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CHEMISTRY

THE D-AND F-BLOCK ELEMENTS

Single Correct Answer Type

- On strongly heating AgNO_3 we get:
a) AgNO_2 b) Silver nitride c) Ag d) Ag_2O
- Transition metals in their compounds show:
a) Ionic bonds
b) Covalent bonds
c) Ionic and covalent bonds
d) Ionic and coordinate bonds
- $4\text{K}_2\text{Cr}_2\text{O}_7 \xrightarrow{\text{Heat}} 4\text{K}_2\text{CrO}_4 + 3\text{O}_2 + X$ In the above reaction, X is
a) CrO_3 b) Cr_2O_7 c) Cr_2O_3 d) CrO_5
- Cynaide process is used for the extraction of
a) Au b) Ag c) Cu d) Both (a) and (b)
- The colour of zinc sulphide is:
a) Yellow b) White c) Brown d) Black
- The metal extracted by cyanide process is
a) Silver b) Copper c) Iron d) Sodium
- Which metal gives hydrogen gas on heating with hot concentrated alkali?
a) Ag b) Ni c) Zn d) Cu
- Which of the following metal ions is not coloured?
a) Ti^{3+} b) Fe^{3+} c) V^{2+} d) Zn^{2+}
- The process of extraction of Au and Ag ores is based on their solubility in:
a) NH_3 b) HCl c) HNO_3 d) KCN
- In the process of extraction of gold,
Roasted gold ore
$$+\text{CN}^- + \text{H}_2\text{O} \xrightarrow{\text{O}_2} [\text{X}] + \text{OH}^-$$
$$[\text{X}] + \text{Zn} \rightarrow [\text{Y}] + \text{Au}$$
Identify the complexes [X] and [Y]
a) $\text{X} = [\text{Au}(\text{CN})_2]^-$, $\text{Y} = [\text{Zn}(\text{CN})_4]^{2-}$ b) $\text{X} = [\text{Au}(\text{CN})_4]^{3-}$, $\text{Y} = [\text{Zn}(\text{CN})_4]^{2-}$
c) $\text{X} = [\text{Au}(\text{CN})_2]^-$, $\text{Y} = [\text{Zn}(\text{CN})_6]^{4-}$ d) $\text{X} = [\text{Au}(\text{CN})_4]^-$, $\text{Y} = [\text{Zn}(\text{CN})_4]^{2-}$
- To dissolve argentite ore which of the following is used?
a) $\text{Na}[\text{Ag}(\text{CN})_2]$ b) NaCN c) NaCl d) HCl
- The magnetic moment μ , of transition metals is related to the number of unpaired electrons n as
a) $\mu = n(n+2)^2$ b) $\mu = n^2(n+2)$ c) $\mu = \frac{n}{(n+2)}$ d) $\mu = \sqrt{n(n+2)}$
- Melting of Zn metal and then pouring it into cold water gives:
a) Zn dust b) Granulated Zn c) Hard Zn metal d) Soft Zn metal
- Percentage of gold in Fool's gold is
a) Zero b) 8 c) 16 d) 30
- Copper sulphate is commercially made from copper scrap by:
a) Dissolving in hot concentrated sulphuric acid
b) Action of dilute sulphuric acid and air
c) Heating with sodium sulphate

- d) Heating with sulphur
16. Which of the following compounds has colour but no unpaired electrons?
 a) KMnO_4
 b) K_2MnO_4
 c) MnSO_4
 d) MnCl_2
17. Mercury forms amalgams with all except:
 a) Al b) Zn c) Ni d) Fe
18. Granulated Zn is obtained by:
 a) Suddenly cooling molten Zn
 b) Adding molten Zn to water
 c) Heating Zn 100 to 150°C
 d) Dropping molten Zn drop by drop
19. In the first transition series, the differentiating electron enters:
 a) 5d-orbital b) 4d-orbital c) 3d-orbital d) 2d-orbital
20. Identify the ore not containing iron.
 a) Limonite b) Siderite c) Carnallite d) Chalcopyrites
21. Purest form of iron is
 a) Cast iron b) Pig form c) Wrought iron d) Steel
22. Which metal adsorbs hydrogen?
 a) Pd b) K c) Al d) Zn
23. The most abundant ore of iron is:
 a) Haematite b) Limonite c) Magnetite d) Siderite
24. Metallic silver may be obtained from AgCl by
 a) Heating it in the current of H_2
 b) Fusing it with sand
 c) Treating with carbon monoxide
 d) Fusing it with Na_2CO_3
25. Choose the correct statement.
 a) Transition elements have low melting points.
 b) Transition elements do not have catalytic activity.
 c) Transition elements exhibit variable oxidation states.
 d) Transition elements show inert pair effect.
26. Bessemer's converter is used in the manufacture of:
 a) Cast iron b) Pig iron c) Steel d) Wrought iron
27. Number of electrons present in the outermost orbit of Fe atom is:
 a) 3 b) 1 c) 2 d) 4
28. Which will reduce acidified potassium dichromate solution?
 a) Potash alum b) Mohr's salt c) Chile saltpetre d) White vitriol
29. The lanthanoids contraction relates to
 a) Atomic radii b) Atomic as well as M^{3+} radii
 c) Valence electrons d) Oxidation states
30. Transition metals show paramagnetism due to
 a) High lattice energy b) Characteristics configuration
 c) Variable oxidation states d) Unpaired electrons
31. 'Mercury' tree can be prepared:
 a) By mixing up mercuric thiocyanate and gum
 b) By adding Nessler's reagent to a ammonium salt solution
 c) By pouring little mercury into AgNO_3 solution
 d) By heating mercuric chloride
32. When excess of SnCl_2 is added to a solution of HgCl_2 , a white ppt. turning to grey is obtained. This grey

colour is due to the formation of:

- a) Hg_2Cl_2 b) SnCl_4 c) Sn d) Hg_2
33. Among the following, the compound that is both paramagnetic and coloured is
a) $(\text{NH}_4)_2(\text{TiCl}_6)$ b) $\text{K}_2\text{Cr}_2\text{O}_7$ c) $\text{K}_3[\text{Cu}(\text{CN})_4]$ d) VOSO_4
34. All the metals form oxides of the type *MO* except
a) Copper b) Barium c) Silver d) Lead
35. Cinnabar is an ore of:
a) Lead b) Zinc c) Silver d) Mercury
36. Heating mixture of Cu_2O and Cu_2S will give
a) Cu_2SO_3 b) $\text{CuO} + \text{CuS}$ c) $\text{Cu} + \text{SO}_3$ d) $\text{Cu} + \text{SO}_2$
37. The substance that sublimes on heating is:
a) MgCl_2 b) AgCl c) HgCl_2 d) NaCl
38. Actinides
a) Have variable valency b) Include element 12
c) Are all synthetic elements d) Have only short lived isotopes
39. The 3*d*-transition series contains elements from atomic number:
a) 22 to 30 b) 21 to 30 c) 21 to 31 d) 21 to 29
40. Which of the following is not a characteristic of transition elements?
a) Variable oxidation states b) Formation of coloured compounds
c) Formation of interstitial compounds d) Natural radioactivity
41. An element which is highly toxic for plants and animals is:
a) Au b) Mn c) Hg d) Ca
42. Native silver metal forms a water soluble complex with a dilute aqueous solution of NaCN in presence of:
a) Nitrogen b) Oxygen c) CO_2 d) Ar
43. Calamine is
a) CaCO_3 b) MgCO_3 c) ZnCO_3 d) $\text{CaCO}_3 + \text{CaO}$
44. Which series of elements have nearly the same atomic radii?
a) F, Cl, Br, I b) Na, K, Rb, Cs c) Li, Be, B, C d) Fe, Co, Ni, Cu
45. Which transition elements exhibit +8 oxidation states?
a) Cu, Zn b) Ru, Os c) Ag, Au d) Cu, Cr
46. When I^- is oxidized by MnO_4^- in alkaline medium, I^- converts into
a) IO_3^- b) I_2 c) IO_4^- d) IO^-
47. Which of the following compounds is used as the starting material for the preparation of potassium dichromate?
a) $\text{K}_2\text{SO}_4 \cdot \text{Cr}_2(\text{SO}_4)_3 \cdot 24\text{H}_2\text{O}$ (Chrome alum)
b) PbCrO_4 (Chrome yellow)
c) FeCr_2O_4 (Chromite)
d) PbCrO_4 , PbO (Chrome red)
48. Which metal makes steel suitable for cutting purposes by maintaining the cutting edge of the blade?
a) Mn b) Al c) W d) C
49. Which form of iron is least ductile?
a) Hard steel b) Cast iron c) Mild steel d) Wrought steel
50. Amalgams are:
a) Always solid
b) Highly coloured alloys
c) Alloys which contain mercury as one of the contents
d) Compounds of mercury
51. Which of the following is a poison?
a) Hg_2Cl_2 b) BaSO_4 c) HgCl_2 d) NaHCO_3

52. Addition of high proportions of manganese makes steel useful in making rails of rail roads because manganese ;
 a) Gives hardness to steel and can remove oxygen and sulphur
 b) Helps the formation of oxides of iron
 c) Can show highest oxidation state of +7
 d) None of the above
53. Pick out the correct statements from the following.
 I. Cobalt (III) is more stable in octahedral complexes.
 II. Zinc forms coloured ions or complexes.
 III. Most of the *d*-block elements and their compounds are ferromagnetic.
 IV. Osmium shows (VIII) oxidation state.
 V. Cobalt (II) is more stable in octahedral complexes.
 a) 1 and 2 b) 1 and 3 c) 2 and 4 d) 1 and 4
54. Ferrous sulphate on heating gives:
 a) SO₃ b) SO₂ c) Fe₂O₃ d) All of these
55. Hydrometallurgy is based on
 a) Calcination b) Roasting c) Oxidation d) Reduction
56. In context with the transition elements, which of the following statements is incorrect?
 a) In addition to the normal oxidation state, the zero oxidation state is also shown by these elements in complexes.
 b) In the highest oxidation state, the transition metal shows basic character and form cationic complexes.
 c) In the highest oxidation state of the first five transition elements (Sc to Mn), all the 4s and 4d electrons are used for bonding.
 d) Once the *d*⁵ configuration is exceeded, the tendency to involve all the 3d electrons in bonding decreases.
57. Which one of the following pairs of elements is called 'chemical twins' because of their very similar chemical properties?
 a) Mn and W b) Mo and Tc c) Fe and Re d) Hf and Zr
58. Which one of the following exist in the oxidation state other than +3?
 a) B b) Al c) Ce d) Ga
59. Excess of KI reacts with CuSO₄ solution and then Na₂S₂O₃ solution is added to it. Which of the statement is incorrect for this reaction?
 a) CuI₂ is formed b) Na₂S₂O₃ is oxidised c) Cu₂I₂ is formed d) Evolved I₂ is reduced
60. Which is formed when iron reacts with carbon?
 a) FeC₂ b) Fe₃C c) FeC₃ d) Fe₂C
61. From sodium argentocyanide Na[Ag(CN)₂], silver is precipitated by adding a powder of:
 a) Tin b) Zinc c) Mercury d) Calcium
62. Which is used for electrical purposes?
 a) German silver b) Beryllium bronze c) Constantan d) Fool's gold
63. Monel metal is an alloy of?
 a) Cu, Ni, Fe, Mn b) Cu, Sn, Zn c) Cu, Sn, P d) Cu, Zn
64. Which metal is not used for making coins?
 a) Gold b) Silver c) Nickel d) Tungsten
65. Which is not true?
 a) ZnS is white solid which turns yellow on exposure to light
 b) ZnS is precipitated on passing H₂S to aqueous Na₂ZnO₂
 c) Basic zinc carbonate is ZnCO₃·3Zn(OH)₂
 d) HgCl₂ reacts with NH₃(g) to give [Hg(NH₃)₄]Cl₂
66. Gold is extracted by hydrometallurgical process, based on its property

- d) Prevent action of oxygen and water
85. Copper metal is not used:
- In taps and water connections
 - As an alloy in high speed drills
 - In electric motor coils
 - In brass utensils
86. In the equation,
 $4M + 8CN^- + 2H_2O + O_2 \rightarrow 4[M(CN)_2]^- + 4OH^-$
 Identify the metal *M*
- Copper
 - Iron
 - Silver
 - Zinc
87. Vapour phase refining of nickel is carried out by using
- I₂
 - Cl₂
 - HCl
 - CO
88. Lanthanide contraction is due to increase in
- Shielding by 4*f*-electrons
 - Atomic number
 - Effective nuclear charge
 - Size of 4*f*-orbitals
89. Which of the following ions is coloured?
- Cu⁺
 - Cu²⁺
 - V⁵⁺
 - Ti⁴⁺
90. Pig iron:
- Contains carbon and other impurities
 - Is pure form of iron
 - Is same as wrought iron
 - Is same as steel
91. In aqueous solution Eu²⁺ ion acts as
- An oxidizing agent
 - A reducing agent
 - An acid
 - All of these
92. Transition elements form complexes because of:
- Small cation size
 - Vacant *d*-orbitals
 - Large ionic charge
 - All are correct
93. Philosopher's wool on heating with BaO at 1100° C produce
- Ba + ZnCl₂
 - BaCdO₂
 - BaZnO₂
 - BaO₂ + Zn
94. Which of the following trivalent ion has the largest atomic radii in the lanthanide series?
- Ce
 - Pm
 - La
 - Lu
95. Ferrous ion changes to *X* ion, on reacting with acidified hydrogen peroxide. The number of *d*-electrons present in *X* and its magnetic moment (in BM) are, respectively
- 6 and 6.93
 - 5 and 5.92
 - 5 and 4.9
 - 4 and 5.92
96. Which of the following is amphoteric oxide?
- SO₂
 - B₂O₃
 - ZnO
 - Na₂O
97. The valence shell electronic configuration of Cr²⁺ ion is
- 4s⁰3d⁴
 - 3p⁶4s²
 - 4s²3d²
 - 4s²3d⁰
98. Which of the following ore is an ore of copper?
- Argentite
 - Haematite
 - Malachite
 - Calamine
99. Chinese white is:
- ZnS
 - ZnCO₃
 - ZnS + BaSO₄
 - ZnO
100. Cerium (*Z* = 58) is an important member of the lanthanides. Which of the following statement about cerium is incorrect?
- The common oxidation states of cerium are +3 and +4
 - Cerium (IV) acts as an oxidizing agent
 - The +4 oxidation state of cerium is not known in solutions
 - The +3 oxidation state of cerium is more stable than the +4 oxidation state
101. If orange-red colour is absorbed from white light, the observed colour is:
- Yellow
 - Orange
 - Blue
 - Violet

102. Which forms interstitial compounds?
 a) Fe b) Ni c) Co d) All of these
103. Steel that is resistant to acids is:
 a) Carbon steel b) Molybdenum steel c) Stainless steel d) Nickel alloy steel
104. Hardness of transition elements is due to:
 a) Large atomic size
 b) Metallic bonding
 c) Covalent bonds
 d) High ionization energy
105. Which does not possess allotropic forms?
 a) C b) Sn c) Fe d) P
106. When hydrogen peroxide is added to acidified potassium dichromate, a blue colour is produced due to formation of
 a) CrO_3 b) Cr_2O_3 c) CrO_5 d) CrO_4^{2-}
107. In the extraction of Ag, Ag_2S is dissolved in:
 a) HCl b) HNO_3 c) KCN d) H_2SO_4
108. The meniscus of mercury in a glass tube is:
 a) Convex upwards b) Concave c) Plane d) Convex inwards
109. The iron obtained from the blast furnace is called:
 a) Pig iron b) Cast iron c) Wrought iron d) Steel
110. Which one of the following has strongest metallic bonding?
 a) Fe b) Sc c) V d) Cr
111. The alloy which contains nickel is:
 a) Brass b) Bell metal c) Bronze d) German silver
112. A hard and resistant alloy generally used in tip of nib of pen is:
 a) Os, Ir b) Pt, Cr c) V, Fe d) Fe, Cr
113. The extraction of which of the following metals involves bessemerization?
 a) Fe b) Ag c) Al d) Cu
114. CuCl absorbs
 a) CO_2 b) SO_2 c) H_2SO_4 d) CO
115. CrO_3 dissolves in aqueous NaOH to give
 a) CrO_4^{2-} b) $\text{Cr}(\text{OH})_3^-$ c) CrO_7^{2-} d) $\text{Cr}(\text{OH})_2$
116. One of the following metals is obtained by leaching its ore with dilute cyanide solution. Identify it.
 a) Titanium b) Vanadium c) Silver d) Zinc
117. German silver alloy contains
 a) Zinc, silver and copper b) Nickel, silver and copper
 c) Germanium, silver and copper d) Zinc, nickel and copper
118. Copper metal of high purity is obtained by:
 a) Carbon reduction b) Hydrogen reduction c) Electrolytic method d) Thermite process
119. The solubility of silver bromide in hypo solution is due to the formation of:
 a) Ag_2SO_3 b) $\text{Ag}_2\text{S}_2\text{O}_3$ c) $[\text{Ag}(\text{S}_2\text{O}_3)]$ d) $[\text{Ag}(\text{S}_2\text{O}_3)_2]^{3-}$
120. Which of the following is a ferrous alloy?
 a) Invar b) Solder c) Magnalium d) Type metal
121. Consider the following statements.
 (I) $\text{La}(\text{OH})_3$ is the least basic among hydroxides of lanthanides
 (II) Zr^{4+} and Hf^{4+} possess almost the same ionic radii
 (III) Ce^{4+} can act as an oxidizing agent
 Which of the above is/are true?
 a) (I) and (III) b) (II) and (III) c) (II) only d) (I) only

