

- Name the gas that can readily decolourise acidified  $\text{KMnO}_4$  solution.
  - $\text{SO}_2$
  - $\text{NO}_2$
  - $\text{P}_2\text{O}_5$
  - $\text{CO}_2$

(NEET 2017)
- $\text{HgCl}_2$  and  $\text{I}_2$  both when dissolved in water containing  $\text{I}^-$  ions, the pair of species formed is
  - $\text{HgI}_2, \text{I}^-$
  - $\text{HgI}_4^{2-}, \text{I}_3^-$
  - $\text{Hg}_2\text{I}_2, \text{I}^-$
  - $\text{HgI}_2, \text{I}_3^-$

(NEET 2017)
- The reason for greater range of oxidation states in actinoids is attributed to
  - actinoid contraction
  - 5f, 6d and 7s levels having comparable energies
  - 4f and 5d levels being close in energies
  - the radioactive nature of actinoids.

(NEET 2017)
- Which one of the following statements related to lanthanons is incorrect?
  - Europium shows +2 oxidation state.
  - The basicity decreases as the ionic radius decreases from Pr to Lu.
  - All the lanthanons are much more reactive than aluminium.
  - Ce(+4) solutions are widely used as oxidizing agent in volumetric analysis.

(NEET-II 2016)
- Which one of the following statements is correct when  $\text{SO}_2$  is passed through acidified  $\text{K}_2\text{Cr}_2\text{O}_7$  solution?
  - $\text{SO}_2$  is reduced.
  - Green  $\text{Cr}_2(\text{SO}_4)_3$  is formed.
  - The solution turns blue.
  - The solution is decolourised.

(NEET-I 2016)
- The electronic configurations of Eu (Atomic No. 63), Gd (Atomic No. 64) and Tb (Atomic No. 65) are
  - $[\text{Xe}]4f^65d^16s^2$ ,  $[\text{Xe}]4f^75d^16s^2$  and  $[\text{Xe}]4f^85d^16s^2$
  - $[\text{Xe}]4f^76s^2$ ,  $[\text{Xe}]4f^75d^16s^2$  and  $[\text{Xe}]4f^96s^2$
  - $[\text{Xe}]4f^76s^2$ ,  $[\text{Xe}]4f^86s^2$  and  $[\text{Xe}]4f^85d^16s^2$
  - $[\text{Xe}]4f^65d^16s^2$ ,  $[\text{Xe}]4f^75d^16s^2$  and  $[\text{Xe}]4f^96s^2$

(NEET-I 2016)
- Gadolinium belongs to 4f series. Its atomic number is 64. Which of the following is the correct electronic configuration of gadolinium?
  - $[\text{Xe}]4f^95s^1$
  - $[\text{Xe}]4f^75d^16s^2$
  - $[\text{Xe}]4f^65d^26s^2$
  - $[\text{Xe}]4f^86d^2$

(2015)
- Assuming complete ionisation, same moles of which of the following compounds will require the least amount of acidified  $\text{KMnO}_4$  for complete oxidation?
  - $\text{FeSO}_3$
  - $\text{FeC}_2\text{O}_4$
  - $\text{Fe}(\text{NO}_2)_2$
  - $\text{FeSO}_4$

(2015)
- Magnetic moment 2.84 B.M. is given by (At. nos. Ni = 28, Ti = 22, Cr = 24, Co = 27)
  - $\text{Cr}^{2+}$
  - $\text{Co}^{2+}$
  - $\text{Ni}^{2+}$
  - $\text{Ti}^{3+}$

(2015, Cancelled)
- Which of the following processes does not involve oxidation of iron?
  - Formation of  $\text{Fe}(\text{CO})_5$  from Fe.
  - Liberation of  $\text{H}_2$  from steam by iron at high temperature.
  - Rusting of iron sheets.
  - Decolourisation of blue  $\text{CuSO}_4$  solution by iron.

