

GPLUS EDUCATION

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CHEMISTRY

THE P-BLOCK ELEMENTS

Single Correct Answer Type

- The Minerals having silicates chains are collectively called
a) Olivine b) Zircon c) Pyroxenes d) Natrolite
- Pyrex glass is a mixture of :
a) Sodium borosilicate and barium borosilicate
b) Sodium silicate and calcium silicate
c) Sodium silicate and lead silicate
d) Sodium silicate and aluminium borosilicate
- Amorphous boron on burning in air forms:
a) $B(OH)_3$
b) Mixture of B_2O_3 and BN
c) Only B_2O_3
d) Only BN
- What is the state of hybridization of carbon in fullerene?
a) sp^2 b) sp^3 c) sp d) sp^3d
- Boron was isolated by:
a) Moseley b) Davy c) Rutherford d) Moisson
- Which reaction cannot give anhydrous $AlCl_3$?
a) Heating of $AlCl_3 \cdot 6H_2O$
b) Passing dry HCl over heated aluminium powder
c) Passing dry Cl_2 over heated aluminium powder
d) Heating a mixture of alumina and coke in a current of dry Cl_2
- An aqueous solution of potash alum gives
a) Two types of ions b) Only one type of ion c) Four types of ion d) Three types of ions
- Which is neutral to litmus?
a) ZnO b) SnO c) CO d) SiO
- Electrolytic reduction of alumina to aluminium by Hall-Heroult process is carried out:
a) In the presence of NaCl
b) In the presence of fluorite
c) In the presence of cryolite which forms a melt with lower melting temperature
d) In the presence of cryolite which forms a melt with higher melting temperature
- The type of glass used in making lenses and prism is
a) Pyrex glass b) Quartz glass c) Jena glass d) Flint glass
- Solid CO_2 is used as :
a) Poison b) Fire extinguisher c) Refrigerant d) Artificial respirant
- Coke is obtained from coal by:
a) Cracking
b) Fractional distillation
c) Destructive distillation
d) None of these
- The liquid field metal expanding on solidification is
a) Cu b) Ga c) Al d) Zn
- Solder is an alloy of

- a) Pb + Sn b) Pb + Sn + Zn c) Pb+ Zn d) Sn+ Zn
15. Graphite is used in nuclear reactors:
 a) As a lubricant b) As a fuel c) As moderator d) None of these
16. BF_3 is an example of Lewis acid because it behaves as:
 a) Nucleophile b) Electrophile c) Free radical d) lyophilic
17. What is the number of free electrons present on each carbon atom in graphite?
 a) 0 b) 3 c) 2 d) 1
18. CCl_4 does not show hydrolysis but SiCl_4 is readily hydrolysed because:
 a) Carbon cannot expand its octet but silicon can expand
 b) Electronegativity of carbon is higher than of silicon
 c) IP of carbon is higher than of silicon
 d) Carbon forms double and triple bonds but not silicon
19. Lead pipes are corroded quickly by
 a) dil. H_2SO_4 b) Acetic acid c) conc. H_2SO_4 d) Water
20. Purification of alumina is essential because:
 a) Impure alumina is a very poor conductor of electricity
 b) Impure alumina has a very high melting point
 c) Impure alumina cannot react with the oxidizing agent
 d) It is difficult to purify aluminium metal
21. Structure of boric acid (H_3BO_3) is:
 a) Trigonal
 b) Tetragonal
 c) Layer structure in which BO_3 units are linked with oxygen
 d) Layer structure in which BO_3 units are linked by H-bonding
22. Producer gas is a mixture of:
 a) $\text{CO} + \text{N}_2$ b) $\text{CO} + \text{H}_2$ c) $\text{N}_2 + \text{CH}_4$ d) $\text{CO} + \text{H}_2 + \text{N}_2$
23. Which statement is false?
 a) Water gas is a mixture of hydrogen and carbon monoxide
 b) Producer gas is a mixture of carbon monoxide and nitrogen
 c) Water gas is a mixture of water vapour and hydrogen
 d) Natural gas consists of methane, ethane and gaseous hydrocarbons
24. Bauxite ore is made up of $\text{Al}_2\text{O}_3 + \text{SiO}_2 + \text{TiO}_2 + \text{Fe}_2\text{O}_3$. This ore is treated with conc. NaOH solution at 500K and 35 bar pressure for few hours and filtered hot. In the filtrate the species present, are
 a) NaAl(OH)_4 only b) $\text{Na}_2\text{Ti(OH)}_6$ only
 c) NaAl(OH)_4 and Na_2SiO_3 both d) Na_2SiO_3 only
25. An element A dissolves both in acid and alkali. It is an example of
 a) Amorphous nature of A b) Allotropic nature of A
 c) Amphoteric nature of A d) Dimorphic nature of A
26. Which melts in boiling water?
 a) Gun metal b) Wood's metal c) Monel metal d) Bell metal
27. Hardest element of III A group of gp.13 is:
 a) B b) Ga c) Al d) In
28. Tin cry refers to :
 a) Conversion of white to grey tin
 b) Tin plating
 c) Conversion of white tetrahedral tin to white rhombohedral tin
 d) Emission of sound while bending a tin rod
29. The method of zone refining of metals is based on the principle of
 a) Greater noble character of the solid metal than that of the impurity

- b) Greater solubility of the impurity in the molten state than in the solid
 c) Greater mobility of the pure metal than that of impurity
 d) Higher melting point of the impurity than that of the pure metal
30. The hybridization of boron atom in orthoboric acid is:
 a) sp b) sp^2 c) sp^3 d) sp^3d
31. Which is not an allotrope of carbon?
 a) Graphite b) Diamond c) Soot d) Carborundum
32. Alum are used as mordant in dyeing because
 a) Dye is adsorbed on $Al(OH)_3$ which is deposited on fibre in the hydrolysis process
 b) Dye is adsorbed on KOH formed due to hydrolysis
 c) Both of the above
 d) None of the above
33. Observe the following statements regarding purification of bauxite
 I. During Hall's process, silica is removed as Si (vapour).
 II. Bauxite ore contaminated with Fe_2O_3 is purified in Baeyer's process.
 III. During Serpeck's process, AlN is formed.
 The correct answer is
 a) I, II and III are correct b) Only I and II are correct
 c) Only I and III are correct d) Only II and III are correct
34. Aluminium is not used
 a) In silvery paints b) As oxidizer in metallurgy
 c) For making utensils d) As a reducing agent
35. Molecular weight of anhydrous aluminium chloride is:
 a) 133.5 b) 267.0 c) 241.5 d) 483.0
36. Mg_2C_3 has the following characteristics:
 a) It is called magnesium allylide
 b) It contains Mg^{2+} and C_3^{4-} ions
 c) It on hydrolysis gives propyne
 d) All of the above
37. Newton's alloy contains :
 a) Bi, Sn, Pb b) Bi, Fe, Cr c) Bi, Sn, Cd d) Pb, Sn, Cd
38. In III A group (thallium) show + 1 oxidation state while other members show + 3 oxidation state, why?
 a) Presence of lone pair of electron in Tl b) Large ionic radius of Tl ion
 c) Inert pair effect d) None of the above
39. The protective film of oxide on the surface of Al metal may be strengthened by:
 a) Galvanizing b) Cathodizing c) Sheradizing d) Anodizing
40. Which of the following is only acidic in nature?
 a) $Mg(OH)_2$ b) $Be(OH)_2$ c) $Al(OH)_3$ d) $B(OH)_3$
41. Which poisonous gas is present in the exhaust of car?
 a) Methane b) Carbon monoxide c) Acetylene d) Ethane
42. A metallic oxide which imparts purple colour to pottery is:
 a) Lead oxide b) Copper oxide c) Sodium oxide d) Manganese dioxide
43. The cryolite is:
 a) $NaAlO_3$ b) Na_3AlF_6 c) Na_3AlO_3 d) Na_2AlF_5
44. Quartz is made of silicon and oxygen joined in a network arrangement that is similar to :
 a) Diamond b) Graphite c) O_2 d) None of these
45. Solid CO_2 is known as dry ice, because
 a) It evaporates at $40^\circ C$ b) It melts at $0^\circ C$
 c) Its boiling points is more than $199^\circ C$ d) It evaporates at $-78^\circ C$ without melting

46. Aluminium chloride exists as dimer, Al_2Cl_6 in solid state as well as in solution of non-polar solvents such as benzene. When dissolved in water, it gives
 a) $[\text{Al}(\text{OH})_6]^{3-} + 3\text{HCl}$ b) $\text{Al}_2\text{O}_3 + 6\text{HCl}$ c) $\text{Al}^{3+} + 3\text{Cl}^-$ d) $[\text{Al}(\text{H}_2\text{O})_6]^{3+} + 3\text{Cl}^-$
47. Hot conc HNO_3 converts graphite into
 a) Graphite oxide b) Benzene hexacarboxylic acid
 c) Both (a) and (b) d) None of the above
48. Which is correct oxidation state of lead?
 a) +3, +4 b) +4 c) +1, +2 d) +2, +4
49. Which of the following is a three dimensional silicate?
 a) Mica b) Spodumene c) Zeolite d) None of these
50. Which of the following is a gas?
 a) BF_3 b) BCl_3 c) BBr_3 d) BI_3
51. Plumbo-solvency means dissolution of lead in:
 a) Hot water b) Acids c) Ordinary water d) Alkalies
52. On doping Ge metal with a little of In, one gets:
 a) *p*-type semiconductor
 b) *n*-type semiconductor
 c) Insulator
 d) Rectifier
53. Vapour density of which gas is near to air?
 a) CO b) CO_2 c) NH_3 d) SO_2
54. Muddy water can be purified through coagulation by using
 a) Common salt b) Alums c) Sand d) Lime
55. The most abundant gas in ordinary air among the following is:
 a) Argon b) Helium c) Carbon dioxide d) Carbon monoxide
56. Corundum is:
 a) SiO_2 b) Al_2O_3 c) CaF_2 d) Cr_2O_3
57. Tin dissolves in dilute HNO_3 forming :
 a) Metastannic acid b) Nitrous oxide c) Ammonium nitrate d) Stannic nitrate
58. The core of a non-luminous Bunsen burner flame is observed to be yellow in colour. This is because of:
 a) Contamination from the metal of the burner
 b) Impurities in the fuel
 c) Incomplete combustion
 d) None of the above
59. The correct order of decreasing ionic nature of lead dihalides is :
 a) $\text{PbF}_2 > \text{PbCl}_2 > \text{PbBr}_2 > \text{PbI}_2$
 b) $\text{PbF}_2 > \text{PbBr}_2 > \text{PbCl}_2 > \text{PbI}_2$
 c) $\text{PbF}_2 < \text{PbCl}_2 > \text{PbBr}_2 < \text{PbI}_2$
 d) $\text{PbI}_2 < \text{PbBr}_2 < \text{PbCl}_2 < \text{PbF}_2$
60. The correct Lewis acid order for boron halides is:
 a) $\text{BF}_3 > \text{BCl}_3 > \text{BBr}_3 > \text{BI}_3$
 b) $\text{BCl}_3 > \text{BF}_3 > \text{BBr}_3 > \text{BI}_3$
 c) $\text{BI}_3 > \text{BBr}_3 > \text{BCl}_3 > \text{BF}_3$
 d) $\text{BBr}_3 > \text{BCl}_3 > \text{BI}_3 > \text{BF}_3$
61. Incomplete combustion of petrol or diesel oil in automobile engines can be best detected by testing the fuel gases for the presence of :
 a) CO + H_2O b) CO c) NO_2 d) SO_2
62. Alum is not used:
 a) As a mordant in dyeing

- b) As an insecticide
 c) In the purification of water
 d) In tanning of leather
63. $\text{BCl}_3 + \text{H}_2\text{O} \rightarrow \text{X}$, the products formed in the reaction are
 a) $\text{B}_2\text{O}_3 + \text{HOCl}$ b) $\text{H}_3\text{BO}_3 + \text{HCl}$ c) $\text{B}_2\text{H}_6 + \text{HCl}$ d) No reaction
64. Boric acid on heating at 150°C gives:
 a) B_2O_3 b) $\text{H}_2\text{B}_4\text{O}_7$ c) HBO_2 d) H_2BO_3
65. Which one of the following orders presents the correct sequence of the increasing basic nature of the given oxides?
 a) $\text{Al}_2\text{O}_3 < \text{MgO} < \text{Na}_2\text{O} < \text{K}_2\text{O}$
 b) $\text{MgO} < \text{K}_2\text{O} < \text{Al}_2\text{O}_3 < \text{Na}_2\text{O}$
 c) $\text{Na}_2\text{O} < \text{K}_2\text{O} < \text{MgO} < \text{Al}_2\text{O}_3$
 d) $\text{K}_2\text{O} < \text{Na}_2\text{O} < \text{Al}_2\text{O}_3 < \text{MgO}$
66. Which fuel has the highest calorific value?
 a) Coal gas b) Water gas c) Producer gas d) Carbon dioxide gas
67. Anodising can be done by electrolyzing dilute H_2SO_4 with Al an anode, this result is
 a) The formation of protective oxide layer b) The formation of $\text{Al}_2(\text{SO}_4)_3$ and SO_2 gas
 c) The formation of AlH_3 and SO_2 gas d) The formation of $\text{Al}(\text{HSO}_3)$ and H_2 gas
68. Tin reacts with conc. H_2SO_4 to give:
 a) α -stannic acid. b) Stannous sulphate c) β - stannic acid d) Stannic sulphate
69. The chemical formula of sindhur is
 a) PbO b) Pb_3O_4 c) ZnO d) SnCl_2
70. Aluminium oxide is not reduced by chemical reactions since
 a) Aluminium oxide is reactive b) Reducing agents contaminate
 c) Aluminium oxide is highly stable d) The process pollutes the environment
71. Aluminium reacts with caustic soda to form
 a) Aluminium hydroxide b) Aluminium oxide
 c) Sodium meta-aluminate d) Sodium tetra aluminate
72. PbO_2 on reaction with HNO_3 gives gas:
 a) NO_2 b) O_2 c) N_2 d) N_2O
73. When orthoboric acid (H_3BO_3) is heated the residue left is:
 a) Boron b) Metaboric acid c) Boric anhydride d) borax
74. Which is a correct statement about diborane structure?
 a) All HBH bond angles are equal b) All H – B bond lengths are equal
 c) It has two three-centre-2 electron bonds d) All hydrogen and boron atoms are in one plane
75. Thermite is a mixture of
 a) $\text{Cr}_2\text{O}_3 + \text{Al}_2\text{O}_3$ b) $\text{Fe}_2\text{O}_3 + \text{Al}$ c) $\text{Fe}_2\text{O}_3 + \text{Al}_2\text{O}_3$ d) $\text{Al}_2\text{O}_3 + 2\text{Cr}$
76. White lead or basic lead carbonate is:
 a) $\text{Pb}(\text{OH})_2 \cdot 2\text{PbCO}_3$
 b) $\text{Pb}(\text{OH})_2 \cdot \text{Pb}(\text{CH}_3\text{COO})_2$
 c) PbCO_3
 d) $\text{PbCO}_3 \cdot \text{Pb}(\text{OH})_2$
77. Cane sugar reacts with conc. HNO_3 to give :
 a) CO_2 and H_2O b) Oxalic acid c) CO and H_2O d) H_2CO_3
78. Man dies in an atmosphere of carbon monoxide, because it:
 a) Combines with the O_2 present in the body to form CO_2
 b) Reduces the organic matter of tissues
 c) Combines with haemoglobin of blood, making it incapable of absorbing O_2
 d) Dries up the blood

