THE P-BLOCK ELEMENTS

CHEMISTRY

Single Correct Answer Type

1. Nitric oxide is:
   a) Acidic towards litmus
   b) Basic towards litmus
   c) Neutral towards litmus
   d) Amphoteric
2. The last member of inert gas family is:
   a) Krypton b) Radon c) Xenon d) Argon
3. Helium –oxygen mixture is used by deep by sea divers in preference to nitrogen oxygen mixture because
   a) Helium is much less soluble in blood than nitrogen
   b) Nitrogen is much less soluble in blood than helium
   c) Due to high pressure deep under the sea nitrogen and oxygen react to give poisonous nitric oxide
   d) Nitrogen is highly soluble in water
4. Among the fluorides below, the one which does not exist is
   a) CF_4 b) HeF_4 c) XeF_4 d) SF_4
5. The percentage of nitrogen in air remains almost constant due to:
   a) The fixation of nitrogen
   b) The activity of symbiotic bacteria
   c) The effect of lightening and bacteria
   d) The nitrogen cycle in nature
6. The metal which does not form ammonium nitrate by reaction with dilute nitric acid is
   a) Al b) Fe c) Pb d) Mg
7. The following acids have been arranged in the order of decreasing acid strength. Identify the correct order
   ClOH(I) BrOH(II) IOH(III)
   a) I > II > III b) II > I > III c) III > II > I d) I > III > II
8. H_2S exhibits:
   a) Oxidizing properties b) Reducing properties c) Basic properties d) None of these
9. Liquid oxygen is:
   a) Colourless b) Pale yellow c) Pale blue d) Dark blue
10. HNO_3 is manufactured by:
    a) Birkeland and Eyde's process
    b) Haber's process
    c) Contact's process
    d) Fischer-Tropsch's process
11. The decreasing values of bond angles from NH_3 (107°)to SbH_3 (91°) down the group 15 of the periodic table is due to
    a) Increasing *bp-bp* repulsion b) Increasing *p*- orbital character in sp^3
    c) Decreasing *lp-bp* repulsion d) Decreasing electronegativity
12. Nitrogen is obtained when $NaNO_2$ react with
    a) NH_4Cl b) NH_4NO_3 c) $(NH_4)_2CO_3$ d) NH_4OH
13. Which of the following statement is wrong?
    a) The stability of hydrides increases from NH_3 to BiH_3 in group 15 of the periodic table
    b) Nitrogen cannot form $d\pi - p\pi$ bond
    c) Single N—N bond is weaker than the single P—P bond
    d) N_2O_4 has two resonance structure

14. Which is monoatomic?
a) Oxygen b) Fluorine c) Neon d) Nitrogen
15. Which gas can be collected over water?
a) NH_3 b) N_2 c) SO_2 d) HCl
16. In the reaction,
$2KI + H_2O_2 + O_3 \longrightarrow 2KOH + O_2 + A$, the compound A is:
a) KIO_3 b) I_2O_5 c) HIO_3 d) I_2
17. In the reaction, $MnO_4^- + I^- \xrightarrow{\text{Alkaline solution}} [X]$; $[X]$ is:
a) IO_3^- b) IO_4^- c) I_2 d) IO^-
18. Number of hydroxyl groups present in pyrosulphuric acid is:
a) 3 b) 4 c) 2 d) 1
19. Which is not an acid salt?
a) $Na_4P_2O_7$ b) NaH_2PO_3 c) NaH_2PO_2 d) $Na_3HP_2O_6$
20. In fisher-Ringe's method of separation of noble gas mixture from air, ... Is used.
a) 90% CaC_2+10%$CaCl_2$ b) Coconut charcoal
c) Soda lime +potash solution d) 90% $CaCO_3$ +10% urea
21. The element which evolves two gases on reacting with conc. H_2SO_4 is:
a) Si b) C c) S d) P
22. When conc. H_2SO_4 is added to dry KNO_3, brown fumes are evolved. These fumes are of:
a) SO_2 b) SO_3 c) N_2O d) NO_2
23. With cold and dilute sodium hydroxide fluorine reacts to give
a) NaF and OF_2 b) NaF + O_3 c) O_2 and O_3 d) NaF + O_2
24. The X—X bond dissociation energy is minimum in:
a) F_2 b) Cl_2 c) Br_2 d) I_2
25. Which of the following is not the characteristic of interhalogen compounds?
a) They are more reactive than halogens
b) They are quite unstable but none of them is explosive
c) They are covalent in nature
d) They have low boiling points and are highly volatile
26. Which is soluble in water?
a) AgCl b) AgBr c) AgI d) AgF
27. In the compounds of type ECl_3, where E = B, P, As, or Bi, the angle Cl–E–Cl for different E are in the order :
a) B > P = As = Bi b) B > P > As > Bi c) B < P = As = Bi d) B < P < As < Bi
28. Colour of iodine solution can be discharged by shaking it with aqueous solution of:
a) H_2O_2 b) Sodium sulphide c) Sodium thiosulphate d) Sodium sulphate
29. Sulphuric acid has great affinity for water because
a) It hydrolyses the acid b) It decomposes the acid
c) Acid forms hydrates with water d) Acid decomposes water
30. Major credit for the discovery of noble gases is given to:
a) Cavendish b) Ramsay c) Rayleigh d) None of these
31. In XeF_2, XeF_4, XeF_6, the number of lone pairs of Xe is respectively
a) 3, 2, 1 b) 1 ,2, 3 c) 2, 3, 1 d) 4, 1, 2
32. Which of the following has *pp-dp* bonding?
a) NO_3^-
b) SO_3^{2-}
c) BO_3^{3-}
d) CO_3^{2-}
33. Acidified iodates are reduced to ... by SO_2.
a) Iodites b) Iodide c) Iodine d) None of these
34. Anhydrone is:

a) $HClO_4$
b) $HClO_3$
c) Anhydrous magnesium perchlorate
d) Anhydrous calcium perchlorate

35. In Kipp's apparatus, H_2S is prepared:
a) Continuously b) By FeS + conc. H_2SO_4 c) By FeS + dil. H_2SO_4 d) By Fe + dil. H_2SO_4

36. The mixture of conc. HCl and HNO_3 in the ratio 3: 1 contains:
a) ClO_2 b) NOCl c) NCl_3 d) N_2O_4

37. Pure nitrogen can be prepared from
a) NH_4OH b) NH_4NO_2 c) $Ba(NO_3)_2$ d) Ca_3N_2

38. Fluorine can be free from HF by passing the mixture through:
a) H_2O b) An alkaline solution c) Conc. H_2SO_4 d) NaF

39. Fluorine is usually obtained from:
a) Fluorspar b) Fluorapatite c) Cryolite d) Tetrafluoromethane

40. Mark the strongest acid
a) HI b) HBr c) HCl d) HF

41. The most basic hydride is
a) NH_3 b) PH_3 c) AsH_3 d) SbH_3

42. Cl_2 is used in the extraction of:
a) Pt b) Au c) Both (a) and (b) d) None of these

43. A hydride of nitrogen having lowest oxidation number of N:
a) NH_3 b) N_3H c) N_2H_4 d) N_2H_2

44. Chlorine acts as a bleaching agent only in presence of
a) Dry air b) Moisture c) Sunlight d) Pure oxygen

45. Swimming pools are disinfected by bubbling through water with a controlled quantity of:
a) Br_2 b) Cl_2 c) O_2 enriched air d) N_2

46. A glass tube containing molten antimony breaks upon solidification of antimony due to:
a) Expansion b) Exothermic reaction c) Endothermic reaction d) None of these

47. Oxygen is paramagnetic. The unpaired electrons are present in :
a) Antibonding orbitals b) Bonding orbitals c) p – orbitals d) f- orbitals

48. By warming a paste of bleaching powder with a solution of ammonia, we get:
a) H_2 b) N_2 c) N_2O_3 d) N_2O_4

49. H_3PO_2 has the name and basicity respectively:
a) Phosphorous acid and two
b) Hypophosphorous acid and two
c) Hypophosphorous acid and one
d) Hypophosphoric acid and two

50. The correct order of acidic nature is:
a) $Cl_2O_7 > SO_2 > P_4O_{10}$ b) $CO_2 > N_2O_5 > SO_3$ c) $Na_2O > MgO > Al_2O_3$ d) $K_2O > CaO > MgO$

51. The van der Waal's forces are the greatest in:
a) Neon b) Argon c) Krypton d) Xenon

52. Starch paper moistened with KI solution turns blue in ozone because of:
a) Iodine liberation
b) Oxygen liberation
c) Alkali formation
d) Ozone reacts with litmus paper

53. Which one is correct statement?
a) Basicity of H_3PO_4 and H_3PO_3 is 3 and 3 respectively
b) Acidity of H_3PO_4 and H_3PO_3 is 3 and 3 respectively
c) Acidity of H_3PO_4 and H_3PO_3 is 3 and 2respectively
d) Basicity of H_3PO_4 and H_3PO_3 is 3 and 2 respectively

54. Ammonia water is a good cleaning agent because it:
    a) Is weakly basic
    b) Emulsifies grease
    c) Leaves no residue when wiped out
    d) All are true
55. A clathrate is defined as a:
    a) Cage compound b) Liquid crystal c) Mixture d) Solid solution
56. The acid employed for etching of glass is
    a) HCl b) $HClO_4$ c) HF d) Aqua regia
57. H_2SO_4 reacts with sugar and acts as:
    a) A dehydrating agent b) An oxidizing agent c) A sulphonating agent d) None of these
58. Ordinary oxygen contains:
    a) Only O^{16} isotope b) Only O^{17} isotope c) A mixture of O^{16}, O^{17} and d) Only O^{18} isotope
59. Metal halide which is insoluble in water is
    a) AgF b) AgI c) KBr d) $CaCl_2$
60. Phosphine is:
    a) Basic b) Acidic c) Amphoteric d) Neutral
61. Antimony dissolves in aquaregia to give:
    a) $SbCl_3$ b) Sb_2O_5 c) $SbCl_5$ d) $Sb(NO_3)_3$
62. Dinitrogen pentoxide a colourless solid is prepared by
    a) Heating NH_4NO_2 with an excess of oxygen b) Dehydrating HNO_3 with CaO
    c) Dehydrating HNO_3 withP_4O_{10} d) Heating a mixture of HNO_2 and $Ca(NO_3)_2$
63. Ammonium compound not used as a fertilizer is:
    a) $(NH_4)_2SO_4$
    b) $(NH_4)_2CO_3$
    c) NH_4NO_3
    d) CAN(calcium ammonium nitrate)
64. At ordinary temperature and pressure, among halogens, chlorine is a gas, bromine is a liquid and iodine is a solid. This is because:
    a) The specific heats are in the order $Cl_2 > Br_2 > I_2$
    b) Intermolecular forces among molecules of chlorine are the weakest and those of iodine the strongest
    c) The order of density is $I_2 > Br_2 > Cl_2$
    d) The order of stability is $I_2 > Br_2 > Cl_2$
65. Sulphur forms the chlorides S_2Cl_2 and SCl_2. The equivalent mass of Sulphur in SCl_2 is 16 g/mol. Therefore, the equivalent mass of Sulphur in S_2Cl_2 is:
    a) 32 g/mol b) 16 g/mol c) 64 g/mol d) 8 g/mol
66. Javelle water is:
    a) Aqueous solution of NaOCl
    b) Used as bleaching agent
    c) Both (a) and (b)
    d) None of the above
67. The strongest acid is:
    a) H_3PO_2 b) H_3PO_3 c) $H_4P_2O_7$ d) H_3PO_4
68. Orthophosphoric acid on heating gives:
    a) Phosphine
    b) Phosphorus pentoxide
    c) Phosphorus acid
    d) Metaphosphoric acid
69. Which oxide is more acidic?
    a) Al_2O_3 b) Na_2O c) MgO d) CaO

70. $SO_2 + H_2S \rightarrow$ product, the final product is
a) H_2SO_3 b) H_2SO_4 c) $H_2S_2O_3$ d) $H_2O + S$
71. Which of the following is not oxidised by O_3?
a) KI b) $FeSO_4$ c) $KMnO_4$ d) K_2MnO_4
72. The gas used for inflating the tyres of aeroplanes is:
a) H_2 b) He c) N_2 d) Ar
73. F_2 is formed by the reaction of K_2MnF_6 with:
a) SbF_5 b) MnF_3 c) KrF_6 d) MnF_4
74. Which statement is not correct for nitrogen?
a) It has a small size b) It does not readily react with O_2
c) It is a typical non-metal d) d-orbitals are available for bonding
75. Which is not oxdised by MnO_2?
a) F b) Cl c) I_2 d) I
76. Passing H_2S gas through nitric acid produces:
a) Rhombic sulphur b) Monoclinic sulphur c) Colloidal sulphur d) Plastic sulphur
77. Schweitzer's reagent is:
a) $[Cu(NH_3)_4]SO_4$ b) $[Ag(NH_3)_2]Cl$ c) $[Cu(NH_3)_2]Cl$ d) $K_4Fe(CN)_6$
78. Industrial name of $H_2S_2O_7$ is
a) Pyrosulphuric acid b) Marshall's acid c) Oleum d) All of these
79. Which does not give oxygen on heating?
a) HgO b) $KMnO_4$ c) $KClO_3$ d) $(NH_4)_2Cr_2O_7$
80. Which of the following pairs is obtained on heating ammonium dichromate?
a) N_2 and H_2O b) N_2O and H_2O c) NO_2 and H_2O d) NO and NO_2
81. Which reaction is not feasible?
a) $2KI + Br_2 \rightarrow 2KBr + I_2$ b) $2KBr + I_2 \rightarrow 2KI + Br_2$
c) $2KBr + Cl_2 \rightarrow 2KCl + Br_2$ d) $2H_2O + 2F_2 \rightarrow 4HF + O_2$
82. The conjugate base of $H_2PO_4^-$ is:
a) HPO_4^{2-} b) P_2O_5 c) H_3PO_4 d) PO_4^{3-}
83. Reaction of solid $KMnO_4$ with conc. H_2SO_4 produces manganese heptoxide (Mn_2O_7) in:
a) Solution state b) Solid state c) Fine powder d) None of these
84. Caro's acid is:
a) $H_2S_2O_3$ b) $H_2S_2O_8$ c) H_2SO_3 d) H_2SO_5
85. Which of the following is not oxidized by MnO_2?
a) F^- b) Cl^- c) Br^- d) I^-
86. Which is an ozonide?
a) KO_3 b) NH_4O_3 c) Cr_2O_3 d) Both (a) and (b)
87. Which statement is false for ozone?
a) It is obtained by silent electric discharge on oxygen
b) It is an endothermic compound
c) It can be obtained by the action of ultraviolet rays on oxygen
d) It cannot be regarded as an allotrope of oxygen
88. Which is true with regard to the properties of PH_3?
a) PH_3 is insoluble in water b) PH_3 has fishy smell
c) PH_3 is neutral towards litmus d) PH_3 is not much stable
89. Nitric acid is generally light yellow due to the presence of:
a) NH_3 b) NO c) NO_2 d) N_2O_5
90. The lightning bolts in atmosphere cause the formation of:
a) NO b) O_3 c) CO_2 d) H_2O_2
91. The structure of IF_7 is:
a) Square pyramid

b) Trigonal bipyramid
c) Octahedral
d) Pentagonal bipyramid

92. What may be expected to happen, when phosphine gas is mixed with chlorine gas?
a) PCl_5 and HCl are formed and the mixture cools down
b) $PH_3 \cdot Cl_2$ is formed with warming up
c) The mixture cools down only
d) PH_3 and HCl are formed and the mixture warms up

93. $HClO_4 + P_2O_5 \rightarrow (A)$and (B) A and B are
a) $HClO_3, H_3PO_4$ b) $Cl_2O_6 + HPO_3$ c) ClO_2, H_2PO_4 d) Cl_2O_7, HPO_3

94. The formula of zinc phosphite is:
a) $ZnHPO_3$ b) $Zn(PO_4)_3$ c) $Zn_2(PO_4)_3$ d) $Zn_3(PO_3)_2$

95. The bonds present in N_2O_5 are:
a) Only ionic
b) Only covalent
c) Covalent and coordinate
d) Covalent and ionic

96. Uranium isotopes are usually separated by using compounds of the halogen:
a) F_2 b) Cl_2 c) Br_2 d) I_2

97. Which of the following halogen oxides is ionic?
a) I_4O_9 b) I_2O_5 c) BrO_2 d) ClO_3

98. Which gas is used to improve the atmosphere of crowded places?
a) H_2 b) O_2 c) O_3 d) N_2O

99. Which of the following is responsible for depletion of the ozone layer in the upper strata of atmosphere?
a) Polyhalogens b) Ferrocene c) Fullerenes d) Freons

100. H_2SO_4 and H_2SO_3 can be distinguished by the addition of:
a) Litmus solution b) $FeCl_3$ solution c) $NaHSO_4$ solution d) Magnesium powder

101. $NaNH_2 + N_2O \longrightarrow X + NaOH + NH_3$ what is the X?
a) NaN_2 b) Na_3N c) NaN_3 d) None of these

102. Ripening of fruits can be carried out in presence of
a) Na_2SO_4 b) NaCl c) CaC_2 d) $CaCl_2$

103. Which is most thermodynamically stable allotropic form of phosphorus?
a) Red b) White c) Black d) Yellow

104. F_2 is isolated by:
a) Electrolysis of HF
b) Electrolysis of KHF_2
c) Electrolysis of Na_3AlF_6
d) Electrolysis of NaF/HF

105. Observe the following statements
I. Bleaching powder is used in the preparation of chloroform.
II. Bleaching powder decomposes in the presence of $CoCl_2$ to liberate O_2.
III. Aqueous KHF_2 is used in the preparation of fluorine.
The correct combination is
a) I,II and III are correct b) Only II is correct
c) Only I and III are correct d) Only I and II are correct

106. Which form of P shows chemiluminescence?
a) White P b) Black P c) Red P d) None of these

107. Which of the following oxy-acids of phosphorus is a reducing agent and monobasic?
a) H_3PO_2 b) H_3PO_3 c) H_3PO_4 d) $H_4P_2O_6$

108. Radon is a noble gas. Its radioactivity is used in the treatment of:
a) Typhoid b) Cancer c) Cough and cold d) Thyroid

109. Which of the following statement is true?
   a) H_3PO_3 is a stronger acid than H_2SO_3
   b) In aqueous medium HF is a stronger acid than HCl
   c) $HClO_4$ is a weaker acid than $HClO_3$
   d) HNO_3 is a stronger acid than HNO_2
110. Number of lone pairs of electrons on Xe atoms in XeF_2, XeF_4 and XeO_3 molecule are respectively
   a) 3, 2 and 1 b) 4, 3 and 2 c) 2, 3 and 1 d) 3, 2 and 0
111. When a lead storage battery is discharged:
   a) SO_2 is evolved
   b) Lead sulphate is consumed
   c) Lead is formed
   d) H_2SO_4 is consumed
112. On heating silver nitrate strongly ……. is obtained finally:
   a) NO_2 b) O_2 c) Silver metal d) All
113. Pure phosphine is not combustible while impure phosphine is combustible, this combustibility is due to the presence of:
   a) P_2H_4 b) N_2 c) PH_5 d) P_2O_5
114. In the contact process of H_2SO_4, SO_3 dissolves in sulphuric acid to give:
   a) Permonosulphuric acid
   b) Thiosulphuric acid
   c) Pyrosulphuric acid
   d) Perdisulphuric acid
115. When chlorine water is exposed to sunlight, O_2 is liberated. Hence:
   a) Hydrogen has little affinity to O_2
   b) Hydrogen has more affinity to O_2
   c) Hydrogen has more affinity to chlorine
   d) It is a reducing agent
116. The number of electrons in a halogen in its outermost orbit in comparison with corresponding noble gas is:
   a) One electron less b) One electron more c) Two electrons less d) Two electrons more
117. The deep blue colour produced on adding excess of ammonia to copper sulphate solution is due to the presence of:
   a) Cu^{2+} b) $[Cu(NH_3)_2]^{2+}$ c) $[Cu(NH_3)_4]^{2+}$ d) $[Cu(NH_3)_6]^{2+}$
118. Which of the following oxo-acids of chlorine is formed on shaking chlorine water with freshly precipitated yellow oxide of mercury?
   a) $HClO_3$ b) $HClO_2$ c) HClO d) $HClO_4$
119. Phosphorus is present in bones as:
   a) $Ca_3(PO_4)_2$ b) $FePO_4$ c) Ca_3P_2 d) Cu_3P_2
120. Paramagnetic molecule is:
   a) Oxygen b) Nitrogen c) Hydrogen d) Chlorine
121. Which is a poison?
   a) Hg_2Cl_2 b) As_2O_3 c) $NaHCO_3$ d) NaCl
122. Which of the following is a tribasic acid?
   a) H_3PO_4 b) HPO_3 c) $H_4P_2O_7$ d) $H_4p_2O_6$
123. Presence of sulphide ion cannot be confirmed by:
   a) $BaCl_2$ b) $(CH_3COO)_2Pb$ c) Sodium nitroprusside d) Dil. H_2SO_4
124. End product of the hydrolysis of XeF_6 is
   a) XeF_4O b) XeF_2O_2 c) XeO_3 d) XeO_3^-
125. In PO_4^{3-} ion, the formal charge on each oxygen atom and P—O bond order respectively are:
   a) -0.75, 1.25 b) -3, 1.25 c) -0.75, 1.0 d) -0.75, 0.6

126. The lightest, non-inflammable gas is:
a) H_2 b) He c) N_2 d) Ar
127. Which of the following chloride is water insoluble?
a) HCl b) AgCl c) Both a and b d) None of the above
128. Which radical can bring about the highest oxidation state of a transition metal?
a) F^- b) Cl^- c) Br^- d) I^-
129. Excess of PCl_5 reacts with conc. H_2SO_4 giving
a) Chlorosulphonic acid b) Thionyl chloride
c) Sulphuryl chloride d) Sulphurous acid
130. Conc. H_2SO_4 displaces HCl from sodium chloride because:
a) Conc. H_2SO_4 is stronger than HCl
b) HCl is a gas whereas H_2SO_4 is a liquid
c) Sulphates are more soluble in water than chlorides
d) Sulphates are less soluble in water than chlorides
131. Which of the following halogens can replace others form their salt solutions?
a) I_2 b) Br_2 c) F_2 d) Cl_2
132. When a mixture of SO_2 and O_2 is passed over ….. the reaction rate increases:
a) Fe + Mo b) $ZnO + Cr_2O_3$ c) V_2O_5 d) zymase
133. Metal reacts with Sulphur to give:
a) Sulphide b) Sulphite c) Sulphate d) Thiosulphate
134. The non-metal other than graphite having metallic lustre is:
a) I_2 b) Si c) Cl_2 d) Br_2
135. Ozone turns benzidine paper:
a) Violet b) Brown c) Blue d) Red
136. Bleaching powder is obtained by the interaction of Cl_2 with a:
a) Dilute solution of Ca(OHb) Concentrated solution oc) Dry CaO d) Dry slaked lime
137. Which statement is incorrect?
a) Chlorine can bleach a wet piece of cloth
b) Iodine stain can be removed by hypo solution
c) Bromine can be prepared from carnallite
d) Bromine is liberated when iodine is passed through an acidified KBr solution
138. The bond Br—Cl is:
a) Polar b) Non-polar c) True covalent d) Coordinate
139. Which element is extracted commercially by the electrolysis of an aqueous solutions of one of its compounds?
a) Sodium b) Aluminium c) Chlorine d) Bromine
140. CN^- ion and N_2 are isoelectronic but in contrast to CN^-, N_2 is chemically inert because of:
a) Low bond energy
b) Absence of bond polarity
c) Unsymmetrical electron distribution
d) Presence of more number of electrons in bonding orbitals
141. Which of the following gases exists more abundantly in nature than the others?
a) Helium b) Neon c) Argon d) Krypton
142. Which inert gas has the highest boiling point?
a) Xe b) Kr c) Ar d) Ne
143. Which characteristic is not correct about H_2SO_4?
a) Reducing agent b) Oxidizing agent c) Sulphonating agent d) Highly viscous
144. XeF_4 exists as …. under ordinary atmospheric conditions.
a) Solid b) Liquid c) Gas d) None of these
145. A gas, that relights glowing splinter, is
a) H_2 b) O_2 c) N_2 d) NO_2

146. The percentage of *p*-character in the orbitals forming P-P bond in P_4 is
a) 25 b) 33 c) 50 d) 75

147. Fermy's salt is:
a) HF b) KHF_2 c) NaCl d) $KClO_3$

148. Which among the following factors is the most important in making fluorine the strongest oxidizing agent?
a) Electron affinity b) Ionisation enthalpy
c) Hydration enthalpy d) Bond dissociation energy

149. Halogens are:
a) Gases under ordinary conditions
b) Electronegative in nature
c) Fuming liquids
d) The gases found in atmosphere

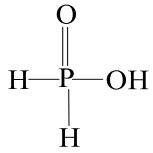
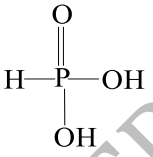
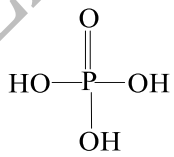
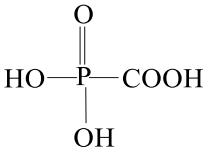
150. Hydrogen sulphide reacts with lead acetate forming a black compound which reacts with H_2O_2 to form another compound. The colour of the compound is:
a) Black b) Yellow c) White d) pink

151. KF combines with HF to form KHF_2. The compound contains the species
a) K^+, F^- and H^+ b) K^+, F^- and HF c) $K^+$and $[HF_2]^-$ d) $[KHF]^+$ and F_2

152. Which compound does not give NH_3 on heating?
a) $(NH_4)_2SO_4$ b) $(NH_4)_2CO_3$ c) NH_4NO_2 d) NH_4Cl

153. When conc. H_2SO_4 is distilled with P_4O_{10}, the product formed is:
a) SO_2 b) S_2O_4 c) SO_3 d) S_2O_3

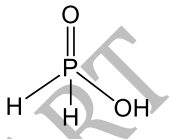
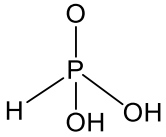
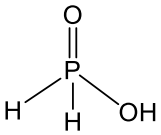
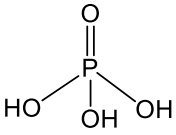
154. Radon was discovered by:
a) Dorn b) Ramsay c) Rayleigh d) None of these

155. The general formula of hypophosphorous acid is:
a) 
b) 
c) 
d) 

156. Ammonia on catalytic oxidation gives an oxide from which nitric acid is obtained. The oxide is:
a) NO b) NO_2 c) N_2O_3 d) N_2O_5

157. Which oxide reacts with both HCl and NaOH?
a) CO_2 b) CaO c) ZnO d) N_2O_5

158. O_2 is denser than air and therefore it is collected in:
a) Spirit b) H_2O c) Mercury d) Kerosene

159. The structural formula of hypophosphorus acid is
a) 
b) 
c) 
d) 

160. Which compound is prepared by the following reaction?

$$\underset{\text{(1:5 volume ratio)}}{Xe + 2F_2} \xrightarrow[673K,\ 5\text{-}6\ atm]{\text{Ni vessel}}$$

a) XeF_2 b) XeF_6 c) XeF_4 d) $XeOF_2$

161. Which one of the following oxides of nitrogen dimerises into a colourless solid /liquid on cooling?
a) N_2O b) NO c) N_2O_3 d) NO_2

162. Which ion cannot be precipitated from water?
a) Cl^- b) NO_3^- c) SO_4^{2-} d) All of these

163. The correct order of solubility in water for He, Ne, Ar, Kr, Xe is
a) Xe > Kr > Ar > Ne > He b) Ar > Ne > He > Kr > Xe
c) He > Ne > Ar > Kr > Xe d) Ne > Ar > Kr > He > Xe

164. Ozone acts as:

a) An oxidizing agent b) A reducing agent c) Bleaching agent d) All of these

165. Correct order of reactivity
a) $I_2>Br_2>Cl_2>F_2$ b) $Br_2>I_2>Cl_2>F_2$ c) $Cl_2>Br_2>I_2>F_2$ d) $F_2>Cl_2>Br_2>I_2$

166. On boiling an aqueous solution of $KClO_3$ with iodine the product formed is:
a) KIO_3 b) $KClO_4$ c) KIO_4 d) KCl

167. When bleaching powder is treated with carbon dioxide:
a) Chlorine is evolved
b) Calcium chloride is formed
c) No reaction occurs
d) It absorbs the gas

168. Which of the following properties does not correspond to the order?
$HI < HBr < HCl < HF$
a) Thermal stability b) Reducing power c) Ionic character d) Dipole moment

169. ClO_2 is an anhydride of:
a) Chlorous acid ($HClO_2$)
b) Chloric acid ($HClO_3$)
c) Mixed anhydride of $HClO_2$ and $HClO_3$
d) None of the above

170. Red P can be obtained by white P by
a) Heating it with a catalyst in an inert atmosphere b) Distilling it in an inert atmosphere
c) Dissolving it in CS_2 and crystallising d) Melting it and pouring the liquid into water

171. In the halogen group chlorine is a gas, bromine is a liquid and iodine exists as solid crystals. Then the next halogen astatine (At) would be:
a) Solid at room temperature
b) Having higher electronegativity
c) Solid with higher IP
d) Least atomic size

172. A solution of chlorine in water contains:
a) HOCl only
b) HCl only
c) HCl and HOCl
d) HCl, HOCl and chlorine

173. Helium gives a characteristic spectrum with:
a) Orange and red lines b) Orange lines c) Yellow lines d) Green lines

174. Molecules of a noble gas do not posses virbrational energy because a noble gas
a) Is monoatomic b) Is chemically inert
c) Has completely filled shells d) Is diamagnetic

175. H_2S is far more volatile than water because:
a) Sulphur atom is more electronegative than oxygen atom
b) Oxygen atom is more electronegative than sulphur atom
c) H_2O has bond angle of nearly 105°
d) Hydrogen is loosely bonded with sulphur

176. Holme's signals can be given by using
a) $CaC_2 + CaCO_3$ b) $CaC_2 + CaCN_2$ c) $CaC_2 + Ca_3P_2$ d) $Ca_3P_2 + CaCN_2$

177. Atomicity of sulphur in rhombic sulphur is
a) 8 b) 2 c) 4 d) 6

178. When chlorine is passed through concentrated solution of KOH, the compound formed is
a) $KClO_4$ b) $KClO_3$ c) $KClO_2$ d) KClO

179. The dipole moment of NF_3 is less than NH_3 because:
a) F is more reactive than H
b) NH_3 forms associated molecules

c) The resultant of the bond polarity is less
d) The resultant of the individual polarities is opposed by the polarity of lone pair

180. Which of the following oxides of nitrogen is the anhydride of nitrous acid?
a) NO b) N_2O_4 c) N_2O_3 d) N_2O_5

181. Aqueous solution of $Na_2S_2O_3$ on reaction with Cl_2 gives:
a) $Na_2S_4O_6$ b) $NaHSO_4$ c) NaCl d) NaOH

182. Halogen molecules are:
a) Monoatomic and form X_2^{2-} ions
b) Diatomic and form X^- ions
c) Diatomic and form X_2^{2-} ions
d) Monoatomic and form X^-ions

183. Least stable oxide of chlorine is
a) Cl_2O b) ClO_2 c) Cl_2O_7 d) ClO_3

184. Bromine water is decolourised by:
a) SO_2 b) C_2H_4 c) C_2H_2 d) All of these

185. Fluorine reacts with water to give
a) HF, $O_2$and O_3 b) HF and F_2 c) HF and O_2 d) HF and O_3

186. The electronic configurations of four elements are given below. Which element does not belong to the same family as others?
a) [Xe]4 $f^{10}, 5d^{10}, 6s^2$ b) [Kr]$4d^{10}, 5s^2$ c) [Ne]$3s^2, 3p^5$ d) [Ar]$3d^{10}, 4s^2$

187. Among the noble gases, xenon reacts with fluorine to give stable xenon fluorides because
a) It has highest ionisation energy
b) It has lowest ionisation energy
c) Its size is largest
d) It is the most readily available gas

188. Which of the following is most volatile?
a) HF b) HCl c) HBr d) HI

189. Which phosphorus reacts with KOH solution to produce phosphine gas?
a) White phosphorus b) Red phosphorus c) Both a and b d) None of these

190. In the treatment of leukaemia…… is used.
a) White phosphorus b) Red phosphorus c) Scarlet phosphorus d) P^{32} isotope

191. Argon was discovered by:
a) Cavendish b) Lavoisier c) Rayleigh d) Thomson

192. Among K, Ca, Fe and Zn , the element which can form more than one binary compound with chlorine is
a) Fe b) Zn c) K d) Ca

193. Red P is used in making:
a) Air freshners
b) Red plastics
c) Red dyes for plastics
d) Safety match-striking surface

194. On heating $(NH_4)_2Cr_2O_7$, the gas evolved is 'X'. The same gas is obtained by heating:
a) NH_4NO_2 b) NH_4NO_3 c) $Mg_3N_2 + H_2O$ d) $Na_2O_2 + H_2O$

195. Ozone with KI solution produces
a) IO_3 b) I_2 c) Cl_2 d) HI

196. Ammonium nitrate decomposes on heating into
a) Ammonia and nitric acid
b) Nitrous oxide and water
c) Nitrogen, hydrogen and ozone
d) Nitric oxide, nitrogen dioxide and hydrogen

197. What is a product obtained in the reaction of $HgCl_2$ and $Hg(CN)_2$?
a) $(CN)_2$
b) Hg(CN)Cl
c) $Hg[Hg(CN)_2Cl_2]$
d) Addition compound $HgCl_2 \cdot Hg(CN)_2$

198. In order to prevent the hot metal filament from getting burnt, when the electric current is switched on, the bulb is filled with:

a) CH_4 b) An inert gas c) CO_2 d) Cl_2

199. Which of the following is incorrect?
a) O_2 is weaker oxidant th b) O_2 has larger bond lengt c) Both O_2 and O_3 are para d) O_2 is linear and O_3 are is

200. Which of the following has—O—O—linkage?
a) $H_2S_2O_6$ b) $H_2S_2O_8$ c) $H_2S_2O_3$ d) $H_2S_4O_6$

201. Which of the following is a metalloid?
a) N b) Bi c) As d) p

202. The weakest acid is
a) HI b) HBr c) HCl d) HF

203. In the preparation of H_2SO_4:
a) SO_2 is dissolved in H_2SO_4
b) SO_2 is dissolved in water
c) SO_3 is dissolved in conc. H_2SO_4
d) SO_3 is dissolved in dilute H_2SO_4

204. Which element is most metallic?
a) Phosphorus b) Arsenic c) Antimony d) Bismuth

205. Concentrated nitric acid reacts with iodine to give:
a) HI b) HOI c) $HOIO_2$ d) $HOIO_3$

206. Electron affinity for a noble gas is approximately equal to:
a) That of halogens
b) Zero
c) That of oxygen family
d) That of nitrogen family

207. Ozonization of water is carried out to remove:
a) Bacterial impurities
b) Bad taste
c) Excess of chlorine present
d) Calcium and magnesium salt present in it

208. Welding of magnesium can be done in an atmosphere of
a) Xe b) He c) Kr d) Ne

209. Which noble gas is not found in atmosphere?
a) Rn b) Kr c) Ne d) Ar

210. Which of the following is not oxidised by O_3?
a) KI b) $FeSO_4$ c) $KMnO_4$ d) K_2MnO_4

211. The m. p. and b. p. is lowest for:
a) He b) Ne c) Xe d) Ar

212. The reaction of the type $2X_2 + S \rightarrow SX_4$, is shown by sulphur when X is
a) Fluorine or chlorine b) Chlorine only
c) Chlorine and bromine only d) F, Cl, Br, all

213. Chlorine, bromine and iodine are placed in the seventh group of the periodic table because:
a) They are non-metals
b) They are electronegative
c) The have seven electrons in the outermost shells of their atoms
d) They are generally univalent

214. Nitric acid whether diluted or concentrated:
a) Reacts with Al to give H_2
b) Reacts with Al to give NO_2
c) Reacts with Al to give NH_4NO_3
d) Hardly affects Al

215. NH_3 can be collected by the displacement of:
a) Mercury b) Water c) Brine d) Conc. H_2SO_4

216. The number of *p*-electrons in bromine atom is:
a) 17 b) 7 c) 15 d) 12
217. Which species has the largest dipole moment?
a) NH_3 b) PH_3 c) AsH_3 d) SbH_3
218. A gas reacts with CaO, but not with$NaHCO_3$. The gas is:
a) CO_2 b) Cl_2 c) N_2 d) O_2
219. Nitrogen can be purified from the impurities of oxides of nitrogen and ammonia by passing through:
a) conc. HCl
b) Alkaline solution of pyrogallol
c) A solution of $K_2Cr_2O_7$ acidified with H_2SO_4
d) A solution of KOH (*aq.*)
220. Which statement is correct?
a) Noble gases are not found in nature
b) Some compounds of noble gas elements are known
c) Atmospheric air is free from noble gases
d) None of the above
221. Calcium phosphide is:
a) Ca_3P b) Ca_3P_2 c) Ca_2P_3 d) CaP_2
222. Which of the following inert gas liquefies easily?
a) He b) Kr c) Ne d) Ar
223. Compounds containing coordinate bonds is:
a) O_3 b) SO_3 c) H_2SO_4 d) All of these
224. When Cl_2 water is added to an aqueous solution of potassium halide in presence of chloroform a violet colour is obtained. On adding more of Cl_2 water, the violet colour disappears and a colourless solution is obtained. This test confirms the presence of the following in aqueous solution:
a) Iodide b) Bromide c) Chloride d) Iodide and bromide
225. Which forms strong $p\pi - p\pi$ bonds?
a) N b) As c) P d) Bi
226. In OF_2 molecule, the total number of bond pairs and lone pairs of electrons present respectively are:
a) 2, 6
b) 2, 8
c) 2, 10
d) 2, 9
227. Nitric acid may be kept in a bottle of:
a) Ag b) Sn c) Pb d) Al
228. The vapour density of NH_4Cl is almost half the expected value because it:
a) Is salt of a strong acid
b) Sublimes on heating
c) Dissociates completely
d) None of the above
229. The least stable hydride of 15th group elements is
a) NH_3 b) PH_3 c) AsH_3 d) BiH_3
230. Which of the light effective in the formation of chlorophyll?
a) Sodium lamp b) Neon lamp c) Mercury lamp d) Argon lamp
231. Which of the following is an explosive compound?
a) $XeOF_4$ b) $XeOF_2$ c) XeF_2 d) XeO_3
232. The most abundant element in the earth crust is
a) O b) Si c) H d) C
233. Blasting of TNT is done by mixing it with:
a) NH_4Cl b) NH_4NO_3 c) NH_4NO_2 d) $(NH_4)_2SO_4$

234. Man dies, when nitrous oxide is inhaled in large quantities because it:
   a) Is poisonous
   b) Causes laughing hysteria
   c) Decomposes haemoglobin
   d) Reacts with organic tissues
235. The chemical used for cooling in refrigerator is
   a) NH_4Cl b) NH_4OH c) liquid NH_3 d) CO_2
236. SO_2 can act as strong oxidizing agent in:
   a) Acidic medium b) Basic medium c) Neutral medium d) None of these
237. Nitrogen gas is absorbed by:
   a) Aluminium carbide b) Calcium carbide c) Ferrous sulphate d) Calcium hydroxide
238. The reaction $3ClO^-\ (aq.) \longrightarrow ClO_3^- + 2Cl^-\ (aq.)$ is an example of :
   a) Oxidation reaction
   b) Reduction reaction
   c) Disproportionation reaction
   d) Decomposition reaction
239. ….. liberates oxygen from water.
   a) P b) Na c) F_2 d) I_2
240. The hydroxide of which metal is soluble in excess of ammonia:
   a) Cr b) Cu c) Fe d) Bi
241. The formation of $O_2^+[PtF6]^-$ is the basis for the formation of xenon fluorides. This is because
   a) O_2 and Xe have comparable sizes
   b) Both O_2 and Xe are gases
   c) O_2 and Xe have comparable ionisation energies
   d) Both a and c
242. In nitrogen family the H—*M*—H bond angle in the hydrides MH_3 gradually becomes closer to 90° on going from N to Sb. This shows that gradually:
   a) The basic strength of the hydrides increases
   b) Almost pure *p*-orbitals are used for *M*—H bonding
   c) The bond energies of *M*—H bond increase
   d) The bond pairs of electrons become farther apart from the central atom
243. Sequence of acidic character is:
   a) $SO_2 > CO_2 > CO > N_2O_5$
   b) $SO_2 > N_2O_5 > CO > CO_2$
   c) $N_2O_5 > SO_2 > CO > CO_2$
   d) $N_2O_5 > SO_2 > CO_2 > CO$
244. Phosphorus is manufactured by heating …… in a furnace.
   a) Bone-ash, sodium chloride and coke
   b) Bone-ash, silica and coke
   c) Bone-ash, silica and lime
   d) Bone-ash, coke and limestone
245. Which oxide of nitrogen is coloured gas?
   a) N_2O b) NO_2 c) N_2O_5 d) NO
246. In KI solution, I_2 readily dissolves and forms
   a) I^- b) KI_2^- c) KI_3 d) KI_2
247. Consider the following compounds
   Sulphur dioxide
   Hydrogen peroxide
   Ozone
   Among these compounds identify those that can act as bleaching agent.
   a) 1 and 3 b) 2 and 3 c) 1 and 2 d) 1,2 and 3

248. Different allotropic forms of sulphur differ in:
a) Crystalline structure b) Molecular weight c) Chemical properties d) Chemical structure

249. Monoatomic element of nitrogen family is:
a) Bismuth b) Phosphorus c) Antimony d) None of these

250. Which noble gas was first of all detected in solar chromosphere?
a) Helium b) Neon c) Argon d) Krypton

251. The acid used in lead storage battery is:
a) Nitric acid b) Sulphuric acid c) Hydrochloric acid d) Phosphoric acid

252. Halogen used in the preparation of insecticides is:
a) I_2 b) Cl_2 c) Br_2 d) F_2

253. Which halogen acid is a liquid?
a) HF b) HCl c) HBr d) HI

254. Halon-1301 is
a) $CCl_2F \cdot CClF_2$ b) $C_2F_4Br_2$ c) CCl_3F d) CF_3Br

255. Skin turns yellow in contact with conc. HNO_3, because:
a) Proteins are converted into xanthoproteins
b) Water is removed by the acid
c) Skin gets burnt
d) Nitrocellulose is formed