122. Iodide of Millon's base is:

- a) $K_2[Hgl_4]$ b) $Hg \begin{matrix} \diagup NH_2 \\ \diagdown O - Hg - I \end{matrix}$ c) $[Hg_2O.NH_2OH].H_2O$ d) $Hg(NH_2)I + Hg$

123. The alloy of steel that is used for making automobile parts and utensils is:

- a) Stainless steel b) Nickel steel c) Tungsten steel d) Chromium steel

124. Which is used as substitute for platinum in jewellery?

- a) Rolled gold b) White gold c) Purple of Cassius d) Faraday's gold

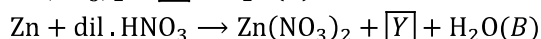
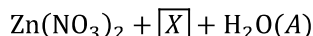
125. The highest oxidation state exhibited by transition metals is

- a) +7 b) +8 c) +6 d) +5

126. $Cl_2 + HgO \rightarrow ?$

- a) $Cl_2O + HgCl$ b) $Cl_2O + HgCl_2$ c) $ClO + HgCl$ d) $ClO + HgCl_2$

127. The following two reactions HNO_3 with Zn are given as (equations are not balanced) $Zn + conc. HNO_3 \rightarrow$



In reactions A and B, the compounds X and Y respectively, are

- a) NO_2 and NO b) NO_2 and NO_2 c) NO and NO_2 d) NO_2 and NH_4NO_3

128. Which of the following electronic configurations belong to transition elements?

- a) $KL 3s^2p^6d^5, 4s^1$
 b) $KL 3s^2p^6d^{10}, 4s^2p^3$
 c) $KL 3s^2p^6d^{10}, 4s^24p^1$
 d) $KLM 4s^2p^6d^{10}, 5s^25p^1$

129. The magnetic moment of a transition metal ion is $\sqrt{15}$ BM. Therefore, the number of unpaired electrons present in it, is

- a) 3 b) 4 c) 1 d) 2

130. Which is not true in case of transition metals?

- a) They are malleable and ductile
 b) They have high melting and boiling points
 c) They crystallise with body centred cubic and hexagonal close packed structure only
 d) They show variable oxidation states although not always

131. Formation of coloured solution is possible when metal ion in the compound contains

- a) Paired electrons b) Lone pair of electrons
 c) Unpaired electrons d) None of these

132. Carbon in wrought iron is present as

- a) Silicon carbide b) Iron carbide
 c) Graphite d) Partly iron carbide and partly as graphite

133. An element is in M^{3+} form. Its electronic configuration is $[Ar]3d^1$, the ion is

- a) Ca^{2+} b) Sc^+ c) Ti^{4+} d) Ti^{3+}

134. Each transition series contains:

- a) 12 elements b) 10 elements c) 14 elements d) 8 elements

135. Lanthanide contraction is caused due to

- a) The appreciable shielding on outer electrons by $4f$ -electrons from the nuclear charge.
 b) The appreciable shielding on outer electrons by $5d$ -electrons from the nuclear charge.
 c) The same effective nuclear charge from Ce to Lu.
 d) The imperfect shielding on outer electrons by $4f$ -electrons from the nuclear charge.

136. The properties of Zr and Hf are similar because

- a) Both belong to d -block b) Both belong to same group of Periodic Table
 c) Both have similar radii d) Both have same number of electrons

137. In nitroprusside ion, the iron and NO exist as Fe^{11} and NO^+ rather than Fe^{III} and NO. These forms can be

differentiated by :

- a) Estimating the concentration of iron
- b) Measuring the concentration of CN^- .
- c) Measuring the solid state magnetic moment
- d) Thermally decomposing the compound

138. Railway wagon axles are made by heating rods of iron embedded in charcoal powder. The process is known as

- a) Case hardening
- b) Tempering
- c) Sheradizing
- d) Annealing

139. A substance which is not paramagnetic is:

- a) $\text{Cr}(\text{ClO}_4)_3$
- b) KMnO_4
- c) TiCl_3
- d) VOBr_2

140. Which pair of compounds is expected to show similar colour in aqueous medium?

- a) FeCl_3 and CuCl_2
- b) VOCl_2 and CuCl_2
- c) VOCl_2 and FeCl_2
- d) FeCl_2 and MnCl_2

141. Lunar caustic is chemically:

- a) Silver chloride
- b) Silver nitrate
- c) Sodium hydroxide
- d) Potassium nitrate

142. Lanthanoids and actinoids resembles in:

- a) Electronic configuration
- b) Oxidation state
- c) Ionisation energy
- d) Formation of complex

143. Horn silver is:

- a) AgCl
- b) Ag_2S
- c) SnS
- d) AgNO_3

144. Silver nitrate solution gives a red precipitate with:

- a) Sodium iodide
- b) Potassium chloride
- c) Calcium nitrate
- d) Sodium chromate

145. Of the following outer electronic configurations of atoms, the highest oxidation state is achieved by which one of them?

- a) $(n-1)d^8 ns^2$
- b) $(n-1)d^5 ns^1$
- c) $(n-1)d^3 ns^2$
- d) $(n-1)d^5 ns^2$

146. Powdered silver ore is treated with NaCN solution and air is bubbled through the mixture to give:

- a) AgCN
- b) Ag
- c) $\text{Ag}(\text{CN})_2$
- d) $\text{Na}[\text{Ag}(\text{CN})_2]$

147. Chromium has most stable oxidation state of:

- a) +5
- b) +3
- c) +2
- d) +4

148. Cuprous salts are generally colourless while cuprous oxide is:

- a) Green
- b) Blue
- c) Red
- d) Yellow

149. Which of the following manganese oxide is amphoteric?

- a) MnO_2
- b) Mn_2O_3
- c) Mn_2O_7
- d) MnO

150. Impurities of Cu and Ag from gold are removed by

- a) Boiling impure gold with dil. H_2SO_4
- b) Boiling impure gold with conc. H_2SO_4
- c) Electrolytically
- d) Both (b) and (c)

151. Identify the incorrect statement among the following

- a) *d*-block elements show irregular and erratic chemical properties among themselves.
- b) La and Lu have partially filled *d*-orbitals and no other partially filled orbital.
- c) The chemistry of various lanthanoids is very similar.
- d) *4f* and *5f*-orbitals are equally shielded.

152. Which of the following ions form most stable complex compound?

- a) Mn^{2+}
- b) Ni^{2+}
- c) Fe^{2+}
- d) Cu^{2+}

153. Silver halides are used in photography because they are:

- a) Photosensitive
- b) Soluble in hyposolution
- c) Soluble in NH_4OH
- d) Insoluble in acids

154. $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$ on heating gives a gas which is also given by
 a) Heating NH_4NO_2 b) Heating NH_4NO_3 c) $\text{Mg}_3\text{N}_2 + \text{H}_2\text{O}$ d) $\text{Na}(\text{Comp.}) + \text{H}_2\text{O}$
155. Gold dissolves in aqua regia forming:
 a) Auric chloride b) Aurous chloride c) Chloroauric acid d) Aurous nitrate
156. Essential constituent of an amalgam is:
 a) Fe b) An alkali metal c) Silver d) Mercury
157. In blast furnace, iron oxide is reduced by
 a) Hot blast of air b) Carbon monoxide c) Carbon d) Silica
158. In M is element of actinoids series, the degree of complex formation decreases in the order
 a) $M^{4+} > M^{3+} > \text{MO}_2^{2+} > \text{MO}_2^+$ b) $\text{MO}_2^+ > \text{MO}_2^{2+} > M^{3+} > M^{4+}$
 c) $M^{4+} > \text{MO}_2^{2+} > M^{3+} > \text{MO}_2^+$ d) $\text{MO}_2^{2+} > \text{MO}_2^+ > M^{4+} > M^{3+}$
159. Stainless steel has iron and
 a) Cr b) Cu c) Co d) Zn
160. The correct statement(s) among the following is/are;
 (i) All the d and f -block elements are metals
 (ii) All d and f -block elements form coloured ions
 (iii) All d and f -block elements are paramagnetic
 a) (i) only b) (i) and (ii) c) (ii) and (iii) d) All of these
161. Which of the following pair will have effective magnetic moment equal?
 a) Ti^{2+} and V^{2+} b) Cr^{2+} and Fe^{2+} c) Cr^{3+} and Mn^{2+} d) V^{2+} and Sc^{3+}
162. Which of the following compounds volatilises on heating?
 a) FeCl_3 b) HgCl_2 c) CaCl_2 d) MgCl_2
163. Aufbau law is not valid for:
 a) Cu and Ar b) Cu and Cr c) Cr and Ar d) Fe and Ag
164. Which of the following statements is not true for Mohr's salt?
 a) It decolourises KMnO_4 solution
 b) It is a double salt
 c) Oxidation state of iron is +3
 d) It is a primary standard
165. The $3d$ -block element that exhibits maximum number of oxidation states is
 a) Sc b) Ti c) Mn d) Zn
166. Number of electrons in $3d$ -orbital of V^{2+} , Cr^{2+} , Mn^{2+} , and Fe^{2+} are 3, 4, 5 and 6 respectively. Which of the following ions will have largest value of magnetic moment (μ)?
 a) V^{2+} b) Cr^{2+} c) Mn^{2+} d) Fe^{2+}
167. Identify the reaction that does not take place during the smelting process of copper extraction
 a) $2\text{FeS} + 3\text{O}_2 \rightarrow 2\text{FeO} + 2\text{SO}_2 \uparrow$ b) $\text{Cu}_2\text{O} + \text{FeS} \rightarrow \text{Cu}_2\text{S} + \text{FeO}$
 c) $2\text{Cu}_2\text{S} + 3\text{O}_2 \rightarrow 2\text{Cu}_2\text{O} + 2\text{SO}_2 \uparrow$ d) $\text{FeO} + \text{SiO}_2 \rightarrow \text{FeSiO}_3$
168. Which of the following is most stable?
 a) V^{3+} b) Ti^{3+} c) Mn^{3+} d) Cr^{3+}
169. The white anhydrous copper sulphate on heating decomposes to give:
 a) $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ b) $\text{CuSO}_4 \cdot \text{H}_2\text{O}$ c) $\text{CuO} + \text{SO}_3$ d) SO_3
170. NH_3 does not form complex with:
 a) AgI b) AgBr c) AgCl d) None of these
171. Which sulphide has a yellow colour?
 a) CuS b) PbS c) ZnS d) CdS
172. Which of the following is not a property of transition elements?
 a) Fixed valency b) Catalytic property c) Paramagnetism d) Colour
173. Fe^{2+} ion can be distinguished by Fe^{3+} ion by:
 a) BaCl_2 b) AgNO_3 c) NH_4SCN d) None of these

174. Which one of the following transition metal ions is diamagnetic?
 a) Co^{2+} b) Ni^{2+} c) Cu^{2+} d) Zn^{2+}
175. Elements of group 11 and 12 are:
 a) Normal elements b) Transition elements c) Alkaline earth metals d) Alkali metals
176. Hard steel contains:
 a) No carbon b) 0.6-1.5% carbon c) 5% carbon d) 0.5-0.2% carbon
177. Iron, once dipped in concentrated H_2SO_4 , does not displace copper from sulphate solution, because:
 a) It is less reactive than copper
 b) A layer of sulphate is deposited on it
 c) A layer of oxide is deposited on it
 d) None of the above
178. Which shows a jump in second ionization potential?
 a) Co b) Ni c) Zn d) Cu
179. Manganese steel contains:
 a) Fe + C + Mn b) Fe + C + Al c) Fe + Mn d) Fe + Mn + Cr
180. Which sets are the transition elements?
 a) Ti, Zr, Hf b) V, Nb, Ta c) Rh, Rb, Pd d) All of these
181. The extraction of nickel involves:
 a) The formation of $\text{Ni}(\text{CO})_4$
 b) The decomposition of $\text{Ni}(\text{CO})_4$
 c) The formation and thermal decomposition of $\text{Ni}(\text{CO})_4$
 d) The formation and catalytic decomposition of $\text{Ni}(\text{CO})_4$
182. Cu_2O is:
 a) Black oxide of copper b) Copper(II) oxide c) Red oxide of copper d) Cupric oxide
183. Number of electrons transferred in each case when KMnO_4 acts as an oxidising agent to give MnO_2 , Mn^{2+} , $\text{Mn}(\text{OH})_3$ and MnO_4^{2-} , are respectively:
 a) 3, 5, 4 and 1 b) 4, 3, 1 and 5 c) 1, 3, 4 and 5 d) 5, 4, 3 and 1
184. When metallic copper comes in contact with moisture, a green powder/pasty coating can be seen over it. This is chemically known as
 a) Copper carbonate-copper sulphate b) Copper carbonate-copper hydroxide
 c) Copper sulphate-copper sulphide d) Copper sulphide-copper carbonate
185. German silver is an alloy of:
 a) Copper, zinc and nickel
 b) Copper and silver
 c) Copper and tin
 d) Copper, zinc and silver
186. Incorrect statement is
 a) Atomic radii of Zr and Hf are same because of lanthanide contraction
 b) Zn and Hg do not show variable valency
 c) Across the lanthanides series, the basicity of lanthanide hydroxides decreases
 d) Protactinium is transuranic element
187. -----is the best conductor of electricity among coinage metals:
 a) Ag b) Cu c) Au d) All of these
188. Cu^{2+} ions give precipitate with $\text{K}_4\text{Fe}(\text{CN})_6$. The colour of precipitate is:
 a) Blue b) Green c) Red d) Brown
189. Across the lanthanide series, the basicity of lanthanide hydroxides
 a) Increases b) Decreases
 c) First increases and then decreases d) First decreases and then increases
190. 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 sodium ferrocyanide
 d) Anhydrous white $CuSO_4$ is dissolved in water
191. Useful lanthanoid member is:
 a) Cerium b) Lanthanum c) Neodymium d) Lutetium
192. Which of the following has got incompletely filled f -subshell?
 a) Gadolinium b) Lutetium c) Lawrencium d) Tantalum
193. Silver nitrate is usually supplied in coloured bottles because it is:
 a) Oxidized in air
 b) Decomposed in sunlight
 c) Explodes in sunlight
 d) Reactive towards air in sunlight
194. Mercury is purified by:
 a) Solidifying
 b) Distillation in vacuum
 c) Treatment with dil. HNO_3
 d) Electrolytic method
195. Pt black is
 a) Pt metal mixed with MnO_2
 b) Velvety black power obtained by reduction of $PtCl_4$ with glucose or sodium formate
 c) Pt metal coated with black colour
 d) None of the above
196. 'Hydride gap' is referred to which region of the Periodic Table?
 a) Groups 3, 4 and 5 b) Groups 5, 6 and 7 c) Groups 4, 5 and 6 d) Groups 7, 8 and 9
197. Which of the following electronic configuration represents the maximum magnetic moment?
 a) d^3 b) d^2 c) d^8 d) d^6
198. Volatile metals Zn, Cd and Hg are purified by:
 a) Liqutation b) Distillation c) Cupellation d) Electrolysis
199. Zinc, cadmium and mercury are:
 a) d -block elements b) p -block elements c) s -block elements d) f -block elements
200. Select the incorrect statement about transition elements
 a) The last electron enters in the d -orbital
 b) Their properties are in between s and p -block elements
 c) Scandium is the transition element with smallest atomic radii
 d) Their common oxidation state is +3
201. Which of the following types of metals form the most efficient catalysts?
 a) Alkali metals b) Alkaline earth metals
 c) Transition metals d) All of these
202. In the reaction $SnCl_2 + 2HgCl_2 \rightarrow A + SnCl_4$, A is:
 a) Hg_2Cl_2 b) Hg c) HgCl d) $HgCl_3$
203. Mohr salt is made up of which combination of salt?
 a) Ammonium sulphate and potash. b) Ammonium sulphate and ferrous sulphate.
 c) Ammonium sulphate and copper sulphate. d) Ammonium sulphate and magnesium sulphate.
204. Maximum oxidation state is presented by:
 a) CrO_2Cl_2 and MnO_4^- b) MnO_2 c) $[Fe(CN)_6]^{3-}$ and $[Co(CN)_6]^{3-}$
205. Lanthanides are
 a) 14 elements in the sixth period (atomic no. = 90 to 103) that are filling $4f$ sub level.
 b) 14 elements in the seventh period (atomic no. = 90 to 103) that are filling $5f$ sub level.