79. Which has highest b.p.?
 a) Diamond b) Graphite c) Charcoal d) Lamp black
80. Carbon cannot be used in the reduction of Al_2O_3 because
 a) It is an expensive proposition
 b) The enthalpy of formation of CO_2 is more than that of Al_2O_3
 c) Pure carbon is not easily available
 d) The enthalpy of formation of Al_2O_3 is too high
81. Which of the following has most density?
 a) Pb b) B c) Cu d) Fe
82. Which of the following oxides is amphoteric in character?
 a) SnO_2 b) SiO_2 c) CO_2 d) CaO
83. Water gas is produced by :
 a) Passing steam through a red hot coke bed
 b) Saturating hydrogen with moisture
 c) Mixing oxygen and hydrogen in the ratio of 1 : 2
 d) Heating a mixture of CO_2 and CH_4 in petroleum refineries
84. CO forms a volatile compound with:
 a) Nickel b) Copper c) Sodium d) Aluminium
85. Red lead is:
 a) PbO b) Pb_3O_4 c) PbO_2 d) HgS
86. The order of acidic strength of boron trihalides
 a) $\text{BF}_3 < \text{BCl}_3 < \text{BBr}_3 < \text{BI}_3$ b) $\text{BI}_3 < \text{BBr}_3 < \text{BCl}_3 < \text{BF}_3$
 c) $\text{BCl}_3 < \text{BBr}_3 < \text{BI}_3 < \text{BF}_3$ d) $\text{BBr}_3 < \text{BCl}_3 < \text{BF}_3 < \text{BI}_3$
87. Heating an aqueous solution of aluminium chloride to dryness will give:
 a) AlCl_3 b) Al_2Cl_6 c) Al_2O_3 d) $\text{Al}(\text{OH})\text{Cl}_2$
88. Buckminster fullerene is
 a) Pure graphite b) C-60 c) Diamond d) C-90
89. Lead (IV) oxide is obtained by :
 a) Heating lead (II) oxide strongly in air
 b) Heating lead strongly in pure oxygen
 c) Oxidizing lead with conc. HNO_3
 d) Heating Pb_3O_4 with conc. HNO_3
90. Graphite is a soft solid lubricant extremely difficult to melt. The reason for this anomalous behaviour is that, graphite
 a) Is a non-crystalline substance
 b) Is an allotropic form of diamond
 c) Has molecules of variable molecular masses like polymers
 d) Has carbon atoms arranged in large plates of rings of strongly bound carbon atoms with weak interplate bonds
91. The composition of the common glass is
 a) $\text{Na}_2\text{O} \cdot \text{CaO} \cdot 6\text{SiO}_2$ b) $\text{Na}_2\text{O} \cdot \text{Al}_2\text{O}_3 \cdot \text{SiO}_2$ c) $\text{CaO} \cdot \text{Al}_2\text{O}_3 \cdot \text{SiO}_2$ d) $\text{Na}_2\text{O} \cdot \text{CaO} \cdot 6\text{SiO}_2$
92. Aluminium becomes passive in nitric acid because it:
 a) Is a noble metal
 b) Forms a thin film of oxide
 c) Positive reduction potential
 d) None of the above
93. Among the following substituted silanes the one which will give rise to cross linked silicone polymer on hydrolysis is
 a) R_4Si b) RSiCl_3 c) R_2SiCl_2 d) R_3SiCl

94. The thermal stability of CF_4 is
 a) Less than SiF_4 b) More than SiF_4 c) Less than CCl_4 d) Less than SiCl_4
95. An oxide of an element is a gas and dissolves in water to give an acidic solution. The element belongs to
 a) II group b) IV group c) VIII group d) Zero group
96. The C—X bond energy order for carbon tetra halides is:
 a) $\text{CF}_4 > \text{CCl}_4 > \text{CBr}_4 > \text{Cl}_4$
 b) $\text{CCl}_4 > \text{CBr}_4 > \text{Cl}_4 > \text{CF}_4$
 c) $\text{Cl}_4 > \text{CBr}_4 > \text{CCl}_4 > \text{CF}_4$
 d) None of the above
97. An example of a major air pollutant is:
 a) Oxygen b) Carbon dioxide c) Carbon monoxide d) Helium
98. Pewter is an alloy of :
 a) Pb and Sn b) Pb, Sb and Sn c) Pb, Bi and Sn d) Pb, Bi, Sn and Cd
99. Rose metal is an alloy of.
 a) Sn + Pb + Bi b) Sn + Cu c) Sn + Sb + Cu d) None of these
100. An insulator is:
 a) Silicon b) Graphite c) Aluminium d) Diamond
101. Boron nitride on reacting with caustic alkali gives:
 a) NH_3 b) N_2O c) Na_3BO_3 d) NO_2
102. The different layers in graphite are held together by
 a) Metallic bonding b) Covalent bonding c) Ionic bonding d) Van der Waals' forces
103. Colemanite is a mineral of:
 a) Mg b) B c) Al d) Mn
104. Which of the following is a mixed oxide?
 a) Fe_2O_3 b) PbO_2 c) BaO_2 d) Pb_3O_4
105. In the sale of diamonds the unit of weight is carat. One carat is equal to:
 a) 100 mg b) 300 mg c) 400 mg d) 200 mg
106. Which gas present in atmosphere darkens the surface painted by white lead?
 a) SO_2 b) NH_3 c) CO_2 d) H_2S
107. Which of the following is most abundant in the earth crust?
 a) In b) Ga c) B d) Al
108. Which form of carbon has a two-dimensional sheet-like structure?
 a) Coal b) Coke c) Diamond d) Graphite
109. Extraction of metal from the ore cassiterite involves
 a) Carbon reduction of an oxide ore b) Self-reduction of a sulphide ore
 c) Removal of copper impurity d) Removal of iron impurity
110. An alumina-silica clay, called bentonite is dropped from aeroplanes in the slurry form for:
 a) Fertilizing the soil
 b) Spreading water over fires
 c) Cooling the soil
 d) Fumigation
111. Gun shots are made of lead with a little arsenic. The function of As is to increase:
 a) Range of fire b) Power of fire c) Brittleness d) Weight of fire
112. The colour of blue glass is due to the presence of oxide of
 a) Cr b) Co c) Au d) Ag
113. The glass having smallest coefficient of thermal expansion is :
 a) Soda lime glass b) Soft glass c) Safety glass d) Pyrex glass
114. Carborundum is obtained when silica is heated at high temperature with
 a) Carbon b) Carbon monoxide c) Carbon dioxide d) Calcium carbonate

115. R_3SiCl on hydrolysis forms:
 a) R_3SiOH b) $R_3Si - O - SiR_3$ c) $R_2Si = O$ d) None of these
116. Tin plague is the:
 a) Conversion of stannous to stannic
 b) Conversion of white tin to grey tin
 c) Emission of sound while bending a tin rod
 d) Atmospheric oxidation of tin
117. Water glass is:
 a) Calcium silicate
 b) Sodium, calcium silicate
 c) Sodium silicate
 d) Magnesium silicate
118. If a person is injured by the shot of a gun and all the pellets could not be removed, it may cause poisoning by:
 a) Hg b) Pb c) Fe d) As
119. Which property is common in diamond and graphite?
 a) Electrical conductivity
 b) Relative atomic weight
 c) Crystal structure
 d) Density
120. Carbon dioxide is used for extinguishing fire because:
 a) It has a relatively high critical temperature
 b) In solid state, it is called dry ice
 c) It is neither combustible nor a supporter of combustion
 d) It is a colourless gas
121. In which of the following the inert pair effect is most prominent?
 a) Si b) Ge c) Pb d) C
122. One recently discovered allotrope of carbon (*e. g.*, C_{60}) is known as
 a) Fluorine b) Fullerene c) Flourene d) Freon
123. Which oxide has three dimensional structure?
 a) CO b) CO_2 c) SiO_2 d) SO_2
124. Diamond and graphite are:
 a) Isomers b) Isotopes c) allotropes d) Polymers
125. CO_2 is called dry ice or drikold because:
 a) It wets the surface
 b) It does not melt
 c) At atmospheric pressure solid CO_2 changes directly into the gas and the liquid phase is not formed and does not wet the surface
 d) It is gaseous in nature
126. Minium is:
 a) PbO b) Pb_3O_4 c) PbO_2 d) All of these
127. Which of the following is called alum?
 a) $NaAlO_2$
 b) $Na_2SO_4 \cdot Al_2(SO_4)_3 \cdot 24H_2O$
 c) $KCl \cdot MgCl_2 \cdot 6H_2O$
 d) $FeSO_4 \cdot (NH_4)_2SO_4 \cdot 6H_2O$
128. The carbon of microphones used in public address systems is :
 a) Graphite b) Charcoal c) Coke d) Lamp black
129. Aluminium is extracted by the electrolysis of

- a) Alumina
c) Molten cryolite
- b) Bauxite
d) Alumina mixed with molten cryolite
130. In Gold Schmidt reaction, certain metallic oxides are reduced to the metallic state by heating with:
a) Metallic magnesium b) Metallic aluminium c) Metallic iron d) Sodium metal
131. Formula for agate is
a) Na_2SiO_3 b) $\text{K}_2\text{O} \cdot \text{SiO}_2 \cdot \text{Al}_2\text{O}_3$ c) SiO_2 d) CaF_2
132. Pure CO can be obtained from:
a) Sodium oxalate
b) Nickel tetracarbonyl
c) Formic acid
d) Carbon dioxide and hydrogen
133. Which is used for the manufacture of optical instruments?
a) Water glass b) Pyrex glass c) Flint glass d) Jena glass
134. Red liquor is :
a) $(\text{CH}_3\text{COO})_3\text{Al}$ b) $\text{Al}(\text{OH})_3$ c) $\text{Al}_2(\text{CO}_3)_3$ d) $\text{Al}_2(\text{SO}_4)_3$
135. Which element has a limited coordination number of four?
a) Sn b) C c) Si d) Ge
136. Aqueous ammonia is used as a precipitating reagent for Al^{3+} ions as $\text{Al}(\text{OH})_3$ rather than aqueous NaOH, because:
a) NH_4^+ is a weak base
b) NaOH is a very strong base
c) NaOH forms $[\text{Al}(\text{OH})_4]^-$ ions
d) NaOH forms $[\text{Al}(\text{OH})_2]^+$ ions
137. In Goldschmidt aluminothermic process, thermite contains
a) 3 part of Al_2O_3 , and 4 part of Al b) 3 parts of Fe_2O_3 and 2 parts of Al
c) 3 parts of Fe_2O_3 and 1 part of Al d) 1 parts of Fe_2O_3 and 1 part of Al
138. During the electrolysis of cryolite, aluminium and fluorine are formed in molar ratio
a) 1:2 b) 2:3 c) 1:1 d) 1:3
139. Suppose you have to determine the percentage of carbon dioxide in a sample of a gas available in a container. Which is the best absorbing material for the carbon dioxide?
a) Heated copper oxide b) Cold, solid calcium chloride
c) Cold, solid calcium hydroxide d) Heated charcoal
140. The dissolution of $\text{Al}(\text{OH})_3$ by a solution of NaOH results in the formation of:
a) $[\text{Al}(\text{H}_2\text{O})_4(\text{OH})]^{2+}$ b) $[\text{Al}(\text{H}_2\text{O})_2(\text{OH})_4]^-$ c) $[\text{Al}(\text{H}_2\text{O})_3(\text{OH})_3]$ d) $[\text{Al}(\text{H}_2\text{O})_6(\text{OH})_3]$
141. Prussic acid is the name of :
a) PH_3 b) HPO_3 c) HCN d) HNC
142. Which gas is used in aerated water?
a) CO_2 b) SO_2 c) CO d) Water vapours
143. Which is not an ore of lead?
a) Galena b) Anglesite c) Calamine d) Cerussite
144. Borax on heating with cobalt oxide forms a blue bead of:
a) $\text{Co}(\text{BO}_2)_2$ b) CoBO_2 c) $\text{Co}_3(\text{BO}_3)_2$ d) $\text{Na}_3\text{Co}(\text{BO}_3)_2$
145. Inorganic benzene is:
a) BN b) BF_4 c) B_2H_6 d) $\text{B}_3\text{N}_3\text{H}_6$
146. The correct formula of borax is:
a) $\text{Na}_2[\text{B}_4\text{O}_5(\text{OH})_4] \cdot 8\text{H}_2\text{O}$
b) $\text{Na}_2\text{B}_4\text{O}_7 \cdot 4\text{H}_2\text{O}$
c) $\text{Na}_2[\text{B}_4\text{O}_5(\text{OH})_4] \cdot 10\text{H}_2\text{O}$

- d) $\text{Na}_2\text{B}_4\text{O}_7 \cdot 8\text{H}_2\text{O}$
147. The formula of mineral borax is
 a) $\text{Na}_2\text{B}_4\text{O}_7$ b) $\text{Na}_2\text{B}_4\text{O}_7 \cdot 4\text{H}_2\text{O}$ c) $\text{Na}_2\text{B}_4\text{O}_7 \cdot 5\text{H}_2\text{O}$ d) $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$
148. The hardest compound of boron is:
 a) Boron oxide b) Boron nitride c) Boron carbide d) Boron hydride
149. For purification of alumina, the modern processes most useful when (i) the impurity present is a lot iron oxides and (ii) the impurity present is a lot of silica, are
 a) For (i) the Hall's process; for (ii) Baeyer's process
 b) For (i) Serpeck's process; for (ii) Baeyer's process
 c) For (i) Hall's process; for (ii) Serpeck's process
 d) For (i) Baeyer's process; for (ii) Serpeck's process
150. Carbon reacts with conc. H_2SO_4 to give :
 a) $\text{CO}_2, \text{SO}_2, \text{H}_2\text{O}$ b) $\text{SO}_2, \text{H}_2\text{O}, \text{CO}$ c) $\text{CO}, \text{H}_2\text{O}$ d) $\text{CO}_2, \text{H}_2\text{O}$
151. Massicot is prepared by:
 a) Heating tin in air all about 300°C
 b) Heating litharge
 c) Heating red lead
 d) Heating lead nitrate
152. Animal charcoal is used for decolourisation of sugar because:
 a) It oxidizes coloured material
 b) It reduces coloured material
 c) It converts coloured material into colourless
 d) It adsorbs coloured material
153. Which is used as disinfectant?
 a) Boric acid b) Sulphuric acid c) Phosphorus acid d) Phosphoric acid
154. Which gas is liberated when Al_4C_3 is hydrolysed?
 a) CH_4 b) C_2H_2 c) C_2H_6 d) CO_2
155. The coal form containing maximum percentage of carbon is:
 a) Lignite b) Anthracite c) Bituminous d) Peat
156. Water softner is
 a) Borax b) Zeolite c) Both (a) And (b) d) None of these
157. Carbon dioxide is a gas but silica is a solid because :
 a) Carbon dioxide is composed of discrete covalent CO_2 molecules whereas silica has continuous tetrahedral structure
 b) CO_2 molecules are lighter than SiO_2 molecules
 c) CO_2 is more acidic than SiO_2
 d) Melting point of silica is very high
158. Alums are used for
 a) Tanning of leather b) Coagulation of blood c) Purification of water d) All of these
159. On heating Al at 800°C in air, Al_2O_3 is formed. The reaction is:
 a) An endothermic reaction
 b) An exothermic reaction
 c) Reduction of aluminium
 d) None of the above
160. White lead is
 a) PbCO_3PbO b) PbCO_3 c) $\text{Pb}(\text{OH})_2 \cdot 2\text{PbCO}_3$ d) $\text{PbSO}_4 \cdot \text{PbO}$
161. Hot and conc. HNO_3 react with carbon to form:
 a) CO_2 b) CO c) $\text{C}_6\text{H}_5\text{COOH}$ d) $\text{NO}_2 + \text{CO}_2$
162. Anodised aluminium is:

- a) Al obtained at anode
 b) Al prepared electrolytically
 c) Alloy of Al containing 95% Al
 d) Al electrolytically coated with aluminium oxide
163. AlCl_3 is
 a) Anhydrous and ionic
 b) Covalent and basic
 c) Anhydrous and covalent
 d) Co-ordinate and acidic
164. The variety of glass, used for the preservation of eggs is:
 a) Jena glass
 b) Safety glass
 c) Water glass
 d) Bottle glass
165. Which of the following is used for making optical instruments?
 a) SiO_2
 b) Si
 c) SiH_4
 d) SiC
166. Tincal is
 a) $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$
 b) NaNO_3
 c) $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$
 d) NaCl
167. Tin (II) fluoride (anhydrous) can be obtained by :
 a) Treating tin with F_2
 b) Treating tin with HF
 c) Dissolving SnO in HF
 d) None of these
168. Which of the following is the correct statement for red lead?
 a) It is an active form of lead
 b) It decomposes into Pb and CO_2
 c) Its molecular formula is Pb_2O_3
 d) It decomposes into PbO and O_2
169. Potash alum dissolves in water to give a/an
 a) Acidic solution of H_2SO_4
 b) Alkaline solution
 c) Acidic solution of HCl
 d) Neutral solution
170. Which is the least pure form of carbon?
 a) Graphite
 b) Lamp black
 c) Wood charcoal
 d) Animal charcoal
171. The calorific value of carbon is about kcal.
 a) 7.8
 b) 15.6
 c) 47
 d) 94
172. Aluminium metal is refined by
 a) Serpeck's process
 b) Baeyer's process
 c) Hall's process
 d) Hoop's process
173. The metal which does not form ammonium nitrate by reaction with dil HNO_3 is
 a) Al
 b) Fe
 c) Pb
 d) Mg
174. Which one of the following metals work as a reduction in smelting process?
 a) C
 b) Al
 c) Zn
 d) None of these
175. The incorrect statement/s among the following is/are
 IV. NCl_5 does not exist while PCl_5 does.
 V. Lead prefers to form tetravalent compounds.
 VI. The three C – O bonds are not equal in the carbonate ion.
 VII. Both O_2^+ and NO are paramagnetic.
 a) I, III and IV
 b) I and IV
 c) II and III
 d) I and III
176. Which of the following is known as inorganic benzene?
 a) Borazine
 b) Phosphonitrilic acid
 c) Boron nitride
 d) *p*-dichlorobenzene
177. Which element does not exhibit allotropy?
 a) C
 b) Sn
 c) Si
 d) Pb
178. Carbon monoxide will not reduce:
 a) Litharge
 b) Cupric oxide
 c) Zinc oxide
 d) Ferric oxide
179. Graphite is made by heating coke with silica for many hours in a :
 a) Blast furnace
 b) Blast of steam under pressure

- c) In presence of air
d) High electric arc furnace
180. When carbon monoxide is passed over solid caustic soda heated to 200°C, it forms
a) Na_2CO_3 b) CH_3COONa c) NaHCO_3 d) HCOONa
181. In purification of bauxite by hall's process
a) Bauxite ore is fused with Na_2CO_3
b) Bauxite ore is heated with NaOH solution at 50°C
c) Bauxite ore is heated with NaHCO_3
d) Bauxite ore is fused with coke and heated at 1800°C in a current of nitrogen
182. Which of the following is not a Lewis acid?
a) SiF_4 b) FeCl_3 c) BF_3 d) C_2H_4
183. Sapphire is a mineral of:
a) Cu b) Zn c) Al d) Hg
184. Which is/are fire extinguishers?
a) Dry powder containing sand + NaHCO_3
b) $\text{NaHCO}_3 + \text{H}_2\text{SO}_4$
c) Foamite extinguishers containing $\text{NaHCO}_3 + \text{Al}_2(\text{SO}_4)_3$
d) All of these
185. Boron nitride has the structure of the type
a) Graphite type b) Diamond type
c) Both diamond and graphite type d) NaCl type
186. The structure and hybridization of $\text{Si}(\text{CH}_3)_4$ is :
a) bent, sp b) trigonal, sp^2 c) octahedral, sp^3d d) tetrahedral, sp^3
187. Al_2O_3 can be converted to anhydrous AlCl_3 by heating:
a) A mixture of Al_2O_3 and carbon in dry Cl_2 gas
b) Al_2O_3 with Cl_2 gas
c) Al_2O_3 with HCl gas
d) Al_2O_3 with NaCl in solid state
188. Eka aluminium is:
a) Gallium b) Germanium c) Indium d) Scandium
189. Elements of group IV used in semiconductors are
a) C, Si, Ge b) Si, Ge, Sn c) Si, Ge d) B, Si, Ge
190. The acid used for etching the glass is:
a) Sulphuric acid b) Perchloric acid c) Hydrofluoric acid d) Aqua-regia
191. The greatest percentage of CO is in:
a) Coal gas b) Producer gas c) Water gas d) Oil gas
192. The process used for purification of bauxite are containing iron oxide impurity is known as:
a) Hoopé's process b) Serpeck's process c) Baeyer's process d) Electrolytic process
193. Which statement is correct?
a) BCl_3 and AlCl_3 are both Lewis acids and BCl_3 is stronger than AlCl_3
b) BCl_3 and AlCl_3 are both Lewis acids and AlCl_3 is stronger than BCl_3
c) BCl_3 and AlCl_3 are both equally strong Lewis acids
d) Both BCl_3 and AlCl_3 are not Lewis acids
194. In the electrolysis of alumina, cryolite is added to:
a) Lower the melting point of alumina
b) Increase the electrical conductivity
c) Both (a) and (b)
d) Remove impurities from alumina
195. Which is true for an element R present in III group of the periodic table?

- a) It has oxidation state of + 4
 c) It forms R_2O_3
- b) It is gas at room temperature
 d) It forms RX_2
196. In III A group, Tl (thallium,) shows +1 oxidation state while other members show +3 oxidation state, why?
 a) Presence of lone electron in Tl
 b) Insert pair effect
 c) Large ionic radius of Tl ion
 d) None of the above
197. Which of the following elements is a metalloid?
 a) C
 b) Ge
 c) Bi
 d) Sn
198. Hydrogen forms a bridge in the chemical structure of:
 a) Hydrogen peroxide
 b) Lithium hydride
 c) Diborane
 d) Sodium peroxide
199. Which of the following is a use of alum?
 a) Making explosives
 b) Bleaching clothes
 c) Water softening
 d) All of these
200. Red lead is an example of a/an...oxide
 a) Basic
 b) Mixed
 c) Super
 d) Amphoteric
201. Carbon monoxide on heating with sulphur gives:
 a) COS
 b) SO_2
 c) SO_3
 d) None of these
202. Crystalline varieties of carbon is :
 a) Graphite
 b) Coke
 c) Peat
 d) Gas carbon
203. Formula of feldspar is
 a) $K_2O \cdot Al_2O_3 \cdot 6SiO_2$
 c) $Al_2O_3 \cdot 2SiO_2 \cdot 2H_2O$
 b) $K_2O_3 \cdot Al_2O_3 \cdot 6Si_2O_2 \cdot 2H_2O$
 d) $3MgO \cdot 4SiO_2 \cdot H_2O$
204. The ratio of Fe_2O_3 and Al, in thermite is
 a) 1:3
 b) 1:2
 c) 3:1
 d) None of these
205. The relative Lewis acid character of boron trihalides is in the order
 a) $BI_3 > BBr_3 > BF_3 > BCl_3$
 c) $BF_3 > BCl_3 > BBr_3 > BI_3$
 b) $BI_3 > BBr_3 > BCl_3 > BF_3$
 d) $BCl_3 > BF_3 > BI_3 > BBr_3$
206. Alum is added to muddy water because
 a) It acts as disinfectant
 b) It results in coagulation of clay and sand
 c) Clay is soluble in alum, hence removes it
 d) It makes water alkaline which is good for health
207. The reducing agent in thermite process is
 a) MnO_2
 b) BaO_2
 c) Mg
 d) Al
208. There are two H-bridge bonds in diborane molecule because there are:
 a) Only 12 electrons
 b) 14 electrons
 c) 2 electrons less than required for bonding
 d) Two electrons more than required for bonding
209. Name of structure of silicates in which three oxygen atoms of $[SiO_4]^{4-}$ are shared is
 a) Pyrosilicate
 c) Linear chain silicate
 b) Sheet silicate
 d) Three dimensional silicate
210. Pb reacts with dilute HNO_3 produces
 a) NO
 b) NH_4NO_3
 c) N_2O_5
 d) NO_2
211. Aluminium appears like gold when it is mixed with:
 a) 90% Cu
 b) 50% Ni
 c) 90% Sn
 d) 50% Co
212. Purification of aluminium done by electrolytic refining is known as
 a) Hoopé's process
 b) Serpeck's process
 c) Hall's process
 d) Baeyer's process
213. Which of the following is used in making printer's ink, shoe polish, black varnish and paint?
 a) Lamp black
 b) Bone black
 c) Carbon black
 d) None of these
214. The hottest part of the Bunsen burner flame is:

- a) Top of the outer zone
 b) A little below the tip of the flame
 c) Above the inner zone
 d) Blue zone
215. In the aluminothermic process, aluminium acts as:
 a) An oxidizing agent b) A flux c) A reduction agent d) A solder
216. Diborane reacts with water to form:
 a) HBO_2 b) H_3BO_3 c) $\text{H}_3\text{BO}_3 + \text{H}_2$ d) H_2
217. The chief impurity present in red bauxite is
 a) SiO_2 b) Fe_2O_3 c) K_2SO_4 d) NaF
218. Be and Al exhibits many properties which are similar but the two elements differ is:
 a) Exhibiting amphoteric nature in their oxides
 b) Forming polymeric hydrides
 c) Forming covalent halides
 d) Exhibiting maximum covalency in compounds
219. Borax bead test is responded by:
 a) Divalent metals
 b) Heavy metals
 c) Light metals
 d) Metal which forms coloured metaborates
220. A fibrous mineral which can withstand red hot flames without any damage is
 a) Talc b) Glass wool c) Soap stone d) Asbestos
221. Lead may be replaced from its salt solution by:
 a) Cu b) Au c) Ag d) Mg
222. Unstable lead compounds are
 a) PbCl_4 , PbBr_4 and PbI_4 b) PbCl_2 , PbBr_2 and PbI_2
 c) PbO , PbO_2 and Pb_3O_4 d) PbCl_4^{2-} , PbCl_6^{2-}
223. Which acid is formed when SiF_4 reacts with water?
 a) H_2SO_4 b) H_2SiF_4 c) H_2SiF_6 d) None of these
224. Which of the following reactions occurs at the cathode during the charging of lead accumulator?
 a) $\text{Pb}^{2+} + 2e \rightarrow \text{Pb}$
 b) $\text{Pb}^{2+} + \text{SO}_4^{2-} \rightarrow \text{PbSO}_4$
 c) $\text{Pb} \rightarrow \text{Pb}^{2+} + 2e$
 d) $\text{PbSO}_4 + 2\text{H}_2\text{O} \rightarrow \text{PbO}_2 + 4\text{H}^+ + \text{SO}_4^{2-} + 2e$
225. The two type of bonds present in B_2H_6 are covalent and.....
 a) Ionic b) Coordinate c) Hydrogen bridge d) None of these
226. Which one shows most pronounced inert pair effect?
 a) Si b) Sn c) Pb d) C
227. Which of the following is an ore of lead?
 a) Galena b) Calamine c) Malachite d) Dolomite
228. Soldiers of Napoleon army while at Alps during freezing winter suffered a serious problem as regards to the tin buttons of their uniforms. While metallic tin buttons got converted to grey powder. This transformation is related to
 a) An interaction with nitrogen of the air at very low to temperatures
 b) A change in the partial pressure of oxygen in the air
 c) A change in the crystalline structure of tin
 d) An interaction with water vapour contained in the humid air
229. In SiF_6^{2-} and SiCl_6^{2-} which one is known and why?
 a) SiF_6^{2-} because of small size of F b) SiF_6^{2-} because of large size of F

- c) SiCl_6^{2-} because of small size of Cl d) SiCl_6^{2-} because of large size of Cl
230. Which of the following has structure similar to graphite?
a) BN b) B c) B_4C d) B_2H_6
231. Tin(II) chloride (anhydrous) can be obtained :
a) By melting tin in an atmosphere of Cl_2
b) By treating tin with conc. HCl and heating the product to dryness
c) By treating tin with dil. HCl and heating the product to dryness
d) By treating tin with HCl(gas)
232. Which statement is not true about potash alum?
a) Its empirical formula is $\text{KAl}(\text{SO}_4)_2 \cdot 12\text{H}_2\text{O}$
b) Its aqueous solution is basic in nature
c) It is used in dyeing industries
d) On heating it melts and loses its water of crystallization
233. Solder is an alloy of :
a) Pb, Sb and Sn b) Pb and Sn c) Pb, Bi and Sn d) Sn, Sb and Cu
234. The thermal stability order for group 14 halides is:
a) $\text{GeX}_2 < \text{SiX}_2 < \text{SnX}_2 < \text{PbX}_2$
b) $\text{SiX}_2 < \text{GeX}_2 < \text{PbX}_2 < \text{SnX}_2$
c) $\text{SiX}_2 < \text{GeX}_2 < \text{SnX}_2 < \text{PbX}_2$
d) $\text{PbX}_2 < \text{SnX}_2 < \text{GeX}_2 < \text{SiX}_2$
235. Mica is chemically:
a) Potassium alumino silicate having sheet structure
b) Calcium alumino silicate having fibrous structure
c) Calcium magnesium silicate having three dimensional network
d) Hydrated sodium alumino silicate having three dimensional network
236. When tin is treated with concentrated nitric acid
a) It is converted into stannous nitrate b) It is converted into stannic nitrate
c) It is converted into metastannic acid d) It becomes passive
237. An element 'X' which occurs in the first short period has an outer electronic structure s^2p^1 . What is the formula and acid-base character of its oxides?
a) XO_3 , basic b) X_2O_3 , basic c) X_2O_3 , acidic d) XO_2 , acidic
238. Pb and Sn are extracted from their Chief ores by:
a) Carbon reduction and self reduction
b) Self reduction and carbon reduction
c) Electrolysis and self reduction
d) Self reduction and electrolysis
239. Boron readily dissolves in:
a) Conc. HCl
b) Fused NaOH at 673 K
c) Fused Na_2CO_3 at 1173K
d) A mixture of conc. HNO_3 and conc. H_2SO_4 (1 : 2)
240. The borax bead is chemically:
a) B_2O_3 b) $\text{Na}_2\text{B}_4\text{O}_7$ c) Na_3BO_3 d) $\text{B}_2\text{O}_3 + \text{NaBO}_2$
241. Inorganic benzene is
a) $\text{B}_3\text{H}_3\text{N}_3$ b) BH_3NH_3 c) $\text{B}_3\text{H}_6\text{N}_3$ d) $\text{H}_3\text{B}_3\text{N}_6$
242. Boric acid is prepared from borax by the action of:
a) Hydrochloric acid b) Sodium hydroxide c) Carbon dioxide d) Sodium carbonate
243. Which of the following does not contain silicon?
a) Kaoline b) Agate c) Ruby d) Quartz