256. The pair of species having identical shape for molecules of both species is
a) XeF_2, IF_2^- b) BF_3, NH_3 c) CF_4, SF_4 d) PCl_5, ICl_5

257. Which of the following pairs are correctly matched?

1.haber process	Manufacture of ammonia
2.le-blanc process	Manufacture of sulphuric acid
3.birkeland -Eyed process	Manufacture of nitric acid
4. solvay process	Manufacture of sodium carbonate

Select the correct answer using the codes given below
a) 2,3 and 4 b) 1,2,3,and 4 c) 1,2and 4 d) 1,3and 4

258. Which molecule does not possess distorted geometry?
a) Cl — F b) IF_3 c) IF_5 d) IF_7

259. Iodine displaces chlorine from which one of the compounds?
a) KCl b) $CaCl_2$ c) CCl_4 d) $KClO_3$

260. Which member of oxygen family has the highest catenation ability?
a) Oxygen b) Sulphur c) Selenium d) Tellurium

261. When heated NH_3 is passed over CuO gas evolved is
a) N_2 b) N_2O c) HNO_3 d) NO_2

262. The noble gas used in the preparation of first noble gas compound was:
a) Xe b) He c) Cr d) Rn

263. P_2O_5 is used extensively as a:
a) Dehydrating agent b) Catalytic agent c) Reducing agent d) Preservative

264. Oxygen differs from sulphur in:
a) Allotropy
b) Formation of ions
c) Number of electrons in the outermost orbit
d) Nature of hydrides

265. Which of the following salt would give SO_2 with hot and dil.H_2SO_4 and also decolourises Br_2 water?
a) Na_2SO_3 b) $NaHSO_4$ c) Na_2SO_4 d) Na_2S

266. On heating ammonium dichromate, the gas evolved is:
a) Oxygen b) Ammonia c) Nitrogen d) Nitric oxide

267. Regular use of which of the following fertilizers increases the acidity of soil?
a) KNO_3

b) NH_2CONH_2
c) $(NH_4)_2SO_4$
d) Superphosphate of lime

268. The halogen showing maximum coordination number of sulphur in SX_n halides is
a) Cl b) Br c) F d) I

269. BCl_3 is a planar molecule whereas NCl_3 is pyramidal because:
a) BCl_3 has no lone pair of electrons but NCl_3 has a lone pair of electrons
b) B—Cl bond is more polar than N—Cl bond
c) Nitrogen atom is smaller than boron atom
d) N—Cl bond is more covalent than B—Cl bond

270. The bond angle in Cl_2O molecule is:
a) 180° b) 105° c) 90° d) 111°

271. Mark the wrong statement. Halogens are all coloured.
a) This is due to absorption of visible light by their molecules resulting in the excitation of outer electrons to higher energy levels
b) The small F_2 molecules absorb high energy violet radiation and appear yellow
c) Large I_2 molecule absorb low energy yellow and green radiations and appear violet in colour
d) The excitation energy required by the small fluorine atoms is smaller than required by the large iodine atom

272. Which reaction can be used to prepare phosphoric acid?
a) $P_2O_3 + H_2O \xrightarrow{20^\circ C}$ b) $P_2O_3 + H_2O \xrightarrow{80^\circ C}$ c) $P_2O_3 + H_2O \xrightarrow{25^\circ C}$ d) P + conc. $HNO_3 \longrightarrow$

273. Which gas is filled in electric bulbs/tubes?
a) O_2 b) N_2 c) Ar d) He

274. Iodine is formed when potassium iodide reacts with a solution of
a) $ZnSO_4$ b) $CuSO_4$ c) $(NH_4)_2SO_4$ d) Na_2SO_4

275. The interatomic distances in H_2 and Cl_2 molecules are 74 and 198 pm respectively. The bond length of HCl is:
a) 272 pm b) 136 pm c) 124 pm d) 248 pm

276. Mg on heating to redness in an atmosphere of N_2 and then on treating with H_2O gives:
a) NH_3 b) H_2 c) N_2 d) O_2

277. The bleaching action of bleaching powder is due to
a) Nascent hydrogen b) Nascent oxygen c) Nascent chlorine d) None of these

278. In the preparation of O_2 from $KClO_3$, MnO_2 acts as:
a) Activator b) Catalyst c) Oxidizing agent d) Dehydrating agent

279. Which noble gas has highest and least polarisability respectively?
a) He, Xe b) Ne, Kr c) Kr, Ne d) Xe, He

280. Nitrolim, a nitrogeneous fertilizer, is:
a) Ca_3H_2 b) $Ca(CN)_2$ c) $CaCN_2$ d) $CaCN_2 + C$

281. H_2S cannot be dried by passing over conc. H_2SO_4 because:
a) The acid oxidises it
b) The acid combines with H_2S to form a salt
c) Both form complex
d) It dissolves in the acid

282. The chemical name of bleaching powder is:
a) Calcium chloro hypochlorite
b) Calcium hypochlorite
c) Calcium chlorate
d) Calcium perchlorate

283. The following are some statements related to VA group hydrides
I. Reducing property Increases from NH_3 to BiH_3

II. Tendency to donate lone pair decreases from NH_3 to BiH_3
III. Thermal stability of hydrides decreases from NH_3 to BiH_3
IV. Bond angle of hydrides decreases from $NH_3$to BiH_3
The correct statements are
a) I, II, III and IV b) I, III and IV c) I, II, IV d) I and IV

284. The deficiency of iodine in diet causes
a) Rickets b) Night blindness c) Beri –beri d) Goitre

285. The number of $P-O-P$ bonds in cyclic metaphosphoric acid is
a) Zero b) Three c) Two d) Four

286. Which noble gas is more soluble in water?
a) He b) Ar c) Ne d) Xe

287. An important method of fixation of atmospheric N_2 is:
a) Fischer-Tropsch's process
b) Haber's process
c) Frasch's process
d) Solvay's process

288. Which statement about noble gases is not correct?
a) Xe forms XeF_6
b) Ar is used in electric bulbs
c) Kr is obtained during radioactive disintegration
d) He has the lowest b. p. among all the noble gases

289. Noble gases are group of elements which exhibit very
a) High chemical activity b) Much paramagnetic properties
c) Minimum electronegativity d) Low chemical activity

290. On passing H_2S through acidified $FeCl_3$ solution, $FeCl_3$ is converted into:
a) $FeCl_2$ b) $Fe_2(SO_4)_3$ c) FeS d) $FeSO_4$

291. $HPO_3 + H_2O \xrightarrow{\text{Heat}}$? The product is:
a) $H_4P_2O_7$ b) H_3PO_3 c) H_3PO_4 d) P_2O_5

292. Ozone reacts with:
a) C_2H_4 b) C_2H_2 c) C_6H_6 d) All of these

293. The inert gas abundantly found in atmosphere is
a) Xe b) Kr c) He d) Ar

294. When SO_2 gas is passed through cupric chloride solution:
a) The solution becomes colourless
b) A white precipitate is formed
c) No change takes place
d) Solution becomes colourless and a white precipitate is formed

295. The reaction of chlorine with CO in the presence of sunlight gives:
a) $COCl_2$ b) CO_2Cl_2 c) HOCl d) $H_2Cl_2O_2$

296. The mixture of noble gases is separated by:
a) Ramsay-Rayleigh's first method
b) Ramsay-Rayleigh's second method
c) Fischer and Ringe's method
d) Dewar's coconut charcoal adsorption method

297. The boiling points of halogens increase with increase in molecular weight, it is because:
a) As the size increases molecules undergo association leading to higher stability
b) Bond strength increases due to increase in electronegativity
c) Van der Waals' forces increase with increase in number of electrons per mole
d) None of the above

298. NCl_3 on hydrolysis yields:

a) N_2 and NOCl b) NO and HCl c) NH_3 and HOCl d) N_2O and NH_3

299. The strongest oxidizing agent is:
a) H_3PO_4 b) HNO_3 c) H_3PO_3 d) HNO_2

300. Increasing order of acid strengths of hydrogen halides is:
a) HF < HCl < HBr < HI
b) HCl < HI < HBr < HF
c) HCl < HBr < HI < HF
d) None of these

301. Noble gases are sparingly soluble in water due to
a) Dipole-dipole interaction b) Dipole-induced dipole interaction
c) Induced dipole-induced dipole interaction d) Hydrogen bonding

302. Oxidation state exhibited by sulphur
a) +6 b) +4 c) 0 d) All of these

303. Low volatile nature of H_2SO_4 is due to:
a) Hydrogen bonding b) Van der Waals' forces c) Strong bonds d) None of these

304. When Na_2S is added to sodium nitroprusside solution:
a) Beautiful violet colour is produced
b) A complex $[Fe(CN)_5NOS]^{4-}$ is formed
c) The complex $Na_4[Fe(CN)_5NOS]$ is formed
d) All of the above

305. The reaction,

$$2SO_2 + O_2 + 2H_2O \longrightarrow 2H_2SO_4$$

is an example of :
a) Synthesis of H_2SO_4
b) Analysis of H_2SO_4
c) Displacement reaction
d) Double decomposition

306. The gases absorbed by alkaline pyrogallol and oil of turpentine respectively are:
a) O_3, CH_4 b) O_2, O_3 c) SO_2, CH_4 d) N_2O, O_3

307. Ozone turns tetramethyl base paper:
a) Green b) Violet c) Red d) Black

308. A student accidently splashes few drops of conc H_2SO_4 on his cotton shirt, after a while, the splashed parts blacken and holes appear. This is happened because sulphuric acid
a) Dehydrates the cotton with burning b) Causes the cotton react with air
c) Heats up the cotton d) Removes the elements of water from cotton

309. Aquaregia is a mixture of:
a) $3HCl + HNO_3$ b) $3HNO_3 + HCl$ c) $H_3PO_4 + H_2SO_4$ d) $HCl + CH_3COOH$

310. The bond angle in H_2S is:
a) $109^\circ 28'$ b) $104^\circ 51'$ c) 120° d) 92.5°

311. In the manufacture of sulphuric acid by contact process, tyndall box is used to
a) Filter dust particles b) Remove impurities
c) Convert SO_2 to SO_3 d) Test the presence of dust particles

312. The oxide insoluble in water is:
a) TeO_2 b) SO_2 c) PoO_2 d) SeO_2

313. Which indicates the common laboratory method for the preparation of chlorine?
a) $4HCl + O_2 \longrightarrow 2H_2O + 2Cl_2$
b) $2NaCl + 2H_2O \longrightarrow 2NaOH + H_2 + Cl_2$
c) $MnO_2 + 4HCl \longrightarrow MnCl_2 + Cl + 2H_2O$
d) $2Mg_2OCl_2 + O_2 \longrightarrow 4MgO + 2Cl_2$

314. The geometry of XeF_6 is

a) Tetrahedral b) Pentagonal bipyramidal
c) Octahedral d) Square planar

315. Chlorine acts as a bleaching agent only is presence of
a) Dry air b) Moisture c) Sunlight d) Pure oxygen

316. Which one of the following pentafluorides cannot be formed?
a) PF_5 b) AsF_5 c) SbF_5 d) BiF_5

317. SO_2 oxidises:
a) Mg b) $K_2Cr_2O_7$ c) $KMnO_4$ d) All of these

318. Which of the following has highest proton affinity?
a) NH_3 b) PH_3 c) H_2O d) H_2S

319. Nuclear fusion produces:
a) Argon b) Deuterium c) Helium d) Krypton

320. Concentrated hydrochloric acid when kept in open air sometimes produces a cloud of white fumes. The explanation for it is that
a) Concentrated hydrochloric acid emits strongly smelling HCl gas all the time
b) Oxygen in air reacts with the emitted HCl gas to form a cloud of chlorine gas
c) Strong affinity of HCl gas for moisture in air results in forming of droplets of liquid solution which appears like a cloudy smoke.
d) Due to strong affinity for water, concentrated hydrochloric acid pulls moisture of air towards itself. This moisture forms droplets of water and hence the cloud.

321. In the dewar's method of separation of noble gases, the mixture of noble gases is kept in contact with coconut charcoal at 173 k . Which one of the following gaseous mixtures is not adsorbed on to the charcoal?
a) Ar, Kr b) Xe, Ar c) He, Ne d) Xe, Kr

322. The type of hybrid orbitals used by chlorine atom in ClO_2^- is
a) sp b) sp^2 c) sp^3 d) None of these

323. The oxidation state of N is highest in:
a) N_3H
b) NH_3
c) N_2H_4
d) NH_2OH

324. Formula of rhombic Sulphur is:
a) S_2 b) S c) S_4 d) S_8

325. The noble gases are unreactive because they:
a) Have the same number of electrons
b) Have an atomicity of one
c) Are gases with low densities
d) Have stable electronic configuration or closed valency shell

326. Phosphine reacts with copper sulphate solution to form:
a) Copper b) Copper phosphide c) Copper phosphate d) Copper phosphite

327. Desicchlora is
a) Anhydrous $Ba(ClO_4)_2$ b) Anhydrous $CaCl_2$
c) Anhydrous $Mg(ClO_4)_2$ d) Conc H_2SO_4

328. Who among the following first prepared a stable compound of noble gas?
a) Neil Bartlett b) Reyleigh c) Ramsay d) Rutherford

329. On exposure to light electrical conductivity of selenium:
a) Increases
b) Decreases
c) Remains same
d) First decreases then increases

330. For H_3PO_3 and H_3PO_4 the correct choice is
a) H_3PO_3 is dibasic and reducing
b) H_3PO_3 is dibasic and non-reducing
c) H_3PO_3 is tribasic and reducing
d) H_3PO_3 is tribasic and non reducing

331. When chlorine reacts with dil. NaOH under cold conditions, the oxidation state of chlorine changes from zero to
a) -1 and +5
b) +1 and +4
c) +5 and +3
d) -1 and +1

332. Yellow ammonium sulphide is:
a) $(NH_4)_2S$
b) $(NH_4)_2S_x$
c) $(NH_4)_2S_8$
d) $(NH_4)_2S_4$

333. Sulphuric acid is used:
a) In lead storage batteries
b) As a dehydrating agent
c) In making fertilizers
d) All of the above

334. Hydrolysis of NCl_3 gives NH_3 and X which of the following is X?
a) $HClO_4$
b) $HClO_3$
c) HOCl
d) $HClO_2$

335. How many lone pairs are associated with xenon atom in XeF_2, SeF_4 and XeF_6 respectively?
a) 1, 2 and 3
b) 2, 3 and 1
c) 3, 2 and 1
d) 4, 3 and 2

336. Nitrous oxide
a) Is an acidic oxide
b) Is a mixed oxide
c) Support the combustion of sulphur
d) Highly soluble in hot water

337. The number of unpaired electrons in the *p*-subshell of oxygen atom is
a) 1
b) 2
c) 3
d) 4

338. $(NH_4)_2Cr_2O_7$ on heating liberates a gas. The same gas will be obtained by
a) Heating NH_4NO_3
b) Heating NH_4NO_2
c) Treating H_2O_2 with $NaNO_2$
d) Treating Mg_3N_2 with H_2O

339. Fluorapatite is a mineral of:
a) F_2
b) Br_2
c) P
d) As

340. Least malleable and ductile metal is:
a) Au
b) Ag
c) Ni
d) Bi

341. Which of the following is not correct?
a) $3O_2 \underset{\text{discharge}}{\overset{\text{Silent electric}}{\rightleftharpoons}} 2O_3$;
$\Delta H = -284.5KJ$
b) Ozone undergoes addition reaction with unsaturated carbon compounds
c) Sodium thiosulphate reacts with I_2 to form sodium tetrathionate and sodium iodide.
d) Ozone oxidises lead sulphide to lead sulphate

342. Laughing gas is prepared by heating
a) NH_4Cl
b) NH_4NO_3
c) $NH_4Cl + NaNO_3$
d) $(NH_4)_2SO_4$

343. A certain element forms a solid oxide which when dissolved in water forms an acidic solution. The element is:
a) Neon
b) Sodium
c) Phosphorus
d) sulphur

344. NO_2 cannot be obtained by heating :
a) KNO_3
b) $Pb(NO_3)_2$
c) $Cu(NO_3)_2$
d) $AgNO_3$

345. The product obtained by heating $(NH_4)_2SO_4$ and KCNO is
a) Ammonia
b) Ammonium cyanide
c) Urea
d) Hydrocyanic acid

346. The silver halide, which is least soluble in NH_4OH, is:
a) AgF
b) AgCl
c) AgBr
d) AgI

347. Fermings salt is
a) HF
b) KHF_2
c) NOCl
d) $KClO_3$

348. H_3PO_3 is

a) A dibasic acid b) A tribasic acid c) Monobasic d) Neutral

349. Correct order of decreasing thermal stability is as
a) $NH_3 > PH_3 > AsH_3 > SbH_3$ b) $PH_3 > NH_3 > AsH_3 > SbH_3$
c) $AsH_3 > PH_3 > NH_3 > SbH_3$ d) $SbH_3 > AsH_3 > PH_3 > NH_3$

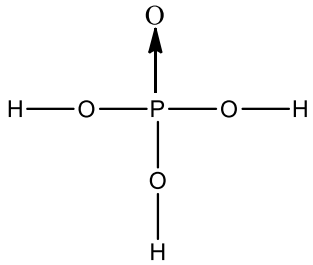
350. Most electropositive halogen is:
a) F b) Cl c) Br d) I

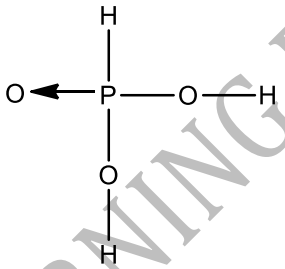
351. Argon is used
a) In filling airships b) To obtain low temperature
c) In high temperature welding d) In readiotherapy for treatment of cancer

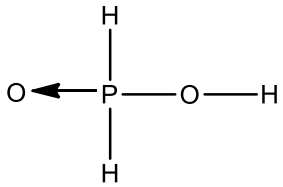
352. K_2CS_3 can be called potassium:
a) Sulphocyanide b) Thiocarbide c) Thiocarbonate d) Thiocyanate

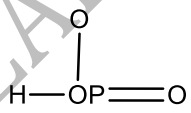
353. Which of the following has S—S bond
a) $H_2S_2O_6$ b) $H_2S_2O_7$ c) $H_2S_2O_8$ d) Mustard gas

354. The structure of orthophosphoric acid is

a) 

b) 

c) 

d) 

355. Bleaching action of chlorine is due to:
a) Reduction b) Oxidation c) Chlorination d) Hydrogenation

356. In clatherates of xenon with water, the nature of bonding between xenon and water molecule is
a) Dipole induced dipole interaction b) Coordinate
c) Hydrogen bonding d) Covalent

357. Asthma patients use a mixture of…..for respiration.
a) O_2 and H_2 b) O_2 and He c) O_2 and Ar d) O_2 and Ne

358. When ammonium nitrate is heated at 250°C the gas evolved is
a) N_2 b) NH_3 c) N_2O_3 d) N_2O

359. Fluorine gas is stored in:
a) Copper vessels b) Steel vessels c) Both (a) and (b) d) None of these

360. Conc. HNO_3 reacts with iron to:
a) Render iron passive
b) Give ferrous nitrate and nitric oxide
c) Give ferric nitrate and ammonium nitrate
d) Give ferric nitrate and nitrogen dioxide

361. Which one of the following statements is not true?
a) Among halide ions, iodine is the most powerful reducing agent
b) Fluorine is the only halogen that does not show variable oxidation state
c) HOCl is stronger acid than HOBr
d) HF is a stronger acid than HCl

362. In nitroprusside ion, the iron and NO exist as Fe^{II} and NO^+ rather than Fe^{III} and NO. These forms can be differentiated by:
a) Estimating the concentration of iron
b) Measuring the concentration of CN^-

c) Measuring the solid state magnetic moment
d) Thermally decomposing the compound

363. The colourless gas liberated by passing excess of chlorine through NH_3 gas is:
a) NCl_3 b) HCl c) N_2 d) H_2

364. The basicity of H_3PO_4 is
a) 2 b) 3 c) 4 d) 5

365. A radioactive element resembling iodine in properties is:
a) Astatine b) Lead c) Radium d) Thorium

366. Which of the following form of interhalogen compounds does not exists?
a) IF_7 b) ClF_3 c) ICl d) $BrCl_7$

367. Which one is true peroxide?
a) NO_2 b) MnO_2 c) BaO_2 d) SO_2

368. When a colourless gas is passed through bromine water, decolourization takes place. The gas is:
a) HCl b) HBr c) H_2S d) SO_2

369. In case of nitrogen, NCl_3 is possible but not NCl_5 while in case of phosphorus, PCl_3 as well as PCl_5 are possible. It is due to
a) Lower electronegativity of P but not in N
b) Lower tendency of H bond formation in P than N
c) Availability of vacant d-orbital in P but not in N
d) Occurrence of P in solid while N in gaseous state at room temperature

370. The bonds present in pernitric acid are:
a) Ionic bonds
b) Covalent bonds
c) Semipolar bonds or dative bonds
d) Coordinate and covalent bonds

371. In which of these processes platinum is used as a catalyst?
a) Oxidation of ammonia to form HNO_3 b) Hardening of oils
c) Productions of synthetic rubber d) Synthesis of methanol

372. D_3 line observed in the yellow region of the sun's spectrum is due to
a) Na b) Ne c) Kr d) He

373. A greenish yellow gas reacts with an alkali metal hydroxide to form a halate which can be used in fireworks and safety matches. The gas and halate respectively are:
a) $Br_2, KBrO_3$ b) $Cl_2, KClO_3$ c) $I_2, NaIO_3$ d) $Cl_2, NaClO_3$

374. Correct statement about white phosphorus is:
a) It ignites at 240°C b) It is violet-red solid c) It is not poisonous d) It ignites at 30°C

375. Ammonia reacts with excess of chlorine to form:
a) N_2 and NH_4Cl b) NCl_3 and HCl c) NH_4Cl and NCl_3 d) N_2 and HCl

376. The noble gas which can diffuse through rubber and glass easily is
a) Xe b) Ne c) Ar d) He

377. Ozone depletes due to the formation of following compound
a) Acrolein b) Chlorine nitrate c) Peroxy acetyl nitrate d) SO_2 and SO_3

378. A substance which gives a yellow precipitate when boiled with an excess of nitric acid and ammonium molybdate and red precipitate with $AgNO_3$ is
a) Orthophosphate b) Pyrophosphate c) Metaphosphate d) Hypophosphate

379. Nitrous acid reacts with H_2SO_4 to give:
a) $NO_2 + SO_2$ b) $NO + SO_2$ c) $NO + SO_3$ d) None of these

380. Among the properties (a) reducing , (b) oxidising and (c) complexing, the set of properties shown by CN^- ion towards metal species is:
a) a, b, c b) b, c c) c, a d) a, b

381. Sea-weeds are important sources of:
a) Iron b) Chlorine c) Iodine d) Bromine

382. CAN pellets are coated with calcium silicate because:
a) CAN is explosive b) CAN is hygroscopic c) CAN is water soluble d) None of these
383. Yellow phosphorus is kept in:
a) Water b) Ether c) Alcohol d) Kerosene
384. F_2 combines with all non-metals directly except:
a) N_2 b) P c) Xe d) Kr
385. Which one of the following has lowest bond dissociation energy?
a) Cl —Cl b) F —F c) Br —Br d) I —I
386. Ozone reacts with moist iodine giving:
a) HIO_3 b) I_4O_9 c) IO_5 d) I_2O_5
387. On heating sodium as well as sulphur can be melted. Molten sodium and molten sulphur are used as:
a) Medium for extracting metals
b) Catalysts
c) Metal refiners
d) Electrodes in batteries
388. Oxidation of metals by HNO_3 does not depend on:
a) Nature of metal b) Conc. of HNO_3 c) Temperature d) Catalyst
389. In froth floatation process for the purification of ores, the particles of ore float because
a) Their surface is not easily wetted by water b) They are light
c) They are insoluble d) They bear electrostatic charge
390. XeF_6 on complete hydrolysis gives:
a) XeO_3 b) XeO c) XeO_2 d) Xe
391. The zero group members are collectively known as:
a) Inert gases b) Rare gases c) Noble gases d) All of these
392. How many lone pair of electrons are present on Xe in $XeOF_4$?
a) 1 b) 2 c) 3 d) 4
393. Hypophosphorous acid, H_3PO_2 is
a) A monobasic acid b) A Tribasic acid c) A Dibasic acid d) Not acidic at all
394. The ionization potential of X^- ion is equal to:
a) The electron affinity of X atom
b) The electronegativity of X atom
c) The ionization potential of X atom
d) None of the above
395. Which oxide of chlorine is most powerful oxidizing agent?
a) Cl_2O b) ClO_2 c) Cl_2O_6 d) Cl_2O_7
396. In Ostwald process of manufacturing of HNO_3 catalyst used is
a) MO b) Fe c) Mn d) Pt
397. In the reaction,
$HNO_3 + P_4O_{10} \longrightarrow 4HPO_3 + X$
the product X is
a) N_2O_3 b) N_2O_5 c) NO_2 d) H_2O
398. Given are H_3PO_2, H_3PO_3, H_3PO_4 and $H_4P_2O_7$, which of the above oxoacids results into two series of salts?
a) H_3PO_2 b) H_3PO_3 c) H_3PO_4 d) $H_4P_2O_7$
399. Which of the following is a mixed anhydride?
a) NO b) NO_2 c) N_2O_5 d) N_2O
400. Pure N_2 can be obtained by:
a) Heating barium azide b) NH_3 and CuO c) Both (a) and (b) d) None of these
401. Sulphur trioxide is dissolved in heavy water to form a compound X. The hydridisation of sulphur in X is
a) sp^2 b) sp^3 c) sp d) dsp^2
402. What happens to the colour of litmus paper when a drop of H_2SO_4 is added to it?
a) It turns red to blue b) It turns blue to red c) It gets destroyed d) It is unaffected

403. Which noble gas does not form clathrates?
a) Xe b) Kr c) He d) Ar
404. Strongest reducing agent is:
a) H_2O b) H_2S c) H_2Se d) H_2Te
405. Most abundant element in earth's crust is:
a) O b) Se c) S d) Te
406. Which reaction yields the greatest quantity of chlorine from a given quantity of hydrochloric acid?
a) Warming conc. HCl with MnO_2
b) Warming conc. HCl with PbO_2
c) Mixing conc. HCl with $KMnO_4$
d) Treating bleaching powder with HCl
407. Superphosphate of lime is
a) A mixture of normal calcium phosphate and gypsum
b) A mixture of primary calcium phosphate and gypsum
c) Normal calcium phosphate
d) Soluble calcium phosphate
408. In Birkeland and Eyde process, the temperature of the electric arc is about:
a) 1500°C b) 4000°C c) 3000°C d) 2000°C
409. Sulphides of which element are not precipitated in acidic or alkaline medium?
a) K b) Ca c) Al d) All of these
410. Select the correct statement.
a) Sodium metal is stored under kerosene
b) One of the oxides of carbon is a basic oxide
c) Metals can form only basic oxides
d) To prevent combination of white phosphorus with oxygen it is kept in kerosene
411. SO_2 is dried by:
a) CuO b) HNO_3 c) P_2O_5 d) Anhyd. $CaCl_2$
412. When Zn reacts with very dilute nitric acid it produces?
a) NO b) NH_4NO_3 c) NO_2 d) H_2
413. The geometry of H_2S and its dipole moment are:
a) Angular and non-zero b) Angular and zero c) Linear and zero d) Linear and non-zero
414. Graham's salt is:
a) Sodium aluminosilicate
b) Sodium hexametaphosphate
c) Ferrous ammoniumsulphate
d) Potassium chromium sulphate
415. Yellow oils of sulphur is/are
a) H_2S b) H_2S_1, H_2S_3 c) H_2SO_4 d) CS_2, NH_2CSNH_2
416. In the atmosphere N_2 is present as element with O_2 because:
a) N_2 is more reactive
b) N_2 is inert
c) N_2 does not react with O_2
d) N_2 is actively participating in the reaction
417. Percentage of argon in air is about:
a) 10 per cent
b) 0.1 per cent
c) Much less than 0.1 per cent
d) 1 per cent
418. Select the incorrect statement among the following
a) O_3 is used as germicide for purification of air.
b) In O_3 ,O—O bond length is identical with that of molecular oxygen

c) O_3 molecule is angular in shape.
d) O_3 is an oxidizing agent.

419. For advertisement the coloured dischared tubes contain
a) He b) Ne c) Ar d) Kr

420. Which reaction cannot be used for the preparation of the halogen acid?
a) $2KBr + \underset{\text{Conc.}}{H_2SO_4} \longrightarrow K_2SO_4 + 2HBr$
b) $NaCl + \underset{\text{Conc.}}{H_2SO_4} \longrightarrow NaHSO_4 + HCl$
c) $NaHSO_4 + NaCl \longrightarrow Na_2SO_4 + HCl$
d) $CaF_2 + \underset{\text{Conc.}}{H_2SO_4} \longrightarrow CaSO_4 + 2HF$

421. The principal source of helium is:
a) Air b) Monazite sand c) Radium d) All of these

422. Heat of vaporisation of NH_3 is high due to:
a) Its basic nature b) Its polar nature c) Hydrogen bonding d) Solubility in water

423. Which is an essential trace element involved in physiology of thyroid glands?
a) Fe b) Ca c) Na d) I_2

424. Which coagulates white of an egg?
a) Orthophosphoric acid b) Metaphosphoric acid c) Hypophosphoric acid d) Pyrophosphoric acid

425. The fluoride which does not exist is:
a) CF_4 b) SF_6 c) HeF_4 d) XeF_4

426. The solubility of iodine in water increases in presence of
a) Chloroform b) Alcohol c) Potassium iodide d) Sodium hydroxide

427. Sal volatile is:
a) NH_4Cl b) $(NH_4)_2SO_4$ c) $(NH_4)_2CO_3$ d) NH_4NO_3

428. Halogen acid used in the preparation of aqua regia is:
a) HF b) HBr c) HCl d) HI

429. Bromine is liberated when an aqueous solution of KBr is treated with
a) Dil H_2SO_4 b) I_2 c) Cl_2 d) SO_2

430. In nitrogen family, the H—*M*—H bond angle in the hydrides gradually becomes closer to 90° on going from N to Sb. This shows that gradually:
a) The basic strength of the hydrides increases
b) Almost pure *p*-orbitals are used for *M*—H bonding
c) The bond energies of *M*—H bond increase
d) The bond pair-lone pair of electrons show lesser repulsion due to decreasing electronegativity trend

431. NH_4Cl is used to clean metal surfaces because:
a) It dissociates into NH_3 and HCl on heating
b) NH_3 forms a soluble complex with the metal
c) NH_4Cl forms a volatile chloride
d) None of the above

432. Which reagent can separate nitric oxide from nitrous oxide?
a) Sodium nitroprusside solution
b) $FeSO_4$ Solution
c) Nessler's reagent
d) Ammoniacal silver nitrate solution

433. The shape and hybridisation of ICl_3 is:
a) Triangular planar, sp^3
b) Pyramidal, $sp^3\ d^2$
c) Tetrahedral, sp^3

d) Bent T, $sp^3\ d$

434. The anhydride of pyrosulphuric acid is:
a) SO_2 b) S_2O_3 c) SO_3 d) S_2O_7

435. Which one is strongest oxidizing agent?
a) HClO b) $HClO_2$ c) $HClO_3$ d) $HClO_4$

436. Which is not an oxo-acid of chlorine?
a) HClO b) $HClO_2$ c) $HClO_3$ d) $HClO_5$

437. A greenish-yellow coloured gas is liberated on heating a mixture of two substances which are:
a) KBr + HCl b) KI + HCl c) MnO_2 + HCl d) NaCl + H_2SO_4

438. What are the products obtained when ammonia is reacted with excess chlorine?
a) N_2 and NCl_3 b) N_2 and HCl c) N_2 and NH_4Cl d) NCl_3 and HCl

439. PH_3 produces smoky rings when it comes in contact with air. This is because:
a) It is inflammable
b) It combines with water vapours
c) It combines with nitrogen
d) It contains impurity of P_2H_4

440. The least stable anion of oxo-acids of chlorine is
a) ClO^- b) ClO_2^- c) ClO_3^- d) ClO_4^-

441. Among H_2O, H_2S, H_2Se and H_2Te, the one with highest boiling point is:
a) H_2O because of H-bonding
b) H_2Te because of high mol. wt.
c) H_2S because of H-bonding
d) H_2Se because of low mol. wt.

442. Non-combustible hydride is:
a) PH_3 b) AsH_3 c) SbH_3 d) NH_3

443. In H_3PO_3:
a) Each hydrogen atom is attached to oxygen atom
b) Two hydrogen atoms are attached to oxygen atoms
c) One atom of H is attached to oxygen atom
d) None of the above

444. In the known interhalogen compounds the maximum number of halogen atoms is:
a) 4 b) 5 c) 7 d) 8

445. Which of the following is the life saving mixture for an asthma patient?
a) Mixture of helium and oxygen
b) Mixture of neon and oxygen
c) Mixture of xenon and nitrogen
d) Mixture of argon and oxygen

446. Which species is not known?
a) XeF_6 b) XeF_4 c) XeO_3 d) KrF_6

447. The reaction of the type $2X_2 + S \longrightarrow SX_4$, is shown by sulphur when X is
a) Fluorine or chlorine
b) Chlorine only
c) Chlorine and bromine only
d) F, Cl Br all

448. Oxygen reacts with each of the following elements readily, except:
a) P b) Na c) S d) Cl

449. Cane sugar reacts with concentrated HNO_3 to give:
a) CO_2 and H_2O b) Oxalic acid c) Carbonic acid d) CO and H_2O

450. Phosgene is the name of:
a) A phosphorus compound
b) A phosphonium compound
c) Carbonyl chloride
d) Phosphorus halide

451. H_2S is not a/an

a) Reducing agent b) Acidic c) Oxidising agent d) None of these

452. The idea which prompted Bartlett to prepare first ever compound of noble gas was:
   a) High bond energy of Xe—F
   b) Low bond energy of F—F in F_2
   c) Ionization energies of O_2 and xenon were almost similar
   d) None of the above

453. Which of the following statements regarding sulphur is incorrect?
   a) SO_2 molecule is paramagnetic.
   b) The vapour at 200°C consists mostly of S_8 rings.
   c) At 600 C the gas mainly consists of S_2 molecules.
   d) The oxidation state of sulphur is never less than +4 in its compounds.

454. Which of the following is a solid in nature?
   a) N_2O_3 b) N_2O c) NO d) N_2O_5

455. On heating copper nitrate strongly ….. is finally obtained.
   a) Copper b) Copper oxide c) Copper nitrite d) Copper nitride

456. Which of the following dissolves in water but does not give any oxyacid solution?
   a) SO_2 b) OF_2 c) SCl_4 d) SO_3

457. The colour of I_2 is violet because it:
   a) Absorbs violet light
   b) Does not absorb light
   c) Absorbs yellow and green light
   d) None of the above

458. Compounds formed when the noble gases get entrapped in the cavities of crystal lattices of certain organic and inorganic compounds are known as:
   a) Interstitial compounds
   b) Clathrates
   c) Hydrates
   d) Picrates

459. The mineral clevite on heating gives:
   a) He b) Xe c) Ar d) Ra

460. Bromine can be liberated from potassium bromide solution by:
   a) Iodine solution b) Chlorine water c) Sodium chloride d) Potassium iodide

461. Which element is not considered as 'chalcogens'?
   a) Selenium b) Oxygen c) Sulphur d) Polonium

462. When lead nitrate is heated it produces
   a) NO_2 b) NO c) N_2O_5 d) N_2O

463. Which is the most easily liquefiable rare gas?
   a) Xe b) Kr c) Ar d) Ne

464. The outermost electronic configuration of group 15 or VA elements is:
   a) ns^2np^1 b) ns^2np^2 c) ns^2np^3 d) ns^2np^4

465. The noble gas used in atomic reactor ,is
   a) Krypton b) Oxygen c) Neon d) Helium

466. Atom that requires high energy of excitation is:
   a) F b) Cl c) Br d) I

467. In modern process phosphorus is manufactured by:
   a) Heating a mixture of phosphorite mineral with sand and coke in electric furnace
   b) Heating calcium phosphate with coke
   c) Heating bone-ash with coke
   d) Heating the phosphate mineral with sand

468. Which property is most important in making fluorine the strongest oxidising halogen?

a) Bond dissociation energy
b) Ionisation enthalpy
c) Hydration enthalpy
d) Electron affinity

469. Which has maximum vapour pressure or most volatile or low b.p.?
a) HCl b) HI c) HF d) HBr

470. Amphoteric oxide is:
a) Sb_4O_6 b) N_2O_5 c) Bi_2O_3 d) Na_2O

471. Bone black is polymorphic form of
a) Phosphorus b) Sulphur c) Carbon d) Nitrogen

472. In which case, the order of acidic strength is not correct?
a) HI>HBr>HCl b) HIO_4>$HBrO_4$>$HClO_4$
c) $HClO_4$>$HClO_3$>$HClO_2$ d) HF>H_2O>NH_3

473. Which compound does not has S—S bond?
a) $Na_2S_2O_4$ b) $Na_2S_4O_6$ c) $Na_2S_2O_3$ d) $Na_2S_2O_7$

474. The chamber acid contains …… H_2SO_4.
a) 10.20% b) 35.45% c) 67.80% d) 82.90%

475. Compound of Sulphur used in electrical transformer is:
a) SO_2 b) H_2S c) SO_3 d) SF_6

476. The inert gases producing maximum number of compounds are
a) He and Ne b) Ar and Ne c) Kr and Ne d) Ar and Xe

477. The fertilizer named 'Nitrolim' is prepared by the use of :
a) $CaO + N_2$ b) $CaC + N_2$ c) $CaC_2 + N$ d) $CaC_2 + N_2$

478. When KBr is treated with concentrated H_2SO_4 reddish brown gas is evolved. The gas is
a) Bromine b) HCl
c) Mixture of bromine and HBr d) None of the above

479. Sulphur trioxide can be obtained by which of the following reaction:
a) $S + H_2SO_4 \xrightarrow{\Delta}$ b) $H_2SO_4 + PCl_5 \xrightarrow{\Delta}$ c) $CaSO_4 + C \xrightarrow{\Delta}$ d) $Fe_2(SO_4)_3 \xrightarrow{\Delta}$

480. The metallic form of phosphorus is:
a) White P b) Red P c) β-black P d) α-black P

481. The atomic weight of noble gases is obtained by using the relationship:
a) Atomic weight = equivalent weight × valency
b) Atomic weight = equivalent weight/valency
c) Atomic weight $= \frac{\text{Valency}}{\text{Equivalent weight}}$
d) 2× VD= molecular weight = atomic weight

482. When HNO_3 reacts with metals, nitrogen dioxide is usually evolved if the acid is:
a) Dilute b) Very dilute c) Moderately strong d) Concentrated

483. Which one of the following reaction of xenon compounds is not feasible?
a) $XeO_3 + 6HF \longrightarrow XeF_6 + 3H_2O$
b) $3XeF_4 + 6H_2O \longrightarrow 2Xe + XeO_3 + 12HF + 1.5O_2$
c) $2XeF_2 + 2H_2O \longrightarrow 2Xe + 4HF + O_2$
d) $XeF_6 + RbF \longrightarrow Rb[XeF_7]$

484. Fixation of nitrogen means:
a) Reaction of nitrogen with oxygen
b) Conversion of free atmospheric nitrogen into nitrogen compounds
c) Decomposition of nitrogeneous compounds to yield free nitrogen
d) The action of denitrifying bacteria on nitrogen compounds

485. One mole of fluorine is reacted with two moles of hot and concentrated KOH. The products formed are KF, H_2O and O_2. The molar ratio of KF, H_2O and O_2 respectively is:
a) 1 : 1 : 2 b) 2 : 1 : 0.5 c) 1 : 2 : 1 d) 2 : 1 : 2

486. Slow acting nitrogenous fertilizer among the following is
a) NH_2CONH_2 b) NH_4NO_3 c) CaNCN d) KNO_3
487. Liquor ammonia is
a) Ammonium hydroxide b) Liquefied ammonia gas
c) Concentrated solution of NH_3in water d) A solution of NH_3 in alcohol
488. In ramsay and rayleigh's isolation of noble gases from air, the nitrogen of the air is finally converted into
a) $NaNO_2$ Only b) NO and NO_2 c) $NaNO_3$ Only d) $NaNO_2$ and $NaNO_3$
489. Superphosphate of lime is used in:
a) Cement industry b) Glass industry c) Agriculture d) metallurgy
490. Noble gases are:
a) Colourless
b) Odourless
c) Tasteless and non-inflammable
d) All of the above
491. Nitric acid is used in the manufacture of :
a) TNT b) Picric acid c) NH_4NO_3 d) All of these
492. The symbol Rn represent:
a) Radium b) Radon c) Rhenium d) Rhodium
493. The gas which is absorbed by ferrous sulphate solution giving blackish brown colour is:
a) NH_3 b) N_2 c) CO d) NO
494. Conc. HNO_3 is heated with P_2O_5 to form:
a) N_2O b) NO c) NO_2 d) N_2O_5
495. Cold fire is related to
a) White P b) Red P c) PH_3 d) P_2O_5
496. The non-existent species is:
a) XeF_5 b) BrF_5 c) SbF_5 d) PF_5
497. In Kroll and ICl process of the production of titanium, the inert gas used is:
a) Ne b) Ar c) Kr d) Xe
498. A 500 g toothpaste sample has 0.2 g fluoride concentration. What is the concentration of F^- in ppm?
a) 250 b) 200 c) 400 d) 1000
499. PCl_3 on hydrolysis gives
a) HPO_3 b) H_3PO_2 c) H_3PO_4 d) H_3PO_3
500. Which halogen does not show bleaching property?
a) F_2 b) Cl_2 c) Br_2 d) I_2
501. Which of the following is called stranger gas?
a) N_2O b) Xe c) Cl_2 d) N_2
502. Noble gases possess:
a) High ionization potential
b) Zero electron affinity
c) High electrical conductance
d) All of the above
503. What would happen when a solution of potassium chromate is treated with an excess of dilute nitric acid?
a) CrO_4^{2-} is reduced to +3 state of Cr b) CrO_4^{2-} is oxidized to + 7 state of Cr
c) $Cr_2O_7^{2-}$ and H_2O are formed d) $Cr^{3-}$and $Cr_2O_7^{2-}$ are formed
504. A green yellow gas reacts with an alkali metal hydroxide to form a halate which can used in fireworks and safety matches. The gas and halate respectively are
a) $Br_2, KBrO_3$ b) $Cl_2, KClO_3$ c) $I_2, NaIO_3$ d) $Cl_2, NaClO_3$
505. When plants and animals decay, the organic nitrogen is converted into inorganic nitrogen
a) Nitrates b) Nitrides c) Ammonia d) Elements of nitrogen
506. Which of the following species is not a pseudohalide?

