} < Y^{3+}$

Q.62 The atomic number of vanadium (V), chromium (Cr), manganese (Mn) and iron (Fe) are respectively 23, 24, 25 and 26 which one of these may be expected to have the highest second ionization enthalpy **[AIEEE 2003]**

[1] V [2] Cr [3] Mn [4] Fe

Q.63 A reduction in atomic size with increase in atomic number is a characteristic of elemenl of **[AIEEE 2003]**

[1] High atomic masses [2] d-block

[3] f -block [4] Radioactive series

Q.64 Which one of the following statements is correct **[AIEEE 2003]**

[1] Manganese salts give violet borax bead test in the reducing flame

[2] From a mixed precipitate of AgCl and AgI ammonia solution dissolves only AgCl

[3] Ferric ions give a deep green precipitate on adding potassium ferrocyanide solution

[4] On boiling a solution having K^+ .Ca^{2+} and HCO_3^- ions we get a precipitateof $K_2Ca(CO_3)_2$

Q.65 Manganese is related to which block of periodic table **[MP PMT 2003]**

[1] s-block [2] p-block [3] d-block [4] f -block

Q.66 Calamine is a mineral, which is **[MP PMT 2003]**

[1] $ZnCO_3$ [2] ZnS [3] $ZnSO_4$ [4] ZnO

Q.67 Transition metals are related to which block **[MP PMT 2003]**

[1] s-block [2] p-block [3] d-block [4] None of these

Q.68 Which transition metal reduces steam to evolve hydrogen

[1] Mg [2] Fe [3] Sc [4] Pt

Q.69 Which of the following element does not show variable valency **[MP PMT 2003]**

[1] Ni [2] Zn [3] Cu [4] Mn

Q.70 Which of the following transition metals can have highest oxidation state **[Rajasthan PET 2003]**

[1] Cr [2] Co [3] Ni [4] Cu

Q.71 Formula of ferric sulphate is **[AFMC 2003]**

[1] $FeSO_4$ [2] Fe $(SO_4)_2$ [3] Fe_2SO_4 [4] $Fe_2(SO_4)_3$

Q.72 When $CuSO_4$ is hydrated, then it becomes **[AFMC 2003]**

[1] Acidic [2] basic [3] Neutral [4] Amphoteric

Q.73 Silvering of mirror is done by **[AFMC 2003]**

[1] $AgNO_3$ [2] Ag_2O_3 [3] Fe_2O_3 [4] Al_2O_3

Q.74 In which compound chromium has + 6 oxidation state **[CPMT 2003]**

[1] $K_2Cr_2O_7$ [2] $CrCl_3$ [3] $Cr(SO_4)_2$ [4] None of these

Q.75 Cryolite helps in **[BHU 2003]**

[1] Lowering the melting point [2] Increasing the melting point

[3] Increasing the electrical conductivity [4] Decreasing the electrical conductivity

Q.76 Lanthanide contraction occurs because **[AMU 2000; BHU 2003]**

[1] f-orbital electrons are easily lost [2] f-orbital an incompletely filled

[3] f-orbital electron an poor shielders of nuclear charge

[4] f-orbital do not come out on the surface of atom and are buried inside

Q.77 Ammonia forms the complex ion $[Cu(NH_3)_4]^{2+}$ with copper ions in alkaline solutions but not in acidic solution. What is the reason for it **[AIEEE 2003]**

[1] In acidic solutions hydration protects copper ions

[2] In acidic solutions protons coordinate with ammonia molecules forming NH_4^+ ions and NH_3 molecules are not available

[3] In alkaline solutions insoluble $Cu(OH)_2$ is precipitated which is soluble in excess of any alkali

[4] Copper hydroxide is an amphoteric substance

Q.78 One mole of the complex compound $[Co(NH_3)_5]Cl_3$, gives 3 moles of ions on dissolution in water. One mole of the same complex reacts with two moles of $AgNO_3$ solution to yield two moles of AgCl(s). The structure of the complex is **[AIEEE 2003]**

[1] $[Co(NH_3)_5Cl]Cl_2$ [2] $[Co(NH_3)_3Cl_3]. 2NH_3$

[3] $[Co(NH_3)_4Cl_2]Cl.NH_3$ [4] $[Co(NH_3)_4Cl]Cl_2.NH_3$

Q.79 In the coordination compound, $K_4[Ni(CN)_4]$ oxidation state of nickel is **[AIEEE 2003]**