244. Which one of the following statements about the zeolites is false?
 a) They are used as cation exchangers.
 b) They have open structure which enables them to take up small molecules.
 c) Zeolites are aluminosilicates having three dimensional network.
 d) Some of the SiO_4^{4-} units are replaced by AlO_4^{5-} and AlO_6^{9-} ions in zeolites.
245. Least stable hydride is :
 a) Methane b) Plumbane c) Silane d) Stibine
246. Which member of group 13 is liquid at 30°C ?
 a) B b) Al c) Ga d) Tl
247. Which fuel has the highest calorific value (kJ/kg)?
 a) Charcoal b) Kerosene c) Wood d) Cow dung
248. Lead sulphate is soluble in :
 a) conc. HNO_3 b) KMnO_4/H^+ c) $\text{K}_2\text{Cr}_2\text{O}_7/\text{H}^+$ d) None of these
249. Dry ice is
 a) Solid H_2O b) Solid CO_2 c) Solid N_2O_4 d) Solid NH_3
250. Each B – H – B bridge in B_2H_6 is formed by the sharing of
 a) 2 electrons b) 4 electrons c) 1 electrons d) 3 electrons
251. Which one of the following ores is best concentrated by froth-floatation method?
 a) Magnetite b) Cassiterite c) Galena d) Malachite
252. Which metal is powdered, suspended in oil and used as paint?
 a) Fe b) Sn c) Ag d) Al
253. Aqueous solution of potash alum is:
 a) Alkaline b) Acidic c) Neutral d) Soppo
254. In aluminio thermic process, Al is used as
 a) Reducing agent b) Oxidising agent c) Catalyst d) Electrolyte
255. Coal gas:
 a) Burns with a smoky flame
 b) Burns with non-smoky flame
 c) Is not used for lighting purpose
 d) Is not a good fuel
256. Which halide is least stable and has doubtful existence?
 a) Cl_4 b) GeI_4 c) SnI_4 d) PbI_4
257. Carbon suboxide C_3O_2 has
 a) Linear structure b) Bent structure
 c) Trigonal planar structure d) Distorted tetrahedral structure
258. On strong heating lead nitrate gives:
 a) $\text{PbO}, \text{NO}, \text{O}_2$ b) $\text{PbO}, \text{NO}, \text{NO}_2$ c) $\text{PbO}_2, \text{PbO}, \text{NO}_2$ d) $\text{PbO}, \text{NO}_2, \text{O}_2$
259. AlI_3 , when react with CCl_4 , gives
 a) AlCl_3 b) Cl_4 c) Al_4C_3 d) Al_2O_3
260. All alums contain:
 a) One monovalent and one trivalent metal
 b) Both monovalent metal
 c) One divalent and one monovalent metal
 d) Both divalent metal
261. Moderate electrical conductivity is shown by
 a) Silica b) Graphite c) Diamond d) Carborundum
262. The molecules of aluminium chloride in vapour state:
 a) Have no shape
 b) Are shaped like a plane triangle

- c) Are round
d) Are like randomly broken bricks
263. The correct order of increasing atomic radii, is
a) $B < Al < Ga$ b) $Ga < Al < B$ c) $Al < B < Ga$ d) $B < Ga < Al$
264. Identify the statement that is not correct as far as structure of diborane is concerned
a) Each boron atom forms four bonds in diborane
b) There are two bridging hydrogen atoms in diborane
c) The hydrogen atoms are not in the same plane in diborane
d) All B–H bonds in diborane are similar
265. Which of the following is not an ionic trihalide?
a) AlF_3 b) BF_3 c) InF_3 d) GaF_3
266. Identify B in the following reaction,

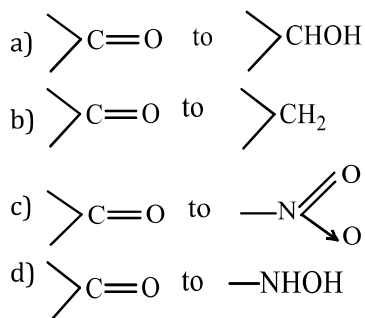
$$H_4SiO_4 \xrightarrow[-H_2O]{1000^\circ C} A \xrightarrow[\Delta]{Carbon} B + CO$$

a) Corundum b) Quartz c) Silica d) Carborundum
267. The stability of hydrides of carbon family is in the order
a) $CH_4 > SiH_4 > GeH_4 > SnH_4 > PbH_4$ b) $CH_4 < SiH_4 < GeH_4 < SnH_4 < PbH_4$
c) $CH_4 > SnH_4 > GeH_4 > SiH_4 > PbH_4$ d) None of the above
268. The number of electrons present in the valency shell of group 13:
a) One b) Two c) Three d) Zero
269. The straight chain polymer is formed by:
a) Hydrolysis of $(CH_3)_2 SiCl_2$ followed by condensation polymerisation
b) Hydrolysis of $(CH_3)_3 SiCl$ followed by condensation polymerisation
c) Hydrolysis of $CH_3 SiCl_3$ followed by condensation polymerisation
d) Hydrolysis of $(CH_3)_4 Si$ by addition polymerisation
270. Moissan boron is
a) Amorphous boron of ultra purity b) Crystalline boron of ultra purity
c) Amorphous boron of low purity d) Crystalline boron of low purity
271. Which of the boron compound is optically active?
a) Boron trifluoride b) Boron anhydride c) Borosalicylic acid d) Sodium tetraborate
272. Extraction of lead by reduction methods is done by
a) Adding more galena into reverberatory furnace
b) Adding more galena and coke into the reverberatory furnace
c) Self reduction of oxide from sulphide present in the furnace
d) Adding more lead sulphate into reverberatory furnace
273. Formation of in-numberable compounds of carbon is due to its
a) High reactivity b) Catenation tendency
c) Covalent and ionic tendency d) Different valency
274. Moissan boron is
a) Amorphous boron of low purity b) Crystalline boron of low purity
c) Amorphous boron ultra purity d) Crystalline boron of ultra purity
275. Boric acid is used in carom boards for smooth gliding of pawns because
a) H_3BO_3 molecules are loosely chemically bonded and hence soft
b) Its low density makes it fluffy
c) It can be powdered to a very small grain size
d) H-bonding in H_3BO_3 gives it a layered structure
276. Iodine is decolourised by:
a) $ZnCl_2$ b) $HgCl_2$ c) $SnCl_2$ d) $AlCl_3$
277. Quartz is an example of

- a) Sn(OH)_2 b) $\text{SnO}_2 \cdot \text{H}_2\text{O}$ c) Na_2SnO_3 d) Na_2SnO_2
295. Ammonical CuCl absorbs:
 a) CO_2 b) SO_2 c) H_2SO_4 d) CO
296. Aluminium hydroxide is soluble in excess at sodium hydroxide forming the ion
 a) AlO_2^{3+} b) AlO_2^- c) AlO_2^{3-} d) Al_2O_3^-
297. The refractive index of diamond is highest among solids. Its value is:
 a) 2.225 b) 3.235 c) 2.15 d) 2.417
298. The correct statement with respect to carbon monoxide is:
 a) It combines with water to give carbonic acid.
 b) It reacts with haemoglobin in red blood cells.
 c) It is a powerful oxidizing agent.
 d) It is used to prepare aerated drinks.
299. SiF_4 gets hydrolysed giving
 a) SiO_2 b) Si(OH)_4 c) $\text{Si(OH)}_2\text{F}_2$ d) H_2SiF_6
300. Highest electronegativity among the following is for:
 a) C b) Si c) Sn d) Pb
301. Addition of SnCl_2 to HgCl_2 gives precipitate
 a) White turning to red b) White turning to grey
 c) Black turning to white d) None of the above
302. The stability of dihalides of Si, Ge, Sn and Pb increases steadily in the sequence
 a) $\text{GeX}_2 < \text{SiX}_2 < \text{SnX}_2 < \text{PbX}_2$ b) $\text{SiX}_2 < \text{GeX}_2 < \text{PbX}_2 < \text{SnX}_2$
 c) $\text{SiX}_2 < \text{GeX}_2 < \text{SnX}_2 < \text{PbX}_2$ d) $\text{PbX}_2 < \text{SnX}_2 < \text{GeX}_2 < \text{SiX}_2$
303. PbO is
 a) Acidic b) Amphoteric c) Basic d) Neutral
304. Among the following the maximum covalent character is shown by the compound:
 a) FeCl_2 b) SnCl_2 c) AlCl_3 d) MgCl_2
305. Asbestos is chemically:
 a) Silicate of calcium and magnesium
 b) Calcium alumino silicate
 c) Magnesium alumino silicates
 d) Calcium silicate + calcium aluminates
306. Living in the atmosphere of CO is dangerous because :
 a) It reduces organic matter of tissues
 b) Dries up the blood
 c) Combines with O_2 present inside to form CO_2
 d) Combines with haemoglobin and makes it incapable to absorb O_2
307. The structure of diborane contains:
 a) four $2\text{C}-2e$ bonds and two $3\text{C}-2e$ bonds
 b) two $2\text{C}-2e$ bonds and two $2\text{C}-2e$ bonds
 c) two $2\text{C}-2e$ bonds and two $3\text{C}-2e$ bonds
 d) four $2\text{C}-2e$ bonds and two $2\text{C}-2e$ bonds
308. Borax is:
 a) $\text{Na}_2\text{B}_4\text{O}_7$ b) $\text{Na}_2\text{B}_4\text{O}_7 \cdot 4\text{H}_2\text{O}$ c) $\text{Na}_2\text{B}_4\text{O}_7 \cdot 7\text{H}_2\text{O}$ d) $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$
309. Heating an aqueous solution of aluminium chloride to dryness will give
 a) Al(OH)Cl_2 b) Al_2O_3 c) Al_2Cl_6 d) AlCl_3
310. Hoopé's process is used for the purification of the metal
 a) Cu b) Al c) Zn d) Ag
311. Which of the following is the electron deficient molecule?
 a) PH_3 b) C_2H_6 c) SiH_4 d) B_2H_6

312. Which is false in case of boric acid(H_3BO_3)?
 a) It is soluble in hot water
 b) It acts as a tribasic acid
 c) It has a planer structure
 d) It acts as a monobasic acid
313. Bleaching powder on treatment with CO_2 gives :
 a) O_2 b) Cl_2 c) HCl d) H_2
314. A gas does not turn lime water milky, supports the combustion of burning magnesium. It has no smell and is colourless. It extinguishes a glowing splint but under some circumstances reacts with oxygen and hydrogen. It is not poisonous. The gas is likely to be :
 a) Water vapour b) Nitrogen c) Carbon dioxide d) Helium
315. Carbon burns in air and forms two oxides CO and CO_2 . This shows that carbon has:
 a) Two allotropic forms
 b) Two oxidation states
 c) Two isotopes
 d) 4 electrons in valency shell
316. Which compound is solid?
 a) CO_2 b) NH_3 c) PH_3 d) SiO_2
317. The first I.P. of Al is smaller than that of Mg because:
 a) Atomic size of Al > Mg
 b) Al has one electron in *p*-orbital
 c) Atomic size of Al < Mgs
 d) Not known
318. Which type of forces bind together the carbon atoms in diamond?
 a) Coulombic forces b) Dipole-dipole forces c) Van der Waals' forces d) Covalent forces
319. Ordinary glass is:
 a) Sodium silicate
 b) Copper silicate
 c) Calcium silicate
 d) A mixture of calcium and sodium silicates with silica
320. Fluorine is more electronegative than either boron or phosphorus. What conclusion can be drawn from the fact that BF_3 has no dipole moment but PF_3 has?
 a) BF_3 is spherically symmetrical, PF_3 is not
 b) BF_3 molecule must be linear
 c) The atomic radius of P is larger than the atomic radius of B
 d) The BF_3 molecule must be planar triangular
321. The materials for manufacture of ordinary glass are :
 a) Gypsum, sand and sodium carbonate
 b) Sodium carbonate and sand
 c) Sodium carbonate , lime stone and sand
 d) Potassium carbonate , sand and lime stone
322. The common semiconductor is :
 a) Fe b) Se c) Ge d) C
323. Alumina is
 a) Acidic b) Amphoteric c) Basic d) None of these
324. In aqueous solution of $GaCl$ disproportionates to
 a) $GaCl_2$ and $GaCl_3$ b) Ga and $GaCl_3$ c) $GaCl_2$ and Ga d) $GaCl_3$ and $GaCl_5$
325. Which of the following does not exist in free form?
 a) BF_3 b) BH_3 c) BCl_3 d) BBr_3

326. Sodium oxalate on heating with conc. H_2SO_4 gives:
 a) CO only b) CO and CO_2 c) CO_2 only d) SO_2 and SO_3
327. In context with the industrial preparation of hydrogen from water gas ($CO+H_2$), which of the following is the correct statement?
 a) CO is oxidised to CO_2 with steam in the presence of a catalyst followed by absorption of CO_2 in alkali
 b) CO and H_2 are fractionally separated using differences in their densities.
 c) CO is removed by absorption in aqueous Cu_2Cl_2 solution
 d) H_2 is removed through occlusion with Pd
328. In the reaction $B_2O_3 + C + Cl_2 \rightarrow A + CO$. The A is
 a) CCl_2 b) BCl_3 c) BCl_2 d) B_2Cl_2
329. In electrolysis of aluminium oxide which of the following is added to accelerate the process
 a) Silica b) Silicate c) Cryolite d) Nickel
330. Silicon react with hot solution of NaOH forming
 a) $Si(OH)_4$ b) $Si(OH)_2$ c) SiO_2 d) Na_2SiO_4
331. Silicon is usually found in :
 a) Sand b) Coal c) Lime d) Lime stone
332. Synthetic gas is a mixture of:
 a) Steam and carbon monoxide
 b) Carbon monoxide and nitrogen
 c) Hydrogen and carbon monoxide
 d) Hydrogen and methane
333. Lead pipes can be used for:
 a) Soft water
 b) Hard water
 c) Both hard and soft water
 d) None of the above
334. Aluminium is not present in which of the following mineral?
 a) Cryolite b) Felspar c) Fluorspar d) Mica
335. Diborane does not undergo cleavage reaction with:
 a) Trimethyl amine b) Ammonia c) CO d) CO_2
336. Stannous oxide can be obtained by:
 a) Heating tin strongly in air
 b) Heating meta-stannic acid
 c) Heating tin(II) oxalate
 d) None of the above
337. Sugar of lead is
 a) $2PbSO_4 \cdot PbO$ b) $PbCO_3 \cdot Pb(OH)_2$ c) $PbCO_3$ d) $(CH_3COO)_2Pb$
338. The fraction by volume of carbon monoxide in producer gas is about:
 a) $1/2$ b) $1/3$ c) $1/4$ d) $2/3$
339. The mass of carbon anode consumed (giving only carbon dioxide) in production of 270 kg of aluminium metal from bauxite by the Hall process is
 (Atomic mass of Al=27)
 a) 180 kg b) 270 kg c) 540 kg d) 90 kg
340. Carbon dioxide dissolves under pressure in water to give:
 a) An alkaline solution
 b) An acidic solution
 c) A neutral solution
 d) A highly alkaline solution
341. $NaBH_4$ is used in organic chemistry to convert:



342. AlCl_3 exists in dimer because:

- a) Al has greater I.P. b) Al has larger radius c) High charge nucleus d) Incomplete p -orbital

343. Which of the following is not correct?

- a) SiO_2 is used as acidic flux
 b) The distance between the layers in graphite is $3.35 \times 10^{-3} \text{ cm}$
 c) SiO_2 reacts with Na_2CO_3 and liberates CO
 d) The hybridisation of C in graphite is sp^2

344. When sand is heated with hydrofluoric acid and a wet rod is brought in contact with vapours evolving a white deposit is due to

- a) SiF_4 b) SiF_2 c) H_4SiO_4 d) None of these

345. Which is not a characteristic property of carbon?

- a) Catenation
 b) Multiple bond formation
 c) Availability of d -orbitals for bonding
 d) Highest electronegativity in the group

346. Which of the following is more stable?

- a) Pb^{4+} b) Sn^{4+} c) Ge^{4+} d) Si^{4+}

347. In diborane the two H—B—H angles are nearly

- a) $95^\circ, 120^\circ$ b) $60^\circ, 120^\circ$ c) $120^\circ, 180^\circ$ d) $95^\circ, 150^\circ$

348. Among the various allotropes of carbon :

- a) Diamond is the hardest and graphite is the softest
 b) Diamond is the hardest and coke is the softest
 c) Diamond is the hardest and lamp black is the softest.
 d) Coke is hardest and diamond is softest

349. Oxides of silicon are:

- a) Liquids b) Solids c) Gases d) None of these

350. Which metal is protected by a layer of its own oxide?

- a) Fe b) Au c) Ag d) Al

351. Which one of the following statements about the zeolite is false?

- a) They are used as cation exchangers
 b) Some of the SiO_4^{4-} units are replaced by AlO_4^{5-} and AlO_6^{9-} ions in zeolite
 c) They have open structure which enables them to take up small molecules
 d) Zeolites are aluminosilicates having three dimensional structure

352. Alane is chemically:

- a) AlH_3 b) $(\text{AlH}_3)_n$ c) LiAlH_4 d) None of these

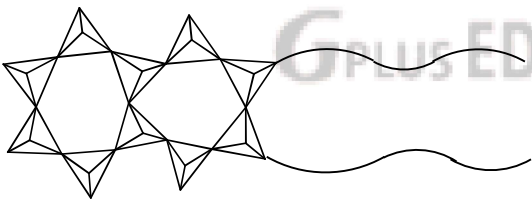
353. Which of the following form dimeric halides?

- a) Al b) Mg c) In d) Ca

354. Pure H_2S gas can be obtained by the action of water on:

- a) CuS b) FeS c) Flower of sulphur d) Al_2S_3

355. BF_3 acts as acid according to:

- a) Lewis b) Bronsted c) Arrhenius d) None of these
356. Which is used to produce smoke screens?
 a) Calcium phosphide b) Sodium carbonate c) Zinc sulphide d) Zinc phosphide
357. Alumino-thermy is a process involving :
 a) Reduction of oxide of a metal by heating with sodium
 b) Exothermic reduction of metal oxides by heating with sodium
 c) Reduction of oxides of a metal by heating with carbon
 d) None of the above
358. In extraction of aluminium the electrolyte is
 a) Fused cryolite with felspar b) Pure alumina in molten state
 c) Fused cryolite with fluorspar d) Pure alumina with bauxite and molten cryolite
359. Nickeloy is an alloy containing:
 a) Ni + Cu + Cr b) Al + Cu + Cr c) Ni + Al + Cu d) None of these
360. By chlorinating carbon disulphide with chlorine in presence of aluminium chloride, we get:
 a) Carbon tetrachloride b) Chloroform c) Chloral d) Methylene chloride
361. The element which forms neutral as well as acidic oxides is:
 a) Sn b) Si c) C d) P
362. Carborundum is the commercial name of :
 a) Al_2O_3 b) $Ca(H_2PO_4)_2$ c) H_3PO_4 d) SiC
363. Which is amphoteric compound?
 a) Cr_2O_3 b) Mn_2O_3 c) Al_2O_3 d) Fe_2O_3
364. Which of the following is not true about potash alum?
 a) Its aqueous solution is basic
 b) It is used in dyeing industries
 c) On heating it melts in its water of crystallization
 d) Its empirical formula is $KAl(SO_4)_2 \cdot 12H_2O$
365. 
- Silicate structure unit of
 a) $(Si_4O_{11})_n^{-6n}$ b) $(Si_2O_{11})_n^{-2n}$ c) (Si_2O_3) d) $(SiO_4)^{-4}$
366. Which of the following gives propyne on hydrolysis?
 a) La_4C_3 b) B_4C c) Al_4C_3 d) Mg_2C_3
367. Which has highest bond energy?
 a) F—F b) C—C c) N—N d) O—O
368. Which is not correct?
 a) $Ge(OH)_2$ is amphoteric
 b) $GeCl_2$ is more stable than $GeCl_4$
 c) GeO_2 is weakly acidic
 d) $GeCl_4$ in HCl forms $[GeCl_2]^{2-}$ ion
369. The purest form of coal is
 a) Peat b) Anthracite c) Bituminous d) Lignite
370. On the addition of mineral acid to an aqueous solution of borax, the compound formed is:
 a) Borodihydride b) Orthoboric acid c) Metaboric acid d) Pyroboric acid
371. Bell metal is an alloy of :
 a) Sn + Pb b) Cu + Sn c) Sn + Sb d) None of these
372. The anhydride of carbonic acid H_2CO_3 is:

- a) C_2O_2 b) CO_2 c) CO d) Na_2CO_3
373. In Al_2Cl_6 , which statement is incorrect?
 a) Four Al–Cl bonds are of same length and two of different length
 b) Six Al–Cl bonds are of same length and two of different length
 c) The angle Cl–Al–Cl is 110° and 93°
 d) The angle Al–Cl–Al is 87°
374. Carbon tetrachloride has zero dipole moment because of:
 a) Planar structure
 b) Smaller size of C and Cl atoms
 c) Regular tetrahedral structure
 d) None of the above
375. Pyrosilicate ion is:
 a) SiO_2^{2-} b) SiO_4^{2-} c) $Si_2O_7^{6-}$ d) $Si_2O_6^{7-}$
376. Diaspora is:
 a) $Al_2O_3 \cdot 2H_2O$ b) $Al_2O_3 \cdot 3H_2O$ c) Al_2O_3 d) $Al_2O_3 \cdot H_2O$
377. The main constituents of coal gas are:
 a) $CH_4 + CO + H_2$ b) $CO_2 + CO + H_2$ c) $CO + CO_2$ d) $CO + N_2$
378. Melting point is highest for:
 a) B b) Al c) Ga d) In
379. Producer gas, a fuel and also a source of nitrogen is obtained by:
 a) Passing steam over incandescent coke
 b) Restricted supply of air through a bed of incandescent coke
 c) Passing a mixture of steam and air over incandescent coke
 d) Spraying oil into hot retorts
380. CO_2 and N_2 are non-supporters of combustion. However, for putting out fires CO_2 is preferred over N_2 because CO_2 :
 a) Does not burn
 b) Forms non-combustible products with burning substances
 c) Is denser than nitrogen
 d) Is a more reactive gas
381. Solder is an alloy of lead with
 a) Copper b) Zinc c) Nickel d) Tin
382. CeO_2 is present in :
 a) Crookes glass b) Pyrex glass c) Flint glass d) All of these
383. The formula of potash alum is
 a) $K_2SO_4 \cdot Al_2(SO_4)_3 \cdot 24H_2O$ b) $K_2SO_4 \cdot Al_2(SO_4)_3 \cdot 18H_2O$
 c) $K_2SO_4 \cdot (NH_4)_2SO_4 \cdot 18H_2O$ d) $Na_2SO_4 \cdot Al_2(SO_4)_3 \cdot 24H_2O$
384. In diborane the two H – B – H angles are nearly
 a) $60^\circ, 120^\circ$ b) $95^\circ, 120^\circ$ c) $95^\circ, 150^\circ$ d) $120^\circ, 180^\circ$
385. Aluminium chloride exists as dimer, Al_2Cl_6 , in solid state as well as in solution of non-polar solvents such as benzene. When dissolved in water, it gives
 a) $Al^{3+} + 3Cl^-$ b) $[Al(H_2O)_6]^{3+} + 3Cl^-$ c) $[Al(OH)_6]^{3-} + 3HCl$ d) $Al_2O_3 + 6HCl$
386. Which is correct for SiO_2 ?
 a) Linear, acidic b) Linear, basic c) Tetrahedral, acidic d) Angular, disc
387. H_3BO_3 is
 a) Monobasic and weak Lewis acid b) Monobasic and weak Bronsted acid
 c) Monobasic and strong Lewis acid d) Tribasic and weak Bronsted acid
388. CO_2 is bubbled into an aqueous solution of Na_2CO_3 , to give:
 a) NaOH b) HCO_3^- c) H_2O d) OH^-

389. The composition of the common glass is
 a) $\text{Na}_2\text{O} \cdot \text{CaO} \cdot 6\text{SiO}_3$ b) $\text{Na}_2\text{O} \cdot \text{Al}_2\text{O}_3 \cdot \text{SiO}_2$ c) $\text{CaO} \cdot \text{Al}_2\text{O}_3 \cdot \text{SiO}_2$ d) $\text{Na}_2\text{O} \cdot \text{CaO} \cdot 6\text{SiO}_2$
390. Feldspar is:
 a) Potassium sodium alumino silicate
 b) A mixture of potassium, aluminium and silicon oxides
 c) Hydrated calcium silicate
 d) None of the above
391. Tungsten carbides is an example of:
 a) A substitutional solid solution
 b) Passive solid solution
 c) Sandwich solid solution
 d) Interstitial solid solution
392. Carbogen is:
 a) Mixture of $\text{O}_2 + 5 - 10\% \text{CO}_2$
 b) Used by pneumonia patients for respiration
 c) Used by victims of CO for respiration
 d) All of the above
393. The compound used in lead accumulators is:
 a) PbO b) Pb_2O_3 c) Pb_3O_4 d) PbO_2
394. Which of the following is pseudoalum?
 a) $(\text{NH}_4)_2\text{SO}_4 \cdot \text{Fe}_2(\text{SO}_4)_3 \cdot 24\text{H}_2\text{O}$
 b) $\text{K}_2\text{SO}_4 \cdot \text{Al}_2(\text{SO}_4)_3 \cdot 24\text{H}_2\text{O}$
 c) $\text{MnSO}_4 \cdot \text{Al}_2(\text{SO}_4)_3 \cdot 24\text{H}_2\text{O}$
 d) None of the above
395. One that marks the paper like lead is:
 a) Ga b) Ti c) B d) Tl
396. Which of the following undergoes sublimation?
 a) AlCl_3 b) NH_4Cl c) Dry ice d) All of these
397. Which is used as mordant?
 a) AlCl_3 b) $\text{Al}_2(\text{SO}_4)_3$ c) Alum d) Al_2O_3
398. Which statement regarding H_3BO_3 is not correct?
 a) It is a strong tribasic acid
 b) It is prepared by acidifying an aqueous solution of borax
 c) It has a layer structure in which planar BO_3 units are joined by H-bonds
 d) It does not act as proton donor but acts on Lewis acid by accepting OH^- ions
399. The elements of IV A group or group 14 have 4 electrons in their outermost orbit. They:
 a) Form M^{4+} ions
 b) Form M^{4+} and M^{4-} ions
 c) Exhibit oxidation state of + 4 and +2
 d) Exhibit oxidation state of + 4
400. Orthoboric acid when heated to red hot gives:
 a) Metaboric acid b) Pyroboric acid c) Boron and water d) Boric anhydride
401. Elements showing the phenomenon of allotropy is
 a) lead b) copper c) tin d) aluminium
402. The function of fluorspar in the electrolytic reduction of alumina dissolved in fused cryolite (Na_3AlF_6) is
 a) To decrease the rate of oxidation of carbonate the anode
 b) To lower the temperature of the melt and to make the fused mixture very conducting
 c) As a catalyst
 d) None of the above

403. Which can be directly brought into solid state from gaseous state?
 a) CO b) CO₂ c) PH₃ d) CO + H₂
404. AlCl₃ on hydrolysis gives:
 a) Al₂O₃ · H₂O b) Al(OH)₃ c) Al₂O₃ d) AlCl₃ · 6H₂O
405. Al reduces most of the metallic oxides due to its greater affinity for:
 a) Oxygen b) Metals c) Electrons d) Protons
406. Annealing of glass is done to:
 a) Make it more brittle
 b) Make it opaque
 c) Check it from becoming brittle
 d) Make it transparent
407. Boron carbide, B₄C is widely used for:
 a) Making acetylene
 b) Making plaster of Paris
 c) As a hardest substance after diamond
 d) Making boric acid
408. Mark the correct statement:
 a) Water gas is used in the manufacture of methyl alcohol.
 b) Water gas has the highest calorific value.
 c) Water gas burns with luminous flame.
 d) The production of water gas is exothermic process.
409. Butter of tin is
 a) SnCl₂ · 5H₂O b) SnCl₂ · 2H₂O c) SnCl₄ · 4H₂O d) SnCl₄ · 5H₂O
410. In laboratory silicon can be prepared by the reaction
 a) Silica with magnesium
 b) By heating carbon in electric furnace
 c) By heating potassium fluosilicate with potassium
 d) None of the above
411. Boric acid is polymeric because of:
 a) Its acidic nature
 b) Presence of hydrogen bonds
 c) Its monobasic nature
 d) Its geometry
412. Which of the following shows variable valency?
 a) B b) Al c) Tl d) None of these
413. Which statement is correct with respect to the property of the elements with increase in atomic number in the carbon family?
 a) Their metallic character decreases
 b) The stability of +2 oxidation state increases
 c) Their ionization energy increases
 d) Their atomic size decreases
414. Among the halides:
 1. BCl₃ 2. AlCl₃
 3. GaCl₃ 4. InCl₃
 The order of decreasing Lewis acid character is:
 a) 1, 2, 3, 4 b) 4, 3, 2, 1 c) 3, 4, 2, 1 d) 2, 3, 4, 1
415. Carbon is soluble in :
 a) Conc. HCl b) dil. HNO₃ c) H₂SO₄ d) dil. HCl
416. Which cannot be prepared by B₂H₆?