a) CNO^- b) $RCOO^-$ c) OCN^- d) NNN^-

507. Dilute HNO_3 reacts with limestone to yield:
a) $Ca(OH)_2 \cdot Ca(NO_3)_2$ b) $CaO \cdot Ca(NO_3)_2$ c) $2CaO \cdot Ca(NO_3)_2$ d) None of the above

508. Sulphur is soluble in:
a) Water b) Dilute HCl c) Ether d) CS_2

509. Which of the following is formed by xenon?
a) XeF_7 b) XeF_4 c) XeF_5 d) XeF_3

510. The oxide which is solid at room temperature is:
a) N_2O b) NO c) N_2O_4 d) N_2O_5

511. Which hydride possesses the maximum complex forming nature?
a) NH_3 b) PH_3 c) BiH_3 d) SbH_3

512. Bad conductor of electricity is:
a) H_2F_2 b) HCl c) HBr d) HI

513. The van der Waals' forces in halogens decrease in the order:
a) $F_2 > Cl_2 > Br_2 > I_2$ b) $I_2 > Br_2 > Cl_2 > F_2$ c) $Br_2 > Cl_2 > F_2 > I_2$ d) $Cl_2 > Br_2 > I_2 > F_2$

514. The word argon means:
a) Noble b) Now c) Strange d) Lazy

515. SO_2 reacts with chlorine to form:
a) Sulphur monochloride
b) Sulphur dichloride
c) Sulphuryl chloride
d) Sulphur trichloride

516. Which hydride does not exist?
a) SbH_3 b) AsH_3 c) PH_5 d) N_2H_4

517. Ozone is formed by the interaction of water with:
a) Chloride b) Chlorine c) Fluorine d) Fluoride

518. PCl_5 exists but NCl_5 does not because:
a) Nitrogen has no vacant '*d*'orbitals
b) Lower tendency of H-bond formation in P than N
c) Lower electronegativity of P than N
d) Occurrence of P in solid state while N_2 in gaseous state at room temperature

519. Which reaction is not valid?
a) $HCl + F_2 \longrightarrow HF + Cl_2$ b) $HF + Cl_2 \longrightarrow F_2 + HCl$
c) $Zn + HCl \longrightarrow ZnCl_2 + H_2$ d) $Al + HCl \longrightarrow AlCl_3 + H_2$

520. Arrange the acids (I) H_2SO_3, (II)H_3PO_3, and (III) $HClO_3$ in the decreasing order of acidic nature.
a) I > III > II b) I > II > III c) III > I > II d) II > III > I

521. With excess of chlorine, ammonia forms:
a) NCl_3 b) $NOCl_2$ c) N_2 d) NH_4Cl

522. Oxalic acid when heated with conc H_2SO_4, gives out
a) CO and CO_2 b) CO_2 and H_2S c) H_2O and CO_2 d) Oxalic sulphate

523. The anhydride of hypochlorous acid is:
a) ClO_3 b) ClO_2 c) Cl_2O_5 d) Cl_2O

524. On bubbling F_2 in 2% solution of NaOH, the product formed are:
a) OF_2 b) NaF c) H_2O d) All of these

525. I_2 dissolves in KI solution due to the formation of
a) KI_2 and I^- b) K^+, I^- and I_2 c) I_3^- d) None of these

526. The correct order of boiling points of the hydrides of nitrogen family is
a) $NH_3 > PH_3 > AsH_3 > SbH_3$ b) $PH_3 < AsH_3 < NH_3 < SbH_3$
c) $NH_3 < PH_3 < SbH_3 < AsH_3$ d) $NH_3 < PH_3 < AsH_3 < SbH_3$

527. In which process sulphur is not used?
a) Protection of grape wines

b) Manufacture of H_2SO_4
c) Manufacture of black shoe polish
d) Vulcanization of rubber

528. When the mineral clevite is heated, it give off the inert gas
a) Helium b) Xenon c) Radon d) Argon

529. In NH_3 and PH_3, the common is
a) Basic nature b) Odour c) Combustibility d) None of these

530. Oxygen is not readily reacted with
a) P b) Cl c) Na d) S

531. Most acidic oxide among the following is
a) Cl_2O_5 b) Cl_2O c) Cl_2O_3 d) Cl_2O_7

532. Which one has the highest bond energy?
a) O—O b) S—S c) Se—Se d) Te—Te

533. $KMnO_4$ is prepared by:
a) Passing Cl_2 through K_2MnO_4 solution
b) Passing O_2 through K_2MnO_4 solution
c) Reaction of KOH with $KMnO_4$
d) Fusing KON with MnO_2

534. Bromine is prepared in the laboratory by heating a mixture of:
a) $MgBr + H_2SO_4$ b) $MgBr_2 + Cl_2$ c) $KBr + MnO_2 + H_2SO_4$ d) KBr + HCl

535. I_2 on rubbing with liquor NH_3 forms with explosion:
a) NH_4I b) N_2 c) $NH_4I + N_2 + I_2$ d) NI_3NH_2

536. When KBr is treated with concentrated H_2SO_4 reddish brown gas evolved, gas is
a) Mixture of bromine and HBr b) HBr
c) Bromine d) None of the above

537. Which of the following noble gases is most reactive?
a) He b) Ne c) Ar d) Xe

538. First stable compound of inert gas was prepared by:
a) Rayleigh and Ramsay
b) Bartlett
c) Frankland and Lockyer
d) Cavendish

539. The function of $Fe(OH)_3$ in the contact process is
a) To remove arsenic impurity b) To detect colloidal impurity
c) To remove moisture d) To remove dust particles

540. Which is incorrect for bleaching powder?
a) Highly soluble in water
b) Light yellow coloured powder
c) Oxidizing agent
d) Reacts with dilute acid to release chlorine

541. Molecule with a three electron bond is:
a) Cl_2 b) NO c) H_2O d) Cl_2O

542. Phosphorus pentoxide cannot be used to dry:
a) Nitrogen b) Ammonia c) Hydrogen sulphide d) Sulphur dioxide

543. Calcium cyanamide on treatment with steam produces
a) $NH_3 + CaO$ b) $NH_3 + CaHCO_3$ c) $NH_3 + CaCO_3$ d) $NH_3 + Ca(OH)_2$

544. Which one of the following statements regarding helium is incorrect?
a) It is used to produce and sustain powerful super conducting magnets
b) It is used in gas-cooled nuclear reactors
c) It is used to fill gas balloons instead of hydrogen because it is lighter and non-inflammable
d) It is used as a cryogenic agent for carrying out experiments at low temperature

545. Hydrogen bromide is dried by passing the gas through:
a) Quick lime b) Anhydrous $CaCl_2$ c) KOH pellets d) Conc. H_2SO_4

546. The ion that cannot undergo disproportionation is:
a) ClO_4^- b) ClO_3^- c) ClO_2^- d) ClO^-

547. Which of the following is the most basic oxide?
a) Bi_2O_3 b) SeO_2 c) Al_2O_3 d) Sb_2O_3

548. Which one is the anhydride of $HClO_4$?
a) ClO_2 b) Cl_2O_7 c) Cl_2O d) Cl_2O_6

549. Phosphine is generally prepared in the laboratory?
a) By heating phosphorus in a current of hydrogen
b) By heating white phosphorus with aqueous solution of caustic potash
c) By decomposition of P_2H_4 at 110°C
d) By heating red phosphorus with an aqueous solution of caustic soda

550. In P_4O_6 the number of oxygen atoms bonded to each P atom is:
a) 1.5 b) 2 c) 3 d) 4

551. The most abundant inert gas in air is:
a) He b) Ne c) Ar d) Kr

552. When concentrated H_2SO_4 is added to dry KNO_3, brown fumes evolve. These fumes are of:
a) SO_2 b) SO_3 c) NO_2 d) NO

553. White phosphorus reacts with caustic soda to give PH_3 and NaH_2PO_2. This reaction is an example of:
a) Oxidation
b) Reduction
c) Neutralisation
d) Oxidation and reduction

554. The molecular formula of dithionic acid is
a) $H_2S_2O_4$ b) $H_2S_2O_6$ c) $H_2S_2O_5$ d) $H_2S_2O_7$

555. The correct order of pseudohalide ,polyhalide and interhalogen are
a) $BrI_2^- -$,OCN^-,IF_5 b) IF_5, BrI_2^-,OCN^- c) OCN^-,IF_5, BrI_2^- d) OCN^-, BrI_2^- ,IF_5

556. The substance which is solid at room temperature forms ionic compounds and reacts with hydrogen forming a hydride, the aqueous solution of which is acidic, could be
a) Al b) Na c) Br_2 d) I_2

557. When I_2 is passed through KCl,KF and KBr solutions
a) Cl_2 and Br_2 are evolved b) Cl_2 is evolved
c) Cl_2 , Br_2 and F_2 are evolved d) None of the above

558. When I_2 is dissolved in CCl_4, the colour that results is
a) Colourless b) Brown c) Bluish green d) Violet

559. Oxide of nitrogen which is soluble in alcohol is:
a) NO_2 b) N_2O c) N_2O_3 d) NO

560. The correct order of reducing abilities of hydrides of V group elements is
a) $NH_3<PH_3<AsH_3<SbH_3<BiH_3$ b) $NH_3>PH_3>AsH_3>SbH_3>BiH_3$
c) $NH_3<PH_3<AsH_3<SbH_3<BiH_3$ d) $SbH_3> BiH_3> AsH_3> NH_3> PH_3$

561. Available chlorine is liberated from bleaching powder when it:
a) Is heated b) Reacts with water c) Reacts with acid d) Reacts with alkali

562. A salt of sulphurous acid is called:
a) Sulphate b) Sulphurate c) Sulphite d) Sulphide

563. The sides of safety matches contains
a) Red phosphorus + sand powder b) P_4S_3
c) $Ca_3(PO)_4$ + glass pieces d) $KClO_3$, KNO_3, sulphur +antimony

564. Which compound is prepared by the following reaction?

$$Xe + 2F_2 \underset{(2:1 \text{ volume ratio})}{\xrightarrow[673K]{Ni}}:$$

a) XeF_4 b) XeF_2 c) XeF_6 d) None of these

565. The most stable hydride is
a) NH_3 b) PH_3 c) AsH_3 d) SbH_3

566. Thomas slag is:
a) $Ca_3(PO_4)_2$ b) $CaCHNH_2$ c) $CaSiO_3$ d) $FeSiO_3$

567. The second most electronegative element in periodic table is:
a) F b) O c) Cl d) N

568. Among the C—X bond (where X = Cl, Br, I) the correct bond energy order is:
a) C—Cl > C—Br > C—I
b) C—I > C—Cl > C—Br
c) C—Br > C—Cl > C—I
d) C—I > C—Br > C—Cl

569. When heated to 800°C, N_2O gives:
a) $NO + O_2$ b) $NO_2 + O_2$ c) $N_2 + O_2$ d) None of these

570. The oxidation number of S in S_8, S_2F_2 and H_2S are respectively:
a) 0, +1, and -2 b) -2, +1, and -2 c) 0, +1 and +2 d) -2, +1, and +2

571. H_2SO_4 has very corrosive action on skin because:
a) It reacts with proteins
b) It acts as an oxidizing agent
c) It acts as dehydrating agent
d) It acts as dehydrating agent and absorption of water is highly exothermic

572. Which oxide do not act as a reducing agent?
a) N_2O_5 b) N_2O c) NO d) NO_2

573. Fuming sulphuric acid is
a) $H_2SO_4 + SO_3$ b) $H_2SO_4 + SO_2$ c) H_2SO_4 d) $H_2SO_4 + SO_4$

574. The weakest acid is:
a) H_2Se b) H_2Te c) H_2O d) H_2S

575. HIO_3 on heating gives:
a) I_2 b) O_2 c) I_2O_5 d) HI

576. Halogen used as an antiseptic is:
a) Fluorine b) Chlorine c) Bromine d) Iodine

577. HF is a weak acid but HCl is a strong acid because:
a) HF is less ionic than HCl
b) HF attacks glass but HCl does not
c) Bond energy of HF is higher than HCl
d) Electron affinity of fluorine is lower than chlorine

578. The product A in the following equation,
$2KMnO_4 \longrightarrow A + MnO_2 + O_2$, is:
a) $K_2Mn_2O_7$ b) K_2MnO_4 c) K_2O d) K_2O_2

579. The element present in combined state in *Laminaria stenophylla* is:
a) Bromine b) Iodine c) Fluorine d) Chlorine

580. In the manufacture of bromine from sea water, the mother liquor containing bromide is treated with
a) Carbon dioxide b) Chlorine c) Iodine d) Sulphur dioxide

581. Which of the following equations is not correctly formulated?
a) $3Cu + 8HNO_3(dil.) \longrightarrow 3Cu(NO_3)_2 + 2NO + 4H_2O$
b) $3Zn + 8HNO_3(very\ dil.) \longrightarrow 3Zn(NO_3)_2 + 2NO + 4H_2O$
c) $4Sn + 10HNO_3(dil.) \longrightarrow 4Sn(NO_3)_2 + NH_4NO_3 + 3H_2O$
d) $As + 3HNO_3(dil.) \longrightarrow H_3AsO_3 + 3NO_2$

582. P_4O_{10} has short and long P— O bonds. The number of short P— O bonds in this compound is:
a) 1 b) 2 c) 3 d) 4
583. Which of the following acts as fluoro Lewis acids?
a) RuF_5 b) SbF_5 c) AsF_5 d) All of these
584. A radioactive element *X* decays to give two inert gases. *X* is:
a) $^{238}_{92}U$ b) $^{226}_{88}Ra$ c) $_{90}Th$ d) $_{89}Ac$
585. Which one of the following can be purified by sublimation?
a) F_2 b) Cl_2 c) Br_2 d) I_2
586. Noble gases do not occur in:
a) Nature b) Ores c) Atmosphere d) Sea water
587. Ammonia is:
a) Polar solvent b) Non-polar c) Paramagnetic d) None of these
588. The treatment of Cu with dilute HNO_3 gives
a) N_2O b) NO c) NH_4^+ d) NO_2
589. Wrong statement about HNO_3 is:
a) The proteins are converted into xanthoproteins
b) HNO_3 acts as a dehydrating agent
c) It exists in two canonical forms
d) HNO_3 acts as an oxidizing agent
590. Sulphur on boiling with NaOH solution gives
a) $Na_2SO_3 + H_2S$ b) $Na_2S_2O_3 + Na_2S$ c) $Na_2S_2O_3 + NaHSO_3$ d) $Na_2SO_3 + SO_2$
591. Electronegativity of an inert gas is:
a) High b) Low c) Negative d) Zero
592. Good conductor of electricity is:
a) Yellow P b) Red p c) Violet P d) Black P
593. Which burns to form an oxide which is gas at room temperature?
a) Hydrogen b) Phosphorus c) Sodium d) Sulphur
594. Helium was discovered by:
a) Frankland and Lockyer
b) Rayleigh
c) Ramsay
d) None of these
595. SO_2 does not act as
a) Bleaching agent b) Oxidising agent c) Reducing agent d) Dehydrating agent
596. $NaOH + P_4 + H_2O \longrightarrow ?$
a) $PH_3 + NaH_2PO_2$ b) $PH_3 + Na_2PO_4$ c) $PH_3 + Na_2HPO_2$ d) $H_3PO_4 + NaO$
597. Peroxy linkage is present in:
a) Caro's acid b) Pyrosulphuric acid c) Sulphurous acid d) Dithionic acid
598. Which requires catalyst?
a) $S + O_2 \longrightarrow SO_2$ b) $2S\ O_2 + O_2 \longrightarrow 2SO_3$ c) $C + O_2 \longrightarrow CO_2$ d) All of the above
599. Which of the following is used in very low temperature thermometers?
a) He b) Ne c) H_2 d) N_2
600. The noble gas forming maximum number of compound is
a) Xe b) Ne c) Ar d) He
601. Dinitrogen tetroxide, N_2O_4, is a mixed anhydride because it:
a) Is a mixture of N_2O_3 and N_2O_5
b) Decomposes into two oxides of nitrogen
c) Reacts with water to form nitric acid
d) Reacts with water to form two acids
602. A depolarizer used in dry batteries is:

a) KOH b) NH_2OH c) MnO_2 d) Na_3PO_4

603. Which one of the following statements regarding helium is incorrect?
   a) Is is used to fill gas balloons instead of hydrogen because it is lighter and non- inflammable
   b) It is used as a cryogenic agent for carrying out experiments at low temperatures.
   c) It is used to produce and sustain powerful superconducting magnets
   d) It is used in gas cooled nuclear reactors.

604. Which of the following is not obtained by direct reaction of constituent elements?
   a) XeO_3 b) XeF_2 c) XeF_6 d) XeF_4

605. White phosphorus is
   a) A monoatomic gas
   b) P_4 a tetrahedral solid
   c) P_8, a crown
   d) A linear diatomic molecule

606. Sides of match box have coating of
   a) Potassium chlorate, red lead
   b) Antimony sulphide, red phosphorus
   c) Potassium chlorate, antimony sulphide
   d) Antimony sulphide, red lead

607. A positive chromyl chloride test is given by a salt containing:
   a) Br^- b) Cl^- c) SO_3^{2-} d) I^-

608. Zinc and cold dil. HNO_3 reacts to produce?
   a) NO b) NO_2 c) NH_4NO_3 d) $ZnNO_3$

609. In presence of moisture, SO_2 can
   a) Act as oxidant b) Act as reductant c) Gain electron d) Not act as reductant

610. Which has the highest molar heat of vaporization?
   a) HBr b) HCl c) HF d) HI

611. SO_2 can be used as:
   a) Bleaching agent b) Disinfectant c) Antichlor d) All of these

612. When sugar is treated with concentrated sulphuric acid, the sugar is charred. In this process, sugar is:
   a) Oxidized b) Dehydrated c) Reduced d) sulphonated

613. Liquid ammonia is used for refrigeration because
   a) It is basic
   b) It is a stable compound
   c) It has a high dipole moment
   d) It has a high heat of vaporisation

614. The smog is essentially caused by the presence of
   a) O_2 and N_2
   b) O_2 and O_3
   c) O_3 and N_2
   d) Oxides of sulphur and nitrogen

615. Boiling of dil. HCl acid does not increase its concentration beyond 20.24 per cent because hydrochloric acid:
   a) Is very volatile
   b) Is extremely soluble in water
   c) Forms a constant boiling mixture
   d) Forms a saturated solution at this concentration

616. Concentrated hydrochloric acid when kept in open air sometimes produces a cloud of white fumes. The explanation for it is that:
   a) Strong affinity of HCl gas for moisture in air results in forming of droplets of liquid solution which appears like a cloudy smoke
   b) Due to strong affinity for water conc. HCl pulls moisture of air towards itself. The moisture forms droplets of water and hence the cloud
   c) conc. HCl emits strongly smelling gas all the time
   d) Oxygen in air reacts with the emitted HCl gas to form a cloud of chlorine gas

617. Atomicity of phosphorus is:
   a) 1 b) 2 c) 3 d) 4

618. Each of the following is true for white and red phosphorus except that they
   a) Can be oxidised by heating in air
   b) Are both soluble in CS_2

c) Consists of same kind of atoms
d) Can be converted into one another

619. The *M*—Cl bond energies are different in:
a) PCl_5 b) PCl_3 c) CCl_4 d) NCl_3

620. Most acidic oxide is:
a) As_2O_3 b) P_2O_3 c) Sb_2O_3 d) Bi_2O_3

621. King of chemicals is:
a) HNO_3 b) H_2SO_4 c) HCl d) None of these

622. Fluorine is the best oxidising agent because it has
a) Highest electron affinity
b) Highest E°_{red}
c) Highest E°_{oxid}
d) Lowest electron affinity

623. Which bond has the greatest polarity?
a) H—Cl b) H—Br c) H—I d) H—F

624. Berthelot's salt is:
a) $KClO_3$ b) KIO_3 c) $KBrO_3$ d) None of these

625. The strongest oxidizing agent among the following is:
a) Ozone b) Oxygen c) Fluorine d) Chlorine

626. All the elements of the oxygen family are:
a) Non-metals b) Metalloids c) Radioactive d) Polymorphic

627. As the number of —OH groups increases in hypophosphorus acid phosphorus acid and phosphoric acid the acidic strength
a) Increases
b) Decreases
c) Remains nearly same
d) Remains appropriately same

628. Nitric acid oxidizes sulphur to:
a) SO_2 b) SO_3 c) H_2SO_3 d) H_2SO_4

629. Which one is correct if HCl and HF are present together in liquid state?
a) $HCl + HF \longrightarrow H_2Cl^+ + F^-$
b) $HCl + HF \longrightarrow$ No reaction
c) $HCl + HF \longrightarrow H_2F^+ + Cl^-$
d) None of the above

630. Red phosphorus is chemically unreactive because:
a) It does not contain P—P bonds
b) It does not contain tetrahedral P_4 molecules
c) It does not catch fire in air even upto 400°C
d) It has a polymeric structure

631. Which acid is not formed by the action of water on phosphorus pentoxide?
a) HPO_3 b) $H_4P_2O_7$ c) H_3PO_4 d) H_3PO_3

632. To make nitrogen dioxide free from oxygen it is passed through U-tube:
a) Containing $FeSO_4$ solution
b) Containing NaOH solution
c) Kept in freezing mixture
d) Kept in boiling water

633. Sulphur does not combine with which of the following halogens to form a compound?
a) Cl_2 b) Br_2 c) I_2 d) F_2

634. If Na_2SO_3 is left open in air, we get:
a) Na_2S b) Na_2SO_4 c) $NaHSO_4$ d) $NaHSO_3$

635. Which is planar molecule?
a) XeO_4 b) XeF_4 c) $XeOF_4$ d) XeO_2F_2

636. Bacteria convert molecular nitrogen into:
a) NO_3 b) Amino acids c) NO_2 d) NH_3

637. Nitric acid (conc.) oxidizes phosphorus to:

a) H_3PO_4 b) P_2O_3 c) H_3PO_3 d) $H_4P_2O_7$

638. The acidity of hydrides of O, S, Se, Te varies in the order
a) $H_2O > H_2S > H_2Se > H_2Te$ b) $H_2O < H_2S < H_2Se < H_2Te$
c) $H_2S > H_2O > H_2Se > H_2Te$ d) $H_2Se > H_2S > H_2O > H_2Te$

639. Which of the following is anhydride of perchloric acid?
a) Cl_2O_7 b) Cl_2O_5 c) Cl_2O_3 d) HCIO

640. When plants and animals decay the organic nitrogen is converted into inorganic nitrogen .The inorganic nitrogen in the form of
a) Ammonia b) Elements of nitrogen c) Nitrates d) Nitrides

641. Minimum bond length will be in:
a) H_2S b) HF c) H_2O d) ICI

642. Which of the following has no action with starch solution?
a) F_2 and Cl_2 b) Br_2 c) I_2 d) None of these

643. H_2S on passing through $KMnO_4$ solution gives:
a) K_2SO_3 b) S c) K_2MnO_4 d) MnO_2

644. What may be expected to happen when phosphine gas is mixed with chlorine gas?
a) PCl_5 and HCl are formed and the mixture cools down
b) $PH_3 \cdot Cl_2$ is formed with warming up
c) PCl_3 and HCl are formed and the mixture warms up
d) The mixture only cools down

645. The compound that gives chorine like smell is:
a) $CHCl_3$ b) $CaOCl_2$ c) Chloretone d) None of these

646. Hyponitrous acid is:
a) HNO_2 b) HNO_4 c) $H_2N_2O_2$ d) CaN_2

647. $P_4 + 3NaOH + 3H_2O \longrightarrow A + 3NaH_2PO_2$ here A is
a) NH_3 b) PH_3 c) H_3PO_4 d) H_3PO_3

648. A gas X is passed through water to form a saturated solution. The aqueous solution on treatment with $AgNO_3$ gives a white precipitate. The saturated aqueous solutions also dissolves Mg ribbon with evolution of colourless gas Y. X and Y are respectively:
a) CO_2, Cl_2 b) Cl_2, CO_2 c) Cl_2, H_2 d) H_2, Cl_2

649. In which reaction there is no change in valency and the oxidation state?
a) $SO_2 + H_2S \longrightarrow 2H_2O + 3S$
b) $2Na + O \longrightarrow Na_2O$
c) $Na_2O_2 + H_2SO_4 \longrightarrow Na_2SO_4 + H_2O_2$
d) $4KClO_3 \longrightarrow 3KClO_4 + KCl$

650. Oxygen gas can be prepared from solid $KMnO_4$ by:
a) Dissolving the solid in dil. HCl
b) Dissolving the solid in dil. H_2SO_4
c) Treating the solid with H_2 gas
d) Strongly heating the solid

651. In solid state of noble gases, the atoms are held together by:
a) Ionic bonds b) Hydrogen bonds c) Van der Waals' forces d) Hydrophobic forces

652. Potassium manganate (K_2MnO_4) is formed when:
a) Chlorine is passed into aqueous K_2MnO_4 solution
b) Manganese dioxide is fused with potassium hydroxide in air
c) Potassium permanganate reacts with conc. Sulphuric acid
d) None of the above

653. Phosphorus pentoxide is widely used as
a) Bleaching agent b) Dehydrating agent c) Oxidising agent d) Reducing agent

654. In the reaction, $HCOOH \xrightarrow{H_2SO_4} CO + H_2O$; H_2SO_4 acts as

a) Reducing agent b) Oxidising agent c) Dehydrating agent d) All of these

655. Which are hydrolysed by water?
a) XeF_2 b) XeF_4 c) XeF_6 d) All of these

656. Weldon mud is:
a) MnO_2 b) $Mn(OH)_2$ c) $2CaO \cdot MnO_2$ d) Mn_2O_3

657. In the manufacture of H_2SO_4 the nitrated acid from the Gay-Lussac's tower is chemically:
a) $H_2SO_4 \cdot NO_2$ b) $H_2SO_4 \cdot NO$ c) $H_2SO_4 \cdot 2NO$ d) $HSO_4 \cdot NO$

658. In PCl_5, phosphorus undergoes:
a) sp^2-hybridisation b) sp^3-hybridisation c) sp^3d-hybridisation d) sp^3d^2-hybridisation

659. The perhalate ion with maximum oxidizing power is:
a) ClO_4^- b) BrO_4^- c) IO_4^- d) ClO^-

660. If two litre of air is passed repeatedly over heated copper and heated Mg till no further reduction in volume takes place, the volume finally obtained will be approximately:
a) 200 mL b) 20 mL c) Zero d) 10 mL

661. What products are expected from the disproportionation reaction of hypochlorous acid?
a) $HClO_3$ and Cl_2O b) $HClO_2$and $HClO_4$ c) HCl and Cl_2O d) HCl and $HClO_3$

662. On exciting Cl_2 molecule by UV light, we get
a) $Cl^{\cdot}$ b) Cl^- c) Cl^+ d) All of these

663. Smelling salt is:
a) $(NH_4)_2SO_4$ b) $(NH_4)_3PO_4$ c) NH_4Cl d) $(NH_4)_2CO_3$

664. Sulphate ion has …… geometry.
a) Trigonal b) Square planar c) Tetrahedral d) None of these

665. Sulphur in + 3 oxidation state is present in
a) Dithionous acid b) Sulphurous acid c) Thiosulphuric acid d) Pyrosulphuric acid

666. Oleum is
a) Fuming H_2SO_4 b) Oil of vitriol c) Castor oil d) Caro's acid

667. A helium atom on losing an electron becomes:
a) α-particle
b) Hydrogen atom
c) Positively charged helium ion
d) Negatively charged helium ion

668. Concentrated nitric acid on heating decomposes to give:
a) $O_2$and N_2 b) NO c) O_2 d) NO_2 and O_2

669. Bromine is obtained on a commercial scale from:
a) Caliche b) Carnallite c) Common salt d) Cryolite

670. The blue coloured gas is:
a) F_2 b) O_3 c) NO d) Cl_2

671. The catalyst used in Haber's process for synthesis of NH_3 is:
a) Pt b) V_2O_5 c) Fe d) Mo

672. The mixture of conc. HCl and HNO_3 made in 3:1 ratio contains
a) ClO_2 b) NOCl c) NCl_3 d) N_2O_4

673. H_2S does not produce metallic sulphide with
a) $ZnCl_2$ b) $COCl_2$ c) $CuCl_2$ d) $CdCl_2$

674. Large deposits of sulphur in nature are found in the form of:
a) Flowers of sulphur b) H_2SO_4 c) H_2SO_3 d) Free sulphur

675. Which of the following does not exist?
a) $KrF^-[SbF_6]^-$ b) $[KrF_3]^-[SbF_4]^+$ c) $KrF^+[MoOF_5]$ d) $KrF^+[WOF_5]^-$

676. In XeO_3, Xe is:
a) sp^3-hybridized b) sp^2-hybridized c) sp-hybridized d) sp^3d-hybridized

677. When H_2S reacts with halogens, halogens:

a) Are oxidized b) Are reduced c) Form Sulphur halides d) None of these

678. Gaseous HCl is a poor conductor of electricity, while its aqueous solution is a good conductor. This is because:
   a) H_2O is a good conductor of electricity
   b) A gas cannot conduct electricity, but a liquid can
   c) HCl gas does not obey Ohm's law, whereas the solution does
   d) HCl ionizes in aqueous solution

679. Oxygen exhibits positive oxidation state in
   a) CO b) F_2O c) NO d) N_2O

680. The poisson's ratio for inert gases is:
   a) 1.40 b) 1.66 c) 1.34 d) None of these

681. The noble gas which is not found in atmosphere?
   a) Ne b) Ar c) Rn d) Kr

682. Which is not correct for white phosphorus (P_4)?
   a) Six P—P sigma bonds
   b) Four P—P single bonds
   c) Four lone pair of electrons
   d) P—P—P angle of 60°

683. Reaction of HNO_3 with I, S, P and C gives respectively
   a) HIO_3, H_2SO_4, H_3PO_4 and CO_2 b) HIO_3, H_2SO_4, H_3PO_3 and CO_2
   c) HIO_2, H_2SO_4, H_3PO_4 and CO d) I_2O_5, SO_2, P_2O and CO_2

684. Which of the following cannot be formed?
   a) He^{2+} b) He^{+} c) He d) He_2

685. Make the element which displaces three halogens from their compounds
   a) Br b) F c) Cl d) I

686. Which of the following phosphorus is most stable?
   a) White b) Red c) Black d) All stable

687. Ozone reacts with dry iodine to give:
   a) IO_2 b) I_2O_3 c) I_2O_4 d) I_4O_9

688. Fluorine absorbs ….. portion of light and appears yellow.
   a) Yellow b) Green c) Violet d) Red

689. The hybridization and bond angle in SO_3 are:
   a) sp^2 ,120° b) sp^3 ,109° 28' c) sp^2 ,109° 28' d) None of these

690. The substance used in smoke screen is
   a) Sodium chloride b) Sodium phosphate c) Calcium fluoride d) Calcium phosphide

691. Which is cyclic phosphate?
   a) $Na_5P_3O_{10}$ b) $Na_6P_4O_{13}$ c) $Na_4P_4O_{12}$ d) $Na_7P_5O_{16}$

692. PCl_5 does not react with:
   a) CH_3COOH b) $C_2H_5NH_2$ c) C_6H_5OH d) H_2SO_4

693. Elements O, S, Se and Te are usually known as:
   a) Metals b) Rare earth metals c) Coinage metals d) Chalcogens

694. Phosphine is produced by adding water to
   a) CaC_2 b) HPO_3 c) Ca_3P_2 d) P_4O_{10}

695. Which of the following is more soluble in water?
   a) N_2 b) O_2 c) Ar d) He

696. Which of the following compound is tribasic acid?
   a) H_3PO_2 b) H_3PO_3 c) H_3PO_4 d) $H_4P_2O_7$

697. Which pair gives Cl_2 at room temperature?
   a) Conc. HCl + $KMnO_4$ b) NaCl + Conc. H_2SO_4 c) NaCl + MnO_2 d) NaCl + Conc. HNO_3

698. Which of the following oxide does not form acidic aqueous solution?

a) N_2O_3 b) NO_2 c) N_2O_5 d) NO

699. Which one below is a pseudohalide?
a) I_3^- b) IF^- c) ICl d) CN^-

700. The Nessler's reagent contains:
a) Hg_2^{2+} b) Hg^{2+} c) Hg_2^- d) Hg_4^{2-}

701. Interhalogen compounds are:
a) Ionic compounds
b) Coordinate compounds
c) Molecular compounds
d) Covalent compounds

702. Fluorine does not show positive oxidation states because:
a) It is a most electronegative element
b) It forms only anions in ionic compounds
c) It cannot form multiple bonds
d) It shows non-bonded electron pair repulsion due to small size

703. Poison for platinum, a catalyst in contact process of H_2SO_4 is:
a) S b) P c) As d) C

704. The solubility of iodine in water is greatly increased by:
a) Adding an acid
b) Boiling the solution
c) Cooling the solution
d) Adding potassium iodide

705. The catalyst used in the preparation of red P from yellow P is:
a) I_2 b) Ni c) ZnO d) Fe

706. Which one of the following is present as an active ingredient in bleaching powder for bleaching action?
a) $CaCl_2$ b) $CaOCl_2$ c) $Ca(OCl)_2$ d) CaO_2Cl

707. Nitrogen dioxide
a) Does not dissolve in water
b) Dissolves in water forming nitric acid
c) Dissolves in water to form a mixture of nitrous and nitric acid
d) Dissolves in water to form nitrous acid and gives off oxygen

708. The gas used in gas thermometer is:
a) He b) O_2 c) Xe d) Ne

709. Mixture of O_2 and N_2O is used as:
a) Fuel b) Anaesthetic c) In welding d) Oxidizing agent

710. Which of the following acids does not attack Cu and Ag?
a) Dilute HNO_3 b) Dilute HCl c) Conc. H_2SO_4 d) Aqua regia

711. Number of isotopes of oxygen is:
a) 1 b) 3 c) 2 d) 0

712. The angular shape of ozone molecule (O_3) consists of:
a) 2 sigma and 2 π-bonds
b) 1 sigma and 1 π-bond
c) 2 sigma and 1 π-bond
d) 1 sigma and 2 π-bonds

713. Bromine vapour turns moist starch-iodide paper:
a) Brown b) Red c) Blue d) Colourless

714. Nitric oxide is prepared by the action of HNO_3 on
a) Cu b) Sn c) Zn d) Fe

715. The allotrope of Sulphur stables below 90°C is:
a) Rhombic sulphur b) Monoclinic sulphur c) Plastic sulphur d) Flowers of sulphur

716. Concentrated H_2SO_4 is not used to prepare HBr from KBr because it:
   a) Oxidizes HBr
   b) Reduces HBr
   c) Causes disproportionation of HBr
   d) Reacts too slowly with KBr
717. There is an ozone layer at a height of about 29 kilometres above the surface of the earth. Which of the following statements is true?
   a) It is harmful because ozone is dangerous to living organisms
   b) It is beneficial because oxidation reactions can proceed faster in the presence of ozone
   c) It is beneficial because ozone cuts out the ultraviolet radiation of the sun
   d) It is harmful because ozone cuts out the important radiations of the sun which are vital for photosynthesis
718. Cl_2 on passing through Na_2SO_3 solution gives:
   a) Na_2S b) Na_2SO_4 c) $NaHSO_3$ d) NaHS
719. SO_2 reduces:
   a) Mg b) H_2S c) $KMnO_4$ d) All of these
720. The brown yellow colour often shown by nitric acid can be removed by:
   a) Bubbling air through the warm acid
   b) Boiling the acid
   c) Passing ammonia through acid
   d) Adding a little Mg powder
721. Which one will liberate Br_2 from KBr?
   a) I_2 b) SO_2 c) HI d) Cl_2
722. The halide which does not give a precipitate with $AgNO_3$ is:
   a) F^- b) Cl^- c) Br^- d) I^-
723. HF present as impurity in gaseous F_2, can be removed by passing over:
   a) P_2O_5 b) NaF c) H_2SO_4 d) $CaCl_2$
724. In pyrophosphoric acid the number of hydroxy groups present are:
   a) 4 b) 3 c) 5 d) 7
725. Deep sea divers used to respirate is a mixture of
   a) Oxygen and nitrogen b) Oxygen and argon c) Oxygen and hydrogen d) Oxygen and helium
726. Which of the following gives M^{3+} ion most readily?
   a) P b) N c) Sn d) Bi
727. Oxygen is more electronegative than sulphur, yet H_2S is acidic while H_2O is neutral. This is because:
   a) Water is a highly associated compound
   b) H—S bond is weaker than H—O bond
   c) H_2S is a gas while H_2O is a liquid
   d) The molecular weight of H_2S is more than that of H_2O
728. HI reacts with HNO_3 to form:
   a) O_2 b) N_2O c) HIO_3 d) $NO_2 + I_2$
729. Phosphate + conc. HNO_3 + $(NH_4)_2$ MoO_4 solution ⟶ Yellow precipitate.
   The composition of yellow precipitate is:
   a) $(NH_4)_3PO_4 \cdot MoO_3$ b) $(NH_4)_3PO_4 \cdot 12MoO_3$ c) $(NH_4)_2PO_4 \cdot 12MoO_3$ d) $NH_4PO_4 \cdot MoO_3$
730. Density of nitrogen gas prepared from air is slightly greater than that of nitrogen prepared by chemical reaction from a compound of nitrogen because aerial nitrogen contains:
   a) CO_2
   b) Argon
   c) Some N_2 molecules analogous to O_2
   d) Greater amount of N_2 molecules derived from N^{15} isotope
731. Antichlor is a compound:

a) Which absorbs chlorine
b) Which removes Cl_2 from a material
c) Which liberates Cl_2 from bleaching powder
d) Which acts as a catalyst in the manufacture of Cl_2

732. When F_2 reacts with hot and concentrated NaOH then following will be obtained
a) O_2 b) H_2 c) Na_2O d) Na

733. The geometry of $XeOF_4$ molecule is
a) Tetrahedral b) Square pyramidal c) Square planar d) Octahedral

734. Oleum is
a) Castor oil b) Oil of vitriol c) Fuming H_2SO_4 d) None of these

735. Which reacts rapidly with oxygen in the air at ordinary temperature?
a) White P b) Red P c) N_2 d) N_2O

736. The chief source of iodine in which it is present as sodium iodate is
a) Carnallite b) Sea weeds
c) Caliche d) Iodine never exists as sodium iodate

737. As the atomic number of the halogens increases, the halogens:
a) Lose the outermost electrons less readily
b) Become lighter in colour
c) Become less dense
d) Gain electrons less readily

738. An interhalogen compound is:
a) IF_5 b) I_3^- c) CN^- d) $(CN)_2$

739. Phosphine is not collected in air because:
a) It is poisonous
b) It absorbs moisture
c) It catches fire spontaneously in air
d) It is combustible

740. Bones glow in the dark, because:
a) They contain a shining material
b) They contain red phosphorus
c) White phosphorus changes into red phosphorus
d) White phosphorus undergoes slow combustion with air

741. Oxygen exhibits positive oxidation state with:
a) F b) Br c) Cl d) I

742. Which gives carbon with conc. H_2SO_4?
a) Formic acid b) Ethyl alcohol c) Oxalic acid d) Starch

743. The atom larger in size as compared to oxygen is:
a) Ne b) F c) He d) All of these

744. In the reaction,
$2Ag + 2H_2SO_4 \longrightarrow Ag_2SO_4 + 2H_2O + SO_2, H_2SO_4$ is:
a) Reducing agent b) Oxidant c) Catalyst d) Dehydrating agent

745. Among the phosphatic fertilizers, superphosphate of lime is a mixture of $Ca(H_2PO_4)_2$ and:
a) $CaSO_4 \cdot 2H_2O$ b) $CaSO_4 \cdot H_2O$ c) $CaSO_4 \cdot \frac{1}{2}H_2O$ d) $CaSO_4$

746. What is the oxidising agent chlorine water?
a) HCl b) $HClO_2$ c) HOCl d) None of these

747. Which of the following halogens is solid at room temperature?
a) Iodine b) Fluorine c) Chlorine d) Bromine

748. Vegetable colouring matter in presence of moisture is bleached by SO_2 due to:
a) Oxidation b) Reduction c) Sulphonation d) Unsaturation

749. White phosphorus (P_4) does not contain

a) Six $P-P$ single bond
b) Four $P-P$ single bond
c) Four lone pairs of electrons
d) $P-P-P$ angle of 60°

750. The anhydride of nitrous acid is:
a) N_2O_3 b) NO c) N_2O d) N_2O_4

751. XeF_2 on hydrolysis gives
a) XeO_3 b) XeO c) Xe d) XeO_2

752. Coconut charcoal at -180°C is used to separate a mixture of:
a) Ar and Kr b) Ne and Ar c) He and Kr d) He and Ne

753. Paramagnetic oxide of chlorine is:
a) ClO_3 b) Cl_2O_6 c) Cl_2O d) None of these

754. Decreasing order of reducing power of hydrogen halides is:
a) $HI > HBr > HCl > HF$
b) $HF > HI > HBr > HCl$
c) $HI > HF > HBr > HCl$
d) None of these