(2015, Cancelled)
- Because of lanthanoid contraction, which of the following pairs of elements have nearly same atomic radii? (Numbers in the parenthesis are atomic numbers)
  - Zr(40) and Hf(72)
  - Zr(40) and Ta(73)
  - Ti(22) and Zr(40)
  - Zr(40) and Nb(41)

(2015, Cancelled)
- The reaction of aqueous  $\text{KMnO}_4$  with  $\text{H}_2\text{O}_2$  in acidic conditions gives
  - $\text{Mn}^{4+}$  and  $\text{O}_2$
  - $\text{Mn}^{2+}$  and  $\text{O}_2$
  - $\text{Mn}^{2+}$  and  $\text{O}_3$
  - $\text{Mn}^{4+}$  and  $\text{MnO}_2$ .

(2014)

13. Magnetic moment 2.83 BM is given by which of the following ions?  
(At. nos. Ti = 22, Cr = 24, Mn = 25, Ni = 28)  
(a)  $Ti^{3+}$  (b)  $Ni^{2+}$   
(c)  $Cr^{3+}$  (d)  $Mn^{2+}$  (2014)
14. Reason of lanthanoid contraction is  
(a) negligible screening effect of 'f'-orbitals  
(b) increasing nuclear charge  
(c) decreasing nuclear charge  
(d) decreasing screening effect. (2014)
15. Which of the following statements about the interstitial compounds is incorrect?  
(a) They are much harder than the pure metal.  
(b) They have higher melting points than the pure metal.  
(c) They retain metallic conductivity.  
(d) They are chemically reactive. (NEET 2013)
16. Which of the following lanthanoid ions is diamagnetic?  
(At. nos. Ce = 58, Sm = 62, Eu = 63, Yb = 70)  
(a)  $Eu^{2+}$  (b)  $Yb^{2+}$   
(c)  $Ce^{2+}$  (d)  $Sm^{2+}$  (NEET 2013)
17. Identify the correct order of solubility in aqueous medium.  
(a)  $Na_2S > CuS > ZnS$   
(b)  $Na_2S > ZnS > CuS$   
(c)  $CuS > ZnS > Na_2S$   
(d)  $ZnS > Na_2S > CuS$  (NEET 2013)
18. Sc ( $Z = 21$ ) is a transition element but Zn ( $Z = 30$ ) is not because  
(a) both  $Sc^{3+}$  and  $Zn^{2+}$  ions are colourless and form white compounds.  
(b) in case of Sc, 3d orbitals are partially filled but in Zn these are filled.  
(c) last electron is assumed to be added to 4s level in case of Zn.  
(d) both Sc and Zn do not exhibit variable oxidation states. (Karnataka NEET 2013)
19. Identify the alloy containing a non-metal as a constituent in it.  
(a) Invar (b) Steel  
(c) Bell metal (d) Bronze (2012)
20. Which of the statements is not true?  
(a) On passing  $H_2S$  through acidified  $K_2Cr_2O_7$  solution, a milky colour is observed.  
(b)  $Na_2Cr_2O_7$  is preferred over  $K_2Cr_2O_7$  in volumetric analysis.  
(c)  $K_2Cr_2O_7$  solution in acidic medium is orange.  
(d)  $K_2Cr_2O_7$  solution becomes yellow on increasing the pH beyond 7. (2012)
21. The catalytic activity of transition metals and their compounds is ascribed mainly to  
(a) their magnetic behaviour  
(b) their unfilled d-orbitals  
(c) their ability to adopt variable oxidation states  
(d) their chemical reactivity (Mains 2012)
22. Which of the following exhibits only +3 oxidation state?  
(a) U (b) Th  
(c) Ac (d) Pa (Mains 2012)
23. Which one of the following does not correctly represent the correct order of the property indicated against it?  
(a)  $Ti < V < Cr < Mn$ ; increasing number of oxidation states  
(b)  $Ti^{3+} < V^{3+} < Cr^{3+} < Mn^{3+}$ ; increasing magnetic moment  
(c)  $Ti < V < Cr < Mn$ ; increasing melting points  
(d)  $Ti < V < Mn < Cr$ ; increasing 2<sup>nd</sup> ionization enthalpy (Mains 2012)
24. Four successive members of the first series of the transition metals are listed below. For which one of them the standard potential ( $E_M^{0/2+/M}$ ) value has a positive sign?  
(a) Co ( $Z = 27$ ) (b) Ni ( $Z = 28$ )  
(c) Cu ( $Z = 29$ ) (d) Fe ( $Z = 26$ ) (Mains 2012)
25. For the four successive transition elements (Cr, Mn, Fe and Co), the stability of +2 oxidation state will be there in which of the following order?  
(a)  $Mn > Fe > Cr > Co$   
(b)  $Fe > Mn > Co > Cr$   
(c)  $Co > Mn > Fe > Cr$   
(d)  $Cr > Mn > Co > Fe$   
(At. nos. Cr = 24, Mn = 25, Fe = 26, Co = 27) (2011)
26. Acidified  $K_2Cr_2O_7$  solution turns green when  $Na_2SO_3$  is added to it. This is due to the formation of  
(a)  $Cr_2(SO_4)_3$  (b)  $CrO_4^{2-}$   
(c)  $Cr_2(SO_3)_3$  (d)  $CrSO_4$  (2011)
27. Which of the following ions will exhibit colour in aqueous solutions?  
(a)  $La^{3+}$  ( $Z = 57$ ) (b)  $Ti^{3+}$  ( $Z = 22$ )  
(c)  $Lu^{3+}$  ( $Z = 71$ ) (d)  $Sc^{3+}$  ( $Z = 21$ ) (2010)