- a) NaBH_4 b) H_3BO_3 c) $\text{B}_2(\text{CH}_3)_6$ d) $2(\text{CH}_3)_2\text{N} \cdot \text{B}_2\text{H}_6$
417. In feldspar and zeolite, Si^{4+} ions are replaced by which ions?
 a) Oxide ion b) Hydroxide ion c) Aluminium ion d) Potassium ion
418. Diamond and Emerald are :
 a) C, C b) C, Al_2O_3 c) C, Si d) Si, Al
419. Carborundum is
 a) SiC b) $\text{Al}_2\text{O}_3 \cdot \text{H}_2\text{O}$ c) $\text{Al}_2(\text{SO}_4)_3$ d) AlCl_3
420. Which is not an alloy of aluminium?
 a) Magnalium b) Duralumin c) German silver d) Aluminium bronze
421. Purification of alumina takes place by
 a) Bosch process b) Hall's process c) Hoopé's process d) Quaternary process
422. Thermite a mixture used for welding is:
 a) Fe and Al
 b) Ferric oxide and aluminium powder
 c) Barium peroxide and magnesium powder
 d) Cu and aluminium
423. Which of the following on hydrolysis with water gives CH_4 ?
 a) Be_2C b) Al_4C_3 c) Mn_3C d) All of these
424. The basic structural unit is silicates is
 a) SiO_2 b) $[\text{Si}_2\text{O}_7]^{2-}$ c) SiO_4 tetrahedron d) $[\text{Si}_2\text{O}_5]^{2-}$
425. Good conductor of heat and current is:
 a) Anthracite b) Diamond c) Charcoal d) Graphite
426. The structure of diborane (B_2H_6) contains
 a) Four $2c - 2e^-$ bonds and four $3c - 2e^-$ bonds b) Two $2c - 2e^-$ bonds and two $3c - 3e^-$ bonds
 c) Two $2c - 2e^-$ bonds and four $3c - 2e^-$ bonds d) Four $2c - 2e^-$ bonds and two $3c - 2e^-$ bonds
427. Which element of group 14 forms only one hydride?
 a) C b) Si c) Sn d) Pb
428. The stability of + 1 oxidation state increases in the sequence:
 a) $\text{Ga} < \text{In} < \text{Al} < \text{Tl}$ b) $\text{Al} < \text{Ga} < \text{In} < \text{Tl}$ c) $\text{Tl} < \text{In} < \text{Ga} < \text{Al}$ d) $\text{In} < \text{Tl} < \text{Ga} < \text{Al}$
429. Aluminium is extracted from alumina (Al_2O_3) by electrolysis of a molten mixture of:
 a) $\text{Al}_2\text{O}_3 + \text{Na}_3\text{AlF}_6 + \text{CaF}_2$
 b) $\text{Al}_2\text{O}_3 + \text{KF} + \text{Na}_3\text{AlF}_6$
 c) $\text{Al}_2\text{O}_3 + \text{HF} + \text{NaAlF}_4$
 d) $\text{Al}_2\text{O}_3 + \text{CaF}_2 + \text{NaAlF}_4$
430. Ultra violet rays are not allowed to pass through:
 a) Flint glass b) Crown glass c) Crookes glass d) Safety glass
431. Metal protected by a layer of its own oxide is:
 a) Al b) Ag c) Au d) Cu
432. The fuel gas having volume composition equal to 34% $\text{CH}_4 + 48\% \text{H}_2 + 15\% \text{O}_2 + 3\% \text{CO}$ is:
 a) Oil gas b) Water gas c) Coal gas d) Petrol gas
433. Glass having higher refractive index is prepared of oxide of
 a) NiO b) CoO c) PbO d) CaO
434. The colour of copper metaborate and chromium metaborates are respectively:
 a) Blue, green b) Green, blue c) Red, green d) Brown, blue
435. Which gas is essential constituent of almost all fuel gases?
 a) CO_2 b) N_2 c) Co d) H_2O
436. When SnCl_2 reacts with HgCl_2 , the product formed are :
 a) $\text{Sn} + \text{HgCl}_4$ b) $\text{Sn} + \text{Cl}_2 + \text{Hg}_2\text{Cl}_2$ c) SnCl_4 and Hg_2 d) None of these
437. The precious stone aquamarine is:

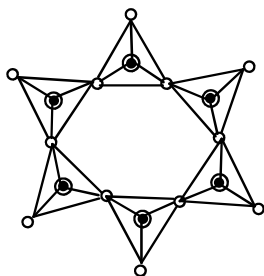
- a) Mg-Al silicate b) Be-Al silicate c) Na-Al silicate d) Fluoro silicate of Al
438. $B(OH)_3 + NaOH \rightleftharpoons NaBO_2 + Na[B(OH)_4] + H_2O$
How can this reaction is made to proceed in forward direction?
- a) Addition of *cis*-1, 2-diol b) Addition of borax
c) Addition of *trans*-1, 2-diol d) Addition of Na_2HPO_4
439. CO reacts with chlorine in presence of sunlight to gives:
- a) $COCl_2$ b) CO_2 c) CCl_4 d) $CHCl_3$
440. Silicon is
- a) Semiconductor b) Insulator c) Conductor d) None of these
441. Aluminium vessels should not be washed with materials containing washing soda since
- a) Washing soda reacts with aluminium to form soluble aluminate
b) Washing soda reacts with aluminium to form insoluble aluminium oxide
c) Washing soda is expensive
d) Washing soda is easily decomposed
442. When a mixture of sand and KNO_3 is heated strongly the product(s) is/are:
- a) NO_2 b) O_2 c) K_2SiO_3 d) All of these
443. Aluminium deposited as vaporous on glass forms a good mirror, essentially because:
- a) It has better shine than Ag
b) It does not scratch
c) Coating is much smoother
d) It does not tarnish in air
444. CO is poisonous gas, antidote for CO poisoning is
- a) Carborundum b) Carbogen c) Carbonic acid d) Pure oxygen
445. When CO is heated with NaOH under pressure, we get:
- a) Sodium benzoate b) Sodium acetate c) Sodium formate d) Sodium oxalate
446. Glass is a
- a) Micro crystalline solid b) Gel
c) Super cooled liquid d) Polymeric mixture
447. Difference between diamond and graphite is due to:
- a) Graphite combines with oxygen to form carbon dioxide but diamond does not
b) The atoms in each have different masses
c) The crystal structure in diamond is different from that in graphite
d) All of the above
448. Which element is used for making a transistor?
- a) Sn b) Sb c) Si d) Mg
449. Which one of the following compounds, is not a protonic acid?
- a) $SO(OH)_2$ b) $SO_2(OH)_2$ c) $B(OH)_3$ d) $PO(OH)_3$
450. Aluminium reacts with nitrogen to form:
- a) AlN b) Al_2N_3 c) Al_2N d) Al_4N_6
451. Silica is a/an
- a) Acidic flux only b) Gangue only
c) Basic flux only d) Both gangue and acidic flux
452. Which one of the following is the correct statement?
- a) Boric acid is a protonic acid
b) Beryllium exhibits coordination number of six
c) Chlorides of both beryllium and aluminium have bridged chloride structure in solid phase
d) $B_2H_6 \cdot 2NH_3$ is known as inorganic benzene
453. Which of the following is a mixed oxide?
- a) Fe_2O_3 b) PbO_2 c) Pb_3O_4 d) BaO_2

454. Which metal burn in air at high temperature with the evolution of much heat?
 a) Cu b) Pb c) Hg d) Al
455. Which is a true acid anhydride?
 a) Al_2O_3 b) CO c) CaO d) CO_2
456. Roasted tin stone ore after washing with water is known as
 a) Block tin b) White tin c) Black tin d) Granulated tin
457. Compound of lead used in match industry is:
 a) PbO b) PbO_2 c) $PbCl_2$ d) None of these
458. Which gas has more percentage in coal gas?
 a) CO b) H c) H_2 d) CH_4
459. A particular elements belongs to group 13 and II period of the periodic table. It is:
 a) Gas, slightly metallic b) Liquid, metallic c) Solid, non-metallic d) Solid, less metallic
460. In graphite, the sheets are held by :
 a) Ionic forces b) Covalent forces c) Van der Waals' forces d) Metallic forces
461. Silicones have the general formula
 a) $(SiO_4)^{4-}$ b) SiO_6^{7-} c) $(SiO_3)_n^{-2n}$ d) $(R_2SiO)_n$
462. Water gas cannot be prepared by a continuous process because:
 a) More coke must be added from time to time
 b) The furnace must be allowed to cool occasionally
 c) It cannot be manufactured without producer gas
 d) The reaction ceases when coke is too cool
463. In silica (SiO_2), each silicon atom is bonded to
 a) Two oxygen atoms b) Four oxygen atoms
 c) One silicon and two oxygen atoms d) One silicon and four oxygen atoms
464. Glass reacts with HF to produce
 a) H_2SiO_3 b) SiF_4 c) Na_3AlF_6 d) H_2SiF_6
465. Which glass has the highest percentage of lead?
 a) Soda glass b) Flint glass c) Jena glass d) Pyrex glass
466. Diamond and graphite both are made of carbon atoms. Diamond is extremely hard whereas graphite is soft. This is because :
 a) The chemical bonds between any two carbon atoms in diamond are stronger
 b) Diamond is ionic whereas graphite is covalent
 c) Each carbon atom in diamond is chemically bonded to a greater number of neighbouring carbon atoms
 d) Certain atoms in diamond are smaller in size
467.is the byproduct obtained in the Serpeck's process.
 a) Oxygen b) Ammonia c) Nitrogen dioxide d) Nitric oxide
468. An ionic compound is:
 a) CCl_4 b) $SnCl_2$ c) $SiCl_4$ d) $CeCl_4$
469. Which one of the following is correct statement?
 a) The hydroxide of Aluminium is more acidic than that of boron
 b) The hydroxide of boron is basic, while that of Aluminium is amphoteric
 c) The hydroxide of boron is acidic, while that of Aluminium is amphoteric
 d) The hydroxide of boron and Aluminium are amphoteric
470. Density is highest for :
 a) Si b) Ge c) Sn d) Pb
471. If the flame of a gas stove burns with yellow tips, the burner must be adjusted to provide:
 a) More gas b) More air c) Less air d) None of these
472. Purification of Al by electrolysis method is called
 a) Hall's process b) Baeyer process c) Ostwald process d) Hoopé's process

473. Which element shows more pronounced inert pair effect?
 a) N b) Sn c) Pb d) C
474. Teflon is:
 a) Fluorocarbon b) Hydrocarbon c) Pesticide d) Insecticide
475. CO₂ in water behaves as
 a) Weak dibasic acid H₂CO₃ b) Weak monobasic acid HO-COOH
 c) Weak diacid base CO(OH)₂ d) Weak monoacid base HO-COOH
476. The tendency for catenation in Group 14 elements varies in the order
 a) C >> Si > Ge = Sn > Pb b) C << Si < Ge = Sn < Pb
 c) C >> Si < Ge < Sn < Pb d) C >> Si = Ge = Sn > Pb
477. Coordination number of aluminium is
 a) 8 b) 6 c) 12 d) 4
478. The approximate composition of soda glass is:
 a) SiO₂ 75%, Na₂O 15%, CaO 8%, Al₂O₃ 2%
 b) SiO₂ 45%, Na₂O 4%, CaO 3%, K₂O 4%, PbO 44%
 c) SiO₂ 80%, Na₂O 4%, CaO 0.5%, K₂O 0.5%, B₂O₃ 12%, Al₂O₃ 3%
 d) None of the above
479. Lead pipes are readily corroded by :
 a) H₂SO₄ b) HCl c) CH₃COOH d) Pure water
480. Monosilane on coming in contact with air burns with a luminous flame producing vortex rings. These rings are of
 a) SiO₂ b) SiO c) Si d) H₂SiO₃
481. A colourless gas which burns with blue flame and reduces CuO to Cu is:
 a) N₂ b) CO c) CO₂ d) NO₂
482. Lapis lazuli is
 a) Sodium alumino silicate b) Copper sulphate
 c) Zinc sulphate d) Ferrous sulphate
483. Bone black is an allotrope of :
 a) P b) C c) S d) Bone
484. The use of diamond as a gem depends on its:
 a) Hardness b) High refractive index c) Purest form of carbon d) Chemical inertness
485. PbO isoxide.
 a) Basic b) Acidic c) Amphoteric d) Neutral
486. Common alum is
 a) K₂SO₄ · Al₂(SO₄)₃ · 24H₂O b) (NH₄)₂SO₄ · FeSO₄ · 6H₂O
 c) K₂SO₄ · Cr₂(SO₄)₃ · 24H₂O d) K₂SO₄ · Fe₂(SO₄)₃ · 24H₂O
487. In silicon dioxide
 a) There are double bonds between silicon and oxygen atoms
 b) Silicon atom is bonded to two oxygen atoms
 c) Each silicon atom is surrounded by two oxygen atoms and each oxygen atom is bounded to two silicon atoms
 d) Each silicon atom is surrounded by four oxygen atoms and each oxygen atom is bounded to two silicon atoms
488. Aqueous solution of sodium silicate is:
 a) Acidic b) Alkaline c) Neutral d) Insoluble
489. Boron cannot form which one of the following anions?
 a) BF₆³⁻ b) BH₄⁻ c) B(OH)₄⁻ d) BO₂⁻
490. During day time plants absorb:
 a) Carbon dioxide b) Carbon monoxide c) Nitrogen d) Oxygen

491. Diamond is hard because
 a) All the four valence electrons are bonded to each carbon atom by covalent bonds
 b) It is a giant molecule
 c) It is made up of carbon atoms
 d) It cannot be burnt
492. The process used for purification of bauxite ore containing high silica content as impurity is:
 a) Baeyer's process b) Hall's process c) Hoopé's process d) Serpeck's process
493. The geometry and the hybridisation present about the central atom in BF_3 is:
 a) Linear, sp b) Trigonal planar, sp^2 c) Tetrahedral, sp^3 d) Pyramidal, sp^3
494. Aluminium is mainly extracted from:
 a) Magnetite b) Bauxite c) Alumina d) Haematite
495. A metal, M forms chlorides in its +2 and +4 oxidation states. Which of the following statements about these chlorides is correct?
 a) $M\text{Cl}_2$ is more volatile than $M\text{Cl}_4$
 b) $M\text{Cl}_2$ is more soluble in the anhydrous ethanol than $M\text{Cl}_4$
 c) $M\text{Cl}_2$ is more ionic than $M\text{Cl}_4$
 d) $M\text{Cl}_2$ is more easily hydrolysed than $M\text{Cl}_4$
496. Which is not a crystalline form of silica?
 a) Quartz b) Azurite c) Cristobalite d) Tridymite
497. Which is likely to show inert-pair effect?
 a) K b) Mg c) Al d) Pb
498. A potter wishes to make a deep blue glaze. Which one of these available chemicals should be mixed?
 a) Iron oxide b) Cuprous oxide c) Cobalt oxide d) Nickel oxide
499. Specify the coordination geometry around and hybridization of N and B-atoms in a 1 : 1 complex of BF_3 and NH_3 :
 a) N : Tetrahedral, sp^3 ; B : Tetrahedral, sp^3
 b) N : Pyramidal, sp^3 ; B : Pyramidal, sp^3
 c) N : Pyramidal, sp^3 ; B : Planar, sp^3
 d) N : Pyramidal, sp^3 ; B : Tetrahedral, sp^3
500. The bonds present in borazole are:
 a) $12\sigma, 3\pi$ b) $9\sigma, 6\pi$ c) $6\sigma, 6\pi$ d) $9\sigma, 9\pi$
501. Tin, a silvery white metal exists in:
 a) Four allotropic forms
 b) Three allotropic forms
 c) Five allotropic forms
 d) Two allotropic forms
502. Carbon suboxide C_3O_2 has
 a) Bent structure b) Trigonal planar structure
 c) Linear structure d) Distorted tetrahedral structure
503. Which of the following oxide is amphoteric?
 a) CaO b) CO_2 c) SiO_2 d) SnO_2
504. In graphite, electrons are:
 a) Localized on each carbon atom
 b) Spread out between the sheets
 c) Localized on every third carbon atom
 d) Present in antibonding orbital
505. Which is formed when SiCl_4 vapours are passed over hot Mg?
 a) $\text{SiCl}_2 + \text{MgCl}_2$ b) $\text{Si} + \text{MgCl}_2$ c) $\text{Mg}_2\text{Si} + \text{Cl}_2$ d) MgSiCl_6
506. Which of the following does not have a tetrahedral structure?