[1] -1 [2] 0 [3] + 1 [4] +2

Q.80 The complex used as an anticancer agent is **[AIIMS 2003]**

[1] trans -$[Co(NH_3)_3Cl_3]$ [2] cis -$[PtCl_2(NH_3)_2]$

[3] cis-$K_2[PtCl_2Br_2]$ [4] Na_2CO_3

Q.81 Among the following, which is not the π-bonded organometallic compound **[CBSE 2003]**

[1] $(CH_3)_4Sn$ [2] $K[PtCl_3(\eta^2\text{-}C_2H_4)]$

[3] $Fe[\eta^5\text{-}C_5H_5]_2$ [4] $Cr(\eta^6\text{–}C_6H_6)_2$

Q.82 According to IUPAC nomenclature sodium nitroprussied is named is **[CBSE 2003]**

[1] Sodium pentacyanonitrosyl ferrate (III) [2] Sodium nitroferricyanide

[3] Sodium nitroferrocyanide [4] Sodium pentacyanonitrosyl ferrate (II)

Q.83 Which one of the following octahedral complexes will not show geometric isomerism (A and B are mono dentate ligands) **[CBSE 2003]**

[1] $[MA_5B]$ [2] $[MA_2B_4]$ [3] $[MA_3B_3]$ [4] $[MA_4B_2]$

Q.84 The number of unpaired electrons in the complex ion $[CoF_6]^{3-}$ is (Atomic no. Co = 27) **[CBSE 2003]**

[1] Zero [2] 2 [3] 3 [4] 4

Q.85 In the process of extraction of gold. Roasted gold ore + $CN^- + H_2O \xrightarrow{O_2}$ [X] + OH^-

[X] + Zn $\rightarrow$ [Y] + Au Identify the complexes [X] and [Y] **[IIT JEE 2003]**

[1] X = $[Au(CN)_2]^-$,Y = $[Zn(CN)_4]^{2-}$ [2] X = $[Au(CN)_4]^{3-}$,Y = $[Zn(CN)_4]^{2-}$

[3] X = $[Au(CN)_2]^-$,Y = $Zn(CN)_6]^{4-}$ [4] X = $[Au(CN)_4]^-$, Y = $[Zn(CN)_4]^{2-}$

Q.86 $(Me)_2SiCl_2$ on hydrolysis will produce **[IIT JEE 2003]**

[1] $(Me)_2Si(OH)_2$ [2] $(Me)_2Si = O$ [3] $–[–O–(Me)_2Si –O–]_n$ [4] $Me_2SiCl(OH)$

Q.87 Mixture X = 0.02 mol of $[Co(NH_3)_5SO_4]Br$ and 0.02 mol of $[Co(NH_3)_5Br]SO_4$ was prepared in 2 litre of solution

1 litre of mixture X + excess $AgNO_3 \rightarrow$ Y.

1 litre of mixture X + excess $BaCl_2 \rightarrow$ Z

Number of moles of Y and Z are **[IIT JEE 2003]**

[1] 0.01,0.01 [2] 0.02.0.01 [3] 0.01, 0.02 [4] 0.02. 0.02

Q.88 Magnetic moment of $[Cu(NH_3)_4]^{2+}$ ion is **[Rajasthan PET 2003]**

[1] 1.414 [2] 1.73 [3] 2.23 [4] 2.38

Q.89 The possible number of optical isomers in $[Co(en)_2Cl_2]^+$ are **[MP PET 2003]**

[1] 2 [2] 3 [3] 4 [4] 6

Q.90 The correct order of hybridisations of central atom in NH_3, $[PtCl_4]^{2-}$, PCl_5 and BCl_3 is **[MP PMT 2003]**

[1] dsp^2, dsp^3, sp^2 and sp^3 [2] sp^3, sp^3, sp^3d and sp^2

[3] dsp^2, sp^2 , sp^3 and dsp^3 [4] dsp^2, sp^3, sp^2 and dsp^3

Q.91 What is the structural formula of lithium tetrahydridoaluminate **[MP PMT 2003]**