*d- and f-Block Elements*

28. Which of the following ions has electronic configuration  $[\text{Ar}]3d^6$ ?
- (a)  $\text{Ni}^{3+}$  (b)  $\text{Mn}^{3+}$   
 (c)  $\text{Fe}^{3+}$  (d)  $\text{Co}^{3+}$   
 (At. nos. Mn = 25, Fe = 26, Co = 27, Ni = 28)  
 (2010)

29. Which of the following pairs has the same size?
- (a)  $\text{Fe}^{2+}$ ,  $\text{Ni}^{2+}$  (b)  $\text{Zr}^{4+}$ ,  $\text{Ti}^{4+}$   
 (c)  $\text{Zr}^{4+}$ ,  $\text{Hf}^{4+}$  (d)  $\text{Zn}^{2+}$ ,  $\text{Hf}^{4+}$   
 (2010)

30. Match List I (substances) with List II (processes) employed in the manufacture of the substances and select the correct option.

List I (Substances)	List II (Processes)
(A) Sulphuric acid	(i) Haber's process
(B) Steel	(ii) Bessemer's process
(C) Sodium hydroxide	(iii) Leblanc process
(D) Ammonia	(iv) Contact process

(a) A - (i), B - (iv), C - (ii), D - (iii)  
 (b) A - (i), B - (ii), C - (iii), D - (iv)  
 (c) A - (iv), B - (iii), C - (ii), D - (i)  
 (d) A - (iv), B - (ii), C - (iii), D - (i)  
 (Mains 2010)

31. Which of the following oxidation states is the most common among the lanthanoids?
- (a) 4 (b) 2  
 (c) 5 (d) 3 (Mains 2010)

32. Which one of the elements with the following outer orbital configurations may exhibit the largest number of oxidation states?
- (a)  $3d^5 4s^1$  (b)  $3d^2 4s^2$   
 (c)  $3d^2 4s^2$  (d)  $3d^3 4s^2$  (2009)

33. The correct order of decreasing second ionisation enthalpy of Ti(22), V(23), Cr(24) and Mn(25) is
- (a)  $\text{Mn} > \text{Cr} > \text{Ti} > \text{V}$  (b)  $\text{Ti} > \text{V} > \text{Cr} > \text{Mn}$   
 (c)  $\text{Cr} > \text{Mn} > \text{V} > \text{Ti}$  (d)  $\text{V} > \text{Mn} > \text{Cr} > \text{Ti}$   
 (2008)

34. Which one of the following ions is the most stable in aqueous solution?
- (At. No. Ti = 22, V = 23, Cr = 24, Mn = 25)  
 (a)  $\text{V}^{3+}$  (b)  $\text{Ti}^{3+}$   
 (c)  $\text{Mn}^{3+}$  (d)  $\text{Cr}^{3+}$  (2007)

35. Identify the incorrect statement among the following:
- (a) Lanthanoid contraction is the accumulation of successive shrinkages.