- a) BH_3 b) NH_4^+ c) BH_4^- d) CH_4
507. Which of the following oxides is strongly basic?
 a) Tl_2O b) B_2O_3 c) Al_2O_3 d) Ga_2O_3
508. Aluminium metal is corroded in coastal places near to the sea, because protective oxide film:
 a) Is removed by seawater
 b) Reacts with seawater
 c) Is attacked by salt present in seawater
 d) Reacts with sand particles
509. The most abundant metal in the earth crust
 a) Al b) Ca c) Fe d) Na
510. Which mixed sulphate is not an alum?
 a) $\text{K}_2\text{SO}_4 \cdot \text{Al}_2(\text{SO}_4)_3 \cdot 24\text{H}_2\text{O}$
 b) $\text{K}_2\text{SO}_4 \cdot \text{Cr}_2(\text{SO}_4)_3 \cdot 24\text{H}_2\text{O}$
 c) $\text{Na}_2\text{SO}_4 \cdot \text{Fe}_2(\text{SO}_4)_3 \cdot 24\text{H}_2\text{O}$
 d) $\text{CuSO}_4 \cdot \text{Al}_2(\text{SO}_4)_3 \cdot 24\text{H}_2\text{O}$
511. $(\text{Me})_2\text{SiCl}_2$ on hydrolysis will produce
 a) $(\text{Me})_2\text{Si}(\text{OH})_2$ b) $(\text{Me})_2\text{Si} = \text{O}$
 c) $[-\text{O} - (\text{Me})_2\text{Si} - \text{O} -]_n$ d) $\text{Me}_2\text{SiCl}(\text{OH})$
512. In the aluminothermic process, Al acts as a/an
 a) Solder b) Oxidizing agent c) Reducing agent d) Flux
513. Which is used as control rods in nuclear reactors?
 a) Al b) Ga c) Tl d) B
514. Potash alum is water soluble and ionises in aqueous solution to give:
 a) One type of ions b) Two types of ions c) Three types of ions d) Four types of ions
515. Which is covalent compound?
 a) Aluminium oxide b) Aluminium fluoride c) Aluminium chloride d) Aluminium sulphate
516. Lead sugar is:
 a) PbCl_2 b) $\text{Pb}(\text{NO}_3)_2$ c) PbSO_4 d) $(\text{CH}_3\text{COO})_2\text{Pb}$
517. Which does not exist?
 a) $[\text{SnCl}_6]^{2-}$ b) $[\text{GeCl}_6]^{2-}$ c) $[\text{SiCl}_6]^{2-}$ d) $[\text{CCl}_6]^{2-}$
518. Which form of carbon is used in making boot polish, printing ink, paint and black varnish?
 a) Bone black b) Graphite c) Gas carbon d) Lamp black
519. Which of the following shows bond in silicone?
 a) $\text{Si}-\text{C}-\text{Si}-\text{O}-\text{Si}$ b) $\text{Si}-\text{C}-\text{Si}-\text{C}-\text{Si}$ c) $-\overset{|}{\text{Si}}-\text{O}-\overset{|}{\text{Si}}-\text{O}-\overset{|}{\text{Si}}-$ d) $\text{Si}-\text{Si}-\text{Si}-\text{Si}$
520. Which of the following organo-silicon compound on hydrolysis will give a three dimensional silicone?
 a) R_3SiCl b) RSiCl_3 c) SiCl_4 d) R_2SiCl_2
521. Which type of silicate is shown in the given figure?



- a) Orthosilicate b) Pyrosilicate c) Meta silicate d) None of these
522. Tin sulphide is:
 a) Yellow solid
 b) Soluble in yellow ammonium sulphide

- c) Precipitated by H_2S in acidic medium
d) All of the above
523. CO_2 is liberated during :
a) Combustion of coke b) Fermentation c) Respiration d) All of these
524. Which of the following glass is used in making wind screen of automobiles?
a) Saftey b) Jena c) Crook's d) Pyrex
525. Lead pipes are not suitable for drinking water because
a) A layer of lead dioxide is deposited over pipes
b) Lead forms basic lead carbonate
c) Lead reacts with water containing air to form $Pb(OH)_2$
d) Lead reacts with air to form litharge
526. When sodium or potassium oxide is heated in a current of CO_2 at $360^\circ C$, we get:
a) Sodium formate b) Sodium oxalate c) Sodium acetate d) Sodium carbonate
527. Aluminium forms:
a) Electrovalent compounds only
b) Covalent compounds only
c) Electrovalent and covalent compounds both
d) Coordinate compounds only
528. Chrome yellow is:
a) $PbCrO_4$ b) $K_2Cr_2O_7$ c) $PbMoO_4$ d) Pb_3O_4
529. Which oxidation states are the most characteristics of lead and tin respectively?
a) +2, +4 b) +4, +4 c) +2, +2 d) +4, +2
530. The alloy used in preparation of balance beam:
a) Magnalium b) Duralumin c) Aluminium bronze d) Nickeloy
531. The substance used to impart green colour to glass is:
a) Cu_2O b) CdS c) MnO_2 d) Cr_2O_3
532. In the reaction: $BF_3 + 3LiBH_4 \rightarrow 3LiF + X$; X is:
a) B_4H_{10} b) B_2H_6 c) BH_3 d) B_3H_8
533. Which metal powder if spread in air, becomes hazardous?
a) Al b) B c) Ca d) K
534. Crystalline silicon was obtained by:
a) Berzelius b) Wöhlar c) Deville d) Winkler
535. Aluminium is more reactive than iron but aluminium is less easily corroded than iron because:
a) Aluminium is a noble metal
b) Oxygen forms a protective oxide layer
c) Iron undergoes reaction easily with water
d) Iron forms both mono and divalent ions
536. An aqueous solution of a substance gives a white precipitate on treatment with dil HCl, which dissolved on heating. On passing H_2S in hot acidic solution a black precipitate is formed. The substance is:
a) Hg_2^{2+} salt b) Cu^{2+} salt c) Ag^+ salt d) Pb^{2+} salt
537. Silicon hydrides are named as:
a) Silicones b) Silicates c) Silicols d) Silanes
538. H_2SO_4 is not used for the preparation of CO_2 from marble chips because:
a) It does not react
b) Huge amount of heat is evolved
c) The reaction is vigorous
d) Calcium sulphate is sparingly soluble and gets deposited on marble chips and stops the reaction
539. Which compound can make fire proof clothes?
a) Aluminium sulphate b) Ferrous sulphate c) Magnesium sulphate d) Cuprous sulphate

540. B—F bond order in BF_3 is:
 a) 1 b) 2 c) 3 d) 4/3
541. A kettle which becomes furred-up in use has inside it a deposit composed mainly of:
 a) Calcium carbonate
 b) Magnesium bicarbonate
 c) Magnesium sulphate
 d) Sodium sulphate
542. Among the following the hardest substance is :
 a) Peat b) Lignite c) Graphite d) Anthracite
543. Aluminium is obtained by
 a) Reducing Al_2O_3 with coke b) Electrolysing Al_2O_3 dissolved in Na_3AlF_6
 c) Reducing Al_2O_3 with chromium d) Heating alumina with cryolite
544. Which of the following is not correct in case of boron nitride?
 a) It is also called borazon
 b) It is chemically unreactive
 c) It is hard because it has diamond like structure
 d) It has magnetic properties
545. When sugar is treated with conc. H_2SO_4 , we get a pure form of :
 a) Carbon b) Hydrogen c) Oxygen d) None of these
546. Borazole is obtained by reaction of:
 a) $\text{NH}_3 + \text{B}_2\text{H}_6$ in 2 : 1 ratio
 b) $\text{NH}_3 + \text{B}_2\text{H}_6$ in 1 : 2 ratio
 c) $\text{NH}_3 + \text{B}_2\text{H}_6$ in 1 : 4 ratio
 d) $\text{NH}_3 + \text{B}_2\text{H}_6$ in 4 :1 ratio
547. Percentage of lead in lead pencil is
 a) 20 b) 80 c) 70 d) Zero
548. In B_2H_6 :
 a) There is a direct boron-boron bond
 b) The structure is similar to that of C_2H_6
 c) The boron atoms are linked through hydrogen bridges
 d) All the atoms are in one plane
549. Zn on heating with barium carbonate gives :
 a) BaO b) ZnO c) CO d) All of these
550. Covalency and hybridization of B in BF_4^- is:
 a) 5, sp b) 4, sp^3 c) 3, sp^3 d) 2, sp^2
551. Hybridisation of boron in diborane is:
 a) sp b) sp^2 c) sp^3 d) sp^3d^2
552. When tin is treated with concentrated nitric acid
 a) It is converted into stannous nitrate b) It becomes passive
 c) It converted into stannic nitrate d) It is converted into metastannic acid
553. The ability of a substance to assume two or more crystalline structures is called:
 a) Isomerism b) Amorphism c) Polymorphism d) Isomorphism
554. Glass is soluble in:
 a) HF b) H_2SO_4 c) HClO_4 d) Aqua-regia
555. Al_2O_3 formation involves large quantity of heat evolution which makes its use in:
 a) Deoxidizer b) Confectionary c) Indoor photography d) Thermite welding
556. Duralumin is an alloy of:
 a) Al and Mg b) Mg and Cu c) Al, Mg, Mn and Cu d) Al and Cu
557. Among the following the purest form of carbon is :

- a) Bituminous coal b) Coal-tar c) Coal gas d) Graphite
558. Which of the following anion is present in chain structure of silicate?
 a) $[\text{Si}_2\text{O}_5^{2-}]_n$ b) $[\text{SiO}_3^{2-}]_n$ c) SiO_4^{4-} d) $\text{Si}_2\text{O}_7^{6-}$
559. Tin reacts with:
 a) Hot conc. HCl b) Conc. HNO_3 c) HgCl_2 on heating d) All of these
560. Which gas is responsible for green house effect?
 a) CO_2 b) SO_2 c) CO d) SO_3
561. Al and Ga have the same covalent radii because of:
 a) Greater shielding power of *s*-electrons of Ga atoms
 b) Poor shielding power of *s*-electrons of Ga atoms
 c) Poor shielding power of *d*-electrons of Ga atoms
 d) Greater shielding power of *d*-electrons of Ga atoms
562. BCl_3 does not exist as dimer but BH_3 exist as dimer (B_2H_6) because:
 a) Chlorine is more electronegative than hydrogen
 b) There is $p\pi - p\pi$ back bonding in BCl_3 but BH_3 does not contain such multiple bonding
 c) Large sized chlorine atoms do not fit in between the small boron atoms whereas small sized hydrogen atoms get fitted between boron atoms
 d) None of the above
563. Magnalium contains
 a) Al + Mg b) Mg + Cu c) Mg + Fe d) Mg + Ag
564. Crystalline form of silica is called
 a) Crystalline silicon b) Quartz c) Rock d) Talc
565. Borax is prepared by treating colemanite with:
 a) NaNO_3 b) NaCl c) Na_2CO_3 d) NaHCO_3
566. Which is not the property of diamond?
 a) It is insoluble in all solvents
 b) It is an isomer of graphite
 c) It is purest form of carbon
 d) It is oxidized with a mixture of $\text{K}_2\text{Cr}_2\text{O}_7$ and H_2SO_4 at 200°C
567. What happens when steam is passed over red hot carbon?
 a) $\text{C} + 2\text{H}_2\text{O} \rightarrow \text{CO}_2 + 2\text{H}_2$
 b) $\text{C} + \text{H}_2\text{O} \rightarrow \text{CO} + \text{H}_2$
 c) Water vapour dissociates into H_2 and O_2
 d) None of the above
568. In the electrolytic method of obtaining aluminium from purified bauxite, cryolite is added to the charge in order to
 a) Minimize the heat loss due to radiation
 b) Protect aluminium produced from oxygen
 c) Dissolve bauxite and render it conductor of electricity
 d) Lower the melting point of bauxite
569. Boric acid when burnt with ethyl alcohol gives a green edged flame due to the combustion of:
 a) Boric anhydride b) Metaboric acid c) Ethyl borate d) Orthoboric acid
570. Purest form of silica is :
 a) Quartz b) Flint c) Sandstone d) Keiselguhr
571. Alzheimer's disease is caused due to Al interaction with internal organs of the body if food is contaminated with Al. This disease
 a) Induces senility in young persons b) Causes memory loss
 c) Both (a) and (b) d) None of the above
572. In the reaction, $\text{LiH} + \text{AlH}_3 \rightarrow \text{LiAlH}_4$, AlH_3 and LiH act as:

- a) Lewis acid and Lewis base
 b) Lewis base and Lewis acid
 c) Bronsted base and Bronsted acid
 d) None of the above
573. Metalloid among the following is:
 a) Si b) C c) Ge d) Pb
574. The most abundant metal in the earth crust is
 a) Na b) Al c) Ca d) Fe
575. Alumina may be converted into anhydrous aluminium chloride by:
 a) Heating it with conc. HCl
 b) Heating in a current of dry chlorine
 c) Heating it with rock salt
 d) Mixing it with carbon and heating the mixture in a current of dry chlorine
576. Which metal is an important component of transistors?
 a) Ag b) Ge c) Os d) Ra
577. When Al is added to potassium hydroxide solution:
 a) No reaction takes place
 b) Oxygen is evolved
 c) Water is produced
 d) Hydrogen is evolved
578. An acid among the following is:
 a) $B(OH)_3$ b) $Al(OH)_3$ c) $Fe(OH)_3$ d) None of these
579. Which is not used as a refrigerant?
 a) NH_3 b) CO_2 c) CCl_2F_2 d) CO
580. Which is used in high temperature thermometry?
 a) Na b) Tl c) Ga d) Hg
581. Which ore is best concentrated by froth floatation process?
 a) Malachite b) Cassiterite c) Galena d) Magnetite
582. Buckminsterfullerene is a variety of
 a) Boron b) Carbon c) Ammonia d) Fluorine
583. Commercially important ore of lead is:
 a) Haematite b) Sphalerite c) Siderite d) Galena
584. $(CH_3)_2SiCl_2$ undergoes hydrolysis but $(CH_3)_2CCl_2$ does not why?
 a) Low lying d -orbitals present in Si but not in C b) Only $3p$ orbital is involved in C
 c) Silicon is more acidic d) Si – Cl bond is more polar than C – Cl bond
585. The state of hybridization of boron and oxygen atoms in boric acid (H_3BO_3) are respectively:
 a) sp^3 and sp^3 b) sp^2 and sp^3 c) sp^3 and sp^2 d) sp^2 and sp^2
586. Al-Bronze contains Al and:
 a) Zn b) Sb c) Cu d) Ni
587. Which one of the following is used as an acid flux in metallurgy?
 a) CaO b) SiO_2 c) Na_2CO_3 d) SO_2
588. In the electrolytic method of obtaining aluminium from purified bauxite, cryolite is added to the charge in order to
 a) Minimise the heat loss due to radiation
 b) Protect aluminium produced from oxygen
 c) Dissolve bauxite and render it conductor of electricity
 d) Lower the melting point of bauxite
589. CO_2 is not used in :
 a) Making Na_2CO_3 b) Fire extinguishers c) Making aerated water d) Disinfecting water