[1] $Al[LiH_4]$ [2] $Al_2[LiH_4]_3$ [3] $Li[AlH_4]$ [4] $Li[AlH]_4]_2$

Q.92 The oxidation state of Fe in the complex $[Fe(CO)_5]$ is **[MP PMT 2003]**

[1] -1 [2] +2 [3] +4 [4] Zero

Q.93 Ligands. in complex compounds **[MP PMT 2003]**

[1] Accept e^- -pair [2] Donate e^- -pair

[3] Neither accept e^- -pair nor donate [4] All of these happen

Q.94 The correct name of $[Pt(NH_3)_4Cl_2][PtCl_4]$ is **[MP PET 2003]**

[1] Tetra ammine dichloro platinum (iv) tetrachloro platinate (ii)

[2] Dichloro tetra ammine platinium (iv) tetrachloro platinate (ii)

[3] Tetrachloro platinum (ii) tetra ammine platinate (iv)

[4] Tetra chloro platinum (ii) dichloro tetra ammine platinate (iv)

Q.95 Which one of the following has largest number of isomers ? **[AIEEE 2004]**

[1] $[Co(en)_2Cl_2]^+$ [2] $[Co(NH_3)_5Cl]^{2+}$ [3] $[Ir(PR_3)_2][(H(CO)]$ [4] $[Ru(NH_3)_4Cl_2]^+$

Q.96 The correct order of magnetic moments (spin only values in B.M.) among is :

[1] $[Fe(CN)_6]^{4-} > [CoCl_4]^{2-} > [MnCl_4]^{2-}$ [2] $[MnCl_4]^{2-} > [Fe(CN)_6]^{4-} > [CoCl_4]^{2-}$

[3] $[Fe(CN)_6]^{4-} > [MnCl_4]^{2-} > [CoCl_4]^{2-}$ [4] $[MnCl_4]^{2-} > [CoCl_4]^{2-} > [Fe(CN)_6]^{4-}$

Q.97 Which one of the following complexes is an outer orbital complex ? **[AIEEE 2004]**

[1] $[Ni(NH_3)_6]^{2+}$ [2] $[Mn(CN)_6]^{4-}$ [3] $[Co(NH_3)_6]^{3+}$ [4] $[Fe(CN)_6]^{4-}$

Q.98 Cerium (Z = 58) is an important member of the lanthanoids. Which of the following statments about cerium is incorrect ? **[AIEEE 2004]**

[1] Cerium (IV) acts as an oxidizing agent

[2] The +3 oxidation state of cerium is more stable than the +4 oxidation state

[3] The +4 oxidation state of cerium is not known in solutions

[4] The common oxidation states of cerium are +3 and +4

Q.99 Among the properties (a) reducing (b) oxidising (c) complexing, the set of properties shown by CN^- ion towards metal species is : **[AIEEE 2004]**

[1] a, b, c [2] b, c [3] c, a [4] a, b

Q.100 The coordination number of central metal atom in a complex is dertermined by : **[AIEEE 2004]**

[1] The number of only anionic lignads bonded to the metal ion

[2] The number of ligands around a metal ion bonded by pi–bonds

[3] The number of ligands around a metal ion bonded by sigma and pi–bonds both

[4] The number of ligands around a metal ion bonded by sigam bonds

Q.101 The soldiers of Napolean army while at Alps during freezing winter suffered a serious problem as reagards to the tin buttons of their uniforms. White metallic tin buttons got converted to grey powder. This transformation is related to : **[AIEEE 2004]**

[1] An interaction with water vapour contained in the humid air

[2] A change in the cyrstalline structure of tin

[3] A change in the partial pressure of oxygen in the air

[4] An interaction with nitrogen of the air at very low temperature

Q.102 The valence shell electronic configuration of Cr^{2+} ion is **[Orissa JEE 2005]**

[1] $4s^o3d^4$ [2] $4s^23d^2$ [3] $4s^23d^o$ [4] $3p^64s^2$

Q.103 The main reason for larger number of oxidation states exhibited by the actinoids than the corresponding lanthanoids is **[CBSE PMT 2005]**

[1] Lesser energy difference between 5f and 6d orbitals than between 4f and 5d orbitals