- (b) As a result of lanthanoid contraction, the properties of 4d series of the transition elements have no similarities with the 5d series of elements.  
 (c) Shielding power of 4f electrons is quite weak.  
 (d) There is a decrease in the radii of the atoms or ions as one proceeds from La to Lu.  
 (2007)

36. In which of the following pairs are both the ions coloured in aqueous solution?
- (At. no. : Sc = 21, Ti = 22, Ni = 28, Cu = 29, Co = 27)  
 (a)  $\text{Ni}^{2+}$ ,  $\text{Cu}^+$  (b)  $\text{Ni}^{2+}$ ,  $\text{Ti}^{3+}$   
 (c)  $\text{Sc}^{3+}$ ,  $\text{Ti}^{3+}$  (d)  $\text{Sc}^{3+}$ ,  $\text{Co}^{2+}$ .  
 (2006)

37. Copper sulphate dissolves in excess of KCN to give
- (a)  $\text{Cu}(\text{CN})_2$  (b)  $\text{CuCN}$   
 (c)  $[\text{Cu}(\text{CN})_4]^-$  (d)  $[\text{Cu}(\text{CN})_4]^{2-}$   
 (2006)

38. More number of oxidation states are exhibited by the actinoids than by the lanthanoids. The main reason for this is
- (a) more active nature of the actinoids  
 (b) more energy difference between 5f and 6d orbitals than that between 4f and 5d orbitals  
 (c) lesser energy difference between 5f and 6d orbitals than that between 4f and 5d orbitals  
 (d) greater metallic character of the lanthanoids than that of the corresponding actinoids.  
 (2006, 2005)

39. The number of moles of  $\text{KMnO}_4$  reduced by one mole of KI in alkaline medium is
- (a) one (b) two  
 (c) five (d) one fifth. (2005)

40. 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 ionisation enthalpy?
- (a) Vanadium ( $Z = 23$ )  
 (b) Chromium ( $Z = 24$ )  
 (c) Manganese ( $Z = 25$ )  
 (d) Iron ( $Z = 26$ ) (2005)

41. The aqueous solution containing which one of the following ions will be colourless?
- (Atomic number : Sc = 21, Fe = 26, Ti = 22, Mn = 25)  
 (a)  $\text{Sc}^{3+}$  (b)  $\text{Fe}^{2+}$   
 (c)  $\text{Ti}^{3+}$  (d)  $\text{Mn}^{2+}$  (2005)