755. Nitrogen does not combine directly with:
a) Ca b) Al c) Ag d) Mg

756. Which of the following is the strongest oxidising agent?
a) HOCI b) $HClO_2$ c) $HClO_3$ d) $HClO_4$

757. In case of halogen family, which trend occurs as the atomic number increases?
a) Ionic radius decreases
b) Ionization potential decreases
c) Covalent character in MX_2 decreases (where M=metal and X=halogen)
d) None of the above

758. What is the product formed when phosphorus trioxide is dissolved in water?
a) HPO_3 b) H_3PO_4 c) H_3PO_3 d) HPO_2

759. Approximately what percentage of air by volume gets used in a process of combustion?
a) 20% b) 10% c) 35% d) 55%

760. There is no $S-S$ bond is
a) $S_2O_4^{2-}$ b) $S_2O_3^{2-}$ c) $S_2O_5^{2-}$ d) $S_2O_7^{2-}$

761. The acidic nature of HF can be increased in presence of:
a) SbF_5 b) H_2O c) $HClO_4$ d) None of these

762. Identify the incorrect statement among the following
a) Ozone reacts with SO_2 to give SO_3
b) Silicon reacts with NaOH(aq) in the presence of air to give Na_2SiO_3 and H_2O
c) Cl_2 reacts with excess of NH_3 to give N_2 and HCl
d) Br_2 reacts with hot and strong NaOH solution to give NaBr, $NaBrO_4$ and H_2O

763. S—S bond is not present in:
a) $S_2O_7^{2-}$ b) $S_4O_6^{2-}$ c) $S_2O_4^{2-}$ d) $S_2O_3^{2-}$

764. Which of the following oxides are acidic?
a) Mn_2O_7 b) CrO_3 c) Both (a) and (b) d) None of these

765. The pentavalence in phosphorus is more stable as compared to that of nitrogen even though they belong to the same group. It is due to
a) Inert nature of nitrogen
b) Reactivity of phosphorus
c) Larger size of phosphorus atom
d) Dissimilar electronic configuration

766. Which of the following is kept in water?
a) White phosphorus b) Sodium c) Potassium d) Calcium

767. The formula of iodine acetate is:
a) $I(CH_3COO)$ b) $I(CH_3COO)_3$ c) $I_2(CH_3COO)$ d) $(CH_3COO)_2I$

768. Phosphine is not evolved when:

a) White phosphorus is boiled with a strong solution of $Ba(OH)_2$
b) Phosphorus acid is heated
c) Calcium hypophosphite is heated
d) Metaphosphoric acid is heated

769. The last orbit of argon would have electrons
a) 2 b) 6 c) 8 d) 18

770. Xenon directly combines with:
a) Oxygen b) Rubidium c) Fluorine d) Chlorine

771. Structure of XeF_5^+ ion is
a) Trigonal bipyramidal b) Square pyramidal c) Octahedral d) Pentagonal

772. Thermal stability of hydrogen halide follows the order:
a) HI > HBr > HCl > HF
b) HI > HF > HBr > HCl
c) HI > HBr > HF > HCl
d) HF > HCl > HBr > HI

773. Iodine is fromed when KI reacts with solution of
a) $CuSO_4$ b) $(NH_4)_2\ SO_4$ c) $ZnSO_4$ d) $FeSO_4$

774. The strongest reducing agent among the following is
a) F^- b) CI^- c) Br^- d) I^-

775. In Birkeland Eyde process, the raw material used is
a) Air b) NO_2 c) HNO_3 d) NH_3

776. Liquid flow from a higher to a lower level. Which of the following liquids can climb up the wall of the glass vessel in which it is placed?
a) Alcohol b) Liquid He c) Liquid N_2 d) water

777. Which is not correct for N_2O?
a) It is laughing gas and is used as anaesthetic agent
b) It is nitrous oxide
c) It is not a linear molecule
d) It is least reactive of all the oxides of nitrogen

778. The strongest acidic oxide is:
a) SO_2 b) SO_3 c) P_2O_5 d) Sb_2O_3

779. Apatite is an ore of
a) Fluorine b) Chlorine c) Bromine d) Iodine

780. The sulphur molecule (S_8) possesses:
a) Cubical structure
b) Spherical structure
c) Tetrahedral structure
d) W-shaped ring structure

781. Copper turnings when heated with concentrated sulphuric acid will give
a) H_2S b) SO_2 c) SO_3 d) O_2

782. PCl_5 is prepared by the action of Cl_2 on:
a) P_2O_3 b) P_2O_5 c) H_3PO_3 d) PCl_3

783. Chlorine water on cooling deposits greenish-yellow crystals of:
a) $Cl_2 \cdot 2H_2O$ b) $Cl_2 \cdot H_2O$ c) $Cl_2 \cdot 3H_2O$ d) $Cl_2 \cdot 8H_2O$

784. Which inert gas have highest boiling point?
a) Xe b) Ar c) Kr d) He

785. Metaphosphoric acid is:
a) H_3PO_2 b) HPO_3 c) H_3PO_3 d) H_3PO_4

786. H_3PO_3 has…… non ionisable P—H bonds
a) 3 b) 1 c) 2 d) None of these

787. Dry bleach caused by
a) Cl_2 b) SO_2 c) H_2O_2 d) O_3

788. Ammonia is dried over
a) Slaked lime b) Calcium chloride
c) Phosphorus pentoxide d) Quick lime

789. The bond dissociation energy of Cl_2,Br_2 and I_2 follow
a) $Cl_2>I_2>Br_2$ b) $I_2>Br_2>Cl_2$ c) $I_2=Cl_2=Br_2$ d) $Cl_2>Br_2>I_2$

790. Which is correct statement?
a) Nitric oxide is isoelectronic with CO_2
b) Nitric oxide is diamagnetic
c) Nitric oxide is an endothermic compound
d) Nitric oxide gas is used as general anaesthetic

791. The noble gas which behaves abnormally in liquid state is:
a) Xe b) Ne c) He d) Ar

792. Which of the following is correct with reference to protonic acids?
a) PH_3 is more basic than NH_3
b) PH_3 is less basic than NH_3
c) PH_3 is as basic as NH_3
d) PH_3 is amphoteric while NH_3 is basic

793. Amongst the following, the basic oxide is
a) Bi_2O_3 b) Sb_2O_3 c) N_2O_5 d) P_2O_5

794. One gas bleaches the colour of the flowers by reduction while the other by oxidation. The gases are:
a) CO and CO_2 b) H_2S and Br_2 c) SO_2 and Cl_2 d) NH_3 and SO_3

795. Cl_2O_6 is an anhydride of:
a) $HClO_3$ b) $HClO_2$ c) $HClO_4$ d) Mixed anhydride of HCl

796. In the upper layers of the atmosphere ozone is formed by the:
a) Combination of oxygen molecules
b) Action of electric discharge on oxygen molecules
c) Action of ultraviolet rays on oxygen
d) None of the above

797. Inert gases such as helium behave like ideal gases over a wide range of temperature. However, they condense into the solid state at very low temperatures. It indicates that at very low temperature there is a:
a) Weak attractive force between the atoms
b) Weak repulsive force between the atoms
c) Strong attractive force between the atoms
d) Strong repulsive force between the atoms

798. Calcium phosphide is used in smoke screens because it:
a) Burns to form soot
b) Gives PH_3 which forms smoke
c) Immediately catches fire in air
d) Is a gas which brings tears in eyes

799. The inert gas obtained from monazite sand is:
a) He b) Ne c) Ar d) Kr

800. Sulphur does not exist as S_2 molecule because
a) It is less electronegative b) It is not able to constitute $p\pi$-$p\pi$ bonds
c) It has ability to exhibit catenation d) Of tendency to show variable oxidation states.

801. The oxide of nitrogen which reacts with NaOH solution giving both sodium nitrate and sodium nitrite is:
a) NO_2 b) N_2O_5 c) N_2O_3 d) NO

802. Oxide of nitrogen used as catalyst in lead chamber process for the manufacture of H_2SO_4 is:
a) NO b) N_2O c) N_2O_3 d) N_2O_5

803. The non-existent compound is:

a) PH_4I b) AsH_3 c) $SbCl_2$ d) As_2O_3

804. A colourless gas on passing through bromine water decolourises it. The gas is:
a) HCl b) HBr c) CO_2 d) SO_2

805. When silver chloride dissolves in ammonia, it forms?
a) $Ag(NH_3)Cl$ b) $Ag(NH_3)_2Cl$ c) $Ag(NH_3)_3Cl$ d) $Ag(NH_3)_4Cl$

806. Which of the following pairs has bleaching property?
a) O_3 and NO_2 b) O_3 and H_2S c) SO_2 andCl_2 d) Cl_2 and NO_2

807. Which of the following is not a hydride?
a) HCl b) CaH_2 c) CsH d) LiH

808. Iron is dropped in dil HNO_3 it gives
a) Ferric nitrate b) Ferric nitrate and NO_2
c) Ferrous nitrate and ammonium nitrate d) Ferrous nitrate and nitric oxide

809. Pnicogens are the elements of group?
a) 15 b) 13 c) 8 d) Zero

810. The percentage of available chlorine in a commercial sample of bleaching powder is:
a) 12% b) 35% c) 58% d) 85%

811. Complete fertilizer is that supplies to the soil:
a) S, K, and N b) N, K and P c) S, K and P d) S and N

812. The element which liberates O_2 from water is:
a) Na b) Ca c) F d) N

813. SF_6 exists but OF_6 does not because:
a) d-orbitals of sulphur are vacant and are vacant and are available for bonding
b) More bonding electrons can be accommodated in orbitals with $n = 3$
c) Sulphur has larger ionization energy than oxygen
d) The difference of electronegativity is less between oxygen and fluorine

814. N_2O_4 molecule is completely changed into $2NO_2$ molecules at:
a) $-10^{\circ}C$ b) 140 – 150°C c) 420°C d) $-40^{\circ}C$

815. Out of (i) XeO_3 (ii) $XeOF_4$ and (iii) XeF_6, the molecules having same number of lone pairs on Xe are:
a) (i) and (ii) only b) (i) and (iii) only c) (ii) and (iii) only d) (i), (ii) and (iii)

816. Chlorous acid and its salts (chlorites) are:
a) Good oxidising agents
b) Good reducing agents
c) Good bleaching agents
d) Good oxidising and bleaching agents

817. Antimony burns in chlorine to form:
a) $SbCl_3$ b) $SbCl_2$ c) $SbOCl_2$ d) $SbCl_5$

818. Bromargyrite is a mineral of:
a) Pb b) Sn c) I_2 d) Br_2

819. Helium is used in gas balloons instead of hydrogen because:
a) It is lighter than H_2
b) It is non-combustible
c) It is more abundant than H_2
d) Its leakage can be detected easily

820. Reaction of PCl_3 and PhMgBr would give
a) Bromobenzene b) Chlorobenzene
c) Triphenylphosphite d) Dichlorobenzene

821. Which does not give ammonia with water?
a) Mg_3N_2 b) AIN c) $CaCN_2$ d) $Ca(CN)_2$

822. Bond length is maximum in:
a) HI b) HBr c) HCl d) HF

823. Nitrogen molecule is chemically less active because it has a …… between two nitrogen atoms.

a) Single bond b) Double bond c) Triple bond d) Coordinate bond

824. If Cl_2 gas is passed into aqueous solution of KI containing some CCl_4 and the mixture is shaken, then:
a) Upper layer becomes violet
b) Lower layer becomes violet
c) Homogeneous violet layer is formed
d) None of the above

825. In NO_3^- ion, the number of bond pair and lone pair of electrons on nitrogen atom are:
a) 2, 2 b) 3, 1 c) 1, 3 d) 4, 0

826. Cl_2 is used in the manufacture of:
a) Chloroform b) CCl_4 c) Westron d) All of these

827. Which element shows polymorphism?
a) O b) S c) Se d) All of these

828. N_2O is formed on reaction with dil. HNO_3 with:
a) Cu b) Hg c) Ag d) Fe

829. The inert gases present in atmosphere are:
a) He and Ne b) He, Ne and Ar c) He, Ne, Ar and Kr d) He, Ne, Ar, Kr and Xe

830. Orthophosphoric acid is ionized in…….steps.
a) 1 b) 2 c) 3 d) 4

831. In the clathrates of xenon with water, the nature of bonding between xenon and water molecule is:
a) Covalent
b) Hydrogen bonding
c) Coordinate
d) Dipole-induced dipole

832. Which one is least soluble in water?
a) BaF_2 b) CaF_2 c) SrF_2 d) MgF_2

833. If $NO_2(N_2O_4)$ is dissolved in NaOH, we get solution of ?
a) $NaNO_2$ b) $NaNO_3$
c) Mixture of $NaNO_2$ and $NaNO_3$ d) $NaNO_4$

834. The bond angles in OF_2, OCl_2 and OBr_2 show the order:
a) $OF_2 > OCl_2 > OBr_2$ b) $OF_2 > OB_2 > OCl_2$ c) $OBr_2 > OCl_2 > OF_2$ d) $OCl_2 > OBr_2 > OF_2$

835. Xenon tetrafluoride has hybridisation and structure as:
a) sp^3 tetrahedral b) $sp^3\ d^2$ square planar c) $sp^3\ d^2$ pyramidal d) $sp^3\ d^3$ octahedral

836. The atomicity of phosphorus is X and the PPP bond angle in the molecule is Y. what are X and Y ?
a) X=4, Y=90° b) X=4, Y=60° c) X=3, Y=120° d) X=2, Y=180°

837. Bottle of PCl_5 is kept stoppered because it:
a) Explodes b) Get oxidized c) Is volatilized d) Reacts with moisture

838. Sometimes a yellow turbidity appears while passing H_2S gas even in the absence of II group radicals. This is because:
a) Sulphur is present I the mixture as impurity
b) IV group radicals are precipitated as sulphides
c) Of the oxidation of H_2S gas by some acid radicals
d) III group radicals are precipitated as hydroxides

839. The oxidation of thiosulphate ion by iodine gives:
a) SO_3^{2-} b) SO_4^{2-} c) $S_2O_8^{2-}$ d) $S_4O_6^{2-}$

840. Rain water sometimes contains NH_4NO_3 because lightening in the sky causes the air to react and produce oxides of nitrogen and:
a) H_2 b) NH_3 c) CO_2 d) Noble gases

841. The number of molecules of water needed to convert one molecule of P_2O_5 into orthophosphoric acid is:
a) 2 b) 3 c) 4 d) 5

842. Which of the following is the correct order of increasing enthalpy of vaporization?

a) $NH_3<PH_3<AsH_3$ b) $AsH_3<PH_3<NH_3$ c) $PH_3<AsH_3<NH_3$ d) $NH_3<AsH_3<PH_3$

843. Which of the following was previously known as muriatic acid?
a) Cl_2 b) Br_2 c) HCl d) H_2SO_4

844. Which metal forms an amphoteric oxide?
a) Cr b) Fe c) Cu d) Zn

845. H_2SO_4 is added while preparing a standard solution of Mohr's salt to prevent:
a) Hydration b) Reduction c) Hydrolysis d) Complex formation

846. The element which catches fire in air at 30°C and is stored under water is
a) Sodium b) Phosphorus c) Magnesium d) Zinc

847. Which are solid?
a) XeF_2 b) XeF_4 c) XeF_6 d) All of these

848. Cl_2O is an anhydride of:
a) $HClO_4$ b) HOCl c) Cl_2O_3 d) $HClO_2$

849. Ammonium dichromate is used in some fireworks. The green coloured powder blown is:
a) CrO_3 b) Cr_2O_3 c) Cr d) $CrO(O_2)$

850. An element forms a gaseous oxide which on dissolving in water gives an acid solution. The element is:
a) S b) Na c) P d) H

851. PCl_3 and cold water reacts to produce which of the following ?
a) H_3PO_3 b) H_3PO_2 c) $H_4P_2O_7$ d) H_3PO_4

852. Ammonia on heating with carbon dioxide under pressure gives:
a) NH_4HCO_3 b) $(NH_4)_2CO_3$ c) NH_2COONH_4 d) $(NH_4)_2CO$

853. The acid which forms two series of salts:
a) H_3PO_4 b) H_3PO_3 c) H_3BO_3 d) H_3PO_2

854. The structure of white phosphorus is:
a) Square planar b) Pyramidal c) Tetrahedral d) Trigonal planar

855. Which of the following is strongest oxidizing agent?
a) I_2 b) Br_2 c) Cl_2 d) F_2

856. It 20% nitrogen is present in a compound, its minimum molecular weight can be:
a) 144 b) 70 c) 100 d) 140

857. Which sulphide is insoluble in yellow ammonium sulphide?
a) SnS b) As_2S_3 c) Sb_2S_3 d) Bi_2S_3

858. Which one is most basic in character?
a) F^- b) Cl^- c) Br^- d) I^-

859. Which oxide is alkaline?
a) P_2O_3 b) B_2O_3 c) Bi_2O_3 d) As_2O_3

860. Fluorine oxidises HSO_4^- to:
a) $S_2O_3^{2-}$ b) $S_2O_8^{2-}$ c) $S_4O_6^{2-}$ d) SO_2

861. Oleum is chemically
a) H_2SO_3 b) H_2SO_5 c) $H_2S_2O_7$ d) $H_2S_2O_8$

862. Among halogens maximum oxides are formed by:
a) Fluorine b) Chlorine c) Bromine d) Iodine

863. Which statement is false?
a) Radon is obtained from the decay of radium.
b) Helium is an inert gas.
c) The most abundant noble gas in the atmosphere is He.
d) Xe is the most reactive among the noble gases.

864. Freons are used as:
a) Refrigerant b) Catalyst c) Oxidant d) None of these

865. Sulphur molecule exists as:
a) S_2 b) S_4 c) S_6 d) S_8

866. Noble gases are adsorbed by
a) Anhydrous calcium chloride b) Ferric hydroxide
c) Conc. H_2SO_4 d) Activated coconut charcoal
867. Phosphorus when exposed to air burns spontaneously because:
a) The reaction is endothermic
b) The reaction is exothermic
c) The activation energy is very low
d) Air contains some catalytic agent
868. There is O—O bond is:
a) $S_2O_8^{2-}$ b) $S_4O_6^{2-}$ c) SO_3^{2-} d) $S_2O_7^{2-}$
869. Freons are:
a) CCl_2F_2 b) $CFCl_3$ c) $CClF_3$ d) All of these
870. Normality of pure sulphuric acid is:
a) 4 N b) 12 N c) 24 N d) 36 N
871. The number of S − S bonds in sulphur trioxide
a) Three b) Two c) One d) Zero
872. The number of electrons present in the valency shell of P in PCl_3 is:
a) 12 b) 10 c) 8 d) 18
873. A hydride of nitrogen which is acidic is
a) N_3H b) N_2H_2 c) NH_3 d) N_2H_4
874. Which of the following compound show sublimation?
a) $CaHPO_3$ b) NH_4Cl c) $BaSO_4$ d) $CaCO_3$
875. The highest ionization potential in a period is shown by:
a) Alkaline earth metals b) Alkali metals c) Halogens d) Noble gases
876. $K_2[HgI_4]$ detects the ion/group:
a) NH_2 b) NO c) NH_4^+ d) Cl^-
877. The percentage of nitrogen in urea is about:
a) 70 b) 63 c) 47 d) 28
878. Phosphate mineral of phosphorus is:
a) $Fe_3(PO_4)_2H_2O$ b) $Ca_3(PO_4)_2$ c) $3Ca_3(PO_4)_2 \cdot CaF_2$ d) $3Ca_3(PO_4)_2 \cdot CaCl_2$
879. Dithionic acid has the formula:
a) $H_2S_2O_6$ b) H_2SO_5 c) $H_2S_2O_8$ d) $H_2S_2O_5$
880. A person working with phosphorus suffers from a disease in which bones decay. It is known as
a) Arthritis b) Phossay jaw c) Rickets d) cancer
881. A salt *X* gives white precipitates with lead acetate solution, insoluble in hot water and nitric acid. The salt *X* most probably contains:
a) Cl^- b) Ba^{2+} c) SO_4^{2-} d) CO_3^{2-}
882. S − S bond is present in
a) $\alpha - (SO_3)_n$ b) $\gamma - (S_3O_9)$ c) $H_2S_2O_3$ d) $H_2S_2O_8$
883. NH_3 molecule can enter into complex formation through:
a) Ionic bond
b) Covalent bond
c) Coordinate bond
d) Electron deficient bond
884. Bromine can be liberated from KBr solution by the action of
a) KI b) NaCl c) Cl_2 d) I_2 soluation
885. The oxidation state of Xe and XeO_3 and the bond angle in it respectively are
a) +6, 109° b) +8, 103° c) +6, 103° d) +8, 120°
886. Among the following nitrates, lead nitrate, silver nitrate, sodium nitrate and ammonium nitrate; the one that decomposes without leaving any solid residue is

a) Ammonium nitrate b) Sodium nitrate c) Silver nitrate d) Lead nitrate

887. Ammonia and phosphine resemble each other in:
   a) Solubility in water
   b) Forming salt with acid
   c) Stability
   d) Reducing character

888. In the compound of type POX_3, P atoms show multiple bonding of the type:
   a) $p\pi - d\pi$ b) $d\pi - d\pi$ c) $p\pi - p\pi$ d) No multiple bonding

889. Tear gas is:
   a) $COCl_2$ b) $CaOCl_2$ c) NH_3 d) $CCl_3 \cdot NO_2$

890. Which statement is not correct about $(CN)_2$?
   a) It is poisonous gas
   b) It is called pseudohalogen
   c) It is named as cyanogen
   d) None of the above

891. When ammonium chloride is heated with NaOH, a gas is evolved, which has
   a) Pungent odour b) Smell of rotten eggs c) Smell of ammonia d) No smell

892. When phosphine is bubbled through solution of silver nitrate…..is precipitated.
   a) Silver b) Silver phosphide c) Silver oxide d) None of these

893. Hydrolysis of one mole of peroxodisulphuric acid produces:
   a) Two moles of sulphuric acid
   b) Two moles of peroxomonosulphuric acid
   c) One mole of sulphuric acid and one mole of peroxomonosulphuric acid
   d) One mole each of sulphuric acid, peroxomonosulphuric acid and hydrogen peroxide

894. Which has the same electronic configuration as of inert gas?
   a) Ag^{3+} b) Cu^{2+} c) Pb^{4+} d) Ti^{4+}

895. Glacial phosphoric acid is:
   a) H_3PO_4 b) HPO_3 c) $H_4P_2O_7$ d) H_3PO_2

896. Which of the following pairs is not correctly matched?
   a) A halogen which is liquid at room temperature—bromine
   b) The most electronegative element—fluorine
   c) The most reactive halogen—fluorine
   d) The strongest oxidizing agent—iodine

897. Nitrous oxide is known as
   a) Laughing gas b) Laboratory gas c) Breathing gas d) Exercising gas

898. The number of hydrogen atom (s) attached to phosphorus atom in pyrophosphorus acid is
   a) Zero b) One c) Two d) Three

899. Which of the following is not correct?
   a) Ammonia is used as refrigerant
   b) A mixture of $Ca(CN)_2$ and C is known as nitrolim
   c) A mixture of $Ca(H_2PO_4)_2$ and $CaSO_4 . 2H_2O$ is known as superphosphate of lime
   d) Hydrolysis of NCl_3give NH_3 and HOCl

900. Which halide does not hydrolyse?
   a) $SbCl_3$ b) $AsCl_3$ c) PCl_3 d) NF_3

901. The noble gas mixture is cooled in a coconut bulb at 173k. the gases that are not absorbed are
   a) Ne and Xe b) He and xe c) Ar and Kr d) He and Ne

902. In the reaction $H_2S + O_3 \rightarrow$…, the products are:
   a) H_2O, S, O_2 b) $H_2SO_4 + O_2$ c) $H_2O + S$ d) $SO_2 + H_2$

903. When PCl_5 reacts with sulphuric acid, sulphuryl chloride (SO_2Cl_2) is formed as the final product .this shows that sulphuric acid

a) Has two hydroxyl groups in its structure
b) Is a derivative of sulphur dioxide
c) Is a dibasic acid
d) Has greater affinity for water

904. Caliche is:
a) Crude saltpetre
b) Impure nitre
c) Impure carnallite
d) Ashes of sea-weeds

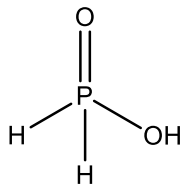
905. The number of paired electron in oxygen molecule are
a) 14
b) 8
c) 16
d) 12

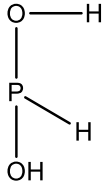
906. The number of sigma bonds in P_4O_{10} is:
a) 6
b) 16
c) 20
d) 7

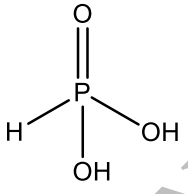
907. Bleaching action of SO_2 is due to
a) Reduction
b) Hydrolysis
c) Oxidation
d) Acidic nature

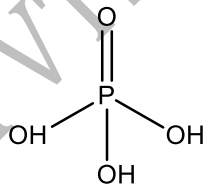
908. Nitrogen is produced when $NaNO_2$ is heated with:
a) NH_4Cl
b) NH_4NO_3
c) $(NH_4)_2CO_3$
d) NH_4OH

909. The structural formula of hypophosphorous acid is

a) 

b) 

c) 

d) 

910. Which of the following compounds gives chlorine dioxide when it reacts with SO_2 in the presence of acid?
a) Sodium chloride
b) Sodium chlorate
c) Sodium perchlorate
d) Sodium chlorite

911. The hydride of group 16 elements showing maximum tendency for complex formation is
a) H_2Te
b) H_2O
c) H_2S
d) H_2Se

912. The noble gas which forms interstitial compounds is
a) Helium
b) Argon
c) Neon
d) Xenon

913. Iodine may be liberated from sodium iodate by:
a) H_2SO_4
b) $NaHSO_3$
c) $KMnO_4$
d) HCl

914. Which oxide is of different type than others?
a) MnO_2
b) PbO_2
c) TiO_2
d) Na_2O_2

915. Oxide of nitrogen used as a catalyst in the lead chamber process for the manufacture of sulphuric acid is:
a) NO
b) N_2O
c) N_2O_3
d) N_2O_5

916. When excess of KI is added to copper sulphate solution:
a) Cuprous iodide is formed
b) I_2 is liberated
c) Potassium iodide is oxidized
d) All of the above

917. The spectrum of helium is similar to:
a) H
b) Na
c) Li^+
d) He^+

918. The reaction of P_4 with X leads selectively to P_4O_6 the X is
a) dry O_2
b) A mixture of O_2 and N_2
c) Moist O_2
d) O_2in the presence of aqueous NaOH

919. $PH_4I + NaOH$ forms:
a) PH_3
b) NH_3
c) P_4O_6
d) P_4O_{10}

920. When fluoride is heated with conc. H_2SO_4 and MnO_2 the gas evolved is:
a) HF
b) MnF_2
c) F_2
d) None of these

921. Which would quickly absorb oxygen?
a) Alkaline solution of pyrogallic acid
b) Concentrated sulphuric acid
c) Lime water
d) Alkaline solution of copper sulphate

922. The compound used as refrigerant is:

a) CCl_4 b) $COCl_2$ c) CF_4 d) CF_2Cl_2

923. Phosphine is not obtained by the reaction when:
   a) White P is heated with NaOH
   b) Red P is heated with NaOH
   c) Ca_3P_2 reacts with water
   d) Phosphorus trioxide is boiled with water

924. Nitrogen forms …. Oxides.
   a) 3 b) 4 c) 5 d) 6

925. Some of the reasons of reacting NH_3 with hydrogen chloride are given below. The incorrect is:
   a) The nitrogen atom of NH_3 gains electrons
   b) NH_3 can give a pair of electrons
   c) A proton in HCl can accept an electron pair from NH_3
   d) The Cl^- ion formed has a stable configuration

926. The compound of Sulphur that can be used as refrigerant is:
   a) S_2Cl_2 b) SO_2 c) SO_3 d) H_2SO_4

927. Oxygen can be obtained from bleaching powder by:
   a) Adding dilute acid
   b) Passing carbon dioxide
   c) Heating with a cobalt salt
   d) Adding alkalies

928. The catalyst used in the manufacture of ammonia is
   a) V_2O_5 b) Pt c) Fe d) $Ni(CO)_4$

929. F_2 is largely used in:
   a) Making Freon b) Making Teflon c) Rocket fuels d) All of these

930. Substance used in Holme's signal is:
   a) NH_3 b) PH_3 c) PH_5 d) P_2O_5

931. Which one of the following combines with Fe (II) ions to form a brown complex?
   a) NO b) N_2O c) N_2O_3 d) N_2O_5

932. All the three atoms of ozone are used up when it reacts with:
   a) H_2O_2 b) PbS c) KI d) SO_2

933. Which can act as an acid in sulphuric acid?
   a) HNO_3 b) H_3PO_4 c) $HClO_4$ d) H_2O

934. SO_2 reduces cupric ion to cuprous ion in presence of:
   a) KOH b) H_2O c) KCNS d) H_2SO_4

935. On heating a salt with NaOH, smell of NH_3 is obtained. The salt contains:
   a) NH_4^+ b) NO_3^- c) NO_2^- d) CH_3COO^-

936. The catalyst used in the manufacture of HNO_3 by Ostwald's process is:
   a) Platinum black b) Finely divided nickel c) Vanadium pentoxide d) Platinum gauze

937. Which is used in vulcanisation of rubber?
   a) SF_6 b) SF_4 c) SF_2 d) S_2Cl_2

938. Superphosphate of lime is obtained from the reaction of:
   a) Calcium carbonate with phosphoric acid
   b) Calcium phosphate with hydrochloric acid
   c) Calcium phosphate with sulphuric acid
   d) Bones with gypsum

939. The anhydride of orthophosphoric acid is:
   a) P_4O_{10} b) P_2O_5 c) P_4O_6 d) P_2O_3

940. Which is bad conductor of electricity?
   a) H_2F_2 b) HCl c) HBr d) HI

941. Which compound has an incorrect formula?
   a) Thionyl chloride— $SOCl_2$

b) Sulphuryl chloride— SO_2Cl_2
c) Oleum— $H_2S_2O_6$
d) Phosphorus oxychloride— $POCl_3$

942. Chromium dissolves in dil. H_2SO_4 to form $Cr(H_2O)_6^{2+}$. The colour of the ion is:
a) Blue b) Green c) Yellow d) Orange

943. The oxide that is not reduced by hydrogen in the hot is:
a) Ag_2O b) Fe_2O_3 c) CuO d) K_2O

944. Bleaching action of SO_2 is due to its
a) Oxidizing property b) Acidic property c) Basic property d) Reducing property

945. The chloric acid and chlorates are:
a) Good oxidizing agents
b) Bleaching agents
c) Undergo disproportionation on heating
d) All of the above

946. The oxidation number of xenon in $XeOF_2$ is
a) Zero b) 2 c) 4 d) 3

947. Which metal liberates H_2 with dil. nitric acid?
a) Zn b) Cu c) Mn d) Hg

948. When dry chlorine is passed over silver chlorate at 460 K, the product is:
a) Cl_2O b) ClO_2 c) ClO_3 d) ClO_4

949. $FeCl_3$ solution on reaction with SO_2 changes to:
a) $FeCl_2$ b) $Fe_2(SO_4)_3$ c) $Fe_2(SO_3)_3$ d) $FeSO_4$

950. Which of the following is known as Berthelot's salt?
a) $(NaPO_3)_6$ b) NaOCl c) $KClO_3$ d) KHF_2

951. Pb reacts with dilute HNO_3 gives
a) NO b) NH_4NO_3 c) N_2O_5 d) NO_2

952. The chemical used for cooling in refrigeration or in manufacture of ice is:
a) CS_2 b) NH_4OH c) NH_4Cl d) Liquid NH_3

953. If an allotropic form changes slowly to a stable form. It is called
a) Enantiotropy b) Dynamic allotropy c) Monotropy d) None of these

954. The percentage of N_2 in air is:
a) 75% by weight b) 78.7% by volume c) Both (a) and (b) d) None of these

955. Xenon best reacts with:
a) The most electropositive element
b) The most electronegative element
c) The hydrogen halides
d) Non-metals

956. 98% H_2SO_4 is:
a) Pyrosulphuric acid b) Oleum c) Azeotropic mixture d) None of these

957. Excess of KI reacts with $CuSO_4$ solution and then $Na_2S_2O_3$ solution is added to it. Which of the statement is incorrect for this reaction?
a) Evolved I_2 is reduced b) CuI_2 is formed c) $Na_2S_2O_3$ is oxidised d) Cu_2I_2 is formed

958. The gas used in the manufacture of ice-cream is:
a) CO_2 b) N_2O c) NO d) N_2O_3

959. A white precipitate is obtained on hydrolysis of:
a) PCl_5 b) NCl_3 c) $BiCl_3$ d) $AsCl_3$

960. The equation, $2KClO_3 \longrightarrow 2KCl + 3O_2$ indicates all of the following, except:
a) New compounds are formed
b) The reaction is exothermic
c) The law of conservation of mass is obeyed

d) The amount of $KClO_3$ decomposes

961. In a given sample of bleaching powder the percentage of available chlorine is 49. The volume of chlorine obtained if 10 g of the sample is treated with HCl at NTP is:
a) 1.5 litre b) 3.0 litre c) 15.0 litre d) 150 litre

962. Which one has the highest percentage of nitrogen?
a) Calcium nitrate b) Ammonium sulphate
c) Urea d) Ammonium nitrate

963. Which has maximum pH in aqueous solution?
a) NaClO b) $NaClO_2$ c) $NaClO_3$ d) $NaClO_4$

964. Which of the following is not a drying and dehydrating agent?
a) Silica gel b) P_2O_5 c) Conc. H_2SO_4 d) Hydrated $CaCl_2$

965. The compound that attacks pyrex glass is:
a) XeF_2 b) XeF_4 c) XeF_6 d) None of these

966. In the reaction $K + SO_2 \longrightarrow$ ...., the products are:
a) $KO_2 + S$ b) $K_2SO_3 + K_2S_2O_3$ c) K_2SO_4 d) None of these

967. Cl(OH)is:
a) An oxide b) A chloride c) A hydride d) An acid

968. Which of the following occurs in free state?
a) N b) P c) As d) Sb

969. Which one is not an acid salt?
a) NaH_2PO_2 b) NaH_2PO_3 c) NaH_2PO_4 d) None of these

970. Oxygen is gas but sulphur is solid because:
a) Oxygen is composed of discrete molecules while sulphur is polymeric
b) Molecular weight of sulphur is much higher than that of oxygen
c) Oxygen is a stronger oxidizing agent than sulphur
d) Boiling point of sulphur is much higher than that of oxygen

971. In contact process impurities of arsenic are removed by:
a) $Al(OH)_3$ b) $Fe(OH)_3$ c) $Cr(OH)_3$ d) Fe_2O_3

972. Concentrated sulphuric acid does not act as:
a) Efflorescent b) Hygroscopic c) Oxidizing agent d) Sulphonating agent

973. Which halogen does not react with water?
a) F_2 b) Cl_2 c) Br_2 d) I_2

974. Which hydride is most acidic?
a) H_2O b) H_2S c) H_2Te d) H_2Se

975. The discovery of isotopes began with the experiments with:
a) Xe b) Kr c) Ar d) Ne

976. In the oxo-acids of chlorine Cl— O bond contains:
a) $d\pi - d\pi$ bonding b) $p\pi - d\pi$ bonding c) $p\pi - p\pi$ bonding d) None of these

977. Arsenic acid is:
a) H_3AsO_3 b) H_3AsO_4 c) H_2AsO_4 d) $HAsO_4$

978. The halogen that is most readily reduced is:
a) Chlorine
b) Bromine
c) Iodine
d) Fluorine

979. The bond angle O—S—O and hybridization of sulphur in SO_2 are:
a) $119.5^\circ, sp^3$ b) $119.5^\circ, sp^2$ c) $109^\circ 28', sp^3$ d) None of these

980. Which of the element of nitrogen family produce maximum number of oxy-acids?
a) N b) P c) As d) Sb

981. Halogens are placed in the VIIA group or gp. 17 of the periodic table, because:

a) They are non-metals
b) They are very reactive
c) They are electronegative
d) They have 7 electrons in outermost orbit

982. Nitrosyl chloride is:
a) NOCl b) $NOCl_2$ c) NO_2Cl_2 d) N_2OCl_2

983. Which of the following gives M^{3-} ion most readily?
a) P b) N c) Sn d) As

984. There is very little difference in acid strength in the acids $H_3PO_4, H_3PO_3, H_3PO_2$ because:
a) Phosphorus in these acids exists in different oxidation states
b) The hydrogen in these acids are not all bound to the phosphorus and have same number of unprotonated oxygen
c) Phosphorus is highly electronegative element
d) Phosphorus oxides are less basic

985. Among the following molecule (i) XeO_3 (ii) $XeOF_4$ (iii)XeF_6
Those having same number of lone pairs on Xe are
a) (i) and (iii) only b) (i) and (ii) only c) (ii) and (iii) only d) (i), (ii) and (iii)

986. Which possesses highest percentage of ionic character?
a) HCl b) HBr c) HF d) HI

987. Bleaching powder slowly loses its activity when it stands in air. This is due to:
a) Reaction with moisture to liberate O_2
b) Auto oxidation
c) Loss of $CaCl_2$
d) Formation of $Ca(OH)_2$

988. Which statement is false?
a) NH_3 is a Lewis base
b) NH_3 molecule is triangular planar
c) NH_3 does not act as reducing agent
d) NH_3 (liquid) is used as a solvent

989. The number of hydrogen atom(s) attached to phosphorus atom in hypophorus acid is ?
a) Three b) One c) Two d) Zero

990. Which one of the following cations does not form a complex with ammonia?
a) Ag^+ b) Cu^{2+} c) Cd^{2+} d) Pb^{2+}

991. In the laboratory H_2S gas is prepared by using black lumps and dil. H_2SO_4. The black lumps are
a) $FeSO_4$ b) MnO_2 c) FeS d) $FeSO_3$

992. Nuclear fusion produces
a) Argon b) Deuterium c) Helium d) Krypton

993. Which possesses least stable covalent P—H bond?
a) PH_3 b) P_2H_6 c) P_2H_5 d) PH_6^+

994. The correct order of the thermal stability of hydrogen halides $(H-X)$is
a) HI>HCI<HF>HBr b) HCI<HF>HBr<HI c) HF>HCl>HBr>HI d) HI>HBr>HCl>HF

995. Noble gases can be separated by:
a) Passing them through some solutions
b) Electrolysis of their compounds
c) Adsorption and desorption on coconut charcoal
d) None of the above

996. Which of the following statements is not valid for oxoacids of phosphorus?
a) All oxoacids contain tetrahedral four coordinated phosphorus
b) All oxoacids contains atleast one $P=O$ unit and one P—OH group
c) Orthophosphoric acid is used in the manufacture of triple superphosphate

d) Hypophosphorous acid is a diprotic acid

997. Which statement is not true for astatine?
a) It is less electronegative than iodine
b) It exhibits only -1 oxidation state
c) Intermolecular forces between the astatine molecules will be larger than between the iodine molecules
d) It is composed of diatomic molecules

998. The only element in VIA group or group 16 elements, which is definitely a metal, is:
a) Tellurium b) Selenium c) Sulphur d) Polonium

999. The increasing order of reactivity of halogens is:
a) $I_2 < Br_2 < Cl_2, < F_2$ b) $Cl_2 < F_2 < Br_2 < I_2$ c) $Cl_2 < Br_2 < I_2 < F_2$ d) $I_2 < Cl_2 < Br_2 < F_2$

1000. Coconut charcoal at - 100°C adsorbs a mixture of:
a) He and Kr b) Ar, Kr and Xe c) Kr and Xe d) He and Ne

1001. Clathrates are
a) Non-stoichiometric compounds b) Complex compounds
c) Interstitial compounds d) Ionic compounds

1002. Two pungent smelling gases bleach a certain substance. The gases may be:
a) Cl_2 and SO_2 b) Cl_2 and NH_3 c) NH_3 and PH_3 d) O_2 and CO_2

1003. Nitrogen is an essential constituent of all:
a) Proteins b) Fats c) Proteins and fats d) None of these

1004. Mark the halogen which shows electropositive character:
a) F b) Cl c) Br d) I

1005. Which of the following is called Berthelot's salt?
a) $(NaPO_3)_6$ b) NaOCl c) $KClO_3$ d) KHF_2

1006. A compound which leaves behind no residue on heating is:
a) $Cu(NO_3)_2$ b) KNO_3 c) NH_4NO_3 d) None of these

1007. Phosphine on reaction with hydrobromic acid gives:
a) PBr_3 b) PH_4Br c) PBr_5 d) P_2H_4

1008. Bleaching powder has the molecular formula:
a) $CaClO_3$ b) CaClO c) $CaOCl_2$ d) $Ca(OCl)_2$

1009. Six volumes of oxygen, on complete ozonisation, form …. Volumes of ozone.
a) 2 b) 4 c) 6 d) 3

1010. Iodine solution stained on clothes can be removed by:
a) NaCl b) NaBr c) $Na_2S_2O_3$ d) $Na_2S_4O_6$

1011. The substance which does not liberate oxygen on treatment with ozone is
a) PbS b) HCl c) SO_2 d) Hg

1012. In the reaction $CaS + H_2S \rightarrow$ ….., the products are:
a) $CaS_2 + H_2$ b) $CaS_3 + H_2$ c) $CaS_5 + H_2$ d) $Ca + S$

1013. HI cannot be prepared by heating KI with conc. H_2SO_4 because:

3.

a) H_2SO_4 is stronger acid than HI
b) HI is stronger acid than H_2SO_4
c) H_2SO_4 is an oxidizing agent
d) HI is more volatile than H_2SO_4