- c) 14 elements in the sixth period (atomic no. = 58 to 71) that are filling 4f sub-level.
 d) 14 elements in the seventh period (atomic no. = 58 to 71) that are filling 4f sub-level.
206. By annealing, steel
 a) Becomes soft
 b) Becomes liquid
 c) Becomes hard and brittle
 d) Is covered with a thin film of Fe₃O₄
207. Which chromium compound is widely used in tanning of leather?
 a) Cr₂O₃
 b) CrO₂Cl₂
 c) CrCl₃
 d) K₂SO₄·Cr₂(SO₄)₃·24H₂O
208. Purple of cassius is
 a) Copper solution
 b) Platinum solution
 c) Gold solution
 d) Copper solution
209. Which is obtained when SO₂ is bubbled through a solution of CuCl₂?
 a) Cu
 b) Cu₂Cl₂
 c) CuSO₄
 d) CuS
210. Substance which do not react with cold water but react with steam are:
 a) C, Ca, SO₂
 b) Fe, Al, Cl₂
 c) CO₂, Na, Mg
 d) C, Fe, Mg
211. Which metal has the highest melting point?
 a) Pt
 b) W
 c) Pd
 d) Au
212. Choose the correct reaction to prepare mercurous chloride (calomel)
 a) $\text{HgCl}_2 + \text{Hg} \xrightarrow{\Delta}$
 b) $\text{Hg} + \text{Cl}_2 \rightarrow$
 c) $\text{HgCl}_2 + \text{SnCl}_2 \rightarrow$
 d) Both (a) and (c)
213. Density, malleability and ductility in coinage metals increase in the order:
 a) Cu, Ag, Au
 b) Au, Ag, Cu
 c) Ag, Au, Cu
 d) Ag, Cu, Au
214. An acidified solution of KMnO₄ oxidizes:
 a) Sulphates
 b) Sulphites
 c) Nitrates
 d) Ferric salts
215. Magnetite is:
 a) 2Fe₂O₃·3H₂O
 b) FeS₂
 c) Fe₃O₄
 d) Fe₂O₃
216. Least paramagnetic property is shown by
 a) Fe
 b) Mn
 c) Ni
 d) Cu
217. Platinum, Palladium, irridium, etc., are called noble metals because:
 a) Alfred Nobel discovered them
 b) They are inert towards many common reagents
 c) They are shining, lustrous and pleasing to look
 d) They are found in native state
218. Silver obtained from argentiferous lead is purified by:
 a) Distillation
 b) Froth floatation
 c) Cupellation
 d) Reaction with KCN
219. Paris green is:
 a) Cu(CH₃COO)₂
 b) Cu₃(AsO₃)₂·2H₂O
 c) Cu(CH₃COO)₂·3Cu(AsO₃)
 d) Co(AlO₂)₂
220. Variable valency is shown by
 a) Normal elements
 b) Transition elements
 c) Typical elements
 d) None of these
221. Which statement about Hg is correct?
 a) Hg is the only liquid metal
 b) Hg²⁺ salts are more stable than Hg₂²⁺ salts
 c) Hg forms no amalgam with iron and platinum
 d) All of the above
222. Most abundant transition element is:
 a) Fe
 b) Sc
 c) Os
 d) None of these
223. Which one of the following acts as an oxidizing agent?
 a) Np⁴⁺
 b) Sm²⁺
 c) Eu²⁺
 d) Yb²⁺
224. Which of the oxide of manganese is amphoteric?
 a) MnO₂
 b) Mn₂O₃
 c) Mn₂O₇
 d) MnO
225. Which one of the following reactions will occur on heating AgNO₃ above its melting point?
 a) $2\text{AgNO}_3 \rightarrow 2\text{Ag} + 2\text{NO}_2 + \text{O}_2$
 b) $2\text{AgNO}_3 \rightarrow 2\text{Ag} + \text{N}_2 + 3\text{O}_2$

245. Transuranic elements begins with
 a) Np b) Cm c) Pu d) U
246. A solution when diluted with H₂O and boiled gives a white ppt. On addition of excess NH₄Cl/NH₄OH, the volume of precipitate decreases due to dissolution leaving behind a white gelatinous precipitate. The precipitate which dissolves in NH₄OH/NH₄Cl is:
 a) Zn(OH)₂ b) Al(OH)₃ c) Mg(OH)₂ d) Ca(OH)₂
247. Which of the following is not correct about transition metals?
 a) Their compounds are generally coloured. b) They can form ionic or covalent compounds.
 c) Their melting and boiling points are high. d) They do not exhibit variable valency.
248. Which one of the following does not decolourise an acidified KMnO₄ solution?
 a) SO₂ b) FeCl₃ c) H₂O₂ d) FeSO₄
249. Which of the following pairs of elements cannot form an alloy?
 a) Zn, Cu b) Fe, Hg c) Fe, C d) Hg, Na
250. Which is known as purple of Cassius?
 a) Colloidal silver solution
 b) Colloidal gold solution
 c) Aqueous solution of soap
 d) As₂S₃ colloidal solution
251. Which of the following ionic species will impart colour to an aqueous solution?
 a) Cu⁺ b) Zn²⁺ c) Cr³⁺ d) Ti⁴⁺
252. The outer electronic configuration of Gd (At. No 64) is
 a) 4f³ 5d⁵ 6s² b) 4f⁸ 5d⁰ 6s² c) 4f⁴ 5d⁴ 6s² d) 4f⁷ 5d¹ s²
253. Mercury is a liquid metal because
 a) It has a completely filled s-orbital.
 b) It has a small atomic size.
 c) It has a completely filled d-orbital that prevents d – d overlapping of orbitals.
 d) It has a completely filled d-orbital that causes d – d overlapping.
254. Composition of azurite mineral is
 a) CuCO₃, CuO b) Cu(HCO₃)₂, Cu(OH)₂ c) 2CuCO₃, Cu(OH)₂ d) CuCO₃, 2Cu(OH)₂
255. What would happen when a solution of potassium chromate is treated with an excess of dilute nitric acid?
 a) Cr³⁺ and Cr₂O₇²⁻ are formed
 b) Cr₂O₇²⁻ and H₂O are formed
 c) CrO₄²⁻ is reduced to + 3 state of Cr
 d) None of the above
256. Zn gives H₂ gas with H₂SO₄ and HCl but not with HNO₃ because:
 a) Zn acts as an oxidising agent when react with HNO₃
 b) HNO₃ is weaker acid than H₂SO₄ and HCl
 c) In electrochemical series Zn is above hydrogen
 d) NO₃⁻ ion is reduced in preference to hydronium ion
257. Which of the following is also known as “Fools gold”?
 a) Wurtzite b) Iron pyrites c) Chalcocite d) Silver glance
258. When steam is passed over heated iron, one of the products is:
 a) FeO b) Fe₂O₃ c) Fe₃O₄ d) FeSO₄
259. In the electrolytic refining of zinc
 a) Graphite is at the anode. b) The impure metal is at the cathode.
 c) The metal ion get reduced at the anode. d) Acidified zinc sulphate is the electrolyte.
260. Which pair of lanthanides is used in glass, blowers, goggles?
 a) Np, Pu b) Pu, Gd c) Fm, Ho d) Pr, Ho
261. One of the following metals forms a volatile compound and this property is taken advantage for its

- extraction. This metal is
- a) Iron b) Nickel c) Cobalt d) Tungsten
262. Pig iron is converted into steel by reducing the amount of carbon contained in it, in a:
- a) Blast furnace b) Pyrite burner c) Bessemer's converter d) None of these
263. Which one of the following forms a complex of coordination number 2 with excess of CN^- ions?
- a) Cu^+ b) Ag^+ c) Ni^{2+} d) Fe^{2+}
264. The radius of La^{3+} (Atomic number of La = 57) is 1.06 Å. Which one of the following given values will be closest to the radius of Lu^{3+} ?
(Atomic number of Lu=71)
- a) 1.60 Å b) 1.40 Å c) 1.06 Å d) 0.85 Å
265. When oxyhaemoglobin changes to deoxyhaemoglobin, Fe^{2+} ion changes from
- a) Diamagnetic to paramagnetic b) Paramagnetic to diamagnetic
c) Diamagnetic to ferromagnetic d) Paramagnetic to ferromagnetic
266. Which statement is incorrect?
- a) Silver glance mainly contains silver sulphide
b) Gold is found in native state
c) Zinc blende mainly contains zinc chloride
d) Copper pyrites also contain Fe_2S_3
267. Amongst TiF_6^{2-} , CoF_6^{3-} , Cu_2Cl_2 and NiCl_4^{2-}
(atomic no Ti=22, Co=27, Cu=29, Ni=28) the colourless species are
- a) CoF_6^{3-} and NiCl_4^{2-} b) TiF_6^{2-} and CoF_6^{3-} , c) Cu_2Cl_2 and NiCl_4^{2-} d) TiF_6^{2-} and Cu_2Cl_2
268. Among the following series of transition metal ions, the one where all metal ions have $3d^2$ electronic configuration is:
- a) Ti^{3+} , V^{2+} , Cr^{3+} , Mn^{4+}
b) Ti^+ , V^{4+} , Cr^{6+} , Mn^{7+}
c) Ti^{4+} , V^{3+} , Cr^{2+} , Mn^{3+}
d) Ti^{2+} , V^{3+} , Cr^{4+} , Mn^{5+}
269. Calomel (Hg_2Cl_2) on reaction with ammonium hydroxide gives
- a) HgO b) Hg_2O
c) $\text{NH}_2-\text{Hg}-\text{Hg}-\text{Cl}$ d) HgNH_2Cl
270. Steel resistant to acid is:
- a) Carbon steel b) Molybdenum steel c) Stainless steel d) Nickel steel
271. Non-stoichiometric compounds are formed by:
- a) Alkali metals
b) Transition elements
c) Noble gases
d) More than one of the above elements
272. *d*-block elements generally form:
- a) Covalent hydrides b) Metallic hydrides c) Interstitial hydrides d) Salt-like hydrides
273. The element present in red blood cells of human blood is:
- a) Fe b) Ra c) Co d) All of these
274. The element which exhibit both vertical and horizontal similarities are:
- a) Inert gas elements
b) Representative elements
c) Rare elements
d) Transition elements
275. Which occurs in nature in free state?
- a) Fe b) Co c) Ni d) Pt
276. H_2S is passed in aqueous solution of to give a white precipitate of ZnS .

- a) $ZnCl_2$ b) $Zn(NO_3)_2$ c) $(CH_3COO)_2Zn$ d) None of these
277. Which of the following are *d*-block elements but not regarded as transition elements?
 a) Cu, Ag, Au b) Zn, Cd, Hg c) Fe, Co, Ni d) Ru, Rh, Pd
278. Which is the least soluble in water?
 a) AgCl b) Ag_2S c) AgI d) AgBr
279. Which of the following elements is alloyed with copper to form brass?
 a) Bismuth b) Zinc c) Lead d) Antimony
280. When $KMnO_4$ reacts with acidified $FeSO_4$:
 a) Only $FeSO_4$ is oxidized
 b) Only $KMnO_4$ is oxidized
 c) $FeSO_4$ is oxidized and $KMnO_4$ is reduced
 d) None of the above
281. The nitrate of which metal leaves metallic globule on heating strongly?
 a) $Cu(NO_3)_2$ b) $AgNO_3$ c) $NaNO_3$ d) $Pb(NO_3)_2$
282. Mond process is used in the extraction of:
 a) Co b) Ni c) Mo d) Zn
283. Blue colour/precipitate will be obtained when $K_4[Fe(CN)_6]$ reacts with:
 a) Fe(II) ions b) Cu(II) ions c) Fe(III) ions d) Cu(I) ions
284. Two of the constituents of German silver are
 a) Ag + Cu b) Ag + Zn c) Cu + Zn d) Cu + Sn
285. A metal is left exposed to air for sometime. It becomes coated with basic green carbonate. The metal is:
 a) K b) Cu c) Zn d) Al
286. Zn and Cd do not show variable valency, because:
 a) They have only two electrons in outermost subshells
 b) Their *d*-subshells are complete
 c) Their *d*-subshells are incomplete
 d) They are relatively soft metals
287. One of the important uses of ferrous sulphate is in the:
 a) Manufacture of blue-black ink
 b) Manufacture of chalks
 c) Preparation of hydrogen sulphide
 d) Preparation of sulphur dioxide
288. Blue vitriol is:
 a) $CuSO_4 \cdot 7H_2O$ b) $ZnSO_4 \cdot 7H_2O$ c) $CuSO_4 \cdot 5H_2O$ d) $FeSO_4 \cdot 7H_2O$
289. Zn does not show variable valency because of
 a) Complete *d*-subshell b) Inert pair effect c) $4s^2$ -subshell d) None of these
290. Which of the following statement (s) is/are correct with reference to the ferrous and ferric ions?
 a) Fe^{3+} given brown colour with ammonium thiocyanate
 b) Fe^{3+} gives brown colour with potassium ferricyanide
 c) Fe^{3+} gives red colour with potassium thiocyanate
 d) Fe^{2+} gives red precipitate with potassium ferricyanide
291. In vapour state $Cu(NO_3)_2$ and $Cu_2(CH_3COO)_4 \cdot 2H_2O$ exist as:
 a) Dimer, monomer b) Monomer, dimer c) Monomer, monomer d) Dimer, dimer
292. Which oxide is least stable at room temperature?
 a) CuO b) Ag_2O c) ZnO d) Sb_2O_3
293. Which of the following metal is correctly matched with its ore?
- | Metal | Ore | | |
|--------------|-------------|-----------|----------|
| a) Zinc | Calamine | b) Silver | Ilmenite |
| c) Magnesium | Cassiterite | d) Tin | Azurite |