42. Among the following series of transition metal ions, the one where all metal ions have  $3d^2$  electronic configuration is  
[At. nos. Ti = 22, V = 23, Cr = 24, Mn = 25]  
(a)  $Ti^{3+}, V^{2+}, Cr^{3+}, Mn^{4+}$   
(b)  $Ti^{4+}, V^{4+}, Cr^{6+}, Mn^{7+}$   
(c)  $Ti^{4+}, V^{3+}, Cr^{2+}, Mn^{3+}$   
(d)  $Ti^{2+}, V^{3+}, Cr^{4+}, Mn^{5+}$  (2004)
43. Lanthanoids are  
(a) 14 elements in the sixth period (atomic no. 90 to 103) that are filling  $4f$  sublevel  
(b) 14 elements in the seventh period (atomic number = 90 to 103) that are filling  $5f$  sublevel  
(c) 14 elements in the sixth period (atomic number = 58 to 71) that are filling the  $4f$  sublevel  
(d) 14 elements in the seventh period (atomic number = 50 to 71) that are filling  $4f$  sublevel. (2004)
44. Which one of the following characteristics of the transition metals is associated with their catalytic activity?  
(a) High enthalpy of atomization  
(b) Paramagnetic behaviour  
(c) Colour of hydrated ions  
(d) Variable oxidation states (2003)
45. The basic character of the transition metal monoxides follows the order  
(Atomic nos. Ti = 22, V = 23, Cr = 24, Fe = 26)  
(a)  $VO > CrO > TiO > FeO$   
(b)  $CrO > VO > FeO > TiO$   
(c)  $TiO > FeO > VO > CrO$   
(d)  $TiO > VO > CrO > FeO$  (2003)
46. The correct order of ionic radii of  $Y^{3+}$ ,  $La^{3+}$ ,  $Eu^{3+}$  and  $Lu^{3+}$  is  
(Atomic nos. Y = 39, La = 57, Eu = 63, Lu = 71)  
(a)  $Y^{3+} < La^{3+} < Eu^{3+} < Lu^{3+}$   
(b)  $Y^{3+} < Lu^{3+} < Eu^{3+} < La^{3+}$   
(c)  $Lu^{3+} < Eu^{3+} < La^{3+} < Y^{3+}$   
(d)  $La^{3+} < Eu^{3+} < Lu^{3+} < Y^{3+}$  (2003)
47. General electronic configuration of lanthanides is  
(a)  $(n-2)f^{1-14}(n-1)s^2p^6d^{0-1}ns^2$   
(b)  $(n-2)f^{10-14}(n-1)d^{0-1}ns^2$   
(c)  $(n-2)f^{0-14}(n-1)d^{10}ns^2$   
(d)  $(n-2)d^{0-1}(n-1)f^{1-14}ns^2$  (2002)
48. An atom has electronic configuration  $1s^2 2s^2 2p^6 3s^2 3p^6 3d^3 4s^2$ , you will place it in  
(a) fifth (b) fifteenth  
(c) second (d) third. (2002)
49. Which of the following shows maximum number of oxidation states?  
(a) Cr (b) Fe  
(c) Mn (d) V  
(2002, 2000, 1994)
50. Zn gives  $H_2$  gas with  $H_2SO_4$  and HCl but not with  $HNO_3$  because  
(a) Zn act as oxidising agent when react with  $HNO_3$   
(b)  $HNO_3$  is weaker acid than  $H_2SO_4$  and HCl  
(c) In electrochemical series Zn is above hydrogen  
(d)  $NO_3^-$  is reduced in preference to hydronium ion. (2002)
51. Which of the following statement is not correct?  
(a)  $La(OH)_3$  is less basic than  $Lu(OH)_3$ .  
(b) In lanthanide series ionic radius of  $Lu^{+3}$  ion decrease.  
(c) La is actually an element of transition series rather lanthanides.  
(d) Atomic radius of Zn and Hf are same because of lanthanide contraction. (2001)
52. The most convenient method to protect the bottom of ship made of iron is  
(a) coating it with red lead oxide  
(b) white tin plating  
(c) connecting it with Mg block  
(d) connecting it with Pb block. (2001)
53. Which ion is colourless?  
(a)  $Cr^{4+}$  (b)  $Sc^{3+}$   
(c)  $Ti^{3+}$  (d)  $V^{3+}$  (2000)
54. Which of the following configuration is correct for iron?  
(a)  $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^7$   
(b)  $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^5$   
(c)  $1s^2 2s^2 2p^6 3s^2 3p^6 3d^5$   
(d)  $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^6$  (1999)
55. Which of the following has more unpaired  $d$ -electrons?  
(a)  $N^{3+}$  (b)  $Fe^{2+}$   
(c)  $Zn^+$  (d)  $Cu^+$  (1999)
56. Bell metal is an alloy of  
(a) Cu + Zn (b) Cu + Sn  
(c) Cu + Pb (d) Cu + Ni (1999)
57. In which of the following compounds transition metal has zero oxidation state?  
(a)  $NOClO_4$  (b)  $NH_2.NH_2$   
(c)  $CrO_5$  (d)  $[Fe(CO)_5]$   
(1999)
58. Which one of the following elements constitutes a major impurity in pig iron?  
(a) Sulphur (b) Oxygen  
(c) Silicon (d) Carbon (1998)