101 Lead nitrate on heating gives lead oxide, nitrogen dioxide and oxygen. The reaction is known as:
4.

a) Combustion b) Combination c) Displacement d) Decomposition

101 Which hydride is the strongest base?
5.

a) AsH_3 b) NH_3 c) PH_3 d) SbH_3

101 Which forms maximum compounds with xenon?
6.

a) F b) Cl c) Br d) I

101 Claude's process is used in the manufacture of:
7.

a) N_2 b) NH_3 c) N_2O d) NO_2

101 Which is a saline oxide?
8.

a) Na_2O_2 b) BaO_2 c) Na_2O d) Fe_2O_3

101 Which set of elements has the strong tendency to form anions?
9.

a) N, O, F b) P, S, Cl c) As, Se, Br d) Sb, Te, I

102 Light blue colour of nitrous acid is due to dissolved:
0.

a) O_2 b) N_2 c) N_2O d) N_2O_3

102 Which one of the following pairs of reactants does not form oxygen when they react with each other?
1.

a) F_2, NaOH solution (hot, conc.) b) F_2, H_2O
c) Cl_2, NaOH solution (cold, dilute) d) $CaOCl_2$, H_2SO_4 , (dilute, small amount)

102 Oxide of a non-metal possesses the following characteristics: (i) It is both a proton donor and proton
2. acceptor. (ii) It is poor conductor of electricity. (iii) It reacts readily with basic and acidic oxides. (iv) It oxidses Fe at boiling point. The oxide is:

a) H_2O b) CO_2 c) H_2O_2 d) NO

102 Most unstable hydride is
3.

a) NH_3 b) PH_3 c) AsH_3 d) BiH_3

102 Phosphide ion has the electronic structure similar to that of:
4.

a) Nitride ion b) Chloride ion c) Fluoride ion d) Sodium ion

102 The gaseous mixture used by deep sea divers for respiration is:
5.

a) $N_2 + O_2$ mixture b) $He + O_2$ mixture c) $Ar + O_2$ mixture d) $Ne + O_2$ mixture

102 A gas that cannot be collected over water is
6.

a) SO_2 b) N_2 c) O_2 d) PH_3

102 Which is used in the manufacture of safe matchsticks?
7.

a) Red phosphorus b) Sulphur c) Selenium d) White phosphorus

102 Bond angle in O_3 molecule is:
8.

a) 108° 29' b) 108° 28' c) 116° 90' d) 120°

102 The noble gas which shows abnormal behaviour in liquid state and behave as super fluid is
9.

a) Ne b) He c) Ar d) Xe

103 Which of the following is not hydrolysed?
0.

a) PF_3 b) $SbCl_3$ c) $AsCl_3$ d) NF_3

103 NH_3 has a much higher boiling point than PH_3 because:
1.

a) NH_3 has a higher molecular weight
b) NH_3 undergoes umbrella inversion
c) NH_3 forms hydrogen bond
d) NH_3 contains ionic bonds whereas PH_3 contains covalent bonds

103 An element belongs to group 15 and third period of the periodic table. Its electronic configuration will be
2.

a) $1s^2\,2s^2\,2p^3$ b) $1s^2\,2s^2\,2p^4$ c) $1s^2\,2s^2\,2p^6\,3s^2 3p^3$ d) $1s^2\,2s^2\,2p^6\,3s^2\,3p^2$

103 The reagent used for testing ammonia is:
3.

a) Bayer's reagent b) Nessler's reagent c) Fenton's reagent d) Molisch reagent

103 Elements of nitrogen family having allotropic forms are:
4.

a) N, Sb, Bi b) N, P, As, Sb c) As, Sb, Bi d) P, As, Bi

103 An example of tetrabasic acid is:
5.

a) Orthophosphorus acid
b) Orthophosphoric acid
c) Metaphosphoric acid
d) Pyrophosphoric acid

103 Phosphoric acid is syrupy liquid due to:
6.

a) Strong covalent bond b) Van der Waals' forces c) Hydrogen bonding d) None of these

103 Two oxides of nitrogen NO and NO_2 react together at 253°K and form a compound of nitrogen *X*. *X* reacts
7. with water to yield another compound of nitrogen *Y*.
The shape of the anion of *Y* molecule is

a) Tetrahedral b) Triangular planar c) Square planar d) Pyramidal

103 The noble gas which forms maximum number of compounds is
8.

a) Ar b) He c) Ne d) Xe

103 When conc. H_2SO_4 is heated with P_2O_5, the acid is converted into
9.

a) Sulphure trioxide
b) Sulphur dioxide
c) Sulphur
d) A mixture of sulphur dioxide and sulphur trioxide

104 The most reactive allotropic form of phosphorus is:
0.

a) Red phosphorus b) Yellow phosphorus c) Black phosphorus d) Violet phosphorus

104 P_2O_5 when treated with cold water gives:
1.

a) Orthophosphoric acid b) Metaphosphoric acid c) Pyrophosphoric acid d) Hypophosphoric acid

104 Sodium pyrophosphate is represented by which of the following formula?

2.

a) $Na_2P_2O_4$ b) $Na_4P_2O_5$ c) $Na_4P_2O_7$ d) $Na_2P_2O_5$

104 Which of the following(s) when heated give nitrogen gas?

3.

a) $(NH_4)_2Cr_2O_7$ b) $Ba(N_3)_2$ c) NH_4NO_3 d) Both a and b

104 Ozone is readily dissolved in:

4.

a) Water b) Turpentine oil c) Carbon disulphide d) Ammonia

104 When $AgNO_3$ is heated strongly, the products formed are

5.

a) NO and NO_2 b) NO_2 and N_2O c) NO and O_2 d) NO_2 and O_2

104 Agron was discovered by

6.

a) Rayleigh b) Ramsay

c) Both (a) and (b) d) Frankland and Lockeyer

104 Phosphorus compound used as drying agent and desiccating agent is:

7.

a) PCl_3 b) PCl_5 c) P_4O_{10} d) P_4O_6

104 How many bonding electron pairs are there in white phosphorus ?

8.

a) 6 b) 12 c) 4 d) 8

104 Which of the following does not react with fluorine?

9.

a) Kr b) Ar c) Xe d) All of these

105 0. Which of the following causes damage to the building containing calcium and responsible for cough and choking in human?

a) Sulphur b) Carbon c) Nitrogen dioxide d) Sulphur dioxide

105 1. ClO^- disproportionate into

a) Cl^- and O b) Cl^- and ClO_3^- c) Cl and O d) Cl^- and O^-

105 2. Hydrofluoric acid is not preserved in glass bottles because:

a) It reacts with the visible part of light

b) It reacts with the sodium oxide of the glass composition

c) It reacts with the aluminium oxide of the glass composition

d) It reacts with the silicon dioxide of glass

105 3. SO_2 acts as temporary bleaching agent but Cl_2 acts as permanent bleaching agent. why?

a) Cl_2 bleaches due to reduction but SO_2 due oxidation

b) Cl_2 bleaches due to oxidation but SO_2 due to reduction.

c) Both of the above

d) None of the above

105 4. Liquid ammonia bottles be opened after cooling them in ice for some time. It is because liquid NH_3:

a) Brings tears in the eyes

b) Has a high vapour pressure

c) Is a corrosive liquid

d) Is a mild explosive

105 5. .... is the compound which can remove both oxygen and nitrogen of the air when it is passed over it at 1000°C.

a) CaC_2 b) $CaCl_2$ c) $CaCN_2$ d) $Ca(CN)_2$

105 The crystals of ferrous sulphate on heating give:
6.

a) $FeO + SO_2 + H_2O$
b) $Fe_2O_3 + H_2SO_4 + H_2O$
c) $Fe_2O_3 + SO_2 + H_2SO_4 + H_2O$
d) $FeO + SO_3 + H_2SO_4 + H_2O$

105 Which one of the following reactions does not occur ?
7.

a) $F_2 + Cl^- \longrightarrow 2F^- + Cl_2$
b) $Cl_2 + 2F^- \longrightarrow 2Cl^- + F_2$
c) $Br_2 + 2I^- \longrightarrow 2Br^- + I_2$
d) $Cl_2 + 2Br^- \longrightarrow 2Cl^- + Br_2$

105 By the action of hot conc H_2SO_4, phosphorus changes to
8.

a) Phosphorous acid
b) Metaphosphoric acid
c) Pyrophosphoric acid
d) Orthophosphoric acid

105 Which is an amphoteric oxide?
9.

a) SO_2
b) B_2O_3
c) ZnO
d) Na_2O

106 Anhydride of nitric acid is:
0.

a) NO
b) N_2O_3
c) N_2O_4
d) N_2O_5

106 Which of the following attacks glass:
1.

a) HCl
b) HF
c) HI
d) HBr

106 Which property of white phosphorus is common to red P?
2.

a) It is soluble in carbon disulphide
b) It shows chemiluminescence
c) It reacts with hot caustic soda solution to give phosphine
d) It burns when heated in air

106 Which one of the following pairs of substances when mixed, produces chlorine gas at room temperature?
3.

a) NaCl and MnO_2
b) NaCl and HNO_3 (conc)
c) NaCl and H_2SO_4 (conc)
d) HCl (conc) and $KMnO_4$

106 Oxygen is divalent, whereas sulphur exhibits valency of 2, 4 and 6 due to:
4.

a) S is bigger atom
b) Ionization potential of sulphur is more
c) S being less electronegative than O
d) Presence of *d*-orbitals in S

106 Which of the following elements is good conductor of electricity?
5.

a) As
b) Sb
c) Bi
d) All of these

106 Which one is known as oil of vitriol?
6.

a) $H_2S_2O_7$
b) H_2SO_3
c) $H_2S_2O_8$
d) H_2SO_4

106 The electrolysis of brine solution to manufacture chlorine is carried out in the:
7.

a) Dennis cell
b) Gray cell
c) Nelson cell
d) Solvay cell

106 The correct order of acidic strength is:
8.

a) $Al_2O_3 < SiO_2 < P_2O_3 < SO_2$

b) $SiO_2 < SO_2 < Al_2O_3 < P_2O_3$
c) $Al_2O_3 < SiO_2 < SO_2 < P_2O_3$
d) $SO_2 < P_2O_3 < SiO_2 < Al_2O_3$

106 Ozone molecule has …….. geometry.
9.

a) Linear b) Triangular c) Tetrahedral d) None of these

107 Which is not true for ozone?
0.

a) It oxidizes lead sulphide
b) It oxidizes potassium iodide
c) It oxidizes mercury
d) It cannot act as bleaching agent

107 The strongest oxidizing agent is:
1.

a) HNO_3 b) H_2SO_4 c) H_2SO_3 d) $H_2S_2O_3$

107 The oxidation states of phosphorus vary from:
2.

a) -1 to $+3$ b) -3 to $+3$ c) -3 to $+5$ d) -5 to $+1$

107 The following elelment forms a molecule with eight of its own atoms
3.

a) Si b) S c) Cl d) P

107 The correct order of acidic nature of oxides is in the order
4.

a) $NO<N_2O<N_2O_3<NO_2<N_2O_5$ b) $N_2O< NO< N_2O_3< NO_2<N_2O_5$
c) $N_2O_5< NO_2< N_2O_3< NO< N_2O$ d) $N_2O_5< N_2O_3,< NO_2< NO< N_2O$

107 Bleaching powder is mixed calcium salt of:
5.

a) HCl and HClO b) $HClO_2$ and HCl c) HClO and $HClO_2$ d) HCl and $HClO_3$

107 In compounds of type ECl_3, where $E = B$, P, As or Bi the angles Cl − E − Cl for different E are in the order
6.

a) $B > P > As > Bi$ b) $B > P = As = Bi$ c) $B < P = As = Bi$ d) $B < P < As < Bi$

107 Bleaching properties of bleaching powder are due to its:
7.

a) Oxidizing properties
b) Reducing properties
c) Basic properties
d) Disinfecting properties

107 One mole of calcium phosphide on reaction with excess water gives
8.

a) One mole of phosphorus pentoxide b) Two moles of phosphine
c) One mole of phosphine d) Two moles of phosphoric acid

107 Which noble gas has the least tendency to form compounds?
9.

a) He b) Ne c) Kr d) Xe

108 Mixture used on tips of matchsticks is:
0.

a) S + K b) Antimony sulphide c) $K_2Cr_2O_7$ + S + red P d) $K_2Cr_2O_7$ + K + S

108 A dark brown solid (X) reacts with NH_3 to form a mild explosive which decomposes to give a violet
1. coloured gas. (X) also reacts with H_2 to give an acid (Y). (Y) can also be prepared by heating its salt with H_3PO_4. X and Y are

a) Cl_2, HCl b) SO_2, H_2SO_4 c) Br_2, HBr d) I_2, HI

108 The catalyst used in the manufacture of H_2SO_4 by contact process is
2.

a) V_2O_3 b) V_2O_5 c) FeO d) Cu

108 Which one is the strongest reducing agent?
3.

a) NH_3 b) AsH_3 c) SbH_3 d) PH_3

108 Which among the following statements are correct?
4. (i)Carbon monoxide is neutral whereas SO_3 is acidic.
(ii)Potassium oxide is basic whereas nitrous oxide is acidic.
(iii) Aluminium and zinc oxides are amphoteric.
(iv) Sulphur trioxide is acidic whereas phosphorus pentoxide is basic.
(v) Carbon dioxide is neutal whereas sulphur dioxide is amphoteric

a) (ii) and (iii) b) (i) and (iv) c) (i) and (iii) d) (ii) and (iv)

108 Aqua fortis is:
5.

a) HNO_3 b) HNO_2 c) H_2NO_2 d) $H_2N_2O_2$

108 Which among the following is the strongest acid?
6.

a) HF b) HCl c) HBr d) HI

108 Which does not liberate O_2 on heating?
7.

a) MgO b) $NaNO_3$ c) Pb_3O_4 d) $KClO_3$

108 Late discovery of F_2 is due to its:
8.

a) High reactivity
b) High ionization potential
c) High electronegativity
d) High electron affinity

108 Peroxy acids are
9.

a) $H_2S_2O_3, H_2S_4O_6$ b) $H_2S_4O_6, H_2SO_5$ c) $H_2SO_5, H_2S_2O_8$ d) $H_2S_2O_3, H_2S_2O_8$

109 The pale-yellow coloured gas is:
0.

a) Cl_2 b) F_2 c) Br_2 d) I_2

109 Which of the following is a pseudohalogen?
1.

a) lCl_3 b) lCl_2^- c) $(CN)_2$ d) N_3^-

109 Cl_2 reacts with CS_2 in presence of I_2 catalyst to form
2.

a) $CHCl_3$ b) C_2H_5Cl c) CCl_4 d) C_2H_6

109 HBr and HI reduce sulphuric acid; HCl can reduce $KMnO_4$ and HF reduces:
3.

a) H_2SO_4 b) $KMnO_4$ c) $K_2Cr_2O_7$ d) None of these

109 A substance *X* when heated with sulphuric acid liberates a gas which turns starch paper blue. The
4. substance is:

a) NaCl b) NaBr c) NaI d) $NaNO_3$

109 NO_2 is not obtained on heating
5.

a) $AgNO_3$ b) KNO_3 c) $Cu(NO_3)_2$ d) $Pb(NO_3)_2$

109 Concentrated H_2SO_4 has great affinity for:
6.

a) H_2S b) H_2O c) CO_2 d) O_2

109 How can you synthesise nitric oxide in the laboratory?

7.

a) Zinc with cold and dilute HNO_3 b) Zinc with concentrated HNO_3

c) Copper with cold and dilute HNO_3 d) Heating NH_4NO_3

109 Number of $p\pi - d\pi$ bonds present in XeO_4 are

8.

a) Four b) Two c) Three d) zero

109 Which acid has P—P linkage?

9.

a) Hypophosphoric acid

b) Pyrophosphoric acid

c) Metaphosphoric acid

d) Orthophosphoric acid

110 By the action of concentrated hydrochloric acid on potassium chlorate we get this mixture of gases:

0.

a) $CO_2 + Cl_2$ b) $O_2 + ClO_2$ c) $Cl_2 + ClO_2$ d) $O_2 + Cl_2 + ClO_2$

110 Generally H_2O exists as a liquid while H_2S as a gas because:

1.

a) H_2O shows hydrogen bonding

b) Molecular weight of H_2S is higher

c) Bond angle in H_2O is larger

d) Size of 'O' atom is smaller than 'S' atom

110 Ammonium salts are oxidized in the soil to nitrites by:

2.

a) Denitrifying bacteria

b) Nitrifying bacteria

c) Ammonifying bacteria

d) Nitrosifying bacteria

110 Bleaching powder is a mixture of:

3.

a) Calcium hypochlorite and calcium chloride

b) Calcium chlorate and calcium chloride

c) Calcium hypochlorite and basic calcium chloride

d) Calcium chlorate and calcium hydroxide

110 When H_2S gas is passed through nitric acid, the product is

4.

a) Rhombic S b) Amorphous S c) Prismatic S d) None of these

110 The chemical formula for tartar emetic is:

5.

a) $\begin{array}{l}CH(OH)COOH\\ |\\ CH(OH)COOK\end{array}$ b) $\begin{array}{l}CH(OH)COONa\\ |\\ CH(OH)COOK\end{array}$ c) $\begin{array}{l}CH(OH)COOK\\ |\\ CH(OH)COOK\end{array}$ d) $\begin{array}{l}CH(OH)COOSbO\\ |\\ CH(OH)COOK\end{array}$

110 Iodine imparts brown colour to:

6.

a) Water b) Benzene c) Alcohol d) Chloroform

110 Neon is extensively used in:

7.

a) Cold storage units

b) Organic compounds

c) Medicines

d) Coloured electric discharge lamps

110 Fluorine exhibits an oxidation state of only -1 because
8.

a) It can readily accept an electron
b) It is very strongly electronegative
c) It is a non metal
d) It belongs to halogen family

110 When oxygen is passed through a solution of Na_2SO_3 we get:
9.

a) Na_2SO_4
b) Na_2S
c) $NaHSO_4$
d) NaH

111 F_2 on treatment with methane gives:
0.

a) CH_2F_2
b) CH_3F
c) CHF_3
d) All of these

111 Coloured oxide is nitrogen is:
1.

a) N_2O
b) NO
c) N_2O_4
d) NO_2

111 Oxalic acid on dehydration by conc. H_2SO_4 gives:
2.

a) $C + CO_2$
b) CO
c) CO_2
d) $CO + CO_2$

111 Which of the following is the life saving mixture for an asthma patient?
3.

a) Mixture of helium and oxygen
b) Mixture of neon and oxygen
c) Mixture of xenon and nitrogen
d) Mixture of argon and oxygen

111 SO_2 reacts with Cl_2 to yield:
4.

a) Thionyl chloride
b) Carbonyl chloride
c) Sulphuryl chloride
d) Sulphur monochloride

111 Which element is used in the preparation of pesticides?
5.

a) Arsenic
b) Bismuth
c) Antimony
d) Nitrogen

111 Which of the following is not a peroxy acid?
6.

a) Perphosphoric acid
b) Pernitric acid
c) Perdisulphuric acid
d) Perchloric acid

111 White phosphorus is:
7.

a) Strong poison
b) Mild poison
c) Non-poisonous
d) None of these

111 Which on heating with conc. H_2SO_4 gives violet vapours?
8.

a) Iodide
b) Nitrate
c) Sulphate
d) Bromide

111 Formation of ozonide is:
9.

a) Addition reaction
b) Substitution reaction
c) Decomposition
d) None of these

112 Which blue liquid is obtained on reacting equimolar amounts of two gases at $-30°C$?
0.

a) N_2O_4
b) N_2O
c) N_2O_3
d) N_2O_5

112 Which of the following is oxidised in air?
1.

a) CH_4
b) H_2O
c) NaCl
d) White phosphorus

112 Which statement is not correct?
2.

a) White and red phosphorus react with chlorine at room temperature

b) White phosphorus is metastable, while red phosphorus is stable
c) White phosphorus is lighter than red phosphorus
d) White phosphorus is highly poisonous, while red phosphorus is not

112 Which element does not form stable diatomic molecules?
3.

a) Iodine b) Phosphorus c) Nitrogen d) Oxygen

112 H_2S is a:
4.

a) Weak dibasic acid
b) Weak monobasic acid
c) Strong dibasic acid
d) Strong monobasic acid

112 Ozone oxidises moist sulphur to:
5.

a) SO_2 b) SO_3 c) H_2SO_4 d) None of these

112 Which element reacts with chlorine to give pentachloride?
6.

a) P b) As c) Sb d) All of these

112 Xenon hexafluoride reacts with silica to form a xenon compound X. The oxidation state of xenon in X is
7.

a) $+2$ b) $+4$ c) $+6$ d) 0

112 Anomalous behavior of oxygen is due to:
8.

a) High electronegativity
b) Small atomic size
c) Non-availability of d-orbitals
d) All of the above

112 In oxo-acids of halogen, $X = O$ bond is formed as a result of:
9.

a) $d\,\pi$ - $d\,\pi$ overlapping b) $p\,\pi$ - $p\,\pi$ overlapping c) $d\,\pi$ - $p\,\pi$ overlapping d) either of these

113 Fuming nitric acid is:
0.

a) Conc. $HNO_3 + NO_2$ b) Conc. $HNO_3 + NO_3$ c) Conc. $HNO_3 + N_2O_3$ d) Conc. $HNO_3 + NO$

113 When NaCl or KCl is heated with conc. H_2SO_4 and solid $K_2Cr_2O_7$, we get:
1.

a) Chromic chloride
b) Chromous chloride
c) Chromyl chloride (CrO_2Cl_2)
d) Chromic sulphate

113 Ozone is used for purifying water because
2.

a) It dissociates and release oxygen
b) Do not leave any foul smell like chlorine.
c) Kills bacteria, cyst, fungi and acts as a biocide.
d) All of the above

113 Nitrogen is a relatively inactive element because:
3.

a) Its atom has a stable electronic configuration
b) It has a low atomic radius
c) Its electronegativity is fairly high
d) Dissociation energy of its molecule is fairly high

113 The following species will not exhibit disproportionation reaction
4.

a) ClO^- b) ClO_2^- c) ClO_3^- d) ClO_4^-

113 Which of the following is used to prepare Cl_2 gas at room temperature from concentrated HCl?
5.

a) MnO_2 b) H_2S c) $KMnO_4$ d) Cr_2O_3

113 Arsine is:
6.

a) Solid b) Liquid c) Supersaturate liquid d) Gas

113 The arrangement of oxygen atoms around phosphorus atoms in P_4O_{10} is:
7.

a) Pyramidal b) Octahedral c) Square planar d) Tetrahedral

113 Most of the elementary gases are obtained by chemical reaction of their compounds. For example, chlorine
8. is obtained by allowing $KMnO_4$ to react with hydrochloric acid. Fluorine, however, can be obtained only by the electrolysis of a fluoride. This is because:

a) Fluorine is a highly reactive gas
b) Fluorine is the strongest chemical oxidizing agent
c) Fluorine is highly poisonous
d) It is easy to electrolyse a fluoride

113 The number of different oxides of chlorine is:
9.

a) 3 b) 4 c) 5 d) 6

114 The gas which does not show oxidizing and bleaching properties is:
0.

a) Chlorine b) Ozone c) Sulphur dioxide d) Nitrous oxide

114 Ammonia is generally manufactured for fertilizers by the reaction:
1.

a) $2NH_4Cl + Ca(OH)_2 \longrightarrow CaCl_2 + 2H_2O + 2NH_3$
b) By passing an electric discharge in a mixture of N_2 and H_2
c) By reducing the byproduct nitric acid
d) By passing a mixture of N_2 and H_2 under high pressure and moderate temperature over a catalyst

114 Which halide of nitrogen is least basic?
2.

a) NF_3 b) NCl_3 c) NI_3 d) NBr_3

114 Reagent used to distinguish H_2O_2 and O_3 is:
3.

a) PbS b) Starch and iodine c) KMnO4 d) Bleaching powder

114 Which one liberates Br_2 from KBr?
4.

a) I_2 b) HI c) Cl_2 d) SO_2

114 Which chloride is explosive?
5.

a) PCl_3 b) $AsCl_3$ c) NCl_3 d) $SbCl_3$

114 Extra pure N_2 can be obtained by heating
6.

a) NH_3 with CuO b) NH_4NO_3 c) $(NH_4)_2Cr_2O_7$ d) Ba $(N_3)_2$

114 Tincture of iodine is:
7.

a) I_2, KI and rectified spirit
b) I_2 and rectified spirit
c) KI and rectified spirit

d) I_2 and water

114 What are the products formed in the reaction of xenon hexafluoride with silicon dioxide?
8.

a) $XeSiO_4 + HF$ b) $XeF_2 + SiF_4$ c) $XeOF_4 + SiF_4$ d) $XeO_3 + SiF_2$

114 Mixture of sand and iodine can be separated by:
9.

a) Dissolving in water and filtering
b) Fractional crystallization
c) Sublimation
d) Separation is not possible

115 Cl_2 gas is evolved as byproduct in the manufacture of all the following elements except:
0.

a) Mg b) Na c) Al d) K

115 Which is more suitable for storing concentrated H_2SO_4?
1.

a) Copper vessel b) Aluminium vessel c) Earthen vessel d) Glass vessel

115 Sodium nitrate on heating with zinc dust and caustic soda gives:
2.

a) $NaNO_2$ b) NH_3 c) NO_2 d) N_2O

115 Which of the following forms vortex ring?
3.

a) P_2O_5 b) PH_3 c) NH_3 d) P_4O_{10}

115 When radioactive minerals like clevite, monazite and pitchblende are heated to 1273 k in vacuo the noble
4. gas obtained is

a) Rn b) Kr c) He d) Ne

115 Diamagnetic oxide of chlorine is:
5.

a) ClO_3 b) Cl_2O_6 c) ClO_2 d) None of these

115 Best absorbent for SO_2 is:
6.

a) H_2SO_4 b) $KOH(aq.)$ c) Water d) $CaCl_2$ anhyd.

115 In which reaction does SO_2 act as oxidizing agent?
7.

a) Acidified $KMnO_4$ b) Acidified $K_2Cr_2O_7$ c) Acidified C_2H_5OH d) H_2S

115 In one of the following reactions HNO_3 does not behave as an oxidizing agent Identify it
8.

a) $I_2 + 10HNO_3 \longrightarrow 2HIO_3 + 10NO_2 + 4H_2O$
b) $3Cu + 8HNO_3 \longrightarrow 3Cu(NO_3)_2 + 2NO + 4H_2O$
c) $4Zn + 10HNO_3 \longrightarrow 4Zn(NO_3)_2 + NH_4NO_3 + 3H_2O$
d) $2HNO_3 + P_2O_5 \longrightarrow 2HPO_3 + N_2O_5$

115 Bleaching powder is an example of:
9.

a) An acidic salt b) A complex salt c) A double salt d) A mixed salt

116 Iron sulphide is heated in air to form *A.* an oxide of sulphur. *A* is dissolved in water to give an acid. The
0. basicity of this acid is….

a) 2 b) 3 c) 1 d) zero

116 When ammonia is dissolved in water:
1.

a) It loses a proton
b) It loses an electron
c) It gains a proton from water molecule

d) It gains an electron from water molecule

116 The $S-S-S$ bond angle in S_8 molecule is

2.

a) 109.5° b) 105° c) 110° d) 60°

116 Which of the following is planar?

3.

a) XeF_2 b) XeO_2F_2 c) XeO_3F d) XeF_4

116 Which oxide of N is neutral?

4.

a) N_2O_3 b) N_2O_5 c) N_2O_4 d) N_2O

116 I_2 can exist in the oxidation states:

5.

a) -1, +1, +3, +5 b) -1, +1, +3 c) +3, +5, +7 d) -1, +1, +3, +5, +7

116 Ozone is manufactured by carrying silent electric discharge using:

6.

a) Siemens ozonizer
b) Brodie's ozonizer
c) Siemens and Halske's ozonizer
d) All of the above

116 Which forms new compound in air?

7.

a) H_2O in air b) O_2 in air c) N_2 in air d) Phosphorus in air

116 Which statement regarding He is incorrect?

8.

a) It is used in gas cooled nuclear reactor
b) It is used as a cryogenic agent for carrying out experiment at low temperature
c) It is used to produce and sustain powerful superconducting magnets
d) It is used to fill gas balloons instead of H_2 because it is lighter and non-combustible

116 Reactivity of NO is due to:

9.

a) Its low molecular weight
b) Its gaseous state
c) Odd electron
d) None of the above

117 Welding of magnesium can be done in an atmosphere of:

0.

a) O_2 b) He c) N_2 d) All of these

117 Colloidal sulphur is obtained by the action of HNO_3 on:

1.

a) H_2S b) HgS c) CaS_2 d) CaS_2O_3

117 Treatment of CS_2 with excess of Cl_2 gives:

2.

a) CCl_4 b) $CHCl_3$ c) Carbon black d) C_2H_5Cl

117 The oxygen family is characterised by the electronic configuration:

3.

a) $ns^2\ np^4$ b) $ns^2\ np^2$ c) $ns^1\ np^3$ d) $ns^2\ np^5$

117 Which one of the following noble gases is used in miner's cap lamps?

4.

a) Helium b) Neon c) Argon d) Krypton

117 Colour of bromine in CS_2 is:

5.

a) Green b) Orange c) Yellow d) Red

117 Bleaching powder on standing forms mixture of:

6.

a) $CaO + Cl_2$ b) $HOCl + Cl_2$ c) $CaCl_2 + Ca(ClO_3)_2$ d) $CaO + CaCl_2$

117 Which statement is not correct?

7.

a) Xe is the most reactive among the rare gases
b) He is an inert gas
c) Radon is obtained from decay of radium
d) The most abundant rare gas found in atmosphere is He

117 Which acid can combine with its own salt again?

8.

a) HF b) HBr c) HCl d) HI

117 Among the following the number of compounds that can react with PCl_5 to give $POCl_3$ is O_2 , CO_2, SO_2, H_2O,

9. H_2 SO_4, P_4O_{10}

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

118 When water is added in conc. H_2SO_4 the reaction is exothermic because:

0.

a) H_2SO_4 is viscous
b) Hydrates of H_2SO_4 are formed
c) H_2SO_4 is corrosive
d) None of the above

118 Polyanion formation is maximum in

1.

a) Nitrogen b) Sulphur c) Oxygen d) Boron

118 The solubility of noble gases in water shows the order:

2.

a) He > Ar > Kr > Ne > Xe
b) He > Ne > Ar > Kr > Xe
c) Xe > Kr > Ar > Ne > He
d) None of the above

118 Solid Cl_2O_6 exists as:

3.

a) $ClO_2^+ \cdot ClO_4^-$ b) Covalent species c) $(ClO_3)_2$ d) None of these

118 Which of the element listed below occurs in allotropic forms?

4.

a) Sulphur b) Copper c) Iodine d) Silver

118 Concentrated HNO_3 reacts with I_2 to gives

5.

a) HI b) HOI c) HIO_3 d) $HOIO_2$

118 Noble gases are adsorbed by:

6.

a) Finely divided Pd and Pt
b) Colloidal Pd
c) Coconut charcoal
d) All of the above

118 In which of the following, NH_3 is not used?

7.

a) Tollen's reagent
b) Nessler's reagent

c) Group reagent for the analysis of IV group basic radicals
d) Group reagent for the analysis of III group basic radicals

118 The element than oxidizes water to oxygen with evolution of heat is:
8.
a) Fluorine b) Chlorine c) Iodine d) Bromine

118 Which of the following compounds is not an "interpseudohalogen"?
9.
a) Cl_2N_3 b) BrCN c) ClCN d) ICN

119 Which is called stranger gas?
0.
a) Kr b) Xe c) He d) Ne

119 The ratio of the gases obtained on dehydration of HCOOH and $H_2C_2O_4$ by conc. H_2SO_4 is:
1.
a) 1 : 2 b) 2 : 1 c) 1 : 3 d) 3 : 1

119 Peroxy compound is:
2.
a) $H_2S_2O_8$ b) $H_2S_4O_8$ c) $H_2S_2O_6$ d) $H_2S_2O_3$

119 During bleaching of chlorine an antichlor is used to:
3.
a) Enhance bleaching action
b) Eliminate last traces of bleaching agent
c) Remove greases from the fibre
d) Liberate oxygen

119 T-shaped interhalogen compound is
4.
a) ClF_3 b) ICl c) ClF_5 d) IF_5

119 The catalyst used in Deacon's process for Cl_2 is:
5.
a) Al_2O_3 b) $CuCl_2$ c) $AlCl_3$ d) MnO_2

119 Nitre cake is:
6.
a) $NaHSO_4$ b) $NaNO_3$ c) $NaNO_2$ d) Na_2SO_4

119 Helium is used in balloons in place of hydrogen because it is
7.
a) Incobusible b) Lighter than hydrogen
c) Radioactive d) More abundant than hydrogen

119 The O—O bond length in ozone is:
8.
a) 1.27 Å b) 1.21 Å c) 1.34 Å d) 1.48 Å

119 The reaction in the Kipp's apparatus stops on closing the outlet, because:
9.
a) The acid becomes weak
b) Gas starts coming out form top
c) A protective film is formed on iron sulphide
d) The contact between sulphide and the acid is broken by the presence of gas collected in the free surface of the middle chamber

120 Sulphur hepto oxide is an anhydride of
0.
a) $H_2S_2O_8$ b) $H_2S_2O_7$ c) H_2SO_4 d) H_2SO_5

120 Hydrolysis of PI_3 yields:
1.

a) Monobasic acid and a salt
b) Monobasic acid and dibasic acid
c) Dibasic acid and tribasic acid
d) Monobasic acid and tribasic acid

120 Which is not poisonous?
2.

a) NH_3 b) PH_3 c) AsH_3 d) SbH_3

120 What is the number of sigma (σ) and pi (π) bonds present in sulphuric acid molecule?
3.

a) $6\sigma, 2\pi$ b) $6\sigma, 0\pi$ c) $2\sigma, 4\pi$ d) $2\sigma, 2\pi$

120 In sulphate ion the oxidation state of sulphur is +6 and the hybridization state of sulphur is:
4.

a) sp^2 b) sp^3 c) d^2sp^3 d) sp^3d^2

120 The element evolving two different gases on reaction with conc. Sulphuric acid is
5.

a) P b) C c) Hg d) S

120 Which statement is correct?
6.

a) Ozone is a resonance hybrid of oxygen
b) Ozone is an allotropic modification of oxygen
c) Ozone is an isomer of oxygen
d) Ozone has no relationship with oxygen

120 When sulphur is boiled with Na_2SO_3 solution, the compound formed is
7.

a) Sodium thiosulphate b) Sodium sulphate c) Sodium sulphide d) Sodium persulphate

120 Number of valence electrons used in the Lewis structure of SO_4^{2-} are:
8.

a) 22 b) 20 c) 18 d) None of these

120 The shape of IF_7 molecule is:
9.

a) Octahedral
b) Pentagonal bipyramidal
c) Tetrahedral
d) Trigonal bipyramidal

121 The strongest acid amongst the following is
0.

a) HClO b) $HClO_2$ c) $HClO_3$ d) $HClO_4$

121 In ordinary Cl_2 gas Cl^{35} and Cl^{37} are in the ratio:
1.

a) 1 : 3 b) 3 : 1 c) 1 : 1 d) 1 : 2

121 Which group is called buffer group of the periodic table?
2.

a) I b) VII c) VIII d) Zero

121 Gradual addition of electronic shells in the noble gases causes a decrease in their
3.

a) Ionisation energy b) Density c) Boiling point d) Atomic radius

121 Colour of iodine solution is disappeared by shaking it with aqueous solution of
4.

a) Na_2S b) $Na_2S_2O_3$ c) Na_2S d) Na_2SO_4

121 S—S bond is not present in

5.

a) $H_2S_2O_4$ b) $H_2S_2O_6$ c) $H_2S_2O_8$ d) None of these

121 Which one among the following non-metals is liquid at 25°C?

6.

a) Bromine b) Sulphur c) Phosphorus d) carbon

121 A radioactive element is:

7.

a) Sulphur b) Polonium c) Tellurium d) Selenium

121 Metalloid among the following is:

8.

a) O b) S c) Te d) Po

121 The basic character of hydrides of the V-group elements decreases in the order

9.

a) $NH_3 > SbH_3 > PH_3 > AsH_3$ b) $SbH_3 > AsH_3 > PH_3 > NH_3$

c) $NH_3 > PH_3 > AsH_3 > SbH_3$ d) $SbH_3 > PH_3 > AsH_3 > NH_3$

122 At room temperature, H_2O is liquid while H_2S is a gas. The reason is

0.

a) Electronegativity of O is greater than S

b) Difference in the bond angles of both the molecules

c) Association takes place in H_2O due to H-bonding while no H-bonding in H_2S

d) O and S belong to different periods

122 The correct order for decreasing acidic strength of oxoacids of gp.15 is:

1.

a) $HNO_3 > H_3SbO_4 > H_3AsO_4 > H_3PO_4$

b) $H_3PO_4 > H_3AsO_4 > H_3SbO_4 > HNO_3$

c) $HNO_3 > H_3PO_4 > H_3AsO_4 > H_3SbO_4$

d) $HNO_3 > H_3AsO_4 > H_3PO_4 > H_3SbO_4$

122 Chlorine gas can be dried by passing over:

2.

a) Quick lime

b) Soda lime

c) Caustic potash sticks

d) Concentrated sulphuric acid

122 Which of the following bonds will be most polar?

3.

a) N—Cl b) O—F c) N—F d) N—N

122 The metal which forms amide on passing NH_3 on it at 300°C is:

4.

a) Magnesium b) Lead c) Aluminium d) sodium

122 The first noble gas compound obtained was:

5.

a) XeF_2 b) XeF_4 c) $XePtF_6$ d) $XeOF_4$

122 Sulphurous acid can be used as:

6.

a) Oxidizing agent b) Reducing agent c) Bleaching agent d) All of these

122 The ease of liquefaction of noble gases decreases in the order:

7.

a) He > Ne > Ar > Kr > Xe

b) Xe > Kr > Ar > Ne > He

c) Kr > Xe > He > Ar > Ne

d) Ar > Kr > Xe > He > Ne

122 The reason why conc H_2SO_4 is used largely to prepare other acids is that conc H_2SO_4
8.

a) Is highly ionised
b) Is dehydrating agent
c) Has high specific gravity and density
d) Has a high boiling point

122 A cold, green flame can be made by passing CO_2 over warm:
9.

a) Bronze
b) White P
c) Grey Sn
d) Green candles

123 Which one of the following reacts with glass?
0.

a) H_2SO_4
b) HF
c) HNO_3
d) $K_2Cr_2O_7$

123 Super halogen is:
1.

a) F_2
b) Cl_2
c) Br_2
d) I_2

123 The gas which is supporter of combustion is:
2.

a) NH_3
b) N_2O
c) NO_2
d) N_2O_5

123 The halide that cannot act as Lewis acid is:
3.

a) $SiCl_4$
b) $SnCl_4$
c) CCl_4
d) SF_4

123 Which gives off oxygen on moderate heating?
4.

a) Cupric oxide
b) Mercuric oxide
c) Zinc oxide
d) Aluminium oxide

123 Which is the true covalent oxide of iodine?
5.

a) I_2O_4
b) I_2O_5
c) I_2O_8
d) I_4O_9

123 Which element out of He, Ar, Kr and Xe forms least number of compounds?
6.

a) Kr
b) Xe
c) Ar
d) He

123 Which one is the anhydride of $HClO_4$?
7.

a) ClO_2
b) Cl_2O_7
c) Cl_2O
d) Cl_2O_6

123 Dry bleaching is done by:
8.

a) Cl_2
b) SO_2
c) O_3
d) H_2O_2

123 Which chemical contains chlorine?
9.

a) Fischer salt
b) Epsom salt
c) Fermy's salt
d) Spirit of salt

124 Which reaction represents the oxidizing behaviour of H_2SO_4?
0.

a) $2PCl_5 + H_2SO_4 \longrightarrow 2POCl_3 + 2HCl + SO_2Cl_2$
b) $2NaOH + H_2SO_4 \longrightarrow Na_2SO_4 + 2H_2O$
c) $NaCl + H_2SO_4 \longrightarrow NaHSO_4 + HCl$
d) $2HI + H_2SO_4 \longrightarrow I_2 + SO_2 + 2H_2O$

124 Which statement is wrong?
1.

a) Oxygen and Sulphur belong to the same group of periodic table
b) Oxygen is a gas while Sulphur is solid
c) Both show +2, +4 and +6 oxidation states
d) H_2S shows no hydrogen bonding

124 Concentrated sulphuric acid can be reduced by
2.

a) NaCl b) NaF c) NaOH d) NaBr

124 3. A solution of SO_2 in water reacts with H_2S precipitating sulphur. Here SO_2 acts as:

a) An oxidizing agent b) A reducing agent c) An acid d) A catalyst

124 4. Sulphuric acid has great affinity for water because

a) Acid decomposes water
b) It hydrolyses the acid
c) It decomposes the acid
d) Acid forms hydrates with water

124 5. Correct order of electron affinities of halogens is

a) F>Cl>Br>I b) I>Br>Cl>F c) Cl>F>I>Br d) Cl>F>Br>I

124 6. The correct order of acidity of halogenic acids is

a) HF<HCl<HBr<HI
b) HI<HBr<HCl<HF
c) HI<HCl<HBr<HF
d) HF<HBr<HI<HCl

124 7. Pearl white is:

a) BiOCl b) SbOCl c) NOCl d) AsOCl

124 8. The nitrate which when heated gives-off a gas or a mixture of gases which cannot relight a glowing splinter is:

a) Sodium nitrate b) Ammonium nitrate c) Lead nitrate d) Potassium nitrate

124 9. H_2SO_4 acts as dehydrating agent in its reaction with:

a) $Ba(OH)_2$ b) Zn c) KOH d) $H_2C_2O_4$

125 0. Nitric oxide is prepared by the action of cold dil. HNO_3 on :

a) Fe b) Cu c) Sn d) Zn

125 1. Which of the following halogen acids has the lowest melting point?

a) HF b) HCl c) HBr d) HI

125 2. The lone pair present on N family hydrides more easily participates in bond formation in:

a) AsH_3 b) PH_3 c) NH_3 d) SbH_3

125 3. Which does not react with $KMnO_4$ solution?

a) O_3 b) H_2O_2 c) H_2S d) H_2SO_3

125 4. Noble gases are prepared by the:

a) Condensation of gases of the air
b) Fractionation of liquid oxygen
c) Removal of nitrogen and oxygen from air
d) Fractionation of liquid air