294. Iron is obtained on large scale from haematite(Fe_2O_3):
- By reduction
 - By oxidation
 - By reduction followed by oxidation
 - By oxidation followed by reduction
295. Which oxide of manganese is amphoteric?
- MnO
 - MnO_2
 - Mn_2O_7
 - Mn_2O_3
296. Which among the following metals does not dissolve in aqua regia?
- Pt
 - Pd
 - Au
 - Ir
297. The one which has lowest ox. no. of Hg:
- $\text{Hg}(\text{NO}_2)_2$
 - HgCl_2
 - $\text{Hg}(\text{NO}_3)_2$
 - Hg_2Cl_2
298. The fraction of chlorine precipitated by AgNO_3 solution from $[\text{Co}(\text{NH}_3)_5\text{Cl}]\text{Cl}_2$ is:
- 1/2
 - 2/3
 - 1/3
 - 1/4
299. Which statement is correct?
- Cd rods are used in atomic reactors to slow down nuclear reaction
 - Cd is a good absorber of neutrons
 - CdS is used as pigment
 - All of the above
300. Acidified solution of chromic acid on treatment with hydrogen peroxide yields
- $\text{CrO}_5 + \text{H}_2\text{O}$
 - $\text{H}_2\text{Cr}_2\text{O}_7 + \text{H}_2\text{O} + \text{O}_2$
 - $\text{Cr}_2\text{O}_3 + \text{H}_2\text{O} + \text{O}_2$
 - $\text{CrO}_3 + \text{H}_2\text{O} + \text{O}_2$
301. Substance used in glazing pottery is:
- ZnO
 - ZnCl_2
 - Alum
 - Calome
302. The brown ring complex compound is formulated as $[\text{Fe}(\text{H}_2\text{O})_5(\text{NO})]\text{SO}_4$. The oxidation state of iron is:
- +1
 - +2
 - +3
 - +4
303. 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?
- $\text{Cr} > \text{Mn} > \text{Co} > \text{Fe}$
 - $\text{Mn} > \text{Fe} > \text{Cr} > \text{Co}$
 - $\text{Fe} > \text{Mn} > \text{Co} > \text{Cr}$
 - $\text{Co} > \text{Mn} > \text{Fe} > \text{Cr}$
- (At. Nos. Cr = 24, Mn = 25, Fe = 26, Co = 27)
304. Which of the following methods can't be used to prepare anhydrous zinc chloride?
- Passing dry chlorine over heated zinc
 - Passing dry hydrogen chloride over heated zinc
 - Heating the crystal of $\text{ZnCl}_2 \cdot 2\text{H}_2\text{O}$
 - Distilling metallic zinc with mercury (II) chloride
305. Prussian blue is due to formation of
- $\text{Fe}[\text{Fe}(\text{CN})_6]_3$
 - $\text{Fe}_2[\text{Fe}(\text{CN})_6]$
 - $\text{Fe}_4[\text{Fe}(\text{CN})_6]_3$
 - $\text{Fe}_3[\text{Fe}(\text{CN})_6]$
306. For which one of the following ions, the colour is not due to a $d - d$ transition?
- CrO_4^{2-}
 - $\text{Cu}(\text{NH}_3)_4^{2+}$
 - $\text{Ti}(\text{H}_2\text{O})_6^{3+}$
 - CoF_6^{3-}
307. Which of the following statement is not correct?
- $\text{La}(\text{OH})_3$ is less basic than $\text{Lu}(\text{OH})_3$
 - In lanthanide series ionic radius of Ln^{3+} ions decrease
 - Zn, Cd, Hg are colourless and are diamagnetic
 - Mn shows maximum oxidation state is +7
308. Which of the following lanthanide is commonly used?
- Lanthanum
 - Nobelium
 - Thorium
 - Cerium
309. Blueprint papers have a coating of:

- a) Mixture of potassium ferricyanide and ammonium ferric citrate or ferric oxalate
 b) Sodium nitroprusside
 c) Prussian blue
 d) None of the above
310. Colour in transition metal compounds is attributed to:
 a) Small sized metal ions
 b) Absorption of light in the UV region
 c) Complete *ns*-subshell
 d) *d – d* transition
311. Which is not ferromagnetic?
 a) Fe b) Co c) Ni d) V
312. Various methods have been employed for protecting iron from rusting. Which of the following is incorrect?
 a) Zinc plating is more permanent than chrome plating
 b) Zinc protects iron but gets corroded itself
 c) Tin plating is cheap but unreliable
 d) None of the above
313. A clock spring is heated to a high temperature and then suddenly plunged into cold water. This treatment will cause the metal to become:
 a) Soft and ductile
 b) More springy than before
 c) Hard and brittle (case hardening)
 d) Strongly magnetic
314. Which has the lowest melting point?
 a) Cs b) Na c) Hg d) Sn
315. The temperature of the slag zone in the metallurgy of iron using blast furnace is
 a) 1200-1500°C b) 1500-1600°C c) 400-700°C d) 800-1000°C
316. Oxygen is absorbed by molten Ag, which is evolved on cooling and the silver particles are scattered; the phenomenon is known as:
 a) Silvering of mirror b) Spitting of silver c) Frosting of silver d) Hairing of silver
317. Which of the following statements regarding copper salts is not true?
 a) Copper(I) Disproportionates into Cu and Cu(II) in aqueous solution
 b) Copper(I) can be stabilised by the formation of insoluble complex compounds such as CuCl_2^- and $\text{Cu}(\text{CN})_2^-$
 c) Copper(I) oxide is red powder
 d) Hydrated CuSO_4 is $\text{Cu}(\text{H}_2\text{O})_4\text{SO}_4 \cdot \text{H}_2\text{O}$
318. Which compound cannot be prepared?
 a) $\text{Zn}(\text{OH})_2$ b) $\text{Cd}(\text{OH})_2$ c) $\text{Hg}(\text{OH})_2$ d) HgCl_2
319. The colour of solution obtained by adding excess of KI in the solution of HgCl_2 is:
 a) Orange b) Brown c) Red d) Colourless
320. Which of the following is the correct sequence of atomic weights of given elements?
 a) $\text{Co} > \text{Ni} > \text{Fe}$ b) $\text{Fe} > \text{Co} > \text{Ni}$ c) $\text{Fe} > \text{Ni} > \text{Co}$ d) $\text{Ni} > \text{Co} > \text{Fe}$
321. Which of the following is known as lunar caustic when in the fused state?
 a) Silver nitrate b) Silver sulphate c) Silver chloride d) Sodium sulphate
322. Silver chloride dissolves in a solution of ammonia but not in water because:
 a) Ammonia is a better solvent than water
 b) Silver ion forms a complex ion with ammonia
 c) Ammonia is a stronger base than water
 d) The dipole moment of water molecule is higher than that of ammonia molecule
323. Which metal is ferromagnetic?

- a) Cr b) Fe c) Zn d) Al
324. Which of the following is called white vitriol?
 a) $ZnCl_2$ b) $MgSO_4 \cdot 7H_2O$ c) $Al_2(SO_4)_3$ d) $ZnSO_4 \cdot 7H_2O$
325. The process of heating of steel to temperature much below redness and then slowly cooling is called:
 a) Annealing b) Hardening c) Tempering d) Case hardening
326. "925 fine silver" means an alloy of
 a) 7.5 % of Ag and 92.5 % Cu b) 92.5 % Ag and 7.5% Cu
 c) 80% Ag and 20% Cu d) 90% Ag and 10% Cu
327. The compound used in preservation of wood is:
 a) NaCl b) $HgCl_2$ c) $ZnCl_2$ d) $CaCl_2$
328. In photography we use
 a) AgI b) NH_3 c) AgCl d) AgBr
329. Brass, bronze and German silver have one common metal. This is
 a) Zn b) Fe c) Al d) Cu
330. Transition metal used for making joins in jewellery is
 a) Zn b) Cu c) Ag d) Cd
331. Which of the following elements has the maximum first ionization potential?
 a) V b) Ti c) Mn d) Cr
332. Fulminating gold is:
 a) $CuFeS_2$
 b) FeS_2
 c) $Au(NH_2) = NH$ or AuN_2H_3
 d) $AuCl_3$
333. The transition metal present in vitamin B_{12} is:
 a) Fe b) Co c) Ni d) Na
334. The most convenient method to protect bottom of ship made of iron is
 a) Coating with red lead oxide b) Connecting with 'Pb' block
 c) Connecting with 'Mg' block d) White tin plating
335. The reaction $MnO_4^- + e \rightarrow MnO_4^{2-}$ takes place in:
 a) Basic medium
 b) Acidic medium
 c) Neutral medium
 d) Both acidic and basic medium
336. Which metal is used in making cathode containers of dry cell?
 a) Zn b) Bi c) Cr d) Fe
337. Railway wagon axles are made by heating iron rods embedded in charcoal powder. This process is known as
 a) Tempering b) Case hardening c) Sherardising d) Annealing
338. The methods chiefly used for the extraction of lead and tin from their ores are respectively
 a) Self reduction and carbon reduction b) Self reduction and electrolytic reduction
 c) carbon reduction and self reduction d) Cyanide process and carbon reduction
339. The most stable oxidation state of lanthanides is
 a) +2 b) +4 c) 0 d) +3
340. In context of the lanthanoids, which of the following statements is not correct?
 a) There is a gradual decrease in the radii of the members with increasing atomic number in the series.
 b) All the members exhibit +3 oxidation state.
 c) Because of similar properties the separation of lanthanoids is not easy.
 d) A availability of 4f-electrons results in the formation of compounds in +4 state for all members of the series.

341. The matte obtained in the extraction of copper contains:
 a) FeSiO_2 b) $\text{SiO}_2 + \text{FeS}$ c) $\text{FeS} + \text{Cu}_2\text{S}$ d) $\text{CuS} + \text{SiO}_2 + \text{FeO}$
342. The electronic configuration of actinoids can to be assigned with degree of certainty because of
 a) Overlapping of inner orbitals
 b) Free movement of electrons over all the orbitals
 c) Small energy difference between $5f$ and $6d$ levels
 d) None of the above
343. In Mac Arthur forrest method, silver is extracted from the solution of $\text{Na}[\text{Ag}(\text{CN})_2]$ by the use of
 a) Fe b) Mg c) Cu d) Zn
344. Transition elements are coloured
 a) Due to unpaired d -electrons b) Due to small size
 c) Due to metallic nature d) All of the above
345. Which one of the elements with the following outer orbital configurations may exhibit the largest number of oxidation states?
 a) $3d^2 4s^2$ b) $3d^3 4s^2$ c) $3d^5 4s^1$ d) $3d^5 4s^2$
346. Lanthanide contraction occurs because
 a) f -orbitals are incompletely filled
 b) f -orbital electrons are easily lost
 c) f -orbital do not come out on the surface of atom and are buried inside
 d) f -orbital electron are poor shielders of nuclear charge
347. Silver nitrate produces a black stain on skin due to:
 a) Its corrosive action
 b) Its reduction to metallic silver
 c) Its strong reducing action
 d) The formation of a complex compound
348. The most stable ion is:
 a) Mn^{2+} b) Sc^{4+} c) Fe^{2+} d) Mn^{3+}
349. The +3 ion of which one of the following has half-filled $4f$ sunshell?
 a) La b) Lu c) Gd d) Ce
350. Calomel may be freed from traces of metallic mercury by washing with:
 a) dil. HNO_3 b) dil. H_2SO_4 c) Water d) Aqua regia
351. One of the following is false for Hg:
 a) It can evolve hydrogen from H_2S
 b) It is metal
 c) It has high specific heat
 d) It is less reactive than H_2
352. Brass is an alloy of:
 a) Zn and Cu b) Cu and Sn c) Zn and Sn d) Cu, Zn and sn
353. Maximum paramagnetism in $3d$ -series is shown by:
 a) Mn b) Co c) Ni d) Fe
354. The metal used for making armoured steel for tanks and domestic safes is:
 a) Manganese b) Aluminium c) Lead d) Chromium
355. Which of the following metals has been used in making boats because it has resistance to corrosion by seawater?
 a) W b) Cu c) Ni d) Ti
356. Which ore contains both iron and copper?
 a) Cuprite b) Chalcocite c) Chalcopyrite d) Malachite
357. $\text{K}_2\text{Cr}_2\text{O}_7 \xrightarrow{\Delta} \text{K}_2\text{CrO}_4 + \text{O}_2 + X$. In the above reaction X is
 a) CrO_3 b) Cr_2O_7 c) Cr_2O_3 d) CrO_5

358. Blood red colour solution is produced when ferric chloride solution is treated with:
 a) KCN b) KSCN c) KCNO d) $K_3[Fe(CN)_6]$
359. The group of metals which is known as ferrous metals is:
 a) Fe, Co, Ni b) Ru, Rh, Pd c) Os, Ir, Pt d) Cr, Mn, Cu
360. In the chemical reaction;
 $Ag_2O + H_2O + 2e^- \rightarrow 2Ag + 2OH^-$
 a) Water is oxidised b) Electrons are reduced c) Silver is oxidised d) Silver is reduced
361. Which is not correct for transition metals?
 a) Variable oxidation states
 b) Complex formation
 c) Partially filled *d*-orbitals
 d) All the ions are colourless
362. Magnetic moment of $[Ag(CN)_2]^-$ is zero. How many unpaired electrons are there?
 a) Zero b) 4 c) 3 d) 1
363. The first man-made atom is:
 a) Os b) Na c) Zr d) Tc
364. Amongst the following, the lowest degree of paramagnetism per mole of the compound at 298 K will be shown by
 a) $MnSO_4 \cdot 4H_2O$ b) $NiSO_4 \cdot 6H_2O$ c) $FeSO_4 \cdot 6H_2O$ d) $CuSO_4 \cdot 5H_2O$
365. Which compound does not dissolve in hot, dil. HNO_3 ?
 a) HgS b) PbS c) CuS d) CdS
366. Heteropoly acids are formed by:
 a) Be b) Fe c) Mo d) Cr
367. When mercury (I) chloride is heated and the vapour so evolved are cooled, the substance on sublimation thus collected consists of
 a) Mercury and mercury (II) chloride b) Mercury (II) chloride
 c) Mercury (I) and mercury (II) chloride d) Mercury
368. Steel contains:
 a) 2.5–4.5%C b) 0.5–1.5%C c) 0.12–0.25%C d) 1–2%C
369. Silver halides are used in photography because they are:
 a) Photosensitive
 b) Soluble in hypo solution
 c) Soluble in NH_4OH
 d) Insoluble in acids
370. A lady's 18 carat gold wedding ring has become discoloured with some minute drops of mercury from a broken thermometer. Which of the following treatments would restore it to its original condition?
 a) Place it in hot strong nitric acid
 b) Place it in cold dilute hydrochloric acid
 c) Heat it gently in a sand-bath
 d) Heat it in chlorine
371. Oxidation state of Hg in amalgam is:
 a) Zero b) One c) Two d) Three
372. In the manufacture of iron from an iron oxide ore, limestone is added because it acts as:
 a) An oxidizing agent b) A reducing agent c) A flux d) A precipitating agent
373. The coordination number of copper in the complex formed by adding excess of NH_3 to $CuSO_4$ solution is:
 a) 4 b) 2 c) 6 d) 5
374. In order to refine "blister copper" it is melted in a furnace and is stirred with green logs of wood. The purpose is:
 a) To expel the dissolved gases in the blister copper

- b) To bring the impurities to surfaces and oxidise them
 c) To increase the carbon content of copper
 d) To reduce the metallic oxide impurities with hydrocarbon gases liberated from the wood
375. Permanent magnets are generally made of alloys of
 a) Mn b) Co c) Pb d) Zn
376. Which metal sulphide is not black?
 a) NiS b) CoS c) CuS d) ZnS
377. The white solid that turns black on addition of NH_4OH is:
 a) AgCl b) PbCl_2 c) Hg_2Cl_2 d) Hg_2I_2
378. Which of the following represents ammonium molybdate?
 a) $(\text{NH}_4)_2\text{MoO}_4$ b) $(\text{NH}_4)\text{MoO}_2$ c) $(\text{NH}_4)_2\text{MoO}_3$ d) $\text{NH}_4 \cdot 12\text{MoO}_3$
379. Gold and silver are called noble metals, because:
 a) They do not normally react
 b) Even acids cannot dissolve them
 c) They are used in jewellery
 d) They are worn by noble men
380. The colour of ${}_{62}\text{Sm}^{3+}$ is yellow. The expected colour of ${}_{66}\text{Dy}^{3+}$ is
 a) Yellow b) Red c) Blue d) Green
381. Which is not an ore of iron?
 a) Haematite b) Magnetite c) Cassiterite d) Limonite
382. On adding excess of NH_3 solution to CuSO_4 solution, the dark blue colour is due to
 a) $[\text{Cu}(\text{NH}_3)]^+$ b) $[\text{Cu}(\text{NH}_3)_4]^{2+}$ c) $[\text{Cu}(\text{NH}_3)_2]^{2+}$ d) None of these
383. Other forms of iron can be produced from:
 a) Cast iron b) Wrought iron c) Pig iron d) Steel
384. The variety of iron having highest melting point is:
 a) Pig iron b) Cast iron c) Wrought iron d) Steel
385. Most of the transition metals are paramagnetic due to the presence of:
 a) Completed d -orbitals b) Completed f -orbitals c) Unpaired electrons d) None of these
386. Spelter is:
 a) Impure Cu b) Impure zinc c) ZnO d) CuO
387. Which of the following is philosopher's wool?
 a) ZnO b) HgO c) Ag_2O d) CuO
388. The density of transition metals....in a series.
 a) Gradually increases b) Gradually decreases c) Remains constant d) None of these
389. Silver containing lead as impurity is purified by
 a) Poling b) Cupellation c) Lavigation d) Distillation
390. Which of the following elements is present as the impurity to the maximum extent in the pig iron?
 a) Phosphorus b) Manganese c) Carbon d) Silicon
391. The magnetic moment of Cu^{2+} ion is
 a) 2.73 b) Zero c) 1.93 d) 1.73
392. Percentage of nickel in nickel steel is:
 a) 1.5% b) 3.5% c) 6.5% d) 8.5%
393. The formula of mercurous ion is:
 a) Hg^+ b) Hg_2^+ c) Hg_2^{2+} d) None of these
394. Which pair consists only acidic oxides?
 a) $\text{CrO}_3, \text{Mn}_2\text{O}_7$ b) $\text{ZnO}_2, \text{Al}_2\text{O}_3$ c) CaO, ZnO d) $\text{Na}_2\text{O}, \text{Al}_2\text{O}_3$
395. The extraction of which of the following metals involves bessemerization?
 a) Fe b) Ag c) Al d) Cu
396. Nessler's reagent is:

- a) KHgI_4 b) K_2HgI_4 c) $\text{K}_2\text{HgI}_4 + \text{NaOH}$ d) $\text{KHgI}_4 + \text{NaOH}$
397. Mac Arthur and Forest cyanide process is used in the extraction of:
a) Cu b) Ag and Au c) Fe d) Cr
398. Which is the chief ore of copper?
a) Galena b) Copper pyrites c) Sphalerite d) Siderite
399. Spiegeleisen is an alloy of:
a) Fe and Mn b) Fe, Mn and C c) Fe, Mn and Cr d) Fe and Cr
400. Among the following ions (hydrated), the colourless metal ion is
a) Cu^+ b) Cu^{2+} c) Fe^{2+} d) Mn^{2+}
401. Transition elements exhibit positive oxidation states only. This is because of:
a) Their large size of the atoms
b) Their electropositive nature
c) Their electronegative nature
d) Their paramagnetic nature
402. Transition metal with low oxidation number will act as
a) An oxidizing agent b) A base c) An acid d) None of these
403. The composition of bell metal is
a) Cu + Sn b) Cu + Ni c) Cu + Zn d) Cu + Ag
404. The most correct statement for transition metals is:
a) They possess low b.p.
b) They exhibit inert pair effect
c) They exhibit variable oxidation states
d) They do not possess catalytic property
405. During the process of electrolytic refining of copper, some metals present as impurity settle as 'anode mud'.
These are
a) Fe and Ni b) Ag and Au c) Pb and Zn d) Se and Ag
406. A compound of a metal ion M^{x+} ($Z = 24$) has a spin only magnetic moment of $\sqrt{15}$ Bohr Magnetons. The number of unpaired electrons in the compound are:
a) 2 b) 4 c) 5 d) 3
407. Lightest transition element is:
a) Fe b) Sc c) Os d) Co
408. AuCl_3 when heated in air gives:
a) Gold oxide b) Gold perchlorate c) Gold nitride d) AuCl
409. White vitriol is:
a) $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ b) $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ c) $\text{ZnSO}_4 \cdot 7\text{H}_2\text{O}$ d) $\text{NiSO}_4 \cdot 5\text{H}_2\text{O}$
410. The metal which liberates hydrogen from hot NaOH solution is:
a) Zn b) Cu c) Ag d) Fe
411. A yellow precipitate will be obtained if AgNO_3 is added to a solution of:
a) KIO_3 b) KI c) CHI_3 d) CH_2I_2
412. Which form of iron has lowest percentage of carbon?
a) Cast iron
b) Wrought iron
c) Steel
d) All have same percentage
413. The element that does not form a nitride is:
a) Al b) Mg c) Ag d) Ca
414. When dil. H_2SO_4 is added to aqueous solution of potassium chromate, yellow colour of solution turns to orange colour. It indicates

- a) Chromate ions are reduced.
 b) Chromate ions are oxidised.
 c) Mono centric complex is converted into dicentric complex.
 d) Oxygen gets removed from chromate ions.
415. Copper exhibits only +2 oxidation state in its stable compounds. Why?
 a) Copper is transition metal in +2 state.
 b) +2 state compounds of copper are formed by exothermic reactions.
 c) Electron configuration of copper in +2 state is $[\text{Ar}]3d^9 4s^0$.
 d) Copper gives coloured compounds in +2 state.
416. In blast furnace the highest temperature is in:
 a) Reduction zone b) Slag zone c) Combustion zone d) Fusion zone
417. Anhydrous ferric chloride is prepared by
 a) Dissolving $\text{Fe}(\text{OH})_3$ in concentrated HCl. b) Dissolving $\text{Fe}(\text{OH})_3$ in dilute HCl.
 c) Passing dry HCl over heated iron scrap. d) Passing dry Cl_2 gas over heated iron scrap.
418. Green vitriol is
 a) $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ b) $\text{ZnSO}_4 \cdot 7\text{H}_2\text{O}$ c) $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ d) $\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$
419. Photographic films or plates have ... as an essential ingredient.
 a) Silver bromide b) Silver oxide c) Silver thiosulphate d) Silver nitrate
420. During the extraction of gold the following reactions take place

$$\text{Au} + \text{CN}^- + \text{H}_2\text{O} \xrightarrow{\text{O}_2} [\text{X}]$$

$$[\text{X}] + \text{Zn} \rightarrow [\text{Y}] + \text{Au}$$
 X and Y are respectively
 a) $[\text{Au}(\text{CN})_2]^-$ and $[\text{Zn}(\text{CN})_6]^{4-}$ b) $[\text{Au}(\text{CN})_4]^{2-}$ and $[\text{Zn}(\text{CN})_4]^{2-}$
 c) $[\text{Au}(\text{CN})_4]^{3-}$ and $[\text{Zn}(\text{CN})_4]^{2-}$ d) $[\text{Au}(\text{CN})_2]^-$ and $[\text{Zn}(\text{CN})_4]^{2-}$
421. Second series of transition elements starts with:
 a) Yttrium b) Chromium c) Zinc d) Scandium
422. The electronic configuration of chromium is
 a) $[\text{Ne}]3s^2 3p^6 3d^4 4s^2$ b) $[\text{Ne}]3s^2 3p^6 3d^5 4s^1$
 c) $[\text{Ne}]3s^2 3p^5 3d^5 4s^2$ d) $[\text{Ne}]3s^2 3p^5 3d^6 4s^1$
423. Which of the following belongs to the actinoid series of elements?
 a) Y b) Ta c) U d) Lu
424. Which of the following statements is not true in regard to transition elements?
 a) All their ions are colourless
 b) They show variable valency
 c) They readily form complex compounds
 d) Their ions contain partially filled *d*-electron levels
425. Sterling silver:
 a) Is an alloy of Ag + Cu
 b) Contains 80% Ag + 20% Cu
 c) Is used in jewellery
 d) All of the above
426. The impurity of sulphur makes the iron:
 a) Fibrous b) Red short c) Cold short d) Malleable
427. In Cu (*Z* = 29):
 a) 13 electrons have spin in one direction and 16 electrons in other direction
 b) 14 electrons have spin in one direction and 15 electrons in other direction
 c) All the electrons have spin in one direction
 d) None of the above

428. Which of the following has the maximum number of unpaired *d*-elements?
 a) Fe^{2+} b) Cu^+ c) Zn d) Ni^{3+}
429. Zn cannot displace the following ions from their aqueous solutions:
 a) Ag^+ b) Cu^{2+} c) Fe^{2+} d) Na^+
430. The lanthanide contraction is responsible for the fact that
 a) Zr and Zn have the same oxidation state b) Zr and Hf have about the same radius
 c) Zr and Nb have similar oxidation state d) Zr and Y have about the same radius
431. Prussian blue is formed when:
 a) Ferrous sulphate reacts with FeCl_3
 b) Ferric sulphate reacts with $\text{K}_4[\text{Fe}(\text{CN})_6]$
 c) Ferrous ammonium sulphate reacts with FeCl_3
 d) Ammonium sulphate reacts with FeCl_3
432. On the extraction of iron, the slag produced is
 a) CO b) FeSiO_3 c) MgSiO_3 d) CaSiO_3
433. In the purification of copper by electrolysis, which is incorrect?
 a) Acidic solution of Cu(II) sulphate is used
 b) H_3O^+ ion is discharged at cathode
 c) Anode is made of Impure copper
 d) OH^- is discharged at anode
434. HgCl_2 is reduced to Hg_2Cl_2 by:
 a) CH_3COOH b) CCl_4 c) HCOOH d) NH_3
435. Among the following the compound that is both paramagnetic and coloured is
 a) $\text{K}_2\text{Cr}_2\text{O}_7$ b) $(\text{NH}_4)_2[\text{TiCl}_6]$ c) VO_2 d) $\text{K}_3[\text{Cu}(\text{CN})_4]$
436. Ferrous sulphate ($\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$) is known as
 a) Vermillion b) Glauber's salt c) Green vitriol d) Mohr's salt
437. Identify the reaction that does not take place in a blast furnace.
 a) $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$ b) $\text{CaO} + \text{SiO}_2 \rightarrow \text{CaSiO}_3$
 c) $2\text{Fe}_2\text{O}_3 + 3\text{C} \rightarrow 4\text{Fe} + 3\text{CO}_2$ d) $\text{CO}_2 + \text{C} \rightarrow 2\text{CO}$
438. The number of incomplete orbitals in inner transition elements is:
 a) 3 b) 4 c) 2 d) 1
439. The final step in the metallurgical extraction of Cu metal from Cu pyrites takes place in a Bessemer converter. The reaction taking place is:
 a) $\text{Cu}_2\text{S} + \text{O}_2 \rightarrow 2\text{Cu} + \text{SO}_2$
 b) $4\text{Cu}_2\text{O} + \text{FeS} \rightarrow 8\text{Cu} + \text{FeSO}_4$
 c) $2\text{Cu}_2\text{O} + \text{Cu}_2\text{S} \rightarrow 6\text{Cu} + \text{SO}_2$
 d) $\text{Cu}_2\text{S} + 2\text{FeO} \rightarrow 2\text{CuO} + 2\text{Fe} + \text{SO}_2$
440. The smelting of iron in a blast furnace involves the following processes:
 a) Combustion b) Reduction c) Slag formation d) All of these
441. The flux used in the smelting of copper is:
 a) Limestone b) Magnesite c) Silica d) Coke
442. The magnetic moment of a salt containing Zn^{2+} ion is
 a) 0 b) 1.87 c) 5.92 d) 2
443. The common metal in brass, bronze and german silver is:
 a) Cu b) Mg c) Al d) Zn
444. Which of the following is not a member of *3d*-transition series?
 a) Fe b) Co c) Au d) Cu
445. The formula of azurite is
 a) $\text{CuCO}_3 \cdot \text{Cu}(\text{OH})_2$ b) $2\text{CuCO}_3 \cdot \text{Cu}(\text{OH})_2$ c) $\text{CuCO}_3 \cdot 2\text{Cu}(\text{OH})_2$ d) $\text{CuSO}_4 \cdot \text{Cu}(\text{OH})_2$
446. The formula of haematite is :

- a) Fe_3O_4 b) Fe_2O_3 c) FeCO_3 d) FeS_2
447. A substance which turns blue when treated with water is:
 a) CuSO_4 b) $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ c) CoSO_4 d) $\text{Au}_2(\text{SO}_4)_3$
448. Which metal does not form amalgam?
 a) Fe b) Cu c) Ag d) Zn
449. Which of the following is correct?
 a) Calomel is mercuric chloride
 b) Calomel is widely used as an antiseptic
 c) Calomel is used medically as purgative
 d) Calomel is freely soluble in water
450. The process used in obtaining metallic silver from argentite is:
 a) Fused mixture of Ag_2S and KCl is electrolysed
 b) Ag_2S is reduced with CO
 c) Ag_2S is roasted to Ag_2O which is reduced with C
 d) Treating with NaCN solution followed by metal displacement with zinc
451. Which one of the following pairs of substances on reaction will not evolve H_2 gas?
 a) Iron and H_2SO_4 (aq)
 b) Iron and steam
 c) Copper and HCl(g)
 d) Sodium and ethyl alcohol
452. Which statement about group 12 elements is wrong?
 a) Zinc forms an alloy with copper
 b) Zn^{2+} is stable
 c) Mercury gives compounds with +1 and +2 valencies
 d) Hg is a liquid element
453. Which of the following is coated over iron articles to protect iron from corrosion?
 a) Paint b) Zinc metal c) Tin metal d) All of these
454. The gas obtained by reactions of $\text{K}_4\text{Fe}(\text{CN})_6$ with conc. H_2SO_4 is
 a) H_2S b) CO c) NO_2 d) CO_2
455. Blister copper is
 a) Impure Cu b) Cu alloy
 c) Pure Cu d) Cu having 1% impurity
456. Effective magnetic moment of Sc^{3+} ion is
 a) 1.73 b) 0 c) 5.92 d) 2.83
457. ZnS containing minute traces of MnS becomes:
 a) Deliquescent b) Phosphorescent c) Hygroscopic d) None of these
458. Platinum metal can be dissolved in:
 a) Hot concentrated hydrochloric acid
 b) Hot concentrated nitric acid
 c) Hot dilute sulphuric acid
 d) A mixture of hydrochloric and nitric acids
459. Ruthenium carbonyl is:
 a) $\text{Ru}(\text{CO})_4$ b) $\text{Ru}(\text{CO})_5$ c) $\text{Ru}(\text{CO})_8$ d) $\text{Ru}(\text{CO})_6$
460. Preparation of looking mirrors involves the use of:
 a) Red lead
 b) Ammoniacal silver nitrate
 c) Ammoniacal AgNO_3 + red lead
 d) Ammoniacal AgNO_3 + red lead + HCHO
461. In the dichromate dianion :

- a) 4 Cr—O bonds are equivalent
 b) 6 Cr—O bonds are equivalent
 c) all Cr—O bonds are equivalent
 d) all Cr—O bonds are non-equivalent
462. In the electrolytic purification of copper some gold is found in the:
 a) Cathode b) Cathode mud c) Anode mud d) None of these
463. Percentage of gold in 21.6 carat gold is:
 a) 21.6 b) 90 c) 10 d) 70
464. An explosion takes place when conc. H_2SO_4 is added to KMnO_4 . Which of the following is formed?
 a) Mn_2O_7 b) MnO_2 c) MnSO_4 d) Mn_2O_3
465. Which statement is not correct?
 a) $\text{Fe}(\text{CO})_5$ reacts with Br_2Cl_4
 b) Carbonyl complexes are usually formed with transition metals
 c) All transition metals form mono metallic carbonyls
 d) The decomposition of $\text{Ni}(\text{CO})_4$ to give Ni is used in the extraction of Ni by Mond's process
466. Which is the common oxidation state of the first transition series of elements?
 a) +2 b) +6 c) +8 d) +4
467. Which of the following is correct?
 a) Duralumin : Al + Cu + Mg + Ag b) German silver: Cu + Zn + C
 c) Gun metal: Cu + Zn + Sn d) Solder : Pb + Al
468. As percentage of carbon increase in iron, its hardness:
 a) Decreases b) Increases c) Remains same d) None of these
469. Which oxide of Mn is acidic in nature?
 a) MnO b) Mn_2O_7 c) Mn_2O_3 d) MnO_2
470. Corrosive sublimate (HgCl_2) can be used to distinguish between
 a) Formic acid and acetic acid b) Acetaldehyde and butanone
 c) Formaldehyde and propanone d) All of the above
471. KMnO_4 in basic medium is used as
 a) Strong oxidising agent b) Strong reducing agent
 c) Strong hydrogenating agent d) Poor reducing agent
472. *d*-block elements are arranged inof periodic table.
 a) Three series b) Six series c) Two series d) Four series
473. Which one of the following metals is extracted by a carbon reduction process?
 a) Copper b) Iron c) Aluminium d) Magnesium
474. The spin only magnetic moment of Mn^{4+} ion is nearly
 a) 3 BM b) 6 BM c) 4 BM d) 5 BM
475. Coinage alloy has the composition of:
 a) Ag + Cu + Ni b) Au + Ag + Cu c) Au + Zn + Ag d) Ag + Fe + Cu
476. Which of the following is used for sterilization of surgical instruments?
 a) HgCl_2 b) ZnCl_2 c) Hg_2Cl_2 d) ZnO
477. Rusting of iron in moist air involves:
 a) Loss of electrons by Fe
 b) Gain of electrons by Fe
 c) Neither gain nor loss of electrons
 d) Hydration of Fe
478. A chocolate brown coloured compound with acetic acid and potassium ferrocyanide is obtained from a salt solution containing:
 a) Cu b) Cd c) Sn d) Hg
479. What is the oxidation state of iron in Mohr's salt?