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59. Which one of the following ionic species will impart colour to an aqueous solution?  
 (a)  $\text{Zn}^{2+}$  (b)  $\text{Cu}^+$   
 (c)  $\text{Ti}^{4+}$  (d)  $\text{Cr}^{3+}$  (1998)
60. Which one of the following elements shows maximum number of different oxidation states in its compounds?  
 (a) Gd (b) La  
 (c) Eu (d) Am (1998)
61. Without losing its concentration,  $\text{ZnCl}_2$  solution cannot be kept in contact with  
 (a) Pb (b) Al  
 (c) Au (d) Ag (1998)
62. Which of the following does not represent the correct order of the property indicated?  
 (a)  $\text{Mn}^{2+} > \text{Ni}^{2+} < \text{Co}^{2+} < \text{Fe}^{2+}$   
 (b)  $\text{Fe}^{2+} > \text{Co}^{2+} > \text{Ni}^{2+} > \text{Cu}^{2+}$   
 (c)  $\text{Ni}^{2+} > \text{Cr}^{2+} > \text{Fe}^{2+} > \text{Mn}^{2+}$   
 (d)  $\text{Se} > \text{Ti} > \text{Cr} > \text{Mn}$  (1997)
63. The lanthanide contraction is responsible for the fact that  
 (a) Zr and Hf have about the same radius  
 (b) Zr and Zn have the same oxidation state  
 (c) Zr and Y have about the same radius  
 (d) Zr and Nb have similar oxidation state. (1997)
64. Which of the following element is responsible for oxidation of water to  $\text{O}_2$  in biological processes?  
 (a) Cu (b) Mo  
 (c) Fe (d) Mn (1997)
65. The electronic configuration of gadolinium (Atomic No = 64) is  
 (a)  $[\text{Xe}] 4f^3 5d^3 6s^2$  (b)  $[\text{Xe}] 4f^6 5d^2 6d^2$   
 (c)  $[\text{Xe}] 4f^8 5d^0 6s^2$  (d)  $[\text{Xe}] 4f^7 5d^1 6s^2$ . (1997)
66.  $\text{K}_2\text{Cr}_2\text{O}_7$  on heating with aqueous NaOH gives  
 (a)  $\text{Cr}_2\text{O}_7^{2-}$  (b)  $\text{Cr}(\text{OH})_2$   
 (c)  $\text{CrO}_4^{2-}$  (d)  $\text{Cr}(\text{OH})_3$  (1997)
67. A transition element X has a configuration  $[\text{Ar}]3d^4$  in its +3 oxidation state. Its atomic number is  
 (a) 22 (b) 19  
 (c) 25 (d) 26 (1996)
68. When calomel reacts with  $\text{NH}_4\text{OH}$ , we get  
 (a)  $\text{Hg}_2\text{O}$  (b)  $\text{HgO}$   
 (c)  $\text{HgNH}_2\text{Cl}$  (d)  $\text{NH}_2\text{-Hg-Hg-Cl}$  (1996)
69. The electronic configuration of transition elements is exhibited by  
 (a)  $ns^1$  (b)  $ns^2 np^5$   
 (c)  $ns^2 (n-1)d^{1-10}$  (d)  $ns^2 (n-1)d^{10}$  (1996)
70.  $\text{KMnO}_4$  reacts with oxalic acid according to the equation  
 $2\text{MnO}_4^- + 5\text{C}_2\text{O}_4^{2-} + 16\text{H}^+ \rightarrow 2\text{Mn}^{2+} + 10\text{CO}_2 + 8\text{H}_2\text{O}$   
 Here 20 mL of 0.1 M  $\text{KMnO}_4$  is equivalent to  
 (a) 50 mL of 0.5 M  $\text{C}_2\text{H}_2\text{O}_4$   
 (b) 20 mL of 0.1 M  $\text{C}_2\text{H}_2\text{O}_4$   
 (c) 20 mL of 0.5 M  $\text{C}_2\text{H}_2\text{O}_4$   
 (d) 50 mL of 0.1 M  $\text{C}_2\text{H}_2\text{O}_4$  (1996)
71. Amongst  $\text{TiF}_6^{2-}$ ,  $\text{CoF}_6^{3-}$ ,  $\text{Cu}_2\text{Cl}_2$  and  $\text{NiCl}_4^{2-}$ , which are the colourless species? (atomic number of Ti = 22, Co = 27, Cu = 29, Ni = 28)  
 (a)  $\text{CoF}_6^{3-}$  and  $\text{NiCl}_4^{2-}$  (b)  $\text{TiF}_6^{2-}$  and  $\text{Cu}_2\text{Cl}_2$   
 (c)  $\text{Cu}_2\text{Cl}_2$  and  $\text{NiCl}_4^{2-}$  (d)  $\text{TiF}_6^{2-}$  and  $\text{CoF}_6^{3-}$  (1995)
72. The mercury is the only metal which is liquid at  $0^\circ\text{C}$ . This is due to its  
 (a) high vapour pressure  
 (b) weak metallic bond  
 (c) high ionization energy  
 (d) both (b) and (c). (1995)
73. Which of the following statement concerning lanthanide elements is false?  
 (a) All lanthanides are highly dense metals.  
 (b) More characteristic oxidation state of lanthanide elements is +3.  
 (c) Lanthanides are separated from one another by ion exchange method.  
 (d) Ionic radii of trivalent lanthanides steadily increases with increase in the atomic number. (1994)
74. To protect iron against corrosion, the most durable metal plating on it, is  
 (a) copper plating (b) zinc plating  
 (c) nickel plating (d) tin plating. (1994)
75. When  $\text{CuSO}_4$  is electrolysed using platinum electrodes,  
 (a) copper is liberated at cathode, sulphur at anode  
 (b) copper is liberated at cathode, oxygen at anode  
 (c) sulphur is liberated at cathode, oxygen at anode  
 (d) oxygen is liberated at cathode, copper at anode. (1993)
76. The transition elements have a general electronic configuration