[2] Larger atomic size of actinoids than the lanthanoids

[3] More energy difference between 5f and 6d orbitals than between 4f and 5d orbitals

[4] Greater reactive nature of the actinoids than the lanthanoids

Q.104 Four successive members of the first row transition elements are listed below with their atomic numbers. Which one of them is expected to have the highest third ionization enthalpy **[CBSE PMT 2005]**

[1] Vanadium (Z = 23) [2] Chromium (Z = 24) [3] Iron (Z = 26) [4] Manganese (Z + 25)

Q.105 Among the following pairs of ions. the lower oxidation state in aqueous solution is more stable than the other in **[AIIMS 2005]**

[1] Tl^+, Tl^{3+} [2] Cu^+, Cu^{2+} [3] Cr^{2+}, Cr^{3+} [4] V^{2+}, VO^{2+}

Q.106 The lanthnide contraction is responsible for the fact that **[AIEEE 2005]**

[1] Zr and Y have about the same radius

[2] Zr and Nb have similar oxidation state

[3] Zr and HF have about the same radius

[4] Zr and Zn have the same oxidation sate

Q.107 Which of the following factors may be regarded as the main cause of lanthanide contraction **[AIEEE 2005]**

[1] Poor shielding of one of 4f electron by another in the subshell

[2] Effective shielding of one of 4f electrons by another in the subshell

[3] poorer shielding of 5d electrons by 4f electrons

[4] Greater shielding of 5d electron by 4f electron

Q.108 Which of the following have maximum number of unpaired electrons **[BHU 2005]**

[1] Fe^{3+} [2] Fe^{2+} [3] Co^{2+} [4] Co^{3+}

Q.109 Nickel (Z = 28) combines with a uninegative monodentate ligand X^- to form a paramagnetic complex $[NiX_4]^{2-}$. The number of unpaired electron(s) in the nickel and geometry of this complex ion are, respectively **[AIEEE 2006]**

[1] two, tetrahedral [2] one, square, planar [3] two, square, planar [4] one, tetrahedral

Q.110 Lanthanoid contraction is caused due to - **[AIEEE 2006]**

[1] The appreciable shielding on outer electrons by 5d electrons from the nuclear charge

[2] The same effective nuclear charge from Ce to Lu

[3] The imperfect shielding on outer electrons by 4f electrons from the nuclear charge

[4] The appreciable shielding on outer electrons by 4f electrons from the nuclear charge

Q.111 Identify the incorrect statement among the following: **[AIEEE 2007]**

[1] The chemistry of various lanthanoids is very similar

[2] 4f and 5f orbitals are equally shielded

[3] d-Block elements show irregular and erratic chemical properties among themselves

[4] La and Lu have partially filled d orbitals and no other partially filled orbitals.

Q.112 Which one of the following has a square planar geometry? **[AIEEE 2007]**

[1] $[NiCl_4]^{2-}$ [2] $[PtCl_4]^{2-}$ [3] $[CoCl_4]^{2-}$ [4] $[FeCl_4]^{2-}$

(At. nos. Co = 27, Ni = 28, Fe = 26, Pt = 78)

Q.113 The actinoides exhibit more number of oxidation states in general than the lanthanoids. This is because

[1] the actinoids are more reactive than the lanthanoids **[AIEEE 2007]**

[2] the 5f orbitals extend further from the nucleus than the 4f orbitals

[3] the 4forbitalsare more buried than the 5f orbitals

[4] there is a similarity between 4f and 5f orbitals in their angular part of the wave function

Answer Key - 3

Qus.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	3	1	3	3	1	1	1	1	1	4	4	2	3	2	1	3	4	3	4	2
Qus.	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Ans.	2	1	3	4	3	3	2	3	4	2	2	1	2	1	1	2	2	4	4	4
Qus.	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70
Ans.	4	3	3	2,3	4	4	1	1	1	1	3	2	3	2	3	1	3	2	2	3
Qus.	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
Ans.	4	2	1	2	2	1	1	1	4	1	3	1	2	2	2	3	4	2	1	1
Qus.	101	102	103	104	105	106	107	108	109	110	111	112	113							
Ans.	2	1	1	4	1	3	1	1	1	3	2	2	2							