125 5. When an aqueous solution of hypochlorite is heated:

a) Chlorine is evolved
b) Chlorite is formed
c) Chlorate is formed
d) Chlorine peroxide is formed

125 6. Sodium chromite is:

a) Na_2CrO_4 b) $Na_2Cr_2O_4$ c) $Na_2Cr_2O_7$ d) $Cr_2(SO_4)_3$

125 Liquor ammonia bottles are opened only after cooling because it has high vapour pressure and it is mild explosive.

a) It is a mild explosive
b) It generates high vapour pressure
c) Both a and b
d) It is a lachrymatory

125 Which is the most volatile compound?

a) HCl
b) HI
c) HBr
d) HF

125 In halogen's group which elements has highest electron affinity?

a) F
b) Cl
c) Br
d) I

126 Which halogens oxidises water to oxygen exothermally?

a) Fluorine
b) Chlorine
c) Bromine
d) Iodine

126 Chlorine is mixed with drinking water so that:

a) Bacteria are killed
b) Dirt is removed
c) Water is cleaned
d) Suspension is removed

126 In smoke screens calcium phosphide is used, because it:

a) Catches fire easily
b) Burns and gives soot
c) Forms phosphine which gives smoke
d) None of the above

126 The non-metallic element whose molecules contain maximum number of its atoms is:

a) O
b) Si
c) As
d) P

126 Aqua-regia is

a) 1:3 conc. HNO_3 and conc. HCl
b) 1:2 conc. HNO_3 and conc. HCl
c) 3:1 conc. HNO_3 and conc. HCl
d) 2:1 conc. HNO_3 and conc. HCl

126 XeO_2F_2 is obtained by partial bydrolysis of

a) $XeOF_4$
b) XeF_6
c) Both (a) and (b)
d) None of these

126 Interhalogen compounds are more reactive than the individual halogen because:

a) Two halogens are present in place of one
b) They are more ionic
c) Their bond energy is less than the bond energy of the halogen molecule
d) They carry more energy

126 Oxalic acid when heated with conc. H_2SO_4, gives

a) H_2O_2 and CO_2
b) CO and CO_2
c) H_2O_2 and CO
d) CO_2 and H_2S

126 Which of the following isotopes is present in largest amount?

a) O^{16}
b) O^{17}
c) O^{18}
d) All in equal amounts

126 Who observed helium first on the earth?

a) Lothar Meyer
b) Ramsay
c) Sheele
d) Rutherford

127 The group 15 or VA group elements are commonly known as:
0.

a) Halogens b) Normal elements c) Pnictogens d) None of these

127 In the reduction of HNO_3 to N_2O, the number of mole of electrons involved per mole of HNO_3 is:
1.

a) 8 b) 4 c) 3 d) 6

127 Sulphuric acid reacts with PCl_5 to yield:
2.

a) Thionyl chloride b) Sulphuryl chloride c) Phosphoric acid d) Sulphur monochloride

127 Which of the following compounds can not be stored in glass vessels?
3.

a) XeF_4 b) XeF_6 c) XeO_3 d) XeF_2

127 Which is tribasic acid?
4.

a) H_3PO_2 b) H_3PO_4 c) $H_4P_2O_7$ d) H_3PO_3

127 Which substance chars when warmed with conc. H_2SO_4?
5.

a) Protein b) Fat c) Hydrocarbon d) Carbohydrate

127 When fluoride is heated with conc. H_2SO_4 and MnO_2 the gas evolved is:
6.

a) HF b) F_2 c) SF d) None of these

127 The compound of sulphur used as a solvent in rubber industry is
7.

a) $SO_2(OH)Cl$ b) SO_2 c) SO_3 d) S_2Cl_2

127 Which one can be used to test for H_2S gas?
8.

a) A smell of rotten egg
b) A violet colouration with sodium nitroprusside
c) Turning lead acetate paper black
d) All of the above

127 When H_2S is passed through nitric acid solution, the product formed is:
9.

a) Milk of Sulphur b) colloidal Sulphur c) γ – sulphur d) β – sulphur

128 Sulphurous anhydride is:
0.

a) SO_2 b) SO_3 c) HSO_3^- d) SO_3^{2-}

128 The percentage of ozone in ozonized oxygen is about:
1.

a) 10% b) 40% c) 80% d) 100%

128 The weakest acid among the following is:
2.

a) HClO b) HBr c) $HClO_3$ d) HCl

128 White phosphorus may be separated from red phosphorus by:
3.

a) Sublimation b) Distillation c) Dissolving in CS_2 d) None of these

128 The correct order of bond angles in H_2S, NH_3, BF_3 and SiH_4 is:
4.

a) $H_2S < NH_3 < BF_3 < SiH_4$
b) $NH_3 < H_2S < SiH_4 < BF_3$
c) $H_2S < NH_3 < SiH_4 < BF_3$

d) $H_2S < SiH_4 < NH_3 < BF_3$

128 Solid PCl_5 exists as:

5.

a) PCl_5 b) PCl_4^+ c) PCl_6^- d) PCl_4^+ and PCl_6^-

128 Among the fluorides given below which will further react with F_2?

6.

a) NaF b) CaF_2 c) SF_6 d) IF_5

128 Ammonia is soluble in water because it is:

7.

a) A polar molecule b) Bronsted base c) Both (a) and (b) d) None of these

128 Formula of iodine phosphate is:

8.

a) I_3PO_4 b) $I_2(PO_4)_3$ c) IPO_4 d) I_2PO_4

128 The tetrahedral nature of the three bonds in a chlorate ion (ClO_3^-)is due to:

9.

a) The presence of a lone pair of electrons

b) sp^3-hybridization

c) sp^2-hybridization

d) Trigonal bipyramidal shape of ion

129 Which acid on keeping for long time acquires brown colour?

0.

a) HF b) HCl c) HBr d) HI

129 Potassium chlorate on heating with conc. H_2SO_4 gives:

1.

a) Chlorine dioxide b) $HClO_4$ c) $KHSO_4$ d) All of these

129 In the reaction, $HNO_3 + P_4O_{10} \rightarrow 4HPO_3 + x$, the product x is

2.

a) NO_2 b) N_2O_5 c) N_2O_3 d) H_2O

129 Which has the strongest bond?

3.

a) $F - Br$ b) $F - Cl$ c) $F - F$ d) $Cl - Br$

129 The forces of cohesion in liquid helium are:

4.

a) Covalent b) Ionic c) Van der Waals' d) Metallic

129 When molten sulphur is suddenly cooled by pouring into water, it takes the form of

5.

a) Milk of sulphur b) Colloidal sulphur c) Flower of sulphur d) Plastic sulphur

129 Which does not react with H_2SO_4 to form H_2?

6.

a) Al b) Pb c) Zn d) Mg

129 A certain compound when burnt gave three oxides. The first turned lime water milky, the second turned

7. cobalt chloride paper pink and the third formed an aqueous solution of pH 3 nearly. The elements present in the compound are:

a) C, S, O b) C, H, Na c) C, H, S d) C, H, Ca

129 The starting material in Birkeland and Eyde's process for the manufacture of HNO_3 is:

8.

a) NH_3 b) NO_2 c) Air d) Chile saltpetre

129 Anhydride of sulphuric acid is:

9.

a) SO_2 b) SO_3 c) $H_2S_2O_3$ d) H_2SO_3

130 The essential element of nitrogen fixation is:
0.

a) Zn b) Cu c) Mo d) B

130 Which one of the following configuration represents a noble gas?
1.

a) $1s^2, 2s^2\ 2p^6, 3s^2$ b) $1s^2, 2s^2\ 2p^6, 3s^1$

c) $1s^2, 2s^2\ 2p^6$ d) $1s^2, 2s^2 2p^6, 3s^2\ 3p^6, 4s^2$

130 Which halogen do not form polyhalide ion?
2.

a) F b) Cl c) Br d) I

130 Oxygen is manufactured by fractional distillation of:
3.

a) H_2O b) H_2O_2 c) Na_2O_2 d) Liquid air

130 Which is not the property of nitrogen?
4.

a) Hydrogen bonding b) Catenation c) Supporter of life d) Low b.p.

130 Which metal loses its meniscus after reaction with ozone?
5.

a) Ag b) Hg c) Pb d) Cu

130 The two electrons in helium atom:
6.

a) Occupy different shells
b) Have different spins
c) Have the same spins
d) Occupy different subshells of the same subshell

130 Which of the following is not tetrahedral?
7.

a) SCl_4 b) SO_4^{2-} c) $Ni(CO)_4$ d) $NiCl_4^{2-}$

130 The hydrolysis of PCl_3 produces:
8.

a) $H_3PO_3 + HClO$ b) $H_3PO_3 + HCl$ c) $H_3PO_4 + HCl$ d) $PH_3 + HClO$

130 NaOH can absorb :
9.

a) N_2O_5 b) NO c) N_2O d) All of these

131 The electron affinity of halogens shows the order:
0.

a) I > Cl > F > Br b) Cl > F > Br > I c) F > Cl > I > Br d) F > I > Cl > Br

131 On heating ozone its volumes:
1.

a) Decreases to half
b) Becomes double
c) Increases to 3/2 times
d) Remains unchanged

131 Which non-metal does not combine directly with Cl_2, Br_2 and I_2?
2.

a) Carbon b) Nitrogen c) Oxygen d) All of these

131 Oleum or fuming H_2SO_4 is:
3.

a) A mixture of conc. H_2SO_4 and oil
b) Sulphuric acid which gives fumes of sulphur dioxide

c) Sulphuric acid saturated with sulphur trioxide, *i.e.*, $H_2S_2O_7$
d) A mixture of sulphuric acid and nitric acid

131 4. N_2 forms NCl_3, whereas P can form both PCl_3 and PCl_5 why?
a) P has low lying 3*d* orbitals which can be used for bonding but N_2 does not have low lying 2*d* orbital
b) N_2 atom is larger than P in size
c) P is more reactive towards Cl than N_2
d) None of the above

131 5. Which of the following is pseudohalogen?
a) IF_7 b) $(CN)_2$ c) ICl_2 d) I_3^-

131 6. The decreasing order of b.p. or m.p. of halogens is:
a) $I_2 > Br_2 > Cl_2 > F_2$ b) $F_2 > Cl_2 > I_2 > Br_2$ c) $Cl_2 > Br_2 > I_2 > F_2$ d) $F_2 > I_2 > Cl_2 > Br_2$

131 7. Nitrogen (I) oxide is produced by:
a) Thermal decomposition of ammonium nitrate
b) Disproportionation of N_2O_4
c) Thermal decomposition of ammonium nitrite
d) None of the above

131 8. SO_3 on reacting with conc. HCl gives:
a) Chlorosulphonic acid b) $Cl_2 + H_2SO_3$ c) $Cl_2 + H_2SO_4$ d) None of these

131 9. An inorganic compound producing organic compound on heating is:
a) Sodamide b) Ammonium cyanate c) Sodalime d) Potassium cyanide

132 0. Formula of calcium chlorite is:
a) $CaClO_2$ b) $Ca(ClO_2)_2$ c) $Ca(ClO_3)_2$ d) $Ca(ClO_4)_2$

132 1. The gas not absorbed by coconut charcoal is
a) He b) Ne c) Ar d) Kr

132 2. A black sulphide when treated with ozone becomes white. The white compound is:
a) $ZnSO_4$ b) $CaSO_4$ c) $BaSO_4$ d) $PbSO_4$

132 3. Sulphur on oxidation with hot sulphuric acid gives:
a) SO_3 b) SO_2 c) H_2SO_4 d) None of these

132 4. Which loses weight on exposure to the atmosphere?
a) Conc. H_2SO_4
b) NaOH
c) Anhyd. $AlCl_3$
d) Saturated aqueous solution of CO_2

132 5. The correct order of heat of formation of halogen acids is?
a) HI>HBr>HCl>HF b) HF>HCl>HBr>HI c) HCl>HF>HBr>HI d) HCl>HBr>HF>HI

132 6. The number of $P-O-P$ bridges in the structure of phosphorus pentoxide and phosphorus trioxide are respectively
a) 5, 5 b) 6, 5 c) 5, 6 d) 6, 6

132 Rhombic and monoclinic sulphur are:

7.

a) Isobars b) Isomers c) Isotopes d) Allotropes

132 Copper turning on heating with conc.H_2SO_4 produce

8.

a) H_2S b) O_2 c) SO_3 d) SO_2

132 Which one of the following represents noble gas configuration?

9.

a) $1s^2,2s^2\ 2p^6,3s^2 3p^6 3d^{10},\ 4s^2\ 4p^6 4d^{10},\ 5s^2,5p^6\ 5d^6,6s^2$

b) $1s^2,2s^2\ 2p^6,3s^2 3p^6 3d^{10},4s^2\ 4p^6 4d^{10}\ 5s^2 5p^6\ 5d^1,\ 6s^2$

c) $1s^2,2s^2 2p^6,3s^2 3p^6 3d^{10},\ 4s^2\ 4p^6 4d^{10}\ , 5s^2 5p^6$

d) $1s^2,2s^2 2p^6,3s^2 3p^6 3d^{10},\ 4s^2\ 4p^6 4f^{14}\ ,5s^2 5p^6\ 5d^1$

133 Which of the following is more acidic in nature?

0.

a) HClO b) $HClO_2$ c) $HClO_3$ d) $HClO_4$

133 The lattice energy of lithium halides in the following order

1.

a) LiF > LiCl > LiBr > LiI b) LiI > LiBr > LiCl > LiF

c) LiCl > LiF > LiBr > LiI d) LiBr > LiCl > LiF > LiI

133 Iodine readily dissolves in potassium iodide solution giving

2.

a) I^- b) KI^- c) KI_2^- d) KI_3

133 Which one of the following is not true at room temperature and pressure?

3.

a) P_4O_{10} is a white solid b) SO_2 is a colourless gas

c) SO_3 is a colourless gas d) No_2 is brown gas

133 Amongst H_2O, H_2S, H_2Se and H_2Te one having higher b.pt. is

4.

a) H_2S because of hydrogen bonding b) H_2Se because of lower molecular weight

c) H_2Te because of higher molecular weight d) H_2O because of hydrogen bonding

133 Which of the following acid posses oxidising, reducing and complex forming properties?

5.

a) HCl b) H_2SO_4 c) HNO_2 d) HNO_3

133 The number of π-bonds present in NCl_3 is:

6.

a) 1 b) 2 c) 3 d) None of these

133 Ammonium chloride is removed from its mixture by:

7.

a) Filtration b) Distillation c) Sublimation d) A magnet

133 White smoke is formed when ammonia gas meets with:

8.

a) Water b) HCl c) H_2SO_4 d) HNO_3

133 Pure Cl_2 is prepared on heating:

9.

a) NaCl b) $PtCl_4$ c) $CuCl_2$ d) All of these

134 Liquid ammonia is used in refrigeration because of its

0.

a) High dipole moment b) High heat of vaporisation

c) High basicity d) All of the above

134 The acid used in soft drinks is:
1.

a) H_3PO_4 b) H_3PO_3 c) HPO_3 d) H_3PO_2

134 Which of the elements of group VA does not show allotropy?
2.

a) N b) Bi c) P d) As

134 In the electrothermal process, the compound displaced by silica from calcium phosphate is
3.

a) Calcium phosphide b) Phosphine
c) Phosphorus d) Phosphorus pentoxide

134 It is possible to obtain oxygen from air by fractional distillation because:
4.

a) Oxygen is in different group of periodic table from nitrogen
b) Oxygen is more active than nitrogen
c) Oxygen has higher boiling point than nitrogen
d) Oxygen has lower density than nitrogen

134 NH_3 is an example of:
5.

a) Molecular hydride b) Polymeric hydride c) Metallic hydride d) Interstitial hydride

134 When SO_2 reacts with nitrous acid, the compound formed is:
6.

a) H_2S b) S c) SO_3 d) H_2SO_4

134 Among the halogens, the one which is oxidized by nitric acid is
7.

a) Iodine b) Bromine c) Fluorine d) Chlorine

134 Which is most basic of the following oxides?
8.

a) Na_2O b) BaO c) As_2O_3 d) Al_2O_3

134 Which is stronger acid?
9.

a) H_2SeO_4 b) H_2SO_4 c) H_2TeO_4 d) H_2O

135 Ammonia on reaction with hypochlorite anion, can form
0.

a) NO b) N_2H_4 c) NH_4Cl d) HNO_2

135 Which of the following compounds do not exist?
1.

a) N_4, NCl_5, PO_2 b) N_2, NCl_3, NO_2 c) PCl_5, P_2O_5, NCl_3 d) PO_2, P_4, NCl_3

135 Oxidation of ammonia by CuO yields:
2.

a) N_2 b) N_2O_5 c) NO d) NO_2

135 For chrome plating the electrolytic bath contains:
3.

a) $HClO_4$ and conc. H_2SO_4 b) Chromic acid and conc. Ic) $K_2Cr_2O_7$ d) Chromic sulphate

135 At T (K), 100 L of dry oxygen is present in a sealed container. It is subjeceted to silent electric discharge,
4. till the volumes of oxygen and ozone becomes equal .what is the volume of ozone formed at T (K)?

a) 50 b) 60 c) 30 d) 40

135 What is the correct order of occurrence (% by weight) in air of Ne, Ar and Kr?
5.

a) Ne>Ar>Kr b) Ar>Ne>Kr c) Ar>Kr>Ne d) Ne>Kr>Ar

135 The source of most of the noble gases is:

6.

a) Decay of radioactive minerals
b) The atmospheric air
c) The natural gases coming out of the earth
d) The decay of rocks

135 Incorrect statement for pyrophosphorus acid $H_4 P_2 O_5$ is
7.

a) It contains p in +5 oxidation state
b) It is dibasic acid
c) It is strongly reducing in nature
d) In contains one P—O—P bond

135 $SO_2 + H_2S \longrightarrow$ product. The final product is
8.

a) H_2O+S b) H_2SO_4 c) H_2SO_3 d) $H_2S_2O_3$

135 Pure HBr gas may be obtained by heating sodium bromide with syrupy phosphoric acid and not with
9. concentrated sulphuric acid because concentrated sulphuric acid is:

a) More volatile b) Less stable c) A weaker acid d) An oxidizing agent

136 Fertilizer having the highest nitrogen percentage is:
0.

a) Calcium cyanamide b) Urea c) Ammonium nitrate d) Ammonium sulphate

136 Which gas is evolved by the treatment of magnesium with very dilute solution on HNO_3?
1.

a) N_2 b) NO_2 c) H_2 d) H_2O

136 In colour discharge tubes, which is used?
2.

a) Ne b) Ar c) Kr d) He

136 Which of the following hydrogen halides has the highest boiling point?
3.

a) HI b) HBr c) HCl d) HF

136 Which of the following statement is not true?
4.

a) HF is stronger than HCl
b) Among halide ions, iodide is the most powerful reducing agent
c) Radon is obtained from decay of Radium
d) Xe is most reactive gas among the rare gas

136 In which of the following chlorine is not used:
5.

a) As germicide b) As oxidant c) As cutting tool d) As disinfectant

136 Solubility of iodine in water may be increased by adding
6.

a) Chloroform
b) Potassium iodide
c) Carbon disulphide
d) Sodium thiosulphate

136 Platinum, palladium and iridium are called noble metals because
7.

a) Alfred nobel discovered them
b) They are found in native state
c) They are shining lustrous and pleasing to look at
d) They are inert towards many common reagents

136 Bleaching powder is disinfectant for purification of water. When water born germs are killed. But
8. disinfectant activity is destroyed. It is due to disproportion into

a) $CaCl_2$ and Cl_2 b) $CaCl_2$ and $Ca(ClO_3)_2$ c) CaO and Cl_2 d) CaO, Cl_2 and $CaCl_2$

136 Marshall's acid is:
9.

a) $H_2S_2O_5$ b) $H_2S_2O_8$ c) H_2SO_3 d) H_2SO_5

137 The word neon signifies:

0.

a) New b) Old c) Strange d) None of these

137 Paramagnetic oxide is:

1.

a) NO b) N_2O_4 c) P_4O_6 d) N_2O_5

137 Fluorosis disease is caused due to the reaction of …….. with excess of fluorine in the body.

2.

a) Ca b) Mg c) Fe d) K

137 Among the halogens, the one which is oxidised by nitric acid is

3.

a) Fluorine b) Iodine c) Chlorine d) Bromine

137 Which has the lowest boiling point?

4.

a) NH_3 b) PH_3 c) SbH_3 d) BiH_3

137 The elements S, Se, Te can have two positive oxidation states. Which one of the following is correct?

5.

a) +4 and +6 b) +2 and +4 c) +4 and +8 d) +2 and +6

137 The basicity of orthophosphoric acid is

6.

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

137 Which sulphide is used in the manufacture of "strike anywhere" matches?

7.

a) P_2S_5 b) P_2S_3 c) Sb_2S_3 d) None of these

137 Euchlorine is a mixture of

8.

a) $Cl_2 + ClO_2$ b) $Cl_2 + Cl_2O$ c) $Cl_2O_3 + ClO_2$ d) $Cl_2O + Cl_2O_3$

137 Liquid oxygen:

9.

a) Is an important constituent of rocket fuels
b) Is used for artificial respiration with CO_2
c) Mixed with finely divided carbon is explosive
d) All of the above

138 Acetic acid is added while preparing a standard solution of $CuSO_4 \cdot 5H_2O$ to prevent:

0.

a) Hydration b) Reduction c) Hydrolysis d) Complex formation

138 XeF_2 molecule is

1.

a) Square planar b) Trigonal bipyramidal
c) Trigonal planar d) Linear

138 Iodine is placed between two liquids C_6H_6 and water:

2.

a) It dissolves more in C_6H_6
b) It dissolves more in water
c) It dissolves equally in both
d) Does not dissolve in both

138 Which of the following oxide of nitrogen is the anhydride of HNO_3?

3.

a) NO b) N_2O_3 c) N_2O_5 d) N_3O_4

138 The most stable allotropic form of sulphur is:

4.

a) Rhombic sulphur b) Monoclinic sulphur c) Plastic sulphur d) Flowers of sulphur

138 Permonosulphuric acid is known as

5.

a) Marshall's acid b) Caro's acid c) Sulphuric acid d) None of these

138 The reaction between copper and hot conc. H_2SO_4 gives:

6.

a) SO_3 b) SO_2 c) $Cu(OH)_2$ d) H_2

138 Chlorine bleaches only in the:

7.

a) Absence of acid b) Presence of alkali c) Absence of moisture d) Presence of moisture

138 HNO_3 oxidises:

8.

a) H_2O_2 b) H_2S c) SO_2 d) All of these

138 The $P-P-P$ bond angle in white phosphorus is

9.

a) $60°$ b) $90°$ c) $120°$ d) $109°28'$

139 In the isolation of fluorine, a number of difficulties were encountered. Which statement is correct?

0.

a) The potential required for the discharge of the fluoride ions is the lowest
b) Fluorine reacts with most glass vessels
c) Electrolysis of aqueous HF gives ozonized oxygen
d) All of the above

139 Match List I with List II and select the answer using the codes given below:

1.

Code	List	Code	List II
A	XeF_4	1	Distorted octahedral
B	XeF_6	2	Tetrahedral
C	XeO_3	3	Square planar
D	XeO_4	4	Trigonal pyramidal

a) *A*–4,*B*–1,*C*–3,*D*–2 b) *A*–2,*B*–3,*C*–1,*D*–4 c) *A*–1,*B*–4,*C*–2,*D*–3 d) *A*–3,*B*–1,*C*–4,*D*–2

139 Which of the following elements is radioactive?

2.

a) Oxygen b) Selenium c) Polonium d) Tellurium

139 When SO_2 is passed through acidified solution of H_2S:

3.

a) H_2SO_3 is formed b) H_2SO_4 is formed c) Sulphur sol is formed d) H_2SO_5 is formed

139 Which one of the following reactions of Xenon compounds is not feasible?

4.

a) $3XeF_4 + 6H_2O \longrightarrow 2Xe + XeO_3 + 12HF + 1.5\ O_2$
b) $2XeF_2 + 2H_2O \longrightarrow 2Xe + 4HF + O_2$
c) $XeF_6 + RbF \longrightarrow Rb[XeF_7]$
d) $XeO_3 + 6HF \longrightarrow XeF_6 + 3H_2O$

139 Which blue liquid is obtained on reacting equimolar amounts of two gases at -30°c?

5.

a) N_2O b) N_2O_3 c) N_2O_4 d) N_2O_5

139 Which one is most electronegative?

6.

a) O b) F c) H d) Cl

139 NH_3 gas is dried over:
7.

a) Anhydrous $CaCl_2$ b) P_2O_5 c) Quick lime d) Conc. H_2SO_4

139 The largest bond angle exists in:
8.

a) H_2Se b) NH_3 c) H_2O d) H_2S

139 Increasing order of strength of oxo-acids of chlorine is:
9.

a) $HClO < HClO_2 < HClO_3 < HClO_4$
b) $HClO_4 < HClO_2 < HClO < HClO_3$
c) $HClO < HClO_2 < HClO_3 < HClO_4$
d) None of the above

140 The correct order of bond angles and stability of hydrides given below is:
0.

a) $NH_3 > PH_3 > AsH_3 > SbH_3$
b) $NH_3 > AsH_3 > PH_3 > SbH_3$
c) $SbH_3 > AsH_3 > PH_3 > NH_3$
d) $PH_3 > NH_3 > AsH_3 > SbH_3$

140 The reaction of P_4 with aqueous NaOH gives
1.

a) $P(OH)_3$ b) P_2O_5 c) $P(OH)_5$ d) PH_3

140 $[X] + H_2SO_4 \longrightarrow [Y]$a colourless gas with irritating smell.$[Y] + K_2Cr_2O_7 + H_2SO_4 \longrightarrow$ Green solution $[X]$ and
2. $[Y]$ are:

a) SO_3^{2-}, SO_2 b) Cl^-, HCl c) S^{2-}, H_2S d) CO_3^{2-}, CO_2

140 The smell of nitrogen dioxide is:
3.

a) Pleasant b) Pungent c) Not known d) All are wrong

140 The gas obtained when urea reacts with nitrous acid is:
4.

a) N_2 b) NO c) N_2O d) NO_2

140 The species that does not contain peroxide ion is
5.

a) PbO_2 b) H_2O_2 c) SeO_2 d) BaO_2

140 Phosphine is prepared by the reaction of
6.

a) P and HNO_3 b) P and H_2So_4 c) P and NaOH d) P and H_2S

140 Which of the following does not react with AgCl?
7.

a) $Na_2S_2O_3$ b) NH_4OH c) $NaNO_3$ d) Na_2CO_3

140 The oxidizing property of nitric acid is due to:
8.

a) Its concentration
b) The positive valency of N
c) Its dilution
d) The unstability of its molecule and the presence of nitrogen in its highest state of oxidation

140 The reaction showing endothermic nature and reduction of halogen is:
9.

a) $F_2 + \frac{1}{2} O_2 \longrightarrow F_2O$
b) $Cl_2 + O_2 \longrightarrow Cl_2O$

c) $F_2 + H_2O \longrightarrow 2HF + \frac{1}{2}O_2$

d) None of the above

141 Calcium carbide when heated with nitrogen forms:
0.

a) Ca_3N_2 b) $Ca(CN)_2$ c) $CaCN_2$ d) $Ca(CNO)_2$

ACTIVE SITE TUTORIALS

Date : 23-07-2019
Time : 23:30:00
Marks : 5640

TEST ID: 174
CHEMISTRY

7.THE P-BLOCK ELEMENTS

: ANSWER KEY :

1)	c	2)	b	3)	a	4)	b	165)	d	166)	a	167)	a	168)	b
5)	d	6)	c	7)	a	8)	b	169)	c	170)	a	171)	a	172)	d
9)	c	10)	a	11)	d	12)	d	173)	c	174)	a	175)	b	176)	d
13)	a	14)	c	15)	b	16)	d	177)	a	178)	b	179)	d	180)	c
17)	a	18)	c	19)	a	20)	a	181)	b	182)	b	183)	a	184)	d
21)	b	22)	d	23)	a	24)	d	185)	a	186)	c	187)	b	188)	d
25)	d	26)	d	27)	b	28)	c	189)	a	190)	d	191)	c	192)	a
29)	c	30)	b	31)	a	32)	b	193)	d	194)	a	195)	b	196)	b
33)	c	34)	c	35)	c	36)	b	197)	d	198)	b	199)	c	200)	b
37)	b	38)	a	39)	a	40)	a	201)	c	202)	d	203)	c	204)	d
41)	a	42)	c	43)	a	44)	b	205)	c	206)	b	207)	a	208)	b
45)	a	46)	a	47)	a	48)	b	209)	a	210)	c	211)	a	212)	a
49)	c	50)	a	51)	d	52)	a	213)	c	214)	d	215)	a	216)	a
53)	d	54)	d	55)	a	56)	c	217)	a	218)	b	219)	d	220)	b
57)	a	58)	c	59)	b	60)	a	221)	b	222)	b	223)	d	224)	a
61)	c	62)	c	63)	b	64)	b	225)	a	226)	b	227)	d	228)	c
65)	a	66)	c	67)	c	68)	d	229)	d	230)	b	231)	d	232)	a
69)	a	70)	d	71)	c	72)	b	233)	b	234)	b	235)	c	236)	c
73)	a	74)	d	75)	a	76)	c	237)	b	238)	c	239)	c	240)	b
77)	a	78)	c	79)	d	80)	a	241)	d	242)	d	243)	d	244)	d
81)	b	82)	a	83)	a	84)	d	245)	b	246)	c	247)	d	248)	a
85)	a	86)	d	87)	d	88)	b	249)	a	250)	a	251)	b	252)	b
89)	c	90)	a	91)	d	92)	a	253)	a	254)	b	255)	a	256)	a
93)	d	94)	a	95)	c	96)	a	257)	d	258)	d	259)	d	260)	b
97)	a	98)	c	99)	d	100)	b	261)	a	262)	a	263)	a	264)	d
101)	c	102)	c	103)	c	104)	b	265)	a	266)	c	267)	c	268)	c
105)	d	106)	a	107)	a	108)	b	269)	a	270)	b	271)	d	272)	d
109)	d	110)	a	111)	d	112)	d	273)	c	274)	b	275)	b	276)	a
113)	a	114)	c	115)	c	116)	a	277)	b	278)	b	279)	d	280)	d
117)	c	118)	c	119)	a	120)	a	281)	a	282)	a	283)	a	284)	d
121)	b	122)	a	123)	a	124)	c	285)	b	286)	d	287)	b	288)	c
125)	a	126)	b	127)	b	128)	a	289)	d	290)	a	291)	c	292)	d
129)	c	130)	a	131)	c	132)	c	293)	d	294)	d	295)	a	296)	d
133)	a	134)	a	135)	c	136)	d	297)	c	298)	c	299)	b	300)	a
137)	d	138)	a	139)	c	140)	b	301)	b	302)	d	303)	a	304)	d
141)	c	142)	a	143)	a	144)	a	305)	a	306)	b	307)	b	308)	d
145)	b	146)	d	147)	b	148)	c	309)	a	310)	d	311)	d	312)	c
149)	b	150)	c	151)	c	152)	c	313)	c	314)	b	315)	b	316)	d
153)	c	154)	a	155)	a	156)	a	317)	a	318)	a	319)	c	320)	b
157)	c	158)	b	159)	a	160)	c	321)	c	322)	c	323)	a	324)	d
161)	d	162)	b	163)	a	164)	d	325)	d	326)	b	327)	a	328)	a

329)	a	330)	a	331)	d	332)	b	533)	a	534)	c	535)	c	536)	c
333)	d	334)	c	335)	c	336)	c	537)	d	538)	b	539)	a	540)	a
337)	b	338)	b	339)	c	340)	d	541)	b	542)	b	543)	c	544)	c
341)	a	342)	b	343)	c	344)	a	545)	b	546)	a	547)	a	548)	b
345)	c	346)	d	347)	b	348)	a	549)	b	550)	c	551)	c	552)	c
349)	a	350)	d	351)	c	352)	c	553)	d	554)	b	555)	d	556)	d
353)	a	354)	a	355)	b	356)	a	557)	d	558)	d	559)	b	560)	a
357)	b	358)	d	359)	c	360)	a	561)	c	562)	c	563)	a	564)	b
361)	d	362)	c	363)	b	364)	b	565)	a	566)	a	567)	b	568)	a
365)	a	366)	d	367)	c	368)	d	569)	c	570)	a	571)	d	572)	a
369)	c	370)	d	371)	a	372)	d	573)	a	574)	c	575)	c	576)	d
373)	b	374)	d	375)	b	376)	d	577)	c	578)	b	579)	b	580)	b
377)	b	378)	a	379)	a	380)	c	581)	b	582)	d	583)	d	584)	b
381)	c	382)	b	383)	a	384)	a	585)	d	586)	d	587)	a	588)	a
385)	d	386)	a	387)	d	388)	d	589)	b	590)	b	591)	d	592)	d
389)	a	390)	a	391)	d	392)	a	593)	d	594)	a	595)	d	596)	a
393)	a	394)	a	395)	a	396)	d	597)	a	598)	b	599)	a	600)	a
397)	b	398)	b	399)	b	400)	a	601)	d	602)	c	603)	c	604)	a
401)	b	402)	b	403)	c	404)	d	605)	b	606)	b	607)	b	608)	c
405)	a	406)	d	407)	b	408)	c	609)	b	610)	d	611)	d	612)	b
409)	d	410)	a	411)	c	412)	b	613)	d	614)	d	615)	c	616)	c
413)	a	414)	b	415)	b	416)	b	617)	d	618)	b	619)	a	620)	b
417)	d	418)	b	419)	b	420)	a	621)	b	622)	c	623)	d	624)	a
421)	b	422)	c	423)	d	424)	b	625)	c	626)	d	627)	c	628)	d
425)	c	426)	c	427)	c	428)	c	629)	a	630)	d	631)	d	632)	c
429)	c	430)	d	431)	a	432)	b	633)	c	634)	b	635)	b	636)	d
433)	d	434)	c	435)	a	436)	d	637)	a	638)	b	639)	a	640)	a
437)	c	438)	d	439)	d	440)	a	641)	b	642)	a	643)	b	644)	a
441)	a	442)	d	443)	b	444)	d	645)	b	646)	c	647)	b	648)	c
445)	a	446)	d	447)	a	448)	d	649)	c	650)	d	651)	c	652)	b
449)	b	450)	c	451)	c	452)	c	653)	b	654)	c	655)	d	656)	c
453)	d	454)	d	455)	b	456)	b	657)	d	658)	c	659)	b	660)	b
457)	c	458)	b	459)	a	460)	b	661)	d	662)	a	663)	c	664)	c
461)	d	462)	a	463)	a	464)	c	665)	a	666)	a	667)	c	668)	d
465)	d	466)	a	467)	a	468)	c	669)	b	670)	b	671)	c	672)	b
469)	a	470)	a	471)	a	472)	b	673)	b	674)	d	675)	b	676)	a
473)	d	474)	c	475)	d	476)	d	677)	b	678)	d	679)	b	680)	b
477)	d	478)	a	479)	d	480)	d	681)	c	682)	b	683)	a	684)	d
481)	d	482)	d	483)	a	484)	b	685)	b	686)	b	687)	d	688)	c
485)	b	486)	c	487)	c	488)	d	689)	a	690)	d	691)	c	692)	b
489)	c	490)	d	491)	d	492)	b	693)	d	694)	c	695)	c	696)	c
493)	d	494)	d	495)	a	496)	a	697)	a	698)	d	699)	d	700)	d
497)	b	498)	c	499)	d	500)	d	701)	d	702)	a	703)	c	704)	d
501)	b	502)	d	503)	c	504)	b	705)	a	706)	b	707)	c	708)	a
505)	c	506)	b	507)	d	508)	d	709)	b	710)	b	711)	b	712)	a
509)	b	510)	d	511)	a	512)	a	713)	c	714)	a	715)	a	716)	a
513)	b	514)	d	515)	c	516)	c	717)	c	718)	b	719)	c	720)	a
517)	c	518)	a	519)	b	520)	c	721)	d	722)	a	723)	b	724)	a
521)	a	522)	a	523)	d	524)	d	725)	d	726)	d	727)	b	728)	d
525)	c	526)	b	527)	c	528)	a	729)	b	730)	b	731)	b	732)	a
529)	a	530)	b	531)	d	532)	b	733)	b	734)	c	735)	a	736)	c

737)	d	738)	a	739)	c	740)	d	941)	c	942)	a	943)	d	944)	d
741)	a	742)	d	743)	a	744)	b	945)	d	946)	c	947)	c	948)	b
745)	a	746)	c	747)	a	748)	b	949)	a	950)	c	951)	a	952)	d
749)	b	750)	a	751)	c	752)	d	953)	c	954)	c	955)	b	956)	c
753)	a	754)	a	755)	c	756)	d	957)	b	958)	a	959)	c	960)	b
757)	b	758)	c	759)	a	760)	d	961)	a	962)	c	963)	a	964)	d
761)	a	762)	d	763)	a	764)	c	965)	c	966)	b	967)	d	968)	a
765)	c	766)	a	767)	b	768)	d	969)	a	970)	a	971)	b	972)	a
769)	c	770)	c	771)	b	772)	d	973)	d	974)	c	975)	d	976)	b
773)	a	774)	d	775)	a	776)	b	977)	b	978)	d	979)	b	980)	b
777)	c	778)	b	779)	a	780)	d	981)	d	982)	a	983)	b	984)	b
781)	b	782)	d	783)	d	784)	a	985)	d	986)	c	987)	b	988)	b
785)	b	786)	b	787)	d	788)	d	989)	c	990)	d	991)	c	992)	c
789)	d	790)	c	791)	c	792)	b	993)	d	994)	c	995)	c	996)	d
793)	a	794)	c	795)	d	796)	c	997)	b	998)	d	999)	a	1000)	b
797)	c	798)	b	799)	a	800)	b	1001)	a	1002)	a	1003)	a	1004)	d
801)	a	802)	a	803)	c	804)	d	1005)	c	1006)	c	1007)	b	1008)	c
805)	b	806)	c	807)	a	808)	c	1009)	b	1010)	c	1011)	c	1012)	c
809)	a	810)	b	811)	b	812)	c	1013)	c	1014)	d	1015)	b	1016)	a
813)	a	814)	b	815)	d	816)	d	1017)	a	1018)	c	1019)	a	1020)	d
817)	a	818)	d	819)	b	820)	c	1021)	c	1022)	a	1023)	d	1024)	b
821)	d	822)	a	823)	c	824)	b	1025)	b	1026)	a	1027)	a	1028)	c
825)	d	826)	d	827)	d	828)	d	1029)	b	1030)	d	1031)	c	1032)	c
829)	d	830)	c	831)	d	832)	a	1033)	b	1034)	b	1035)	d	1036)	c
833)	c	834)	c	835)	b	836)	b	1037)	b	1038)	d	1039)	a	1040)	b
837)	d	838)	c	839)	d	840)	b	1041)	b	1042)	c	1043)	d	1044)	b
841)	b	842)	c	843)	c	844)	d	1045)	d	1046)	c	1047)	c	1048)	a
845)	c	846)	b	847)	d	848)	b	1049)	b	1050)	d	1051)	b	1052)	d
849)	b	850)	a	851)	a	852)	c	1053)	b	1054)	b	1055)	a	1056)	c
853)	b	854)	c	855)	d	856)	b	1057)	b	1058)	d	1059)	c	1060)	d
857)	d	858)	a	859)	c	860)	b	1061)	b	1062)	d	1063)	d	1064)	d
861)	c	862)	b	863)	c	864)	a	1065)	c	1066)	d	1067)	c	1068)	a
865)	d	866)	d	867)	c	868)	a	1069)	b	1070)	d	1071)	a	1072)	c
869)	d	870)	d	871)	d	872)	c	1073)	b	1074)	b	1075)	a	1076)	a
873)	a	874)	b	875)	d	876)	c	1077)	a	1078)	b	1079)	a	1080)	c
877)	c	878)	b	879)	a	880)	b	1081)	d	1082)	b	1083)	c	1084)	c
881)	c	882)	c	883)	c	884)	c	1085)	a	1086)	d	1087)	a	1088)	a
885)	c	886)	a	887)	b	888)	a	1089)	c	1090)	b	1091)	c	1092)	c
889)	d	890)	d	891)	c	892)	b	1093)	d	1094)	c	1095)	b	1096)	b
893)	c	894)	d	895)	b	896)	d	1097)	c	1098)	a	1099)	a	1100)	c
897)	a	898)	c	899)	b	900)	d	1101)	a	1102)	b	1103)	c	1104)	d
901)	d	902)	a	903)	a	904)	a	1105)	d	1106)	c	1107)	d	1108)	b
905)	a	906)	b	907)	a	908)	a	1109)	a	1110)	d	1111)	d	1112)	d
909)	a	910)	b	911)	b	912)	a	1113)	a	1114)	c	1115)	a	1116)	d
913)	b	914)	d	915)	a	916)	d	1117)	b	1118)	a	1119)	a	1120)	c
917)	b	918)	b	919)	a	920)	d	1121)	d	1122)	a	1123)	b	1124)	a
921)	a	922)	d	923)	b	924)	c	1125)	c	1126)	d	1127)	c	1128)	d
925)	a	926)	b	927)	c	928)	c	1129)	c	1130)	a	1131)	c	1132)	c
929)	d	930)	b	931)	a	932)	d	1133)	d	1134)	d	1135)	c	1136)	d
933)	c	934)	c	935)	a	936)	d	1137)	d	1138)	b	1139)	d	1140)	d
937)	d	938)	c	939)	a	940)	a	1141)	d	1142)	a	1143)	c	1144)	c

1145) c	1146) d	1147) b	1148) c	1281) a	1282) d	1283) c	1284) c
1149) c	1150) c	1151) d	1152) b	1285) d	1286) d	1287) c	1288) c
1153) b	1154) c	1155) b	1156) b	1289) b	1290) d	1291) d	1292) b
1157) d	1158) d	1159) d	1160) a	1293) c	1294) c	1295) d	1296) b
1161) c	1162) b	1163) d	1164) d	1297) c	1298) c	1299) b	1300) c
1165) d	1166) c	1167) d	1168) d	1301) c	1302) a	1303) d	1304) c
1169) c	1170) b	1171) a	1172) a	1305) b	1306) b	1307) a	1308) b
1173) a	1174) d	1175) b	1176) c	1309) a	1310) b	1311) c	1312) d
1177) d	1178) a	1179) d	1180) b	1313) c	1314) a	1315) b	1316) a
1181) b	1182) c	1183) a	1184) a	1317) a	1318) a	1319) b	1320) b
1185) c	1186) d	1187) b	1188) a	1321) a	1322) d	1323) b	1324) d
1189) a	1190) b	1191) a	1192) a	1325) b	1326) d	1327) d	1328) d
1193) b	1194) a	1195) b	1196) a	1329) c	1330) d	1331) a	1332) d
1197) a	1198) a	1199) d	1200) a	1333) c	1334) d	1335) c	1336) d
1201) b	1202) a	1203) a	1204) b	1337) c	1338) b	1339) b	1340) b
1205) b	1206) b	1207) a	1208) d	1341) a	1342) b	1343) d	1344) c
1209) b	1210) d	1211) b	1212) d	1345) a	1346) d	1347) a	1348) a
1213) a	1214) b	1215) c	1216) a	1349) b	1350) b	1351) a	1352) a
1217) b	1218) c	1219) c	1220) c	1353) b	1354) d	1355) b	1356) b
1221) c	1222) d	1223) c	1224) d	1357) a	1358) a	1359) d	1360) b
1225) c	1226) d	1227) b	1228) d	1361) c	1362) b	1363) d	1364) a
1229) b	1230) b	1231) a	1232) b	1365) c	1366) b	1367) d	1368) b
1233) c	1234) b	1235) b	1236) d	1369) b	1370) a	1371) a	1372) a
1237) b	1238) c	1239) d	1240) d	1373) b	1374) b	1375) a	1376) c
1241) c	1242) d	1243) a	1244) d	1377) c	1378) a	1379) d	1380) c
1245) d	1246) a	1247) a	1248) b	1381) d	1382) a	1383) c	1384) a
1249) d	1250) b	1251) b	1252) c	1385) b	1386) b	1387) d	1388) d
1253) a	1254) d	1255) c	1256) b	1389) a	1390) d	1391) d	1392) c
1257) c	1258) a	1259) b	1260) a	1393) c	1394) d	1395) b	1396) b
1261) a	1262) c	1263) d	1264) a	1397) c	1398) b	1399) c	1400) a
1265) c	1266) c	1267) b	1268) a	1401) d	1402) a	1403) b	1404) a
1269) b	1270) c	1271) b	1272) b	1405) a	1406) c	1407) c	1408) d
1273) b	1274) b	1275) d	1276) a	1409) a	1410) c		
1277) d	1278) d	1279) b	1280) a				

THE P-BLOCK ELEMENTS

CHEMISTRY

: HINTS AND SOLUTIONS :

1 **(c)**
N_2O and NO are neutral oxides of nitrogen.