- (a)  $ns^2np^6nd^{1-10}$   
 (b)  $(n-1)d^{1-10}, ns^{0-2}, np^{0-6}$   
 (c)  $(n-1)d^{1-10}, ns^{1-2}$  (d)  $nd^{1-10} ns^{-2}$   
 (1991)

77. Photographic films and plates have an essential ingredient of

- (a) silver nitrate (b) silver bromide  
 (c) sodium chloride (d) oleic acid.  
 (1989)

78. Nitriding is the process of surface hardening of steel by treating it in an atmosphere of

- (a)  $NH_3$  (b)  $O_3$   
 (c)  $N_2$  (d)  $H_2S$ . (1989)

79. While extracting an element from its ore, the ore is ground and leached with dil. potassium cyanide solution to form the soluble product potassium argentocyanide. The element is

- (a) lead (b) chromium  
 (c) manganese (d) silver. (1989)

80. A blue colouration is not obtained when

- (a) ammonium hydroxide dissolves in copper sulphate

- (b) copper sulphate solution reacts with  $K_4[Fe(CN)_6]$   
 (c) ferric chloride reacts with sod. ferrocyanide  
 (d) anhydrous  $CuSO_4$  is dissolved in water.  
 (1989)

81. The electronic configurations of four elements are given below. Which element does not belong to the same family as others?

- (a)  $[Xe]4f^45d^{10}6s^2$  (b)  $[Kr]4d^{10}5s^2$   
 (c)  $[Ne]3s^23p^5$  (d)  $[Ar]3d^{10}4s^2$   
 (1989)

82. The oxidation state of Cr in  $K_2Cr_2O_7$  is

- (a) +5 (b) +3  
 (c) +6 (d) +7  
 (1988)

83. Hypo is used in photography to

- (a) reduce  $AgBr$  grains to metallic silver  
 (b) convert metallic silver to silver salt  
 (c) remove undecomposed silver bromide as a soluble complex  
 (d) remove reduced silver.  
 (1988)

### Answer Key

1. (a) 2. (b) 3. (b) 4. (c) 5. (b) 6. (b) 7. (b) 8. (d) 9. (c) 10. (a)  
 11. (a) 12. (b) 13. (b) 14. (a) 15. (d) 16. (b) 17. (b) 18. (b) 19. (b) 20. (b)  
 21. (c) 22. (c) 23. (c) 24. (c) 25. (a) 26. (a) 27. (b) 28. (d) 29. (c) 30. (d)  
 31. (d) 32. (b) 33. (c) 34. (d) 35. (b) 36. (b) 37. (c) 38. (c) 39. (b) 40. (c)  
 41. (a) 42. (d) 43. (c) 44. (d) 45. (d) 46. (b) 47. (a) 48. (a) 49. (c) 50. (d)  
 51. (a) 52. (b) 53. (b) 54. (d) 55. (b) 56. (b) 57. (d) 58. (d) 59. (d) 60. (d)  
 61. (b) 62. (c) 63. (a) 64. (c) 65. (d) 66. (c) 67. (c) 68. (c) 69. (c) 70. (d)  
 71. (b) 72. (d) 73. (d) 74. (c) 75. (b) 76. (c) 77. (b) 78. (a) 79. (d) 80. (b)  
 81. (c) 82. (c) 83. (c)