494. Lithopone, a white pigment, consists of:
 a) Al_2O_3 and CaCO_3 b) BaS and PbSO_4 c) ZnS and BaSO_4 d) PbS and MgO
495. The aqueous solution containing which one of the following ions will be colourless?
 a) Ti^{3+} b) Mn^{2+} c) Sc^{3+} d) Fe^{2+}
496. Among the lanthanoids which was obtained by synthetic methods?
 a) Lu b) Pm c) Pr d) Gd
497. The tendency to show complex formation is maximum in:
 a) *s*-block elements b) *p*-block elements c) *d*-block elements d) *f*-block elements
498. *5f*-level is successively filled up in:
 a) Lanthanoids b) Actinoids c) Rare gases d) Transition elements
499. Potassium manganate (K_2MnO_4) is formed when:
 a) Cl_2 is passed into an aqueous KMnO_4 solution
 b) MnO_2 is fused with KOH in air
 c) Formaldehyde reacts with KMnO_4 in presence of strong alkali
 d) KMnO_4 reacts with concentrated H_2SO_4
500. The sandstone in some iron ores is removed by:
 a) Carbon filters b) Compressed air c) Limestone d) Sulphuric acid
501. Copper sulphate solution reacts with KCN and gives
 a) $\text{K}_3[\text{Cu}(\text{CN})_4]$ b) CuCN c) $\text{Cu}(\text{CN})_2$ d) $\text{K}_2[\text{Cu}(\text{CN})_4]$
502. Which of the following ions has the highest magnetic moment?
 a) Ti^{3+} b) Sc^{3+} c) Mn^{2+} d) Zn^{2+}
503. The colour of Mohr's salt, $(\text{NH}_4)_2\text{SO}_4\text{Fe}(\text{SO}_4) \cdot 6\text{H}_2\text{O}$ is:
 a) White b) Green c) Violet d) Blue
504. Of the ions Zn^{2+} , Ni^{2+} and Cr^{3+} , (atomic number of $\text{Zn}=30$, $\text{Ni}=28$, $\text{Cr}=24$)
 a) All three are coloured
 b) All three are colourless
 c) Only Zn^{2+} is colourless and Ni^{2+} and Cr^{3+} are coloured
 d) Only Ni^{2+} is coloured and Zn^{2+} and Cr^{3+} are colourless
505. A reagent that can separate Fe from Zn is:
 a) NaOH b) HCl c) H_2S d) NaNO_2
506. KMnO_4 in basic medium is reduced to
 a) K_2MnO_4 b) MnO_2 c) $\text{Mn}(\text{OH})_2$ d) Mn^{2+}
507. Which of the following elements does not belong to the first transition series?
 a) Ag b) Fe c) Cu d) V
508. Transition metals form complexes in their zero oxidation state. The example of the above fact is:
 a) $\text{Mn}_2(\text{CO})_{10}$ b) $[\text{Cu}(\text{NH}_3)_4]\text{Cl}_2$ c) $\text{Zn}_2[\text{Fe}(\text{CN})_6]$ d) $[\text{Ag}(\text{NH}_3)_2]\text{OH}$
509. Which one of the following properties would you not expect copper to exhibit?
 a) Malleability
 b) High thermal conductivity
 c) Low electrical conductivity
 d) Ductility
510. Calomel is:
 a) Hg_2Cl_2 and Hg b) HgCl_2 c) Hg + HgCl_2 d) Hg_2Cl_2
511. Which of the following reactions represents developing in photography?
 a) $\text{AgNO}_3 + \text{NaBr} \rightarrow \text{AgBr} + \text{NaNO}_3$
 b) $\text{AgBr} + 2\text{NH}_3 \rightarrow [\text{Ag}(\text{NH}_3)_2]\text{Br}$
 c) $\text{AgBr} + 2\text{Na}_2\text{S}_2\text{O}_3 \rightarrow \text{Na}_3[\text{Ag}(\text{S}_2\text{O}_3)_2] + \text{NaBr}$
 d) $\text{C}_6\text{H}_4(\text{OH})_2 + 2\text{AgBr}^x \rightarrow \text{C}_6\text{H}_4\text{O}_2 + 2\text{HBr} + 2\text{Ag}$
512. Extraction for zinc from zinc blende is achieved by

- a) Electrolytic reduction
 b) Roasting followed by reduction with carbon
 c) Roasting followed by reduction with another metal
 d) Roasting followed by self reduction
513. Chromium compound used in tanning of leather is:
 a) Cr_2O_3 b) CrO_2Cl_2 c) CrCl_3 d) $\text{K}_2\text{SO}_4 \cdot \text{Cr}_2(\text{SO}_4)_3 \cdot 24\text{H}_2\text{O}$
514. $\text{FeSO}_4 \cdot (\text{NH}_4)_2 \text{SO}_4 \cdot 6\text{H}_2\text{O}$ is called
 a) Green salt b) Glauber's salt c) Mohr's salt d) Alum
515. When MnO_2 is fused with KOH , a coloured compound formed, the product and its colour is
 a) K_2MnO_4 , purple colour b) KMnO_4 , purple c) Mn_2O_3 , brown d) Mn_3O_4 , black
516. Anhydrous CuCl_2 and CuBr_2 exist as:
 a) Monomer b) Dimer c) Trimer d) polymer
517. From a solution of CuSO_4 , the metal used to recover copper is :
 a) Na b) Ag c) Hg d) Fe
518. When MnO_4 is fused with KOH , a coloured compound is formed. The product and its colour is
 a) K_2MnO_4 , purple colour b) Mn_2O_3 , brown
 c) Mn_2O_4 , black d) KMnO_4 , purple
519. Cerium ($Z = 58$) is an important member of the lanthanides. Which of the following statements about cerium is incorrect?
 a) The common oxidation state of cerium are +3 and +4.
 b) The +3 oxidation state of cerium is more stable than the +4 oxidation state.
 c) The +4 oxidation state of cerium is not known in solutions.
 d) Cerium (IV) acts as an oxidizing agent.
520. Which metal is used for filament of electric bulb?
 a) Pt b) Fe c) W d) Cu
521. Zinc does not show variable valency like *d*-block elements because
 a) It is low melting
 b) *d*-orbital is complete
 c) It is a soft metal
 d) Two electrons are present in the outermost orbit
522. In haemoglobin the iron shows oxidation state :
 a) +2 b) +3 c) +1 d) +4
523. The term 'fool's gold' is used for a mineral which shines like gold. It is:
 a) Iron pyrite b) Copper glance c) Cinnabar d) Cadmium sulphide
524. An aqueous solution of CuSO_4 and NH_4OH gives a deep blue complex of:
 a) Cuprammonium sulphate
 b) Cuprammonium hydroxide
 c) Sodium hexametaphosphate
 d) None of the above
525. Blow holes of steel are removed by adding:
 a) C b) Ni c) Sand d) Spiegeleisen
526. A mixture of TiO_2 and BaSO_4 is called
 a) Titanox b) Lithopone c) White pigment d) None of these
527. Which of the following has highest b.p.?
 a) Cr b) Ti c) Fe d) Co
528. Which group of metals is known as Pt-metals?
 a) Fe, Co, Ni b) Ag, Au, Cu c) Zn, Cd, Hg d) Ru, Rh, Pd
529. The compound ZnFe_2O_4 is
 a) A normal spinel compound b) Interstitial compound

549. Which statement is incorrect?
 a) Iron belongs to 3d-transition series of the periodic table
 b) Iron belongs to f-block of the periodic table
 c) Iron belongs to first transition series
 d) Iron belongs to group VIII of the periodic table
550. In India, iron is obtained from the ore:
 a) Cassiterite b) Azurite c) Haematite d) Cryolite
551. The Fe^{2+} ion is:
 a) Blue b) Light green c) Very dark green d) Yellow
552. Which ion in aqueous medium has orange colour?
 a) $\text{Cr}_2\text{O}_7^{2-}$ b) Cr^{3+} c) MnO_4^- d) MnO_4^{2-}
553. The compound widely used in making reference electrode is:
 a) ZnCl_2 b) CuSO_4 c) Hg_2Cl_2 d) HgCl_2
554. Which statement is incorrect about transition elements
 a) All elements form complexes
 b) All are paramagnetic
 c) All show variable valency
 d) All are not coloured ions
555. The magnetic moment of a transition metal ion is 3.87 BM. The number of unpaired electrons present in it is
 a) 2 b) 3 c) 4 d) 5
556. Which of the following is a lanthanoid?
 a) Ta b) Rh c) Th d) Lu
557. The flux used in soldering is:
 a) HgO b) ZnO c) CdO d) None of these
558. Ferric sulphate on heating gives:
 a) SO_2 and SO_3 b) SO_2 only c) SO_3 only d) S only
559. The raw materials fed into the blast furnace for making iron are:
 a) FeO, CaCO_3 and coke
 b) Fe_2O_3 , CaO and coke
 c) Fe_2O_3 , CaCO_3 and coke
 d) Fe_3O_4 , $\text{Ca}(\text{OH})_2$ and coke
560. Which statement about corrosive sublimate is incorrect?
 a) It is prepared by heating mercury in chlorine
 b) It reduces stannic chloride
 c) It oxidizes stannous chloride
 d) It sublimes readily
561. Chalcopyrites is an ore of
 a) Gallium b) Copper c) Calcium d) Magnesium
562. Siderite is an ore of
 a) Cu b) Al c) Ag d) Fe
563. Which one of the following metals, is extracted on smelting of its ore in blast furnace?
 a) Iron b) Sodium c) Potassium d) Magnesium
564. Chromium is used in making:
 a) Bronze b) Brass c) Stainless steel d) Electrodes
565. Which lanthanide compound is used as a pigment?
 a) CeO_2 b) $\text{Ce}(\text{OH})_3$ c) $\text{Lu}(\text{OH})_3$ d) $\text{Tb}(\text{OH})_3$
566. In the extraction of Zn, the formation of blue flame is due to the burning of:
 a) ZnO b) C c) Zn d) CO

567. Among the following the coloured compound is
 a) CuCl b) $K_3[Cu(CN)_4]$ c) CuF_2 d) $[Cu(CH_3CN)_4]BF_4$
568. What is the correct order of spin only magnetic moment (in BM) of Mn^{2+} , Cr^{2+} and V^{2+} ?
 a) $Mn^{2+} > V^{2+} > Cr^{2+}$ b) $V^{2+} > Cr^{2+} > Mn^{2+}$ c) $Mn^{2+} > Cr^{2+} > V^{2+}$ d) $Cr^{2+} > V^{2+} > Mn^{2+}$
569. Stainless steel contains:
 a) 50%Cr b) 2.5%Cr c) 14%Cr d) 2%Cr
570. $KMnO_4$ (acidic/alkaline) is not decolourized by
 a) Mohr salt b) Oxalic acid c) Benzene d) Propene
571. A solution of $Cr(NO_3)_2$ slowly turns green when concentrated HCl is added to it. It is due to the formation of:
 a) $CrCl_3$ b) Cr_2O_3 c) CrO_4^{2-} d) Chloro complexes
572. Which is not an ore of gold?
 a) Syvanite b) Calaverite c) Covellite d) Bismuth aurite
573. Silver iodide is used to produce artificial rain because:
 a) It is easily prepared
 b) Its structure is ice-like
 c) It can easily be sprayed at high altitude
 d) It is insoluble in rain water
574. The chemical formula of azurite is:
 a) $Cu(OH)_2 \cdot 2CuCO_3$ b) $CuSO_4 \cdot 3Cu(OH)_2$ c) $Cu(OH)_2 \cdot CuCO_3$ d) $CuFeS_2$
575. The magnetic moment (in BM) of Zn^{2+} ion according to spin-only formula is
 a) Zero b) 1.73 c) 2.84 d) 3.87
576. Zinc reacts with very dilute nitric acid to produce:
 a) NO b) NH_4NO_3 c) NO_2 d) H_2
577. Which of the following may be colourless?
 a) Fe^{3+} b) Cr^{3+} c) Cu^{2+} d) Cu^+
578. Fe ore is concentrated by:
 a) Magnetic treatment b) Froth floatation c) Electrolysis d) Roasting
579. In the extraction of copper, the metal formed in the Bessemer's converter is due to the reaction:
 a) $Cu_2S \rightarrow 2Cu + S$
 b) $2Cu_2O \rightarrow 4Cu + O_2$
 c) $2Cu_2S + 3O_2 \rightarrow 2Cu_2O + 2SO_2$
 d) $2Cu_2O + Cu_2S \rightarrow 6Cu + SO_2$
580. In the case of *d*-block elements:
 a) Outermost and penultimate shells are incomplete
 b) Both penultimate and prepenultimate shells are incomplete
 c) Outermost shell is incomplete
 d) Innermost shell is incomplete
581. In electrorefining of copper, some gold is deposited as
 a) Cathode b) Electrode c) Cathode mud d) Anode mud
582. What effect is noticed on shaking dilute sulphuric acid with a small quantity of anhydrous copper sulphate?
 a) The white solid dissolves to form a colourless solution
 b) The white solid dissolves to form a green solution
 c) The white solid turns blue but does not dissolve
 d) The white solid dissolves to form a blue solution
583. A magnetic moment of 1.73 BM will be shown by one among the following compounds:
 a) $[Cu(NH_3)_4]^{2+}$ b) $[Ni(CN)_4]^{2-}$ c) $TiCl_4$ d) $[CoCl_6]^{4-}$
584. In general, the transition elements exhibit their highest oxidation states in their compounds with elements

- a) Ti^{2+} and V^{2+} b) Fe^{2+} and Cu^{2+} c) Cr^{2+} and Fe^{2+} d) Co^{2+} and Ti^{2+}
602. Which of the following is not an actinide?
 a) Curium b) Californium c) Erbium d) Americium
603. Philosopher's wool when heated with BaO at $1100^{\circ}C$ gives the compound :
 a) $BaZnO_2$ b) $Ba + ZnO_2$ c) $BaCdO_2$ d) $BaO_2 + Zn$
604. Brass is an alloy of Cu with
 a) Al b) Sn c) Ag d) Zn
605. Actinides and lanthanides resemble in
 a) Formation of complexes b) Oxidation state
 c) Ionization energy d) Electronic configuration
606. Cuprous chloride is obtained from cupric chloride:
 a) By heating cupric chloride with chlorine
 b) By the electrolysis of cupric chloride containing HCl
 c) By heating cupric chloride with conc. HCl and copper turnings
 d) By passing H_2 over $CuCl_2$
607. The properties of cast iron, wrought iron and steel are different because they have:
 a) Different contents of sulphur
 b) Different contents of carbon
 c) Traces of different elements
 d) Traces of different iron oxides
608. Variable valency is a general feature ofelements.
 a) s-block b) p-block c) d-block d) All of these
609. The inner transition elements are the elements in which the added electrons go to:
 a) $(n - 1) d$ -orbitals
 b) $(n - 2) f$ -orbitals
 c) $(n - 1) d$ -orbitals and $(n - 1) f$ -orbitals
 d) $(n - 1) d$ -orbitals and ns -orbitals
610. The compound insoluble in water is
 a) Mercurous nitrate b) Mercurous chloride
 c) Mercuric nitrate d) Mercurous perchlorate
611. A carbonate ore is
 a) Carnallite b) Limonite c) Siderite d) Horn silver
612. Near the top of a blast furnace employed for the extraction of iron the metal oxides are reduced to spongy iron by:
 a) Carbon b) CO c) CO_2 d) Limestone
613. Black Jack is an ore of
 a) Cr b) Sn c) Zn d) Ni
614. Which of the following statements is correct?
 a) Manganese salt gives violet borax bead test in the reducing flame
 b) Ferric ions give a deep green precipitate on adding potassium ferricyanide solution
 c) On boiling a solution having K^+ , Ca^{2+} , HCO_3^- ions, we get a precipitate of $K_2Ca(CO_3)_2$
 d) From a mixed precipitate of AgCl and AgI, ammonia solution dissolves only AgCl
615. The element showing oxidation states of +2, +3, +4, +6 and +7 is:
 a) Cr b) Mn c) Co d) V
616. When H_2S is passed through $HgCl_2$ we get:
 a) HgS b) $HgS + Hg_2S$ c) $Hg_2S + Hg$ d) Hg_2S
617. Which gas is absorbed by CuCl?
 a) CO_2 b) CO c) SO_2 d) SO_3
618. Standard reduction potential of most of the transition elements is generally:

- a) Negative b) Positive c) Zero d) None of these
619. Auric chloride on reaction with ferrous sulphate changes to:
 a) Au b) AuCl c) Au₂SO₄ d) Au₃(SO₄)₂
620. Which of the following is deliquescent?
 a) ZnCl₂ b) Hg₂Cl₂ c) HgCl₂ d) CdCl₂
621. Which of the following is correct?
 a) Duralumin : Al + Cu + Mg + Ag b) German silver : Cu + Zn + C
 c) Gun metal : Cu + Zn + Sn d) Solder : Pb + Al
622. A certain metal will liberate hydrogen from dilute acids. It will react with water to form hydrogen only when the metal is heated and water is in the form of steam. The metal is probably
 a) Iron b) Potassium c) Copper d) Mercury
623. Calomel reacts with ammonium hydroxide to form:
 a) Hg(NH₂)Cl b) H₂N—Hg—Hg—Cl c) Hg₂O d) HgO
624. An example of double salt is:
 a) Bleaching powder b) K₄[Fe(CN)₆] c) Hypo d) Potash alum
625. Bronze is a mixture of
 a) Pb + Sn b) Cu + Sn c) Cu + Zn d) Pb + Zn
626. The element present in gun metal is
 a) Co b) Cu c) Sc d) Ti
627. Pure conc. HNO₃ makes iron passive as the surface is covered with protective layer of:
 a) Fe(NO₃)₃ b) Fe₃O₄ c) FeO d) Fe₂O₃
628. Thermite process is used in reduction of
 a) Cr₂O₃ b) Al₂O₃ c) PbO₂ d) CuO
629. The slag obtained during the smelting process in the extraction of copper from copper pyrites is composed mainly of:
 a) Cu₂S b) FeSiO₃ c) CuSiO₃ d) SiO₂
630. The mineral from which copper is manufactured is:
 a) Galena b) Pyrite c) Malachite d) Chalcopyrite
631. Metal oxides which decomposes on heating is
 a) ZnO b) CuO c) Al₂O₃ d) HgO
632. The correct formula for diammine silver (I) chloride is:
 a) [Ag, (NH₃)]Cl b) [Ag, (NH₃)₂]Cl c) [Ag, (NH₂)₂]Cl d) [Ag, (NH₄)₂]Cl
633. Which metal is used to add to gold to make it hard?
 a) Cu b) Ag c) Ni d) Zn
634. On igniting Fe₂O₃ at 14000°C, the product obtained is
 a) Fe₂O₃melt b) FeO c) Fe₂O₃ d) Metallic iron
635. Cosmetic powders and zinc ointments contain:
 a) ZnCl₂ b) ZnO c) ZnCO₃ d) ZnSO₄
636. An aqueous solution of FeSO₄, Al₂(SO₄)₃ and chrome alum is heated with excess of Na₂O₂ and filtered. The materials obtained are:
 a) A colourless filtrate and a green residue
 b) A yellow filtrate and a green residue
 c) A yellow filtrate and a brown residue
 d) A green filtrate and a brown residue
637. A transition element X has the configuration [Ar]d⁴ in its +3 oxidation state. Its atomic number is
 a) 25 b) 26 c) 22 d) 19
638. The carbon content of:
 a) Cast iron is in between that of steel and wrought iron
 b) Pig iron is in between that of steel and wrought iron

- c) Steel is in between that of cast iron and wrought iron
 d) Wrought iron is in between that of steel and cast iron
639. If a compound absorbs violet colour from light, it will be :
 a) Yellow b) Orange c) Blue d) Green
640. Which of the two have almost similar size?
 a) ${}_{22}\text{Ti}$ and ${}_{40}\text{Zr}$ b) ${}_{41}\text{Nb}$ and ${}_{73}\text{Ta}$ c) ${}_{39}\text{Y}$ and ${}_{57}\text{La}$ d) ${}_{20}\text{Ca}$ and ${}_{31}\text{Ir}$
641. A white precipitate is formed on adding KI to CuSO_4 solution. It is of
 a) Cu_2I_2 b) CuI_2 c) Cu_2S d) Cu_2SO_4
642. Which of the following is coloured compound?
 a) CuF_2 b) CuI c) NaCl d) MgCl_2
643. Addition of NaOH on Zn^{2+} ion gives a white ppt. which on adding excess of NaOH dissolves. In this solution Zn exists in:
 a) Cationic part b) Anionic part c) Both (a) and (b) d) None of these
644. MnO_4^- reacts with bromide ion in alkaline medium to give
 a) MnBr_4 b) MnOBr_2 c) $\text{MnO}_2, \text{BrO}_3^-$ d) MnO, BrO
645. Cyanide process is used to extraction of
 a) Ag b) Ni c) Pt d) Zn
646. Which of the following weights less when weighted in magnetic field?
 a) ScCl_3 b) FeCl_3 c) TiCl_3 d) VCl_3
647. The process of nitriding used in the treatment of steel is:
 a) Heating steel in an atmosphere of ammonia
 b) Heating steel to a bright redness and then cooling
 c) Heating steel to bright redness and then cooling by plunging in air
 d) None of the above
648. Duraluminium is an alloy contains:
 a) Mg + Al
 b) Mg + Cu + Al + Mn + Si
 c) Mg + Cu
 d) Cu + Al
649. Gun metal is
 a) Cu + Zn b) Cu + Sn + Zn c) Cu + Sn d) Zn + Sn
650. The tempering of steel makes it:
 a) Hard b) Soft c) Heavy d) Brittle
651. Copper sulphate solution reacts with KCN to give
 a) CuCN b) $\text{Cu}(\text{CN})_2$ c) $\text{K}_3[\text{Cu}(\text{CN})_4]$ d) $\text{K}_2[\text{Cu}(\text{CN})_4]$
652. The metallic oxide which impart purple colour to pottery is
 a) Copper oxide b) Chromium oxide c) Lead oxide d) Manganese oxide
653. Formation of interstitial compounds makes the transition metal:
 a) More soft b) More ductile c) More metallic d) More brittle
654. The purest zinc is made by
 a) Electrolytic refining b) Zone refining
 c) The van- Arkel method d) The Mond process
655. Which of the following ions has a magnetic moment of 5.93 BM?
 (At. no. V=23, Cr=24, Mn=25, Fe=26)
 a) Mn^{2+} b) Fe^{2+} c) Cr^{2+} d) V^{3+}
656. $\text{K}_2\text{Cr}_2\text{O}_7 \xrightarrow{\Delta} \text{K}_2\text{CrO}_4 + \text{O}_2 + X$
 In the above reaction X is
 a) CrO_3 b) Cr_2O_7 c) Cr_2O_3 d) CrO_5
657. Soft and pliable steel is obtained by:

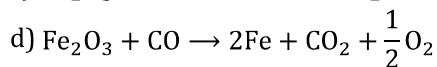
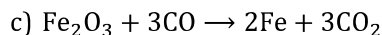
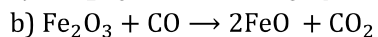
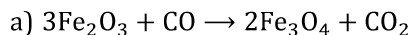
- a) Tempering b) Nitriding c) Annealing d) None of these
658. The highest magnetic moment is shown by the transition metal ion with the outer electronic configuration
a) $3d^2$ b) $3d^7$ c) $3d^5$ d) $3d^9$
659. Which substance can be used in the preparation of making ink?
a) Ag b) AgNO_3 c) AgBr d) $\text{PbCO}_3 \cdot \text{Pb(OH)}_2$
660. Which of the following compounds volatilises on heating?
a) MgCl_2 b) HgCl_2 c) CaCl_2 d) FeCl_3
661. Identify the statement which is not correct regarding copper sulphate
a) It reacts with NaOH and glucose to give Cu_2O b) It gives CuO on strong heating in air
c) It reacts with KCl to give Cu_2Cl_2 d) It reacts with KI to give iodine
662. In solid $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$, copper is coordinated to:
a) 4 water molecules b) 5 water molecules c) 1 sulphate molecule d) 1 water molecule
663. The grey cast iron contains:
a) Iron carbide b) Silicon carbide c) Silicon dioxide d) Graphite
664. When excess of sodium thiosulphate is added to dil. AgNO_3 solution a soluble compound X is formed. However, when dil. $\text{Na}_2\text{S}_2\text{O}_3$ solution is added to cone. AgNO_3 solution a white ppt. turning yellow and finally black ppt. of Y is obtained. Which is correct pair?
a) X is Ag_2S and Y is $\text{Na}_3[\text{Ag}(\text{S}_2\text{O}_3)_2]$
b) X is $\text{Na}_3[\text{Ag}(\text{S}_2\text{O}_3)_2]$ and Y is Ag_2S
c) X is $\text{Ag}_2\text{S}_2\text{O}_3$ and Y is Ag_2S
d) X is $\text{Ag}_2\text{S}_2\text{O}_3$ and Y is $\text{Na}_3[(\text{S}_2\text{O}_3)_2]$
665. Which of the following is an acidic oxide?
a) Mn_2O_3 b) MnO_2 c) Mn_2O_7 d) MnO
666. A developer used in photography is:
a) A weak acid b) A weak base c) A mild reducing agent d) An oxidizing agent
667. Potassium permanganate acts as an oxidant in alkaline and acidic media. The final products formed from KMnO_4 in the two conditions are respectively
a) MnO_2 and Mn^{3+} b) Mn^{3+} and Mn^{2+} c) Mn^{2+} and Mn^{3+} d) MnO_2 and Mn^{2+}
668. The general electronic configuration of transition element is :
a) $(n - 1)d^{1-5}$ b) $(n - 1)d^{1-10} ns^1$ c) $(n - 1)d^{1-10} ns^{0-2}$ d) None of these
669. Mohr's salt is a:
a) Normal salt b) Acid salt c) Basic salt d) Double salt
670. Gun metal is an alloy of:
a) Cu and Al b) Cu, Sn and Zn c) Cu, Zn and Ni d) Cu and Sn
671. A metal gives two chlorides 'A' and 'B'. 'A' gives black precipitate with NH_4OH and 'B' gives white. With KI 'B' gives a red precipitate soluble in excess of KI. 'A' and 'B' are respectively:
a) HgCl_2 and Hg_2Cl_2 b) Hg_2Cl_2 and HgCl_2 c) HgCl_2 and ZnCl_2 d) ZnCl_2 and HgCl_2
672. Which of the following transition metal ions will have definite value of magnetic moment?
a) Sc^{3+} b) Ti^{3+} c) Cu^{3+} d) Zn^{2+}
673. In comparison to ferrous salts, ferric salts are:
a) More stable b) Less stable c) Equally stable d) None of these
674. Fool's gold is
a) CuFeS_2 b) FeS_2 c) CuS_2 d) Cu_2O
675. The material used for the lining of Bessemer's converter in the extraction of copper is:
a) Silica b) Lime c) Iron d) Cu
676. Articles made of copper and bronze slowly tarnish in air and turn green. The green colour is due to the formation of:
a) Copper oxide
b) Copper sulphide

- c) Copper oxalate
d) Basic copper carbonate
677. Which of the following statements concerning transition elements is false?
a) They are all metals.
b) They easily form complex coordination compounds.
c) Compounds containing their ions are mostly coloured.
d) They show multiple oxidation states always differing by units of two.
678. Among Sc(III), Ti(IV), Pd(II) and Cu(II) ions
a) All are paramagnetic
b) All are diamagnetic
c) Sc (III), Ti (IV) are paramagnetic and Pd(II), Cu(II) are diamagnetic
d) Sc (III), Ti (IV) are diamagnetic and Pd(II), Cu(II) are paramagnetic
679. Nessler's reagent is
a) K_2HgI_4 b) $K_2HgI_4 + KOH$ c) $K_2HgI_4 + Hg$ d) $K_2HgI_2 + KOH$
680. The spin only magnetic moment of Fe^{2+} ion (in BM) is approximately.
a) 4 b) 7 c) 5 d) 6
681. Which of the following is not correct about transition metals?
a) Their compounds are generally coloured b) They can form ionic or covalent compounds
c) Their melting and boiling points are high d) They do not exhibit variable valency
682. In the metallurgy of iron, when limestone is added to the blast furnace, the calcium ion ends up as :
a) Slag b) Gangue c) Metallic calcium d) Calcium carbonate
683. KI and $CuSO_4$ solutions on mixing produce
a) $Cu_2I_2 + K_2SO_4$ b) $Cu_2I_2 + I_2 + K_2SO_4$ c) $CuI_2 + K_2SO_4$ d) $CuI_2 + I_2 + K_2SO_4$
684. Which one of the following statements is false?
a) During roasting, moisture is removed from the ore.
b) The ore is freed from almost all nonmetallic impurities.
c) Calcination of ore is carried out in the absence of air.
d) The concentrated zinc blend is subjected to calcination during its extraction by pyrometallurgy.
685. Knowing that the chemistry of lanthanoids (Ln) is dominated by its +3 oxidation state, which of the following statements is incorrect?
a) Because of the large size of the Ln (III) ions the bonding in its compounds is predominantly ionic in character.
b) The ionic sizes of Ln (III) decrease in general with increasing atomic number.
c) Ln (III) compounds are generally colourless.
d) Ln(III) hydroxide are mainly basic in character.
686. Bell metal is an alloy of:
a) Zinc and copper b) Copper and nickel c) Zinc and lead d) Copper and tin
687. Chemical name of vermilion is:
a) Mercuric sulphide b) Mercurous sulphide c) Zinc sulphide d) Cadmium sulphide
688. The stainless steel developed in India contains the following special components:
a) Vanadium and cobalt
b) Nickel and magnesium
c) Manganese and chromium
d) Aluminium and zinc
689. Maximum number of oxidation states of the transition metals is derived from the following configuration:
a) ns -electrons
b) $(n - 1)d$ -electrons
c) $(n + 1)d$ -electrons
d) $ns + (n - 1)d$ -electrons

690. It is always advisable not to cover egg yolk or mustard with silver cutlery because:
- Silver reacts with water of egg yolk to form AgOH
 - Silver reacts with sulphur of egg yolk forming black Ag₂S
 - Silver reacts with egg yolk forming Ag₂SO₄ which is a poisonous substance
 - Silver attracts UV light of the atmosphere, thereby spoiling the food
691. Which of the following is not oxidized by O₃?
- FeSO₄
 - KMnO₄
 - KI
 - K₂MnO₄
692. Mercury is transported in metal containers made of:
- Silver
 - Lead
 - Iron
 - Aluminium
693. Which may be consumed in the elemental form by human beings?
- Zn
 - Cu
 - Ag and Cu
 - Fe
694. Which one of the elements is a *d*-block element?
- As
 - Pt
 - Pb
 - Ra
695. Which metal does not react with CuSO₄ solution?
- Fe
 - Zn
 - Mg
 - Ag
696. Transition metal ions show colour because
- They absorb light
 - They emit light
 - They are paramagnetic
 - They exhibit *d—d* transition
697. Rinnmann's green is:
- ZnO.CoO
 - A green pigment
 - Both (a) and (b)
 - None of these
698. Which of the following ions is colourless in solution?
- V³⁺
 - Cr³⁺
 - Co²⁺
 - Sc³⁺
699. Pig iron is manufactured using:
- An electric furnace
 - A blast furnace
 - An open hearth furnace
 - None of the above
700. Blue vitriol is
- CuSO₄
 - CuSO₄ · 5H₂O
 - Cu₂SO₄
 - CuSO₄ · H₂O
701. Each coinage metal has:
- 18 electrons in their penultimate shell
 - 8 electrons in the outermost shell
 - 2 electrons in the outermost shell
 - 8 electrons in penultimate shell
702. Gold exhibits the variable oxidation states of:
- +2, +3
 - +1, +3
 - +2, +4
 - +1, +2
703. Transition metals and their oxides are used in industrial processes as:
- Detergents
 - Insecticides
 - Catalysis
 - None of these
704. Gravity separation process is used for the concentration of
- Calamine
 - Haematite
 - Chalcopyrite
 - Bauxite
705. The composition of malachite is
- CuFeS₂
 - CuCO₃
 - CuCO₃ · Cu(OH)₂
 - Cu(OH)₂
706. The atomic numbers 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 ionisation enthalpy?
- V
 - Cr
 - Mn
 - Fe
707. Zinc white is a better white pigment than lead white because it:
- Has more covering power than lead white
 - Is not blackened by the action of H₂S
 - Is soluble in water