2 **(b)**
Zero group members are $_2$He, $_{10}$Ne, $_{18}$Ar, $_{36}$Kr, $_{54}$Xe and $_{86}$Rn.

3 **(a)**
In blood He is much less soluble than nitrogen, hence He⟶O_2 mixture is used by deep sea divers in preference to N_2 ⟶O_2 mixture.

4 **(b)**
HeF_4 does not exist

5 **(d)**
It is a fact, follow fixation of N_2.

6 **(c)**
Al, Fe, Mg all reduce dilute HNO_3 into NH_4NO_3 while pb gives NO with dilute nitric acid
$3Pb+8HNO_3 \longrightarrow 3pb(NO_3)_2+2NO+4H_2O$
dilute

7 **(a)**
Acid strength decreases from HClO to HIO as the electronegativity of halogen decrease

8 **(b)**
S in H_2S has lowest oxidation number.

9 **(c)**
It is a fact.

10 **(a)**
It is a fact.

11 **(d)**
$NH_3 > PH_3 > AsH_3 > SbH_3$
As the electronegativity of central atom decreases bonded electron polarises towards central atom more, so, repulsion increases and bond angle increases.

12 **(d)**
$NaNO_2 + NH_4OH \longrightarrow NH_4NO_2 + NaOH$
$NH_4NO_2 \longrightarrow N_2 + 2H_2O$
$\because NH_4NO_2$ is unstable, so it is prepared by reaction of $NaNO_2$ and NH_4OH.

13 **(a)**
The stability of hydrides decreases down the gp., *i.e.*, from NH_3 to BiH_3 which can be observed from their bond dissociation enthalpy. The correct order is $NH_3 < PH_3 < AsH_3 < SbH_3 < BiH_3$.

Property	NH_3	PH_3	AsH_3	SbH_3	BiH_3
$\Delta_{diss}H^{\ominus}(E-H)/kJmol^{-1}$	389	322	297	255	—

14 **(c)**
Noble gases are monoatomic.

15 **(b)**
Rest all are soluble in H_2O.

16 **(d)**
$2KI + H_2O + O_3 \longrightarrow 2KOH + O_2 + I_2$

17 **(a)**
$2KMnO_4 + KI + H_2O \longrightarrow 2KOH + 2MnO_2 + KIO_3$
Oxidant Reductant

18 **(c)**
Pyrosulphuric acid is $H_2S_2O_7$ or $H_2SO_4 + SO_3$ or $HO—SO_2—OH + SO_3$.

19 **(a)**
$Na_4P_2O_7$ is a salt of strong acid and strong base, so it is a neutral salt

20 **(a)**
In Fischer Ringe's method, air free from moisture and CO_2 is passed over a heated mixture of (800°C) of 90% CaC_2 +10% $CaCl_2$ in an iron tube , when following reactions take place
$CaC_2+N_2 \xrightarrow{800°C} CaCN_2+ c$
$2C+O \longrightarrow 2CO$
$C+O_2 \longrightarrow CO_2$
$2CaC_2+3CO_2 \longrightarrow 2\ CaCO_3+ 5C$
$CuO+CO \longrightarrow Cu+CO_2$
CO_2 gas is now absorbed by KOH solution .Thus, a mixture inert gases is obtained.

21 **(b)**
$C + 2H_2SO_4 \longrightarrow CO_2 + 2SO_2 + 2H_2O$

22 **(d)**
$4KNO_3 + 4H_2SO_4 \longrightarrow 4KHSO_4 + 2H_2O + 4NO_2 + O_2$

23 **(a)**
F_2 on reaction with NaOH gives different products under different conditions.
(i) F_2 + dil, cold NaOH
$2F_2 + 2NaOH(cold)(dil) \longrightarrow 2NaF + H_2O + OF_2$
oxygen diflouride

(ii) F_2+hot ,conc.NaOH

$4F_2+NaOH\ (hot)(dil) \longrightarrow 4NaF+2\ H_2O+O_2$

24 **(d)**

The bond energies of F_2, Cl_2, Br_2, and I_2 are 159, 243, 193 and151 J/mol.

26 **(d)**

AgF is soluble in water and rest all halides of Ag are insoluble.

27 **(b)**

BCl_3 is sp^2-hybridized (120°). PCl_3, $AsCl_3$, $BiCl_3$ are sp^2-hybridized with one lone pair. The bond angle is contracted down the group.

28 **(c)**

$2Na_2S_2O_3 + I_2 \longrightarrow Na_2S_4O_6 + 2NaI$

29 **(c)**

H_2SO_4 forms hydrate with water. That's why it has great affinity towards water.

30 **(b)**

Ramsay discovered many (Kr, Xe, Ne) of these gases.

33 **(c)**

$2KIO_3 + 5SO_2 + 4H_2O \longrightarrow K_2SO_4 + 4H_2SO_4 + I_2$

34 **(c)**

Used as desiccant.

35 **(c)**

It is a fact. $FeS + H_2SO_4 \longrightarrow FeSO_4 + H_2S\uparrow$

36 **(b)**

$HNO_3 + 3HCl \longrightarrow NOCl + 2H_2O + 2Cl$

37 **(b)**

$NH_4NO_2 \rightarrow N_2 + 2H_2O$

38 **(a)**

Fluorine reacts with H_2O.

39 **(a)**

Fluorspar is CaF_2.

40 **(a)**

HI is strongest acid because $H-I$ bond is weakest bond

41 **(a)**

NH_3 is a stronger base because lone pair is easily available for donation

42 **(c)**

It is used in extractions of metals like Au, Pt, *e.g.*,

$$PtCl_4 \xrightarrow{873K} Pt + 2Cl_2$$

$$2AuCl_3 \xrightarrow{463K} 2Au + 3Cl_2$$

43 **(a)**

N in NH_3 has -3 oxidation number, the lowest value of oxidation number of N.

44 **(b)**

$Cl_2 + H_2O \rightarrow 2HCl + [O]$ nascent oxygen

45 **(a)**

Cl_2 has disinfectant and antibacterial nature.

46 **(a)**

$Sb(l) \longrightarrow Sb(s)$. Vol. of $Sb(s)$ > Vol. of $Sb(l)$

47 **(a)**

Follow molecular orbital diagram for O_2 .

48 **(b)**

$3CaOCl_2 + 2NH_3 \longrightarrow 3CaCl_2 + N_2 + 3H_2O$

49 **(c)**

H_3PO_2 is monobasic acid.

50 **(a)**

Acidic character of oxides increases along the period.

51 **(d)**

Due to higher at. weight.

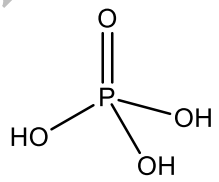
52 **(a)**

$O_3 + 2KI + H_2O \longrightarrow 2KOH + O_2 + I_2$

I_2 + Starch ⟶ Blue

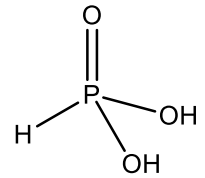
53 **(d)**

Orthophosphoric acid (H_3PO_4) is a tribasic acid because it has three replaceable hydrogen atoms. Hence the basicity of H_3PO_3 is 3. Its structure is as



H_3PO_4 (tribasic acid)

While phosphorous acid(H_3PO_4) dibasic acid because it has two replaceable hydrogen atoms. Hence the basicity of H_3PO_3 is 2 .Its structure is as



H_3PO_3 (dibasic acid)

54 **(d)**

These are facts.

55 **(a)**

Clathrate compounds are formed not by action of valence bonds but by molecules imprisonment. Inert gases do so with metals.

58 **(c)**

It is a fact.

59 **(b)**

AgI is a covalent compound so it is insoluble in water

60 **(a)**

PH_3 is basic in nature.

61 **(c)**
It is a fact.

62 **(c)**
$4\ HNO_2 + P_4O_{10} \longrightarrow 2N_2O_5 + 4HPO_3$

63 **(b)**
It is a fact.

65 **(a)**
Eq. of S = Eq. of Cl; $\frac{64}{E} = \frac{71}{35.5} \quad \therefore E = 32$

66 **(c)**
It is a fact.

67 **(c)**
Although each possesses nearly same strength.

68 **(d)**
$2H_3PO_4 \longrightarrow 2HPO_3 + 2H_2O$

69 **(a)**
Al_2O_3 is amphoteric. Rest all are basic oxide.

70 **(d)**
SO_2 acts as an oxidising agent particularly when treated with stronger reducing agents. SO_2 oxidises H_2S into S
$SO_2 + 2H_2S \rightarrow 2H_2O + S$

71 **(c)**
Mn in $KMnO_4$ has highest oxidation state. It acts only as strong oxidant.

72 **(b)**
He is lightest (after H_2), non-inflammable gas.

73 **(a)**

$$K_2MnF_6 + 2SbF_5 \longrightarrow 2KSbF_6 + MnF_3 + \frac{1}{2}F_2$$

74 **(d)**
$N_7 \rightarrow 1s^2 2s^2 2p^3$
d-orbitals are absent in nitrogen

75 **(a)**
Fluorine cannot be oxidized because it is the most electronegative element of periodic table.

76 **(c)**
H_2S is oxidized to colloidal sulphur or amorphous sulphur by HNO_3.

77 **(a)**
It is a fact.

78 **(c)**
$H_2S_2O_7$ (pyrosulphuric acid)is industrially known as oleum.

79 **(d)**
$(NH_4)_2Cr_2O_7 \longrightarrow N_2 + 4H_2O + Cr_2O_3$

80 **(a)**
Ammonium dichromate on heating gives nitrogen, chromic oxide and water.
$(NH_4)_2Cr_2O_7 \xrightarrow{\Delta} N_2 + Cr_2O_3 + 4H_2O$

81 **(b)**
I_2 cannot oxidise Br^- to Br_2

82 **(a)**

$$H_2PO_4^- \xrightarrow{-H^+} \underset{\text{Conjugate base}}{HPO_4^{2-}}$$

83 **(a)**

$$2KMnO_4 + 2H_2SO_4 \longrightarrow (MnO_3)_2SO_4 + K_2SO_4 + 2H_2O$$

$$(MnO_3)_2SO_4 + H_2O \longrightarrow \underset{\substack{\text{Red-brown}\\ \text{liquid}}}{Mn_2O_7} + H_2SO_4$$

84 **(d)**
Caro's acid is the name for H_2SO_5 or peroxosulphu

85 **(a)**
F^- is oxidized only by electrolysis.

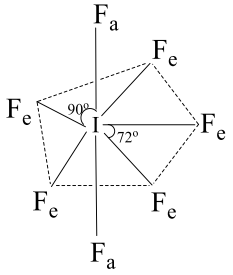
86 **(d)**
KO_3 and NH_4O_3 are ozonides.

87 **(d)**
O_3 is an allotrope of O_2.

88 **(b)**
PH_3 is sparingly soluble in water and has fishy smell

89 **(c)**
NO_2 on dissolution in HNO_3 imparts yellow colour.

91 **(d)**
The structure is pentagonal bipyramid having sp^3d^3. Hybridization as given below:



F_e : Equatorial fluorine
F_a : Apical fluorine
$F_e - I - F_e = 72^\circ$ (5 angles);
$F_e - I - F_a = 90^\circ$ (10 angles).
$F_e - I$ bond length $= 1.858 \pm 0.004$Å
$F_a - I$ bond length $= 1.786 \pm 0.007$Å.

92 **(a)**
$PH_3 + 4Cl_2 \longrightarrow PCl_5 + 3HCl; \qquad \Delta H = +ve$

93 **(d)**
$2HClO_4 + P_2O_5 \rightarrow Cl_2O_7 + 2HPO_3$

94 **(a)**
Salts of H_3PO_3 are called as phosphite (HPO_3^{2-}).

96 **(a)**
UF_6 is gas and thus, rate of diffusion of uranium he isotopes is different.

97 **(a)**

It is $I(IO_3)_3$, *i. e.*, iodine iodate.

98 **(c)**

Ozone readily decomposes to give O_2 and thus, improves the percentage of O_2 at crowded places.

99 **(d)**

Chlorofluoro carbon or cfc' on exposure to UV rays in upper strata of atmosphere dissociates to give free chlorine radicals which results in decomposition of O_3 causing depletion of ozone layer.

$Cl^{\bullet} + O_3 \longrightarrow ClO^{\bullet} + O_2$

$ClO^{\bullet} + O_3 \longrightarrow Cl^{\bullet} + 2O_2$

100 **(b)**

$FeCl_3$ acts as oxidant whereas H_2SO_3 acts as reductant.

101 **(c)**

$NaNH_2 + N_2O \xrightarrow{190^{\circ}C} NaN_3 + NaOH + NH_3$

102 **(c)**

Calcium carbide is used for ripening of fruits

103 **(c)**

Black phosphorous is highest thermodynamic stable form in red , black , white and yellow allotropic forms of phosphorus because its ignition temperature is highest hence it is inert and has a layer structure.

104 **(b)**

On electrolysis F_2 is collected at anode.

105 **(d)**

Reaction s of ethyl alcohol with bleaching powder to form chloroform takes place as

$CH_3CH_2OH + Cl_2 \longrightarrow CH_3.CHO + 2HCl$

$CH_3CHO + 3Cl_2 \longrightarrow CCl_3.CHO + 3HCl$

$2CCl_3.CHO + Ca(OH)_2 \longrightarrow 2CHCl_3 + (HCOO)_2Ca$

Decomposition of bleaching powder is catalysed by cobalt chloride.

$2CaOCl_2 \xrightarrow{CoCl_2} 2CaCl_2 + O_2$

106 **(a)**

Phosphorus glows in dark due to

$P_4 + 5O_2 \longrightarrow P_4O_{10}$ + light.

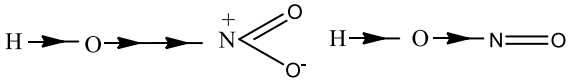
107 **(a)**

Hypophosphorus acid (H_3PO_2) is monobasic acid which act as reducing agent in this molecule two P-H bonds are responsible for its reducing character and one O-H bond is responsible for its monobasic acid character.

108 **(b)**

Radon is used in cancer therapy.

109 **(d)**



Polarity along O—H in $HNO_3$is more in comparison to —O—H in HNO_2.

110 **(a)**

The number of lone pairs of electron on Xe atom in XeF_2, XeF_4 and XeF_6 are 3, 2 and 1 respectively

111 **(d)**

During discharge of battery H_2SO_4 is used up.

112 **(d)**

$AgNO_3 \xrightarrow{\Delta} Ag + NO_2 + \frac{1}{2}O_2$

113 **(a)**

The spontaneous inflammability of phosphine with smoky rings (vortex rings) at the time of preparation is due to the presence of highly inflammable P_2H_4. This property is used in Holme's signal.

114 **(c)**

$H_2SO_4 + SO_3 \longrightarrow H_2S_2O_7$(Pyrosulphuric acid).

115 **(c)**

$Cl_2 + H_2O \longrightarrow 2HCl + \frac{1}{2}O_2$

116 **(a)**

Halogen ns^2np^5;noble gas ns^2np^6.

117 **(c)**

$CuSO_4 + 4NH_3 \longrightarrow [Cu(NH_3)_4]SO_4$; $Cu(NH_3)_4^{2+}$ is blue in colour.

118 **(c)**

$HgO + 2Cl_2 + H_2O \longrightarrow HgCl_2 + 2HClO$

119 **(a)**

Bones contain $Ca_3(PO_4)_2$.

120 **(a)**

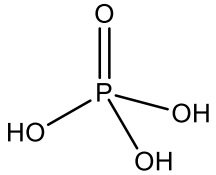
O_2 has two unpaired electrons.

121 **(b)**

As_2O_3 is poison.

122 **(a)**

H_3PO_4 is tribasic acid because it has three replaceable hydrogen atoms.



123 **(a)**

$(CH_3COO)_2$ Pb gives black ppt, sodium nitroprusside gives violet colour, dil. H_2SO_4 produces rotten egg smell with S^{2-}ions.

124 **(c)**

The end product of the hydrolysis of XeF_6 is XeO_3

$XeF_6 \xrightarrow[-2HF]{H2O} XeOF_4 \xrightarrow[-2HF]{H2O} XeO_2F_2 \xrightarrow[-2HF]{H2O} XeO_3$

125 **(a)**

Formal charge on oxygen $= \frac{\text{Total charge}}{\text{NO. of atoms}} = -\frac{3}{4} = -0.75$

Also bond order of each P—O bond is 1.25.

126 **(b)**

He is lightest (after H_2), non-inflammable gas.

127 **(b)**

AgCl is water insoluble chlorine.

128 **(a)**

F^- possesses smallest size.

129 **(c)**

PCl_5 reacts with conc. H_2SO_4 to give sulphuryl chloride by replacing its hydroxyl group with chlorine atoms.

$SO_2(OH)_2 + 2PCl_5 \longrightarrow SO_2Cl_2 + 2POCl_3 + 2HCl$

or

H_2SO_4 sulphuryl chloride

sulphuric acid

130 **(a)**

$NaCl + H_2SO_4 \longrightarrow NaHSO_4 + HCl \uparrow$

131 **(c)**

I_2 is placed above Cl_2, Br_2 and F_2 in electrochemical series. The non-metal placed below, replaces the other from its salt solution.

132 **(c)**

V_2O_5 is catalyst for the reaction, $SO_2 + \frac{1}{2}O_2 \longrightarrow SO_3$

133 **(a)**

$M + S \longrightarrow$ Metal sulphide

134 **(a)**

Iodine develops same metallic nature among halogens and forms some compounds like metals, *e*.g., iodine phosphate.

135 **(c)**

It is a test for ozone.

136 **(d)**

$3Ca(OH)_2 + 2Cl_2 \longrightarrow Ca(OCl)_2 + CaCl_2 \cdot Ca(OH)_2 \cdot H_2O + H_2O$

137 **(d)**

I_2 is placed above Br_2 in electrochemical series and the halogen placed below replaces the other from its salt solution.

138 **(a)**

Both Br and Cl have different electronegativity.

139 **(c)**

It is a fact.

140 **(b)**

CN^- is polar and anionic species. N_2 is non − polar molecule with high bond energy.

141 **(c)**

Gas	Abundance in air by volume(ppm)
Helium	5.2
Neon	18.2
Argon	93.4
Krypton	1.1
Xenon	0.09

142 **(a)**

Boiling points : He Ne Ar Kr Xe Rn

$-269, -246, -186, -153.6, -108.1, -62$

143 **(a)**

S in H_2SO_4 has +6 oxidation no. and thus, H_2SO_4 can act only as oxidant and not reductant.

144 **(a)**

XeF_4 is solid.

145 **(b)**

Since fuels burn faster in the presence of oxygen. When a glowing splinter comes in contact with oxygen, it relights. This is also a test for oxygen.

146 **(d)**

In P_4, each P is sp^3 hybridised so that the percentage of p-character in these orbitals is 75%

148 **(c)**

F_2 has the most negative $\Delta G°$value which is dependent on hydration enthalpy.

149 **(b)**

All are non − metals. F_2, Cl_2(gas), Br_2(liquid), I_2(solid).

150 **(c)**

$Pb(CH_3COO)_2 + H_2S \longrightarrow PbS + 2CH_3COOH$,

$PbS + 2H_2O_2 \longrightarrow PbSO_4 + 2H_2$

151 **(c)**

$KF + HF \longrightarrow KHF_2 \rightleftharpoons K^+ + [HF_2]^-$

152 **(c)**

$NH_4NO_2 \xrightarrow{\Delta} N_2 + 2H_2O$

153 **(c)**

$P_4O_{10} + 2H_2SO_4 \longrightarrow 2SO_3 + 4HPO_3$

154 **(a)**

It is a fact.

155 **(a)**

Hypophosphorous acid is H_3PO_2.

156 **(a)**
$4NH_3 + 5O_2 \longrightarrow 4NO + 6H_2O$

157 **(c)**
ZnO is amphoteric.

158 **(b)**
It is a fact.

159 **(a)**
H_3PO_2 is hypophosphorus acid

160 **(c)**
Follow methods of preparation of Xe fluorides.

161 **(d)**
NO_2 is brown reactive gas with pungent odour, paramagnetic but dimerise to solid N_2O_4.

162 **(b)**
Nitrates of all the metals are water soluble.

163 **(a)**
$Xe > Kr > Ar > Ne > He$

164 **(d)**
All are properties of ozone.

165 **(d)**
Halogens are very reactive due to high electronegativity, high electron affinity and comparatively low bond energies. The reactivity of halogen decreases with increase in atomic number. The correct order of reactivity of halogens is
$F_2 > Cl_2 > Br_2 > I_2$

166 **(a)**
$2KClO_3 + I_2 \longrightarrow 2KIO_3 + Cl_2$

167 **(a)**
$CaOCl_2 + CO_2 \longrightarrow CaCO_3 + Cl_2$

168 **(b)**
Reducing power increase in the order as $HF < HCl < HBr < HI$

169 **(c)**
$2ClO_2 + H_2O \longrightarrow HClO_3 + HClO_2$

170 **(a)**
Red p is obtained from white p by heating it with a catalyst in an inert atmosphere.

172 **(d)**
$Cl_2 + H_2O \longrightarrow HCl +$
$HClO$; also some Cl_2 exists in dissolved state.

173 **(c)**
This is a fact.

174 **(a)**
Since, noble gases are monoatomic, these do not possess vibrational energy as monoatomic molecules do not vibrate.

175 **(b)**
This causes H-bonding in H_2O.

177 **(a)**
Rhombic sulphur occurs in S_8 molecules giving an atomicity of 8

178 **(b)**
When chlorine is passed into hot concentrated solution of KOH, potassium chlorate is formed.
$6KOH + 3Cl_2 \longrightarrow 5KCl + KClO_3 + 3H_2O$

180 **(c)**
$2HNO_2 \rightarrow H_2O + N_2O_3$

181 **(b)**
$4Cl_2 + Na_2S_2O_3 + 5H_2O \longrightarrow 2NaHSO_4 + 8HCl$

182 **(b)**
Halogens exist as X_2 and the ion possesses stable noble gas configuration ns^2np^6.

183 **(a)**
The stability of oxides increases with increase in oxidation state of halogen.

Oxide	oxidation state of halogen
Cl_2O	+1
ClO_2	+4
ClO_3	+6
Cl_2O_7	+7

$\therefore Cl_2O$ is least stable oxide of chlorine.

184 **(d)**
The colour of Br_2 water is discharged by an unsaturated molecule due to addition of Br_2 on C=C, or by SO_2; $SO_2 + 2H_2O + Br_2 \longrightarrow 2HBr + H_2SO_4$

185 **(a)**
$2F_2 + 2H_2O \rightarrow 4HF + O_2$
$3F_2 + 3H_2O \rightarrow O_3 + 6HF$

186 **(c)**
Rest all are transition elements$(n-1)d^{10}\,ns^2$. Choice (c) represents chlorine.

187 **(b)**
Fluorine is the strongest oxidizing agent and Xe has the lowest ionisation energy among the noble gases and has little tendency to lose electrons

188 **(d)**
The bond strength of H—X decreases from HF and HI because the dissociation energy of H—X bond decreases from HF to HI.

Hydrogen halide :	H—F	H—Cl	H—Br	H—I
Dissociation energy : (kJ mol^{-1})	566	431	366	299

HI is most volatile.

189 **(a)**
White phosphorous on heating with aqueous solution of KOH produce phosphine (PH_3)gas
$P_4 + 3KOH + 3H_2O \longrightarrow 3KH_2PO_2 + PH_3$

190 **(d)**
P^{32} is radioactive.

192 **(a)**
A binary compounds is that compound which is formed by two different elements. Metals or elements which shows variable oxidation states can form more than one binary compound. In the given compounds Fe shows +2 and +3 oxidation states. So, it can form two binary compounds with chlorine as $FeCl_2$ and $FeCl_3$.

193 **(d)**
Due to less reactivity.

194 **(a)**

$$(NH_4)_2Cr_2O_7 \xrightarrow{\triangle} N_2 + Cr_2O_3 + 4H_2O$$

$$NH_4NO_2 \xrightarrow{\triangle} N_2 + 2H_2O$$

195 **(b)**

$$O_3 \rightarrow O_2 + [O]$$
$$2KI + H_2O + [O] \rightarrow 2KOH + I_2$$
$$\overline{2KI + H_2O + O_3 \rightarrow 2KOH + I_2 + O_2}$$

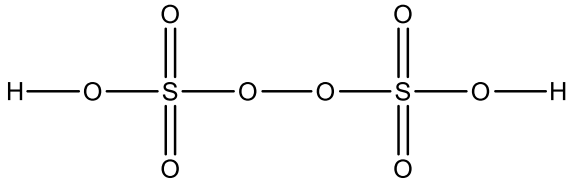
197 **(d)**
$HgCl_2 + Hg(CN)_2 \rightarrow HgCl_2 \cdot Hg(CN)_2$
Mercuric Mercuric Addition compound
Chloride cyanide

198 **(b)**
These do not support combustion.

199 **(c)**
O_2 is paramagnetic; O_3 is diamagnetic.

200 **(b)**
$H_2S_2O_8$ (Marshall's acid)has O—O linkage.

Structure of $H_2S_2O_8$ is given as follows:



201 **(c)**
N, P are non-metals, As, Sb are metalloids or semimetals, Bi is metal in gp. 15

202 **(d)**
HF is the weakest acid.

203 **(c)**
Follow contact process for H_2SO_4.

204 **(d)**
Metallic character increases down the gp.

205 **(c)**
$10HNO_3 + I_2 \longrightarrow 2HIO_3 + 10NO_2 + 4H_2O$

206 **(b)**
Noble gases have completely filled electronic configuration of outermost shell and thus, have no scope for addition of an electron in them.

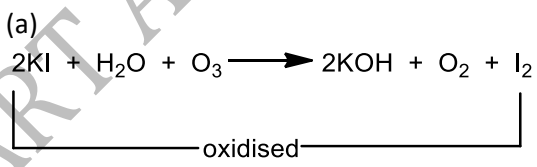
207 **(a)**
O_3 is antibacterial in nature and thus, used as sterilizing agent.

208 **(b)**
Welding of Mg is done in the atmosphere of He due to its inert and non-inflammable nature

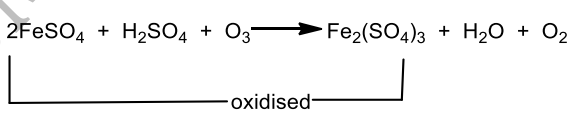
209 **(a)**
Rn is radioactive.

210 **(c)**

(a)



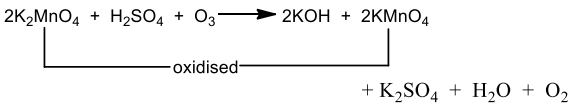
(b)



(c) $KMnO_4 + O_3 \longrightarrow$ no reaction

Because in $KMnO_4$, oxidation state of Mn is +7. Hence, it is the highest oxidation state of Mn, so $KMnO_4$ is not oxidized by ozone.

(d)



211 **(a)**

Boiling points of H_2, He, N_2 Ar are : $-259°C, -268.98°C, -195.8°C, -185.7°C$ respectively.

212 **(a)**
Fluorine and chlorine are more electronegative than sulphur, so they can displace it form it salt

213 **(c)**
It is a reason for the given fact.

214 **(d)**
Al becomes passive in HNO_3.

215 **(a)**
It reacts with rest of all reagents.

216 **(a)**
Br has the configuration.
$1s^2, 2s^2 2p^6, 3s^2 3p^6 3d^{10}, 4s^2 4p^5$

217 **(a)**
Dipole moment of gp. 15 hydrides decreases down the gp.

218 **(b)**
$2CaO + 2Cl_2 \longrightarrow CaCl_2 + Ca(ClO)_2$

219 **(d)**
Oxides of nitrogen are acidic and are dissolved in KOH (alkali).

220 **(b)**
Compounds of Xe, Kr and Rn are known.

221 **(b)**
It is a fact.

222 **(b)**
The maximum temperature at which gas can be liquefied is called its critical temperature. The gas which have high boiling point will change into liquid and so critical temperature of gas will be more

224 **(a)**
$2KI + Cl_2 \longrightarrow I_2 + 2KCl$

$$I_2 + CCl_4 \longrightarrow \text{Violet} \xrightarrow[Cl_2 \text{ water}]{\text{Excess of}} \text{Colourless} + I_2$$

225 **(a)**
Only N_2 has $1\sigma + 2\pi$ bonds in its molecule.

227 **(d)**
Only Al among these does not react with HNO_3.

228 **(c)**
$NH_4Cl \longrightarrow NH_3 + HCl$
1 0 0
0 1 1
$\therefore$ Calculated mol. wt. $\propto$ 1 molecule
Experimental mol. wt. $\propto$ 2 molecule

229 **(d)**
Thermal stability of hydrides of nitrogen family decreases gradually from NH_3 to BiH_3.

230 **(b)**
When an electric discharged is passed through Ne gas in a tube at low pressure, an orange red light is produced which is effective in the formation of chlorophyll and is used in green houses

231 **(d)**
XeO_3 is an explosive compound when dry and its explosion power is 22 times more than TNT

232 **(a)**
The most abundant element in the earth crust is oxygen.

233 **(b)**
It is a fact.

234 **(b)**
It is a fact.

236 **(c)**
SO_2 acts as reducing agent in aqueous medium, as acid in basic medium and oxidizing agent in neutral medium.

237 **(b)**
$CaC_2 + N_2 \longrightarrow CaCN_2 + C$

238 **(c)**
Cl_2 is oxidised ($Cl_2^0 \longrightarrow Cl_2^{5+} + 10e$) and reduced ($Cl_2 \xrightarrow{2e} 2Cl^-$)as well.

239 **(c)**
$$F_2 + H_2O \longrightarrow 2HF + \frac{1}{2}O_2$$

240 **(b)**
Cu hydroxide forms complex with NH_3.

241 **(d)**
The first ionisation energy of xenon is quite close to that of oxygen and the molecular diameter of xenon and oxygen are almost identical.
Based on the above facts it is suggested that since oxygen combines with PtF_6, so xenon should also form similar compounds with PtF_6.

242 **(d)**
The bond pair gets farther apart from central atom due to increasing bond length and thus, lone pair on central atom causes more contraction in bond angles.

243 **(d)**
CO is neutral.

244 **(d)**
$Ca_3(PO_4)_2 + 3SiO_2 \longrightarrow 3CaSiO_3 + P_2O_5$
$2P_2O_5 + 10C \longrightarrow P_4 + 10CO$

245 **(b)**
NO_2 is a brown coloured gas

246 **(c)**
$KI + I_2 \rightarrow KI_3$

247 **(d)**
SO_2, H_2O ans O_3 all of these act as bleaching agent.
248 **(a)**
Allotropes have different crystalline nature.
249 **(a)**
P exists as P_4, Sb exists as Sb_4.
250 **(a)**
He was detected first in solar atmosphere.
251 **(b)**
The electrolyte used in battery is 38% H_2SO_4.
252 **(b)**
Cl_2 is used in preparation of DDT-an insecticide.
253 **(a)**
Due to H-bonding, HF exists in dimeric (H_2F_2) liquid state.
254 **(b)**
Halon-1301 is CF_3Br. The first figure 1 represents no. of C atoms, the second figure represents no. of F atoms, the third figure 0 represents the no. of Cl atoms and last figure 1 represents the Br atom
255 **(a)**
It is a test for proteins.
256 **(a)**
Both XeF_2 and IF_2^- are linear species but the central atoms Xe and I undergo sp^3d hybridisation with all the three equatorial positions occupied by lone pairs of electrons
257 **(d)**
Haber process —NH_3, birkeland –eyde process — HNO_3, solvay process — Na_2CO_3.
258 **(d)**
In rest all molecules the central non-metal atom possesses lone pair of electron which gives rise to distorted geometry.
259 **(d)**
$2KClO_3 + I_2 \longrightarrow 2KIO_3 + Cl_2$
260 **(b)**
In VIA gp, sulphur possesses the maximum tendency for catenation. The catenation order : C > Si ≈ S > P > N > O
261 **(a)**
$3CaO+2NH_3 \longrightarrow 3Ca+N_2+3H_2O$
∴ N_2gas is evolved when CaO reacts with NH_3.
262 **(a)**
Bartlett prepared first compound of Xe as $Xe^+[PtF_6]^-$, a red orange crystalline solid.
$Xe + PtF_6 \longrightarrow Xe^+[PtF_6]^-$
263 **(a)**
P_2O_5 is very good dehydrating agent.
265 **(a)**
Na_2SO_3 reacts with hot and dil, H_2SO_4 to give SO_2 gas which decolourise bromine water
$Na_2SO_3 + H_2SO_4 \longrightarrow Na_2SO_4 + SO_2 + H_2O$
$Br_2 + H_2O \longrightarrow 2HBr + [O]$
$SO_2 + [O] \longrightarrow SO_3$

decolourisation of bromine water
266 **(c)**
$(NH_4)_2Cr_2O_7 \longrightarrow N_2 + Cr_2O_3 + 4H_2O$
267 **(c)**
$(NH_4)_2SO_4 + H_2O \longrightarrow NH_4OH + H_2SO_4$
268 **(c)**
Fluorine due to its very high electronegativity oxidises sulphur to its highest oxidation state and thus, forms SF_6 where S shows its maximum coordination number
269 **(a)**
B in BCl_3 is sp^2-hybridised; N in NCl_3 has sp^3-hybridisation with one lone pair of electron.
270 **(b)**
Cl_2O has sp^3-hybridized oxygen atom with two lone pairs.
271 **(d)**
Excitation energy of F($2p$-electrons) is more than excitation energy of iodine ($5p$-electrons).
272 **(d)**
Rest all will give H_3PO_3.
273 **(c)**
It is an use of Ar.
274 **(b)**
$CuSO_4 + 2KI \rightarrow CuI_2 + K_2SO_4$
$2CuI_2 \rightarrow 2CuI + I_2$
Cuprous iodide
275 **(b)**
Atomic radius of H^+ + atomic radius of Cl $= \frac{74}{2} + \frac{198}{2}$
276 **(a)**
$3Mg + N_2 \longrightarrow Mg_3N_2$
$Mg_3N_2 + 6H_2O \longrightarrow 3Mg(OH)_2 + 2NH_3$
277 **(b)**
In presence of slight amount of a dil acid, bleaching powder loses oxygen. Due to this nascent oxygen, it shows oxidizing and bleaching properties,
$2CaOCl_2 + H_2SO_4 \rightarrow CaCl_2 + CaSO_4 + 2HClO$
$HClO \rightarrow HCl + [O]$
278 **(b)**
$2KClO_3 \xrightarrow{MnO_2} 2KCl + 3O_2$
279 **(d)**

Xe due to largest size more polarisable. He due to smallest size least polarisable.

280 **(d)**

Nitrolim is $CaCN_2 + C$.

281 **(a)**

$H_2S + H_2SO_4 \longrightarrow SO_2 + 2H_2O + S$

283 **(a)**

The reducing property of the hydrides of VA group increases from NH_3 to BiH_3

$NH_3<PH_3<AsH_3<SbH_3<BiH_3$

The tendency to donate lone pair or basic strength decreases from NH_3 to BiH_3

$NH_3>PH_3>AsH_3>SbH_3>BiH_3$

Thermal stability of VA group hydrides deceases from NH_3 to BiH_3

$NH_3>PH_3>AsH_3>SbH_3>BiH_3$

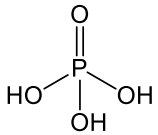
Bond angle of VA group hydrides decreases from NH_3 to BiH_3.

$NH_3>PH_3>AsH_3>SbH_3>BiH_3$

284 **(d)**

The deficiency of iodine in diet causes goitre.

285 **(b)**



3-OH groups are present hence, it is tribasic

286 **(d)**

The solubility increases with increase is mol. wt.

287 **(b)**

It is a fact.

288 **(c)**

He is obtained during radioactive decay.

289 **(d)**

Zero group element show less chemical activity because this group element have 8 electrons in outermost orbit

290 **(a)**

$2FeCl_3 + H_2S \longrightarrow 2FeCl_2 + 2HCl + S$

291 **(c)**

$HPO_3 + H_2O \longrightarrow H_3PO_4$

292 **(d)**

O_3 forms ozonides with each molecule having C=C bond or C≡C bond.

293 **(d)**

Argon is found abundantly in the atmosphere.

294 **(d)**

$SO_2 + 2CuCl_2 + 2H_2O \xrightarrow{KCNS} \underset{White}{Cu_2Cl_2} + H_2SO_4 + 2HCl$

295 **(a)**

$CO + Cl_2 \longrightarrow COCl_2$

296 **(d)**

This is a method to separate noble gases.

297 **(c)**

It is a reason for the given fact.

298 **(c)**

$NCl_3 + 3H_2O \longrightarrow NH_3 + 3HOCl$

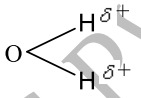
299 **(b)**

HNO_3 is strongest oxidant among all.

300 **(a)**

Larger is the bond length, easier is its dissociation and more is acidic nature in halogen acids.

301 **(b)**



Dipole of water includes dipole in noble gases which interact and causes solubility in water

302 **(d)**

Oxidation state of S is 0 in S_8

Oxidation state of S is +4in SF_4

Oxidation state of S is +6 in H_2SO_4

S shows o,+4 and +6 oxidation states.

In fact S shows 0,-2,+2,+4 and +6 oxidation states,

303 **(a)**

H-bonding in H_2SO_4 makes it a viscous liquid.

304 **(d)**

$Na_2Fe(CN)_5NO + Na_2S \longrightarrow \underset{\text{Violet Complex}}{[Na_4Fe(CN)_5NOS]}$

305 **(a)**

It is a fact.

306 **(b)**

Pyrogallol absorbs O_2

Turpentine oil and oil of cinnamon absorbs O_3.

307 **(b)**

A test for ozone.

308 **(d)**

Concentrated H_2SO_4 has dehydrating property.

When cellulose comes in contact with conc H_2SO_4, it removes water from cotton leaving only black carbon in the form of charred particles

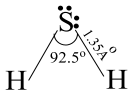
$(C_6H_{12}O_6)_x \rightarrow \underset{\text{Charred particles}}{6C} + 6H_2O$

309 **(a)**

$3HCl + HNO_3 \longrightarrow NOCl + 2H_2O + 2Cl$

310 **(d)**

H_2S has sp^3-hybridization with two lone pair, having V-shaped geometry, *i. e.*,



311 **(d)**
Dust is a colloid which shows tyndall effect. Hence,tyndall box is used to test the presence of dust in gaseous mixture , as dust decreases the effectiveness of catalyst.

312 **(c)**
PoO_2 is insoluble oxide of gp. 16.

313 **(c)**
This is a laboratory method for preparation of Cl_2.

314 **(b)**
XeF_6 show sp^3d^3 hybridisation, it will give pentagonal bipyramidal geometry, but due to presence of lone pair of electron, shape will be distorted octahedral

315 **(b)**
Bleaching action of Cl_2 is only in presence of moisture where nascent oxygen is displaced from H_2O
$Cl_2 + H_2O \rightarrow HCl + HClO$
$HClO \rightarrow HCl + [O]$

316 **(d)**
The +5 oxidation state of Bi is unstable due to inert pair effect. Thus, BiF_5cannot be formed.

317 **(a)**
Mg is reductant and thus, can be oxidized.

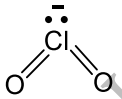
318 **(a)**
NH_3 is stronger base among all these.