590. Boron when heated with carbon forms
 a) B_4C b) BC_4 c) B_4C_3 d) B_2C_3
591. Activation of charcoal:
 a) Can be achieved only with charcoal from nut shells
 b) Increases the adsorbing power of the charcoal
 c) Is accomplished by giving powdered charcoal an electrical charge
 d) Is achieved by heating the charcoal in air
592. Stable compounds in +1 oxidation state are formed by:
 a) B b) Al c) Ga d) Tl
593. Which of the following is a good conductor of heat and electricity?
 a) Diamond b) Graphite c) Anthracite d) Charcoal
594. An aqueous solution of BCl_3 is:
 a) Weak acid b) Weak base c) Neutral d) Strong base
595. Which element occurs in free state?
 a) C b) Si c) Ge d) Sn
596. C and Si belong to IV group or group 14. The maximum coordination number of carbon in commonly occurring compounds is 4, whereas that of silicon is 6. This is due to :
 a) Large size of silicon
 b) Availability of vacant *d*-orbitals in silicon
 c) More electropositive nature of silicon
 d) Silicon being vulnerable to attack by nucleophilic
597. Pyrene (a fire extinguisher) is:
 a) $SiCl_4$ b) CCl_4 c) $GeCl_4$ d) $SbCl_5$
598. Which does not exist?
 a) B^{3+} b) Al^{3+} c) Ga^{3+} d) In^{3+}
599. The reducing power of divalent species decreases in the order :
 a) $Ge > Sn > Pb$ b) $Sn > Ge > Pb$ c) $Pb > Sn > Ge$ d) None of these
600. The hardest substance amongst the following
 a) Be_2C b) Tritonium c) B_4C d) Graphite
601. The hybridization of carbon in carbon monoxide is:
 a) sp^3 b) sp^2 c) sp d) dsp^2
602. Newly shaped glass articles when cooled suddenly become brittle, therefore these are cooled slowly, this process is known as:
 a) Tempering b) Annealing c) Quenching d) Galvanising
603. Aluminium carbide reacts with dil. HCl to give:
 a) C_2H_2 b) C_2H_4 c) CH_4 d) C_2H_6
604. The blue coloured mineral 'Lapis Lazuli' used as semiprecious stone is:
 a) Sodium alumino silicate
 b) Zinc cobaltate
 c) Prussian blue
 d) Basic copper carbonate
605. The correct order of decreasing hardness of the following compounds is:
 a) Diamond > Borazon > Carborundum > Corundum
 b) Borazon > Diamond > Carborundum > Corundum
 c) Corundum > Carborundum > Borazon > Diamond
 d) None of the above
606. It is impossible to fuse strips of copper, silver or iron into soda glass because of a difference in the properties of glass and the metal. The property concerned is:
 a) Coefficient of expansion

- b) Melting point
 c) Ignition point
 d) Heat of fusion
607. The catalyst used in Friedel-Craft's reaction is:
 a) Finely divided nickel
 b) Finely divided platinum
 c) Anhydrous aluminium chloride
 d) Pt
608. The metal used in acid storage batteries is :
 a) Copper b) Tin c) Magnesium d) Lead
609. In Hall's process, the ore is mixed with:
 a) Coke b) Calcium carbonate c) Sodium hydroxide d) Sodium carbonate
610. Sesquioxide of lead is:
 a) PbO b) PbO₂ c) Pb₂O d) Pb₂O₃
611. Tin (IV) chloride (anhydrous) can be obtained :
 a) By action of molten tin and Cl₂
 b) By heating tin and conc. HCl and dehydrating the product in an atmosphere of HCl(g)
 c) By treating tin with dil. HCl and heating the product to dryness
 d) None of the above
612. What product is formed on heating lead nitrate?
 a) PbO + NO + O₂ b) PbO + NO₂ + O₂ c) Pb + NO₂ d) PbO + N₂
613. Which of the following imparts green colour to flame:
 a) B(OMe)₃ b) Na(OMe) c) Al(OBr₂)₃ d) Sn(OH)₂
614. Which among CH₄, SiH₄, GeH₄ and SnH₄ is most volatile?
 a) CH₄ b) SiH₄ c) GeH₄ d) SnH₄
615. Destructive distillation of coal does not gives:
 a) C₂H₂ b) C₂H₄ c) Carbides d) Coal gas
616. Red lead is an example of
 a) Basic oxide b) Super oxide c) Mixed oxide d) Amphoteric
617. Which of the following statements about H₃BO₃ is not correct?
 a) It is prepared by acidifying an aqueous solution of borax
 b) It has a layer structure in which planar BO₃ units are joined by hydrogen bonds
 c) It does not act as proton donor but acts as Lewis acid by accepting hydroxyl ion
 d) It is a strong tribasic acid
618. Cassiterite is an ore of
 a) Iron b) Lead c) Mercury d) Tin
619. Hoopé's process is used in the refining of:
 a) Al b) Zn c) Ag d) Cu
620. B₂O₃ is:
 a) Ionic b) Basic c) Acidic d) Amphoteric
621. Boron compounds behave as Lewis acid because of their:
 a) Acidic nature b) Covalent nature c) Electron deficiency d) Ionization property
622. Which is pseudo solid?
 a) Glass b) Diamond c) Sodium chloride d) CaCO₃
623. The number of carbon compounds is very large because it:
 a) Is tetravalent
 b) Forms double and triple bonds
 c) Is non-metal
 d) shows catenation

624. Which species does not exist?
 a) $[\text{BF}_6]^{3-}$ b) $[\text{AlF}_6]^{3-}$ c) $[\text{GaF}_6]^{3-}$ d) $[\text{InF}_6]^{3-}$
625. Boron halides behave as Lewis acids because of their nature.
 a) Proton donor b) Covalent c) Electron deficient d) Ionising
626. Boron differs from the other members of group 13 because it:
 a) Has much lesser radius
 b) Is non-metal
 c) Is covalent in its compounds
 d) Has maximum covalency of 6 (B_2H_6)
627. The purification method used for mineral $\text{Al}_2\text{O}_3 \cdot 2\text{H}_2\text{O}$ is:
 a) Froth floatation b) Leaching c) Liquefaction d) Magnetic separation
628. Anhydrous AlCl_3 is obtained from
 a) Aluminium and chlorine gas b) Hydrogen chloride gas and Aluminium metal
 c) Both of the above d) None of the above
629. Colour is imparted to glass by mixing:
 a) Synthetic dyes b) Metal oxides c) Oxides of non-metal d) Coloured salt
630. Mineral of aluminium that does not contain oxygen is:
 a) Corundum b) Diaspore c) Bauxite d) Cryolite
631. When Al is added to KOH solution
 a) Hydrogen is evolved b) Oxygen is evolved
 c) Oxygen is evolved d) No action takes place
632. The composition of mica is:
 a) $\text{NaAlSi}_3\text{O}_8 \cdot 3\text{H}_2\text{O}$ b) $\text{K}_2\text{O} \cdot 3\text{Al}_2\text{O}_3 \cdot 6\text{SiO}_2 \cdot 2\text{H}_2\text{O}$ c) $\text{K}_2\text{HAl}(\text{SiO}_4)_3$ d) $\text{NaK} \cdot \text{SiO}_4 \cdot 10\text{H}_2\text{O}$
633. Lead chromate is.....in colour.
 a) Red b) Yellow c) White d) Black
634. Pure boron is best prepared by
 a) Heating B_2O_3 with H_2 b) Heating B_2O_3 with Na and K
 c) Heating KBF_4 with Na or K d) Heating BBr_3 with H_2 in presence of a catalyst
635. The role of fluorspar (CaF_2) which is added in small quantities in the electrolytic reduction of alumina dissolved in fused cryolite (Na_3AlF_6) is:
 a) As a catalyst
 b) To make the fused mixture very conducting
 c) To increase the temperature of the melt
 d) To decrease the rate of oxidation of carbon at the anode
636. Litharge is not commonly used in :
 a) Manufacture of special glasses
 b) Glazing pottery
 c) Preparing paints
 d) Lead storage battery
637. The precious Ruby stone is:
 a) Alumina
 b) Aluminium silicate
 c) Sodium aluminium silicate
 d) Sodium silicate
638. Wood charcoal is used in gas masks because it:
 a) Is poisonous b) Liquefies gas c) Is porous d) Adsorbs gases
639. CO_2 is obtained by heating :
 a) Na_2CO_3 b) K_2CO_3 c) NaHCO_3 d) None of these
640. Which is not correct?

- a) Atomic size decreases
c) Metallic character decreases
- b) Stability of +2 oxidation state increases
d) Ionization energy increases
655. The chemical formula of phosgene or carbonyl chloride is:
a) PH_3 b) COCl_2 c) POCl_3 d) PCl_3
656. Carbon in CO_2 is:
a) sp -hybridized b) sp^2 -hybridized c) sp^3 -hybridized d) dsp^3 -hybridized
657. Ordinary sand (SiO_2) is attacked by:
a) conc. HCl b) conc. HBr c) hot KOH d) None of these
658. Which is not a mineral of aluminium?
a) Anhydrite b) Bauxite c) Corundum d) Diaspora
659. Graphite is soft solid lubricant extremely difficult to melt. The reason for this anomalous behaviour is that graphite.
a) Has molecules of variable molecular masses like polymers
b) Has carbon atoms arranged in large plates of rings of strongly bound carbon atoms with weak interplate bonds
c) Is a non-crystalline substance
d) Is an allotropic form of diamond
660. Which does not react with water?
a) B_2S_3 b) B_4C c) Al_4C_3 d) Al_2S_3
661. Which of the following is obtained on heating, potassium ferrocyanide with H_2SO_4 ?
a) CO_2 b) CO c) C_2H_2 d) $(\text{CN})_2$
662. The metallic character of the elements of IV A group or group 14 :
a) Decreases from top to bottom
b) Has no significance
c) Does not change
d) Increases from top to bottom
663. When a solution of sodium hydroxide is added in excess to the solution of potash alum, we obtain:
a) A white precipitate
b) Bluish white precipitate
c) A clear solution
d) A crystalline mass
664. Which of the following is better fuel?
a) Solid b) Liquid c) Gaseous d) Semi solid
665. Flux is used to
a) Remove silica b) Remove silica undesirable metal oxide
c) Remove all impurities from ores d) Reduce metal oxide
666. Al dissolves in molten NaOH with the formation of:
a) Sodium aluminate (Na_3AlO_3)
b) Sodium meta-aluminate (NaAlO_2)
c) Aluminium hydroxide
d) Alumina
667. Silicon carbide is used as:
a) Dehydrating agent b) Abrasive c) Solvent d) Catalyst
668. Electrolytic reduction of pure alumina is not possible because:
a) It is amphoteric
b) It dissociates on fusion
c) It melts at very high temperature
d) None of the above
669. The main factor responsible for weak acidic nature of B—F bonds in BF_3 is:

- a) Large electronegativity of F
 b) Three centred two electron bonds in BF_3
 c) $p\pi - d\pi$ back bonding
 d) $p\pi - p\pi$ back bonding
670. The correct order of increasing C—O bond length in CO , CO_3^{2-} and CO_2 is:
 a) $\text{CO}_3^{2-} < \text{CO}_2 < \text{CO}$ b) $\text{CO} < \text{CO}_3^{2-} < \text{CO}_2$ c) $\text{CO}_2 < \text{CO}_3^{2-} < \text{CO}$ d) $\text{CO} < \text{CO}_2 < \text{CO}_3^{2-}$
671. A solution of a salt in water on addition of dilute HCl gives a white ppt. soluble in hot water. The salt contains :
 a) Ag^+ b) Pb^{2+} c) H^{2+} d) Fe^{2+}
672. Thallium shows different oxidation states because:
 a) It is a transition metal;
 b) Of inert pair effect
 c) Of its amphoteric character
 d) Of its high reactivity
673. 'Lead Pencil' contains
 a) PbS b) FeS c) Graphite d) Pb
674. Which one is explosive?
 a) PCl_5
 b) $\text{Pb}(\text{NO}_3)_2$
 c) $\text{NH}_4\text{NO}_3 + \text{Al}$ powder
 d) $\text{C}_6\text{H}_5\text{NO}_2$
675. Which of the following is formed when aluminium oxide and carbon is strongly heated in dry chlorine gas?
 a) Aluminium chloride b) Hydrate Aluminium chloride
 c) Anhydrous Aluminium chloride d) None of the above
676. A salt which gives CO_2 with hot H_2SO_4 and also decolourises acidified KMnO_4 on warming is:
 a) HCO_3^- b) CO_3^{2-} c) Oxalate d) acetate
677. The structure of diborane (B_2H_6) contains
 a) Four 2c-2e bonds and two 3c-2e bonds b) Two 2c-2e bonds and four 3c-2e bonds
 c) Two 2c-2e bonds and two 3c-3e bonds d) Four 2c-2e bonds and four 3c-3e bonds
678. Elements of group 13 form oxides of the general formula:
 a) M_4O_5 b) MO c) M_2O_3 d) M_2O_4
679. Quartz watches contain
 a) Hands made of quartz b) Silica coating on the numbers
 c) A crystal of quartz as an essential component d) A coating of quartz on the outer body
680. Alumina on heating with carbon in nitrogen atmosphere gives:
 a) $\text{Al} + \text{CO}$ b) $\text{Al} + \text{CO}_2$ c) $\text{AlN} + \text{CO}$ d) $\text{Al} + \text{CO} + \text{N}_2$
681. Carbon reacts with strong electropositive metal oxides to form:
 a) Carbide b) Carbonate c) Hydroxide d) Oxide
682. Tetrahalides of IV A group of group 14 elements are:
 a) Ionic b) Covalent c) Polar d) Coordinate covalent
683. The percentage of carbon is least in :
 a) White cast iron b) Grey cast iron c) Wrought iron d) Steel
684. Conc. HNO_3 can be stored in container of:
 a) Cu b) Al c) Zn d) Sn
685. Water glass is
 a) Glass made of water b) Sodium silicate c) Calcium formate d) Pyrex glass
686. Tendency of catenation is strongest in:
 a) C b) O c) N d) Si
687. On adding ammonium hydroxide solution to $\text{Al}_2(\text{SO}_4)_3$ (aq):

- a) A precipitate is formed which does not dissolve in excess of ammonium hydroxide
 b) A precipitate is formed which does not dissolve in excess of ammonia solution
 c) No precipitate is formed
 d) None of the above
688. Borax bead test depends on the formation of:
 a) Boron oxide b) Boron metal c) Metal metaborates d) All of these
689. Graphite is good conductor of current but diamond is non-conductor because :
 a) Diamond is hard and graphite is soft
 b) Graphite and diamond have different atomic configuration
 c) Graphite is composed of positively charged carbon ions
 d) Graphite has hexagonal layer structure with mobile π -electrons while diamond has continuous tetrahedral covalent structure with no free electrons
690. When Sn (IV) chloride is treated with excess of conc. HCl, the complex $[\text{SnCl}_6]^{2-}$ is formed. The oxidation state of Sn in this complex is:
 a) +6 b) +4 c) -2 d) +2
691. $\text{SiH}_4 + \text{O}_2$ mixture on bubbling through water and bubbles coming in contact with air:
 a) Burns with a luminous flame
 b) Vortex rings of finely divided silica are formed
 c) $\text{SiH}_4 + 2\text{O}_2 \rightarrow \text{SiO}_2 + 2\text{H}_2\text{O}$, reaction occurs
 d) All of the above
692. The main component of glass which gives heat resistance to laboratory glassware is
 a) PbO b) MgO c) B_2O_3 d) Al_2O_3
693. An element R is in group 13. Which is true with respect of?
 a) It is a gas at room temperature
 b) It has an oxidation state of +4
 c) It forms an oxide of the type $R_2\text{O}_3$
 d) It forms a halide of the type RX_2
694. Bucky ball or buckminster fullerene is:
 a) An allotrope of carbon
 b) It is referred as C – 60
 c) It has sp^2 -hybridized nature and resembles with soccer ball
 d) All of the above