- d) Becomes yellow when heated
708. A yellow ppt. is formed when H_2S is passed through an acidified solution of:
 a) Co^{2+} ions b) Cd^{2+} ions c) Cu^{2+} ions d) Ni^{2+} ions
709. Which metal does not react with water or steam?
 a) K b) Na c) Ca d) Cu
710. Verdigris is
 a) Basic lead b) Basic copper acetate c) Basic lead acetate d) None of the above
711. The percentage of carbon is same in:
 a) Cast iron and pig iron
 b) Cast iron and steel
 c) Pig iron and steel
 d) Pig iron and wrought iron
712. $FeSO_4 \cdot (NH_4)_2SO_4 \cdot 6H_2O$ is called:
 a) Green salt b) Glauber's salt c) Mohr's salt d) Alum
713. Which do not decolourise $KMnO_4$ aqueous solution?
 a) $C_2O_4^{2-}$ b) HSO_3^- c) CO_3^{2-} d) SO_3^{2-}
714. Among the following pair of ions, the lower oxidation state in aqueous solution is more stable in
 a) V^{2+}, VO^{2+} b) Cr^{2+}, Cr^{3+} c) Ti^+, Ti^{3+} d) Cu^+, Cu^{2+}
715. Green vitriol is formed by
 a) $FeS_2 + H_2O + O_2$ b) $FeS_2 + H_2O + CO_2$ c) $FeS_2 + CO + CO_2$ d) $FeS_2 + CO$
716. Densities of transition metals are:
 a) Low b) Very low c) High d) Very high
717. Mercury sulphide on heating with aquaregia yields:
 a) $Hg(NO_3)_2$ b) $HgCl_2$ c) $Hg(NO_2)_2$ d) Hg_2Cl_2
718. All metal chlorides are soluble in water except those of:
 a) Ag, Pb, Hg b) Na, K, Ca c) Zn, Cu, Cd d) Ba, Sr, Li
719. $K_3[Co(NO_2)_6]$ is:
 a) Fischer's salt b) Thenard's blue c) Rinnmann's green d) Blue vitriol
720. Group 11 or IB elements are commonly known as:
 a) Coinage metals
 b) Transition metals
 c) Typical elements
 d) Representative elements
721. Most common oxidation states of Ce (cerium) are
 a) +3, +4 b) +2, +3 c) +2, +4 d) +3, +5
722. The metal present in insulin is:
 a) Cu b) Fe c) Zn d) Mg
723. Transition elements form alloys easily because they have:
 a) Same atomic number
 b) Same electronic configuration
 c) Nearly same atomic size
 d) None of the above
724. Muntz metal is an alloy of:
 a) Cu and Sn b) Cu and Zn c) Ag and Zn d) Zn and Mn
725. A metal forms a volatile carbonyl compound and this property is taken advantages of its extraction. The metal is:
 a) Iron b) Nickel c) Cobalt d) Titanium
726. The temperature of blast furnace to produce iron from its ore Fe_2O_3 varies from $500^\circ C$ at the top of the furnace to about $1900^\circ C$ at the bottom of the furnace. The reaction between the ore Fe_2O_3 and CO at the

lowest temperature (~ 500°C) is:



727. Adam's catalyst is:

a) Pt and PtO

b) Pt

c) Pt and PtO₂

d) Pt₂O and PtO

728. Which one of the following statement is not true with regard to transition elements?

a) They readily form complex compounds.

b) They show variable oxidation states.

c) All their ions are colourless.

d) Their ions contain partially filled *d*-electrons.

729. The element which forms a coloured chloride is:

a) Sb

b) Na

c) Zn

d) Cr

730. In which of the following metallic bond is strongest?

a) V

b) Fe

c) Cr

d) Sc

731. Which metal cation forms stronger complex salt?

a) Zn²⁺

b) Cd²⁺

c) Hg²⁺

d) All of same strength

732. The equilibrium $\text{Cr}_2\text{O}_7^{2-} + 2e \rightleftharpoons 2\text{CrO}_4^{2-}$:

a) Exists in acidic medium

b) Exists in basic medium

c) Exists in neutral medium

d) Does not exist

733. Atomic radii of Ti, Zr and Hf vary

a) $\text{Ti} > \text{Zr} > \text{Hf}$

b) $\text{Ti} < \text{Zr} < \text{Hf}$

c) $\text{Ti} < \text{Hf} < \text{Zr}$

d) $\text{Ti} < \text{Zr} = \text{Hf}$

734. The basic character of the transition metal monoxide follows the order

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

a) $\text{TiO} > \text{VO} > \text{CrO} > \text{FeO}$

b) $\text{VO} > \text{CrO} > \text{TiO} > \text{FeO}$

c) $\text{CrO} > \text{VO} > \text{FeO} > \text{TiO}$

d) $\text{TiO} > \text{FeO} > \text{VO} > \text{CrO}$

735. MnO₂ dissolves in water to give an acid. The colour of the acid is

a) Green

b) Blue

c) Violet

d) Red

736. Which of the following is used as indelible ink?

a) Aqueous CuSO₄ solution

b) Aqueous AgNO₃ solution

c) Aqueous NaCl solution

d) Aqueous NaOH solution

737. Which belongs to the actinides series?

a) Ce

b) Cf

c) Ca

d) Cs

738. Pudding process is used in the manufacture of:

a) Steel

b) Cast iron

c) Wrought iron

d) Pig iron

739. Which method is used to remove lead impurities from silver?

a) Leaching with dilute NaCN solution

b) Parkes process

c) Leaching with dilute NaCN in presence of air

d) Electrolytic purification using AgNO₃

740. Which of the following is the green coloured powder produced when ammonium dichromate is used in fire works?

a) Cr

b) CrO₃

c) Cr₂O₃

d) CrO(O₂)

741. Which of the following is amphoteric?

a) V₂O₃

b) CuO

c) V₂O₅

d) NiO

742. NH₃ forms complex with:

a) CuSO₄

b) CdSO₄

c) AgCl

d) All of these

743. Transition metals are less reactive because of their:
- High ionization potential and low melting point
 - High ionization potential and high melting point
 - Low ionization potential and low melting point
 - Low ionization potential and high melting point
744. The metal that does not displace hydrogen from an acid is:
- Hg
 - Zn
 - Al
 - Ca
745. Percentage of gold in 18 carat gold is
- 75.0%
 - 20.0%
 - 80.0%
 - 38.67%
746. The correct order of ionic radii of Y^{3+} , La^{3+} , Eu^{3+} and Lu^{3+} is
- $Y^{3+} < La^{3+} < Eu^{3+} < Lu^{3+}$
 - $Lu^{3+} < Eu^{3+} < La^{3+} < Y^{3+}$
 - $La^{3+} < Eu^{3+} < Lu^{3+} < Y^{3+}$
 - $Y^{3+} < Lu^{3+} < Eu^{3+} < La^{3+}$
747. Coinage metals show the properties of
- Inert elements
 - Normal elements
 - Typical elements
 - Transitional elements
748. When steel is heated red hot and then slowly cooled, the process is known as:
- Annealing
 - Hardening
 - Tempering
 - Nitriding
749. Which form contains the maximum percentage of carbon?
- Wrought iron
 - Cast iron
 - Malleable iron
 - Steel
750. During the extraction of copper, the impurity (FeS) is removed as slag by mixing the contaminated copper ore with silica and coke. The molecular formula of slag is
- $FeSiO_3$
 - Fe_2O_3
 - FeSi (solid)
 - FeSi (vapour)
751. The correct order of $E^\circ_{M^{2+}/M}$ values with negative sign for the four successive elements Cr, Mn, Fe and Co is
- $Mn > Cr > Fe > Co$
 - $Cr > Fe > Mn > Co$
 - $Fe > Mn > Cr > Co$
 - $Cr > Mn > Fe > Co$
752. Which of the following is the chief ore of copper?
- Cu_2S
 - Cu_2O
 - $CuFeS_2$
 - $CuCO_3 \cdot Cu(OH)_2$
753. The catalytic activity of transition metals and their compounds is ascribed mainly to:
- Their magnetic behavior
 - Their unfilled *d*-orbitals
 - Their ability to adopt variable oxidation states
 - Their chemical reactivity
754. Which is used for stopping bleeding?
- Ferric chloride
 - Mohr's salt
 - Green vitriol
 - Sodium nitroprusside
755. On heating $ZnCl_2 \cdot H_2O$ the compound obtained is:
- $ZnCl_2$
 - $Zn(OH)Cl$
 - $Zn(OH)_2$
 - ZnO
756. Yellow mercury (II) oxide is obtained when
- Hg is heated in excess of air at 623 K
 - $HgCl_2$ is treated with NaOH solution
 - HgS is roasted in air
 - $Hg(NO_3)_2$ is heated in presence of Hg
757. From gold aurocyanide $Na[Au(CN)_2]$, gold can be precipitated by adding powder of:
- Zn
 - Hg
 - Ag
 - None of these
758. Arrange Ce^{3+} , La^{3+} , Pm^{3+} and Yb^{3+} in increasing order of their ionic radii
- $Yb^{3+} < Pm^{3+} < Ce^{3+} < La^{3+}$
 - $Ce^{3+} < Yb^{3+} < Pm^{3+} < La^{3+}$
 - $Yb^{3+} < Pm^{3+} < La^{3+} < Ce^{3+}$
 - $Pm^{3+} < La^{3+} < Ce^{3+} < Yb^{3+}$
759. Black HgS:
- Dissolves in conc. HCl on boiling
 - Dissolves in boiling HCl + a crystal of $KClO_3$
 - Dissolves in NaOH
 - None of the above

760. The actinoids exhibit more number of oxidation states in general than the lanthanoids. This is because
- The $5f$ -orbitals are more buried than the $4f$ -orbitals.
 - There is a similarity between $4f$ and $5f$ -orbitals in their angular part of the wave function.
 - The actinoids are more reactive than the lanthanoids.
 - The $5f$ -orbitals extend further from the nucleus than the $4f$ -orbitals.
761. Hair dyes contain
- Copper nitrate
 - Gold chloride
 - Silver nitrate
 - Copper sulphate
762. A scarlet red precipitate is obtained on treating mercuric chloride solution with:
- H_2S
 - KI
 - NaOH
 - NH_4OH
763. Which of the following statements is wrong?
- An acidified solution of $K_2Cr_2O_7$ liberates iodine from iodides
 - In acidic solution dichromate ions are converted to chromate ions
 - Ammonium dichromate on heating undergoes exothermic decomposition to give Cr_2O_3
 - Potassium dichromate is used as a titrant for Fe^{2+} ions
764. In the electroplating of gold the electrolyte used is:
- Gold chloride
 - Gold nitrate
 - Gold sulphate
 - Potassium aurocyanide
765. Silver is extracted from argentiferous lead by:
- Mond's process
 - Parkes process
 - Haber's process
 - Bergius process
766. Aqua regia reacts with Pt to yield:
- $Pt(NO_3)_4$
 - H_2PtCl_6
 - $PtCl_4$
 - $PtCl_2$
767. Argentite is an ore of
- Fe
 - Al
 - Cu
 - Ag
768. Transition elements exhibits variable valencies because they release electrons from the following orbits
- ns
 - ns and np
 - $(n - 1)d$ and ns
 - $(n - 1)d$
769. For making good quality mirrors, plates of float glasses are used. These are obtained by floating molten glass over a liquid metal which does not solidify before glass. The metal can be:
- Na
 - Mg
 - Hg
 - Sn
770. How is limestone used in Fe extraction?
- Oxidation of Fe ore
 - Reduction of Fe ore
 - Formation of slag
 - Purification of Fe formed
771. When copper pyrites is roasted in excess of air, a mixture of $CuO + FeO$ is formed. FeO is present as impurities. This can be removed as slag during reduction of CuO . The flux added to form slag is
- SiO_2 which is an acid flux
 - Lime stone, which is a basic flux
 - SiO_2 , which is a basic flux
 - CaO , which is a basic flux
772. The 'spin -only' magnetic moment [in units of Bohr magneton, (μ_B)] of Ni^{2+} in aqueous solution would be (Atomic number of Ni=28)
- 2.84
 - 4.90
 - 0
 - 1.73
773. Which of the following is used as purgative?
- HgS
 - Hg_2Cl_2
 - $HgCl_2$
 - $ZnSO_4$
774. The formula of sodium nitroprusside is:
- $Na_4[Fe(CN)_5NOS]$
 - $Na_2[Fe(CN)_5NO]$
 - $NaFe[Fe(CN)_6]$
 - $Na_2[Fe(CN)_6NO_2]$
775. Which set represents an example of non typical transition elements?
- Zn, Cd, Hg
 - Sc, Ti, V
 - Cu, Ag, Au
 - Cr, Fe, Mn
776. When calomel reacts with NH_4OH solution, the compound formed is
- $NH_2 - Hg - Cl$
 - $Hg_2Cl_2NH_3$
 - $Hg(NH_3)_2Cl_2$
 - $HgCl_2NH_3$
777. The highest magnetic moment is shown by the transition metal ion with the configuration

- a) $3d^2$ b) $3d^5$ c) $3d^7$ d) $3d^9$
778. Identify the alloy containing a non-metal as a constituent in it:
a) Bell metal b) Bronze c) Invar d) Steel
779. Chemical name of corrosive sublimate is:
a) Mercurous chloride b) Zinc chloride c) Mercuric chloride d) Aluminium chloride
780. Excess of KI reacts with CuSO_4 solution and then $\text{Na}_2\text{S}_2\text{O}_3$ solution is added to it. Which of the statements is incorrect for this reaction?
a) Cu_2I_2 formed b) CuI_2 is formed
c) $\text{Na}_2\text{S}_2\text{O}_3$ is oxidised d) Evolved I_2 is reduced
781. Cuprous ion is colourless, while cupric ion is coloured because
a) Both have half-filled p and d -orbitals
b) Cuprous ion has a completed d -orbital and cupric ion has incomplete d -orbital
c) Cuprous ion has incomplete d -orbital and cupric ion has a complete d -orbital
d) Both have unpaired electrons in d -orbital
782. Which one of the following is a diamagnetic ion?
a) Co^{2+} b) Cu^{2+} c) Mn^{2+} d) Sc^{3+}
783. Which of the following oxides of chromium is amphoteric in nature?
a) CrO b) Cr_2O_3 c) CrO_3 d) CrO_5
784. Cast iron is manufactured by remelting:
a) Pig iron and pouring into moulds
b) Steel and pouring into moulds
c) Wrought iron and pouring into moulds
d) Iron ore and pouring into moulds
785. The number of $3d$ -electrons in Cu^+ ion is:
a) 8 b) 10 c) 6 d) 12
786. In the extraction of Fe from Fe_2O_3 , the reducing agent used is
a) C b) Al c) Electrolytic reduction d) Cu
787. Transition elements are good conductors of current because:
a) They are metals
b) They are all solids
c) They have free electrons in outer energy orbits
d) All of the above
788. A compound is yellow when hot and white when cold. The compound is :
a) Al_2O_3 b) PbO c) CaO d) ZnO
789. A solid (A) which has photographic effect reacts with the solution of a sodium salt (B) to give a pale yellow ppt. (C). Sodium salt on heating gives brown vapours. Identify A , B and C .
a) AgNO_3 , NaBr , AgBr b) AgNO_3 , NaCl , AgCl_2 c) AgNO_3 , NaBr , AgCl_2 d) AgCl , NaBr , AgBr_2
790. Silver possesses metallic lustre because:
a) It is a noble metal
b) It is coated with the oxide of silver
c) Valency electrons absorb white light completely
d) Valency electrons absorb and eject white light
791. Magnetic moment of manganese in $(\text{NH}_4)_2\text{MnBr}_2$ is
a) 3.87 BM b) 5.91 BM c) 4.89 BM d) 2.82 BM
792. Which transition metal is used for the reduction of steam to hydrogen?
a) Mg b) Fe c) Sc d) Pt
793. The transition elements are more metallic than the representative elements because they have
a) Electron pairs in d -orbitals b) Availability of d -orbitals for bonding

- c) The electron in d -orbitals
- d) Unpaired electron in metallic orbitals
794. Cerium can show the oxidation state of +4 because:
- a) It resembles alkali metals
 - b) It has very low value of IE
 - c) Of its tendency to attain noble gas configuration of xenon
 - d) Of its tendency to attain f^0 configuration