319 **(c)**
$_1H^1 + {}_1H^2 \longrightarrow {}_2He^3 +$ energy. This is fusion.

320 **(b)**
$2HCl+\frac{1}{2}O_2 \longrightarrow H_2O+Cl_2$

321 **(c)**
Only He and Ne are remained unadsorbed on the coconut charcoal at -100°c (173K) as their boiling points are less than -100°c .(He=4K, Ne=27K).

322 **(c)**
ClO_2^- has sp^3 hybridisation and two lone pairs on halogen which produces V-shape bent structure



323 **(a)**
N has $-\frac{1}{3}, -3, -2, -1$ oxidation states in N_3H, NH_3, N_2H_4 and NH_2OH respectively.

324 **(d)**
S_8 has puckered ring structure.

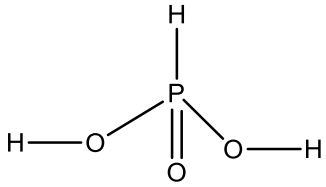
325 **(d)**
Ti has configuration $1s^2, 2s^2 2p^6, 3s^2 3p^6 3d^2, 4s^2$.
Thus, Ti^{4+} has configuration
$1s^2, 2s^2 2p^6, 3s^2 3p^6$, *i*.e., of Ar.

326 **(b)**
$3CuSO_4 + 2PH_3 \longrightarrow \underset{\text{Black}}{Cu_3P_2} + 3H_2SO_4$

327 **(a)**
Anhydrous $Ba(ClO_4)_2$ is an effective drying agent. It is used under the trade name desicchlora

328 **(a)**
Neil Bartlett prepared first noble gas compound, xenon hexafluoride (IV)

330 **(a)**
The structure of H_3PO_3 is given as



In this structure two —OH group are present, so it is dibasic acid. In it one P—H bond is present, so it provides hydrogen and due to such hydrogen it acts as reducting agent.

331 **(d)**
When chlorine reacts with dilute and cold NaOH sodium chlorine and sodium hypochlorite are formed.
$2NaOH(cold) + Cl_2 \longrightarrow NaCl + \underset{\text{Sodium hypochloride}}{NaClO} + H_2O$
Let oxidation state of Cl in NaCl is x
$+1 + x = 0$
X = -1
Let oxidation state of Cl in NaClO is x.
NaClO
$+1 + x - 2 = 0$

x - 1=0

$x = +1$

∴ oxidation states of chlorine changes from 0 to -1 and +1.

332 **(b)**

It is a fact.

333 **(d)**

These are uses of H_2SO_4.

334 **(c)**

Hydrolysis of NCl_3 gives NH_3or NH_4OH and HClO as

$NCl_3 + 4H_2O \longrightarrow NH_4OH + 3HOCl$

335 **(c)**

Xe in XeF_2, XeF_4,

XeF_6 has sp^3d, sp^3d^2 and sp^3d^3 hybridisation wit electrons respectively.

336 **(c)**

N_2O is itself non-combustible but supports combustion

$S + 2N_2O \rightarrow SO_2 + 2N_2$

338 **(b)**

$(NH_4)_2Cr_2O_7 \xrightarrow{\Delta} N_2 \uparrow + Cr_2O_3 + 4H_2O$

$NH_4NO_2 \rightarrow N_2 \uparrow + 2H_2O$

339 **(c)**

Fluorapatite is $CaF_2 \cdot 3Ca_3(PO_4)_2$.

340 **(d)**

It is a fact.

341 **(a)**

The formation of ozone from oxygen is an endothermic reaction not exothermic reaction.

$3O_2 \xrightarrow[\text{discharge}]{\text{Electric}} 2O_3; \qquad \Delta H = 287\ \text{kJ}$

So, statement

$3O_2 \underset{\text{discharge}}{\overset{\text{Silent}}{\rightleftharpoons}} 2O_3; \qquad \Delta H = -284.5\ \text{kJ}$

Is not correct statement.

342 **(b)**

$NH_4NO_3 \rightarrow N_2O + 2H_2O$

(Laughing gas)

343 **(c)**

P_2O_5 is solid acidic oxide.

344 **(a)**

$KNO_3 \xrightarrow{\Delta} KNO_2 + \frac{1}{2}O_2$

345 **(c)**

$(NH_4)_2SO_4 + KCNO \rightarrow NH_4CNO + K_2SO_4$

$\downarrow$

NH_2CONH_2

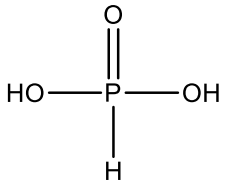
urea

346 **(d)**

AgI is insoluble in NH_4OH.

348 **(a)**

The structure of phosphorous acid H_3PO_3 is as follows



As it has two —groups, hence it shows dibasic character

349 **(a)**

The thermal stability of the hydrides of nitrogen family or group15 elements decreases on moving downwards in the group. Therefore, $NH_3$is the most stable and $BiH_3$is the least stable. The stability of the hydride of group 15 elements decreases in the order.

$NH_3 > PH_3 > AsH_3 > SbH_3 > BiH_3$

350 **(d)**

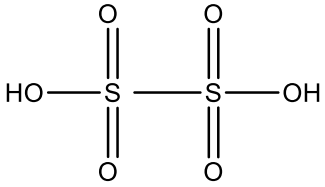
The electropositive character increases down the group, *eg.*, $I(CH_3COO)_3$, IPO_4, etc., are ionic.

352 **(c)**

K_2CS_3 is potassium thiocarbonate.

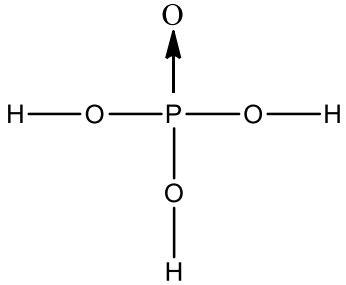
353 **(a)**

Only $H_2S_2O_6$contains S—S bond. Its structure is



354 **(a)**

Orthophosphoric acid(H_3PO_4) is a tribasic acid. Hence, its structure can be represented as $O \leftarrow P(OH)_3$.



$(lp + \sigma bp = 1 + 3 = 4)$

Hence hybridization of p in H_3PO_4 is sp^3 and thus it is tetrahedral in shape.

355 **(b)**

$Cl_2 + H_2O \longrightarrow 2HCl + [O]$

356 **(a)**

Clatherate formation involves dipole induced dipole attraction(∵

water is polar molecule and Xe is non − polar).

357 **(b)**
Divers use He + O_2 mixture for respiration in place of $N_2 + O_2$. The N_2 was found to dissolve in blood at high pressure during diving and after it, the N_2 gas comes out from blood causing painful nerve bursting. The mixture is also used for respiration by asthma patients.

358 **(d)**
Ammonium nitrate on heating at 250°C gives N_2O.

359 **(c)**
F_2 has low reactivity for Cu and steel.

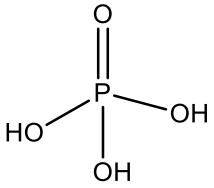
360 **(a)**
Due to the formation of thin oxide film on iron surface.

361 **(d)**
HF is weaker acid due to H-bonding.

362 **(c)**
Fe(II) has four unpaired electrons ($3d^6$)
where Fe(III) has five unpaired electrons ($3d^5$).
This can be obtained by measuring magnetic moment of molecule in solid state.

363 **(b)**
$NH_3 + 3Cl_2 \longrightarrow NCl_3 + 3HCl$

364 **(b)**
Yhe structure of H_3PO_4 is



It can loose three H^+ ions so its basicity is three.

366 **(d)**
Chlorine, being only a slightly stronger oxidizing agent than bromine can not oxidise it to +7 oxidation state as is required for the formation of the compound $BrCl_7$

367 **(c)**
The true peroxide contains $O_2^{2-}(O-O)^{2-}$ ion.
$\because$ Out of given choices only BaO_2 has O_2^{2-} in its structure.
$\therefore$ BaO_2 is true peroxide.

368 **(d)**
$SO_2 + 2H_2O + Br_2 \longrightarrow 2HBr + H_2SO_4$

369 **(c)**
Nitrogen does not have d-orbitals

370 **(d)**
Pernitric acid is HNO_4.

371 **(a)**
Platinum acts as catalyst in the oxidation of ammonia to form nitric oxide .This reaction is used in the ostwald 's method of nitric acid preparation.

$4NH_3+5O_2 \longrightarrow 4NO+6H_2O$
$2NO+O_2 \longrightarrow 2NO_2$
$4NO_2+O_2+2H_2O \longrightarrow 4HNO_3$

372 **(d)**
Frankland and Lockyer pointed out the new D_3 line observed in the yellow region of the sun's spectrum observed by Jonsen in 1868 was due to a new element which they named Helium. It was the first noble gas to be discovered. The two known line D_1 and D_2 were of sodium

373 **(b)**
$3Cl_2(g) + 6KOH(aq.) \xrightarrow{\Delta} KClO_3 + 5KCl + 3H_2O$
(Green yellow gas) (Used in fire-works and safety match box)

374 **(d)**
It is a fact.

375 **(b)**
$NH_3 + 3Cl_2 \longrightarrow NCl_3 + 3HCl$

376 **(d)**
He, because of its small size can diffuse through rubber, glass PVC etc. easily

378 **(a)**
Orthophosphate + Amm. Molybdate $\xrightarrow[\Delta]{HNO_3}$ yellow ppt
$\downarrow + AgNO_3$
Red ppt

379 **(a)**
$2HNO_2 + H_2SO_4 \longrightarrow 2NO_2 + SO_2 + 2H_2O$

380 **(c)**
CN^- acts as complexing agent and reducing agent.
$CuSO_4 + 2KCN \longrightarrow Cu_2(CN)_2 + K_2SO_4 + (CN)_2$
(Reducing agent)
$Cu_2(CN)_2 + 6KCN \longrightarrow 2K_3Cu(CN)_4$(Complexing agent)

381 **(c)**
Laminaria-a sea-weed containing iodine as iodide.

382 **(b)**
It is a fact.

383 **(a)**
Yellow P is readily oxidized in air and thus, kept in water.

384 **(a)**
N_2 does not combine directly with F_2.

385 **(d)**
Lowest bond dissociation energy is of I_2.

386 **(a)**
$5O_3 + I_2 + H_2O \longrightarrow 2HIO_3 + 5O_2$

387 **(d)**
This is a use of molten Na and S.

388 **(d)**
Catalyst has no role in oxidation by HNO_3.

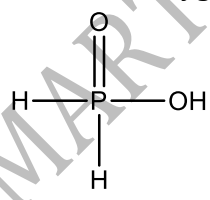
389 **(a)**
In the froth- floatation process, froths are produced by blowing air through water containing pine oil and ore. Ore particles are not wetted by water, hence these being lighter, comes out to the surface with froths and extracted . The impurities are watted by water and becomes heavy .Thus, these settle down.

390 **(a)**
$XeF_6 + 3H_2O \longrightarrow XeO_3 + 6HF$

391 **(d)**
Zero group members are less abundantly found and thus, called as rare gases; due to their least reactivity they are called inert gases; on account of some compounds formed by Kr, Xe, they are named noble gases.

392 **(a)**
Xe in $XeOF_4$ has sp^3d^3-
hybridisation with one lone pair of electron.

393 **(a)**
Hypophosphorous acid is a monobasic acid as it forms one type of salts e.g. sodium hydrogen phophite (NaH_2PO_2)
$NaOH + H_3PO_2 \longrightarrow NaH_2PO_2 + H_2O$
Hydrophosphorus acid has two hydrogen atoms attached to phosphorus and one hydrogen atom attached to oxygen atom(which is ionisable), i.e.,



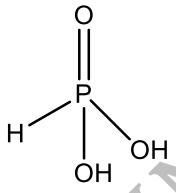
394 **(a)**
$X + e \longrightarrow X^-; \quad \Delta H = -A;$
$X^- \longrightarrow X + e; \quad \Delta H = +A.$

395 **(a)**
Oxidizing nature of oxides decreases with increasing oxidation number of central atom.

396 **(d)**
Oswald process of manufacturing of HNO_3
$4NH_3 + 5O_2 \xrightarrow{Pt} 4NO + 6H_2O + \text{heat}$
$2NO + O_2 \xrightarrow{50^\circ C} 2NO_2(g)$
$3NO_2 + H_2O \longrightarrow 2HNO_3 + NO$
∴ Pt is catalyst in Oswald process.

397 **(b)**
$4HNO_3 + P_4O_{10} \longrightarrow 4HPO_3 + 2N_2O_5$
Dinitrogen pentoxide
The product is dinitrogen pentoxide (N_2O_5)

398 **(b)**
Phosphorus acid (H_3PO_3)is a diprotic acid . It forms two series of salt such as NaH_2PO_3 and Na_2HPO_3 but none of the type $NaPO_3$ with NaOH. Its structure is as



399 **(b)**
$\overset{+4}{2NO_2} + H_2O \longrightarrow \overset{+5}{HNO_2} + HNO_3$
mixed acid
anhydride

400 **(a)**
$Ba_3N_2 \xrightarrow{\Delta} 3Ba + N_2$

401 **(b)**
When SO_3 is dissolved in heavy water D_2SO_4 is formed as
$SO_3 + D_2O \longrightarrow \underset{(X)}{D_2SO_4}$
The hybridization state of S in D_2SO_4 is sp^3

403 **(c)**
He, Ne. Due to its very small size and low molecular weight, these possess weak forces of attraction.

404 **(d)**
The reducing nature of hydrides increases down the group.

405 **(a)**
Most abundant element is oxygen on earth's crust.

406 **(d)**
It is a fact.

407 **(b)**
Superphosphate of lime is a mixture of calcium dihydrogen phosphate and gypsum and is obtained by treating phosphatic rock with conc H_2SO_4
$Ca_3(PO_4)_2 + 2H_2SO_4 + 5H_2O \rightarrow Ca(H_2PO_4)_2 \cdot 2H_2O + 2CaSO_4 \cdot 2H_2O$

superphosphate of lime

408 **(c)**

$N_2 + O_2 \xrightarrow{3000°C} 2NO$; very high temperature is required for dissociation of N_2.

410 **(a)**

Some metals form amphoteric oxides, e.g., ZnO; white P is kept in water. Carbon forms neutral (CO) and acidic oxides (CO_2).

411 **(c)**

SO_2 is an acidic oxide and can be dried by an acidic dehydrating agent.

412 **(b)**

$4Zn + 10HNO_3 \longrightarrow 4Zn(NO_3)_2 + NH_4NO_3 + 3H_2O$
(Very dil.)

413 **(a)**

H_2S has V-shape geometry (sp^3-hybridisation with two lone pair on S atom).

414 **(b)**

Graham's salt is $Na(PO_3)_6$ used as water softener.

416 **(b)**

N_2 possesses high bond energy and thus, is inert.

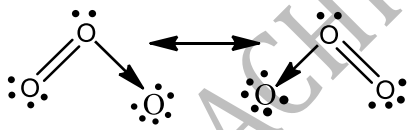
417 **(d)**

It is due to heavier gas argon (at. wt. 40) present with N_2 (at. wt. 28) obtained from atmosphere. Ar is about 1% in air; the most abundant inert gas in atmosphere.

418 **(b)**

In O_3,O—O bond length is identical with that of molecular oxygen. It is found to be intermediate of O—O and O=O bond length.

This is due to reasonance.



In ozone, bond angle of O—O—O is 116.8° and bond length(O—O)is 1.278 Å.

419 **(b)**

For advertisement the coloured discharged tubes contains Ne.

420 **(a)**

HBr is strong reducing agent and will be oxidized b

421 **(b)**

It is a fact.

422 **(c)**

Heat of vaporization of NH_3 is higher in compariso

423 **(d)**

Deficiency of I_2 causes goitre disease which is relat

424 **(b)**

It is a fact.

425 **(c)**

Rest all are known.

426 **(c)**

Iodine has the least affinity for water and is only slightly soluble in it. However, it dissolves in 10% aqueous solution of KI due to the formation of a complex ion *ie*, I_3^-

$I_2 + KI \rightleftharpoons KI_3$

or $I_2 + I^- \rightleftharpoons I_3^-$
(Complex ion)

427 **(c)**

Commercial ammonium carbonate having $(NH_4)_2CO_3$, NH_4HCO_3 and NH_4OCONH_2 is known as sal volatile.

428 **(c)**

Aqua regia is 1 part HNO_3 and 3 parts HCl.

429 **(c)**

A more electronegative halogen can displace less electronegative halogen

$Cl_2 + 2KBr \rightarrow 2KCl + Br_2$

430 **(d)**

As the electronegativity decreases from N to Sb, the repulsion between bond pair-lone pair decreases.

431 **(a)**

Basic impurities on surface are removed by HCl, Acidic impurities are removed by NH_3.

432 **(b)**

$FeSO_4$ solution absorbs NO to give $FeSO_4NO$.

433 **(d)**

I in ICl_3 has sp^3d-hybridisation having two lone pair of electrons and thus, shape is bent T inspite of trigonal bipyramidal.

434 **(c)**

Pyrosulphuric acid is $H_2S_2O_7$. Both SO_3 and H_2S_2O + 6 oxidation state.

435 **(a)**

The oxidizing power of oxo-acids of chlorine decreases with increase with increase in oxidation no. of chlorine.

436 **(d)**

Cl can exhibit maximum oxidation state of +7.

437 **(c)**

$MnO_2 + 4HCl \longrightarrow MnCl_2 + 2H_2O + Cl_2$ (Green-yellow)

438 **(d)**

Ammonia on reaction with excess of chlorine gives nitrogen trichloride.

$NH_3 + 3Cl_2 \longrightarrow NCl_3 + 3HCl$
excess

439 **(d)**
The spontaneous inflammability of phosphine with smoky rings (vortex rings) at the time of preparation is due to the presence of highly inflammable P_2H_4. This property is used in Holme's signal.

440 **(a)**
The thermal stability of the anions of oxo-acids of chorine increase with increasing oxidation number of halogen

442 **(d)**
NH_3 is non-combustible gas.

444 **(d)**
e.g., IF_7; 7 atoms of F and one of I.

445 **(a)**
Mixture of helium and oxygen is the life saving mixture for asthma patient because helium is less soluble in blood than nitrogen.

446 **(d)**
Except Xe fluorides (XeF_2, XeF_4, XeF_6), fluorides of Kr and Rn known are KrF_2, KrF_4 and RnF_2.

447 **(a)**
Element/elements having more electronegativity than(sulphur) can react with it to form compound of type SX_4 .
∵ Fluorine and chlorine are more electronegative than sulphur.
∴ F and Cl can form compound of SX_4 type with S.

448 **(d)**
Reactivity of oxygen with chlorine is minimum because of low electronegativity difference.

449 **(b)**
$C_{12}H_{22}O_{11} \xrightarrow{[O]} 6H_2C_2O_4$

450 **(c)**
$COCl_2$ is called phosgene.

451 **(c)**
1. H_2S acts as a reducing agent, because it can reduce PbO into PbS.

$$PbO+H_2S\longrightarrow PbS+H_2O$$

(b)it is acidic in nature . In chalcogens, the acidic nature of hydride increases from H_2O to H_2Te.

(c) it is not an oxidizing agent.

452 **(c)**
This was a reason for the given fact.

453 **(d)**
Oxidation states of sulphur are

- 2	in	H_2S
0	in	S_8
+ 2	in	$S_2O_3^{2-}$
+ 4	in	SO_2
+ 6	in	SO_3

455 **(b)**

$$Cu(NO_3)_2 \longrightarrow CuO + 2NO_2 + \frac{1}{2}O_2$$

456 **(b)**
OF_2 dissolves in water but does not give any oxyacid solution, while SO_2, $SCl_4$and SO_3 give oxyacid solution in water.

$SO_2 + H_2O \longrightarrow H_2SO_3$
Sulphurous acid

$SCl_4 + 3H_2O \longrightarrow H_2SO_3 + 4HCl$
Sulphurous acid

$SO_3 + H_2O \longrightarrow H_2SO_4$
Sulphuric acid

457 **(c)**
Thus, I_2 shows complementary colour.

458 **(b)**
This is a fact or definition of clathrates of inert gases.

459 **(a)**
It is a fact. The radioactive mineral, clevite, monazite, pitchblende, uranite give He either on heating to 1000°C in vacuum or on heating with H_2SO_4.

460 **(b)**
$Cl_2 + 2KBr \longrightarrow 2KCl + Br_2$

461 **(d)**
In group 16 and period VI the oxyge, sulphur, selenium are chalcogens (ore forming) while polonium being radioactive forms a less number of compounds and is not considered as chalcogens.

462 **(a)**
Lead nitrate on ignition furnish lead oxide and nitrogen dioxide with evolution of O_2 gas.

$$2Pb(NO_3)_2 \xrightarrow{300-400^\circ C} 2PbO+4NO_2+O_2$$

463 **(a)**
Xe is most easily liquefible rare gas because interatomic interactions increases with increasing atomic number.

464 **(c)**

It is a fact.

465 **(d)**

In atomic reactors, helium gas is used. It is also used in filling lighter air-crafts such as air ships weather balloons etc.

467 **(a)**

$Ca_3(PO_4)_2 + 3SiO_2 \longrightarrow 3CaSiO_3 + P_2O_5$

$2P_2O_5 + 10C \longrightarrow P_4 + 10CO$

468 **(c)**

$\frac{1}{2}F_2 + e + aq. \longrightarrow F^-(aq.);\ \Delta H = H_d - EA - H_h$

Heat of hydration being exothermic and maximum for fluorine because of its smaller size and thus, more negative value for ΔH is obtained for reduction of F_2. Thus, F_2 is strong oxidant.

469 **(a)**

The lower is b.p., more is vapour pressure; b.p. order is:

$$HCl < HBr < HI < HF.$$

470 **(a)**

Sb is semi-metal and thus, forms amphoteric oxides.

471 **(a)**

Bone black is polymorphic form of phosphorus. The other forms of phosphorus. The other forms of phosphorus. The other forms of phosphorus and red phosphorus.

472 **(b)**

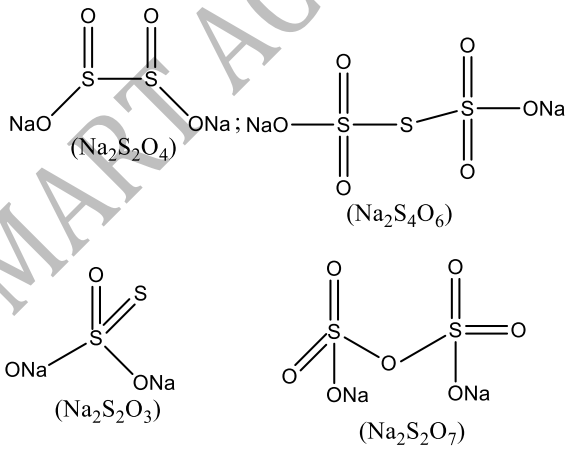
The acidic strength of oxy.acids decreases downwards in a group.

The correct order of acidic strength of oxy – acids of halogen is

$HIO_4 > HBrO_4 > HIO_4$

473 **(d)**

The structure of the given compounds are as



474 **(c)**

It is a fact.

475 **(d)**

Due to its chemically inert nature.

476 **(d)**

The inert gases producing maximum number of compounds are Ar(argon) and Xe(xenon) due to their low ionisation energy.

477 **(d)**

$CaC_2 + N_2 \longrightarrow CaCN_2 + C$

478 **(a)**

$2KBr + 3H_2SO_4 + MnO_2 \rightarrow 2KHSO_4 + MnSO_4 + 2H_2O + Br_2$

479 **(d)**

$Fe_2(SO_4)_3$ on heating gives $SO_3Fe_2(SO_4)_3 \longrightarrow Fe_2O + 3SO_3$

480 **(d)**

It is a fact.

482 **(d)**

It is a fact.

483 **(a)**

XeF_6 has much tendency to hydrolyse. The reverse reaction is more spontaneous.

$XeF_6 + 3\ H_2O \longrightarrow XeO_3 + 6HF$

484 **(b)**

It is a fact.

485 **(b)**

$2F_2 + 4KOH \longrightarrow 4KF + O_2 + 2H_2O$

486 **(c)**

Slow acting nitrogenous fertilizer is one which decomposes slowly. out of given choices CaNCN (or $CaCN_2$ or calcium cyanamide)decomposes very slowly.

$CaNCN + 2H_2O \longrightarrow CaCO_3 + NH_2CONH_2$

$NH_2CONH_2 + H_2O \xrightarrow{\text{urea}} CO_2 + NH_3$

$NH_3 \xrightarrow{\text{Nitrifying bacteria}}$ Soluble nitrates → plants

487 **(c)**

Liquor ammonia is concentrated solution of ammonia in water while liquid ammonia is liquefied ammonia gas.

488 **(d)**

Rayleigh –ramsay separation method

$N_2 + O_2 \xrightarrow{\text{Electric spark}} 2NO$

$2NO + O_2 \longrightarrow 2NO_2$

$2NaOH + 2NO_2 \longrightarrow NaNO_2 + NaNO_3 + H_2O$

489 **(c)**

As fertilizer. It is

$Ca(H_2PO_4)_2 \cdot H_2O + 2(CaSO_4 \cdot 2H_2O).$

490 **(d)**

These are characteristics of noble gases.

491 **(d)**

All are prepared using HNO_3 as one of the reagents.

492 **(b)**
Rn is the symbol for radon.

493 **(d)**
$FeSO_4 \cdot NO$ is formed.

494 **(d)**
$2HNO_3 + P_2O_5 \longrightarrow N_2O_5 + 2HPO_3$

495 **(a)**
The phenomenon of phosphorescence shown by white phosphorus is called cold fire

496 **(a)**
Xe forms XeF_2, XeF_4 or XeF_6 compounds with fluor

497 **(b)**
To provide inert atmosphere.

498 **(c)**
ppm of F $= \frac{\text{Wt. of F}}{\text{Wt. of paste}} \times 10^6 = \frac{0.2}{500} \times 10^6 = 400$

499 **(d)**
$3H_2O + PCl_3 \rightarrow H_3PO_3 + 3HCl$

500 **(d)**
I_2 itself imparts violet colour.

501 **(b)**
Xe is meant stranger

502 **(d)**
These are characteristics of noble gases.

503 **(c)**
$2Cr_4^{2-} + 2H^+ \rightarrow Cr_2O_7^{2-} + H_2O$

504 **(b)**
A halate will be formed from halogen and the greenish yellow gas is Cl_2. The halate which is used in fireworks and safety matches is $KClO_3$
$3Cl_2 + 6KOH \rightarrow KClO_3 + 5HCl + 3H_2O$

505 **(c)**
The inorganic nitrogen exists in the form of ammonia, which may be lost as gas to the atmosphere, may be acted upon by nitrifying bacteria or may be taken up directly by plants

506 **(b)**
Pseudohalides are uninegative groups which show certain characteristics of halide ions, *e.g.*, $CN^-, SeCN^-, SCN^-, N_3^-, OCN^-, NCO^-$

507 **(d)**
$CaCO_3 + 2HNO_3 \longrightarrow Ca(NO_3)_2 + H_2O + CO_2$

508 **(d)**
It is a fact.

509 **(b)**
XeF_2, XeF_4, XeF_6 are formed by xenone

510 **(d)**
N_2O_5 is white crystalline solid which melts at 30°C

511 **(a)**
Lone pair density is maximum in NH_3 due to its small size.

512 **(a)**
H_2F_2 is weakly ionized due to H-bonding.

513 **(b)**
Larger is size and mol. wt. more are van der Waals' forces among molecule.

515 **(c)**
$SO_2 + Cl_2 \longrightarrow SO_2Cl_2$

516 **(c)**
PH_5 is not known.

517 **(c)**
$3H_2O + 3F_2 \longrightarrow 6HF + O_3$

518 **(a)**
Nitrogen does not possess $2d$-subshell and thus, cannot excite its $2s$ paired electron to get unpaired whereas phosphorus does so on account of availability of $3d$-subshell.

519 **(b)**
A more electronegative halogen displaces less electronegative halogen from its halide. Fluorine is more electronegative than chlorine hence, it can displace Cl from HCl while chlorine cannot displace fluorine from HF. Therefore, the following reaction is not valid.
$HF + Cl_2 \longrightarrow F_2 + HCl$

520 **(c)**
More is the electronegativity of central atom (of non-metal) more is acidic nature of oxo-acid.

521 **(a)**
$2NH_3 + 3Cl_2 \longrightarrow 2NCl_3 + 3HCl$

522 **(a)**
$$\begin{matrix}\text{COOH}\\|\\\text{COOH}\end{matrix} \xrightarrow{\text{Conc } H_2SO_4} H_2O + CO + CO_2$$

523 **(d)**
Cl_2O and HClO both have Cl in + 1 oxidation state.

524 **(d)**
$2F_2 + 2NaOH \longrightarrow 2NaF + OF_2 + H_2O$

525 **(c)**
I_2 forms complex ion I_3^- in KI solution due to which it dissolves in it.

526 **(b)**
The boiling point of NH_3 is higher due to the presence of hydrogen bonding .the order of boiling point of hydrides of nitrogen family is as
Hydride: $PH_3 < AsH_3 < NH_3 < SbH_3$
B.P. :185 218 239.6 256.

527 **(c)**
Rest all are uses of H_2SO_4.

528 **(a)**

Clevite is uranium mineral, on heating it gives He

529 **(a)**

$\ddot{N}H_3$ and PH_3 both are basic because of the presence of lone pair of electrons

530 **(b)**

Both O and Cl is electronegative elements so O does not readily react with Cl

531 **(d)**

In case of Cl_2O_7, Cl has +7 oxidation state(oxidation state) and also have highest oxygen content . So it is most acidic.

532 **(b)**

Sulphur possesses maximum bond energy for catenation in VI gp. members.

533 **(a)**

$2K_2MnO_4 + Cl_2 \longrightarrow 2KCl + 2KMnO_4$

535 **(c)**

On rubbing liquor NH_3 with I_2 flakes, a dark brown ppt. of ammoniated nitrogen iodide, $NH_3 \cdot NI_3$ is obtained, which decomposes quickly on drying into $NH_4I + I_2 + N_2$.

$8NI_3 \cdot NH_3 \longrightarrow 5N_2 + 9I_2 + 6NH_4I$

536 **(c)**

$2KBr + 2H_2SO_4 + MnO_2 \xrightarrow{\Delta} 2KHSO_4 + MnSO_4 + 2H_2O + Br_2$

537 **(d)**

Lower is the ionization potential of an element more would be its reducing power and also reactivity.

As we move down the group, the reactivity of noble gases increase due to the decrease ionization energy. Hence, xenon is most reactive.

538 **(b)**

Bartlett prepared first compound of Xe as $Xe^+[PtF_6]^-$, a red orange crystalline solid.

$Xe + PtF_6 \longrightarrow Xe^+[PtF_6]^-$

539 **(a)**

The function of $Fe(OH)_3$ in the contact process is to remove arsenic impurity. $Fe(OH)_3$ is a positive sol, hence it removes arsenic impurity which is a negative sol.

540 **(a)**

A clear solution in water is not formed because of (

542 **(b)**

P_2O_5 reacts with NH_3 in presence of moisture.

543 **(c)**

Calcium cyanamide on treatment with steam produces NH_3 and $CaCO_3$.

$CaNCN + 3H_2O \longrightarrow 2NH_3 + CaCO_3$

544 **(c)**

Helium is twice as heavy as hydrogen, its lifting power is 92% of that of hydrogen. Helium has the lowest melting point of any element which makes liquid helium an ideal coolant for many extremely low temperature application such as crystals, a sophisticated measuring instrument based on super conducting magnet and cryogenic research where, temperature close to absolute zero are needed

545 **(b)**

Rest all react with HBr.

546 **(a)**

Cl in ClO_4^- has highest oxidation number and can b

.

547 **(a)**

$Bi_2O_3$is most basic; SeO_2, Al_2O_3 and Sb_2O_3 are am

548 **(b)**

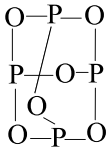
$2HClO_4 \rightarrow H_2O + Cl_2O_7$

549 **(b)**

$P_4 + 3NaOH + 3H_2O \longrightarrow 3NaH_2PO_2 + PH_3$

550 **(c)**

Each P in P_4O_6 has 3P— O bonds;



551 **(c)**

It is due to heavier gas argon (at. wt. 40) present with N_2 (at. wt. 28) obtained from atmosphere. Ar is about 1% in air; the most abundant inert gas in atmosphere.

552 **(c)**

$4KNO_3 + 4H_2SO_4 \longrightarrow 4KHSO_4 + 4NO_2 + 2H_2O + O_2$

553 **(d)**

$P_4 + 3NaOH + 3H_2O \longrightarrow 3NaH_2PO_2 + PH_3$

P is oxidised (zero to + 1 oxidation state inNaH_2PO_2) as well as reduced (zero to – 3 oxidation state in PH_3).

554 **(b)**

$H_2S_2O_4$—dithionous acid

$H_2S_2O_6$—dithionic acid

$H_2S_2O_5$—disulphurous acid

$H_2S_2O_7$— disulphuric acid

555 **(d)**

Pseudohalide they are comination of more than one electronegative atoms which one unit negative charge, e.g. OCN^-, CN^- .

Polyhalide ions the complex ions which are fromed by reaction of halogens among themselves are called polyhalide ions e.g., I_3^-, BrI_2^-.

Interhalogens they are the compounds which are formed halogen react among themselves. one of the halogens behave as cation and other acts as aninon e. g. IF_5 , ICl_5 , BrF_3 .

556 **(d)**

Iodine also forms ionic compounds in +3 state.

557 **(d)**

Upper halogen can replace lower halogen from their compounds solution because a more electronegation halogen displaces less electronegative halogen from its halide.

558 **(d)**

$CCl_4 + I_2 \rightarrow$ Violet colour

559 **(b)**

It is a fact.

560 **(a)**

The reducing character of the hydrides of group v elements depends upon the stability of hydrides. With progressive decrease in stability the reducing character of hydrides increases as we move down the group. Thus ammonia being stable has least reducing ability. The order of reducing abilities of V group hydrides is $NH_3 < PH_3 < AsH_3 < SbH_3 < BiH_3$

561 **(c)**

$$CaOCl_2 + 2CH_3COOH \longrightarrow (CH_3COO)_2Ca + \underset{\text{Available chlorine}}{Cl_2} + H_2O$$

562 **(c)**

Salts of H_2SO_3 or SO_3^{2-} are called sulphite.

563 **(a)**

The head of match stick contains $KClO_3$,KNO_3 ,sulphur and antimony

The sides of match box contains red phosphorus and sand powder.

$P_4S_3$is used in strike any where matches.

564 **(b)**

Follow methods of preparation of Xe fluorides.

565 **(a)**

Thermal stability of the hydrides decrease gradually from NH_3 to BiH_3 .This is due to the reason that atomic size of the element increases down the group and N—H bond strength decreases.

566 **(a)**

$Ca_3(PO_4)_2$ is called Thomas slag.

567 **(b)**

The electronegativity order is F > O > N > Cl.

568 **(a)**

The atomic size increases from Cl to I.

569 **(c)**

$$N_2O \xrightarrow{\Delta} N_2 + \frac{1}{2} O_2$$

570 **(a)**

Find out oxidation no. in each.

571 **(d)**

It is a reason for the given fact.

572 **(a)**

N_2O_5 is an anhydride of HNO_3

$2HNO_3 \rightarrow N_2O_5 + H_2O$

Therefore, it can act only as oxidising agent

573 **(a)**

Oleum is fuming sulphuric acid.

$H_2SO_4 + SO_3 \longrightarrow H_2S_2O_7$

oleum or pyrosulphuric acid

574 **(c)**

The basic character of hydrides decreases down the group or acidic character increases down the group. Also H_2O is neutral.

575 **(c)**

$2HIO_3 \longrightarrow I_2O_5 + H_2O$

576 **(d)**

I_2 possesses antiseptic nature.

578 **(b)**

$$2KMnO_4 \xrightarrow{\Delta} K_2MnO_4 + MnO_2 + O_2$$

579 **(b)**

It is a fact.

580 **(b)**

Cl_2 being a stronger oxidizing agent, oxidises bromide present in the mother liquor to Br_2.

$2Br^-$ (from mother liquor) $+ Cl_2 \longrightarrow Br_2$ (bromide) $+ 2Cl^-$

581 **(b)**

$$4Zn + 10HNO_3 \text{ (V. dil.)} \longrightarrow 4Zn(NO_3)_2 + NH_4NO_3 + 3H_2O$$

582 **(d)**

P_4O_{10} has 4P=O bonds in it which are shorter than P—O single bonds; each P atom has 3P—O and 1P=O bonds, *i.e.*, total 4P—O linkages. ,

583 **(d)**

Fluorides react with these fluoro Lewis acids to form adducts. For example, XeF_2 gives complexes of the type $XeF_2 \cdot 2MF_5$ and $XeF_2 \cdot MF_5$

584 **(b)**

$${}_{88}Ra^{226} \longrightarrow {}_{86}Rn^{222} + {}_{2}He^{4}$$

585 **(d)**

In the sublimation the solid substance converts

into vapours directly. Iodine is found in solid state while F_2 and Cl_2 are found in gaseous state and Br_2 is found in liquid state. so, iodine can be purified by sublimation.

587 **(a)**

NH_3 is a polar molecule.

588 **(a)**

$4Cu+10\ HNO_3 \longrightarrow 4Cu(NO_3)_2+5H_2O+N_2O$

589 **(b)**

Rest all are characteristics of HNO_3.

590 **(b)**

$3S + 4NaOH \xrightarrow{\text{Boiling}} Na_2S_2O_3 + Na_2S$

591 **(d)**

These do not possess the tendency to react.

592 **(d)**

Black P is metallic form of P.

593 **(d)**

SO_2 is gas.

594 **(a)**

It Is a fact.

595 **(d)**

SO_2 acts as a reducing agent, oxidising agent and as a bleaching agent. It does not act as dehydrating agent.

596 **(a)**

$P_4 + 3NaOH+3H_2O \xrightarrow{\Delta} PH_3 + 3NaH_2PO_2$

white phosphorus phosphine sod, hypophosphate

598 **(b)**

Plantinished asbestos or vanadium pentaoxide ($V_2\ O_5$) is used as catalyst in the preparation of sulphur trioxide from SO_2 and oxygen.

$2SO_2 + O_2 \xrightarrow[\text{or } V_2O_5]{\text{Pt, asbestos}} 2SO_3 + \text{Heat}$

599 **(a)**

Liquid helium us used in very low temperature thermometer

600 **(a)**

Xenon forms maximum number of chemical compounds because it has lowest ionization potential among noble gases. (i.e., among the He, Ne, Kr and Xe).

601 **(d)**

$N_2O_4 + H_2O \longrightarrow HNO_2 + HNO_3$

602 **(c)**

MnO_2 is used as depolariser in Lechlanche cell.

603 **(c)**

Helium is not used to produce and sustain powerful superconducting magnets. All others are the uses of helium.

604 **(a)**

XeF_2, XeF_4 and XeF_6 can be directly prepared

$Xe + F_2 + \xrightarrow[673\ K]{\text{Ni tube}} XeF_2;$

$Xe + 2F_2 \xrightarrow[6\ atm]{673\ K} XeF_4$

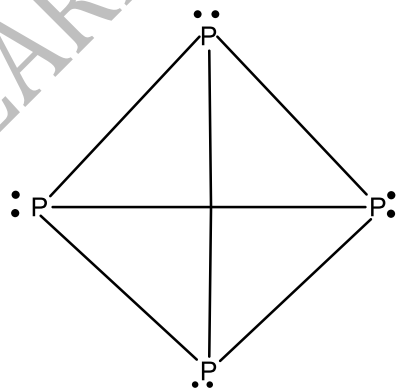
$Xe + 3F_2 \xrightarrow[50-60\ atm]{523-573\ K} XeF_6$

XeO_3 is obtained by the hydrolysis of XeF_6

$XeF_6 + 3H_2O \rightarrow XeO_3 + 6HF$

605 **(b)**

Phosphorus exists in several allotropic forms. out of them red and white are most common or red phosphorus is most stable form of phosphorus.white phosphorus or yellow phosphorus is the most reactive and poisonous allotrope of phosphorus . it is solid at room temperature it catches fire in air hence kept in water it has tetrahedral structure.



White phosphorus (tetrahedral solid)

606 **(b)**

Red phosphorus and antimony sulphide are used for coating of sides of match box

607 **(b)**

Chromyl chloride test is for Cl^-.

608 **(c)**

$Zn + 10\ HNO_3 \longrightarrow 4Zn(NO_3)_2 + NH_4NO_3 + 3H_2O$

Ammonium nitrate

$\therefore$ Zn reacts with cold dil $HNO_3$to produce NH_4NO_3

With dil. HNO_3 it produces —N_2O(nitrous oxide)

With conc. HNO_3it produces —NO_2(nitrous oxide)

609 **(b)**

In presence of moisture ,SO_2 acts as a reducing agent as it gives nascent hydrogen . It reduces hydrogen peroxide into water.

$SO_2+2H_2O \longrightarrow H_2SO_4+2H$

$H_2O_2+2H \longrightarrow 2H_2O$

610 **(d)**

Due to large size of iodine, in HI strong van der Waals' forces are present, Hence, it has highest molar heat of vaporization

611 **(d)**

SO_2 has all these properties.

613 **(d)**

Liquid ammonia is used in refrigeration because it has high heat of vaporisation

615 **(c)**

20.24% HCl

$+ H_2O$ mixture is azeotropic mixture boils at 110°(

616 **(c)**

It is a fact.

617 **(d)**

P exists as P_4.

618 **(b)**

White phosphorus is soluble in CS_2 whereas red phosphorus is insoluble in it

619 **(a)**

In PCl_5 two P—Cl bonds are axially located and three are equatorial. Thus, two P—Cl bonds are weaker than other three.

620 **(b)**

The acidic character of oxides decreases down the group.

621 **(b)**

King of chemicals is H_2SO_4. The economy of a country is measured in terms of consumption of H_2SO_4.

622 **(c)**

Fluorine has Highest E°_{red} (equal to + 2.9 V) due to which it can easily accept an electron and hence it is the best oxidising agent.

623 **(d)**

F is most electronegative halogen.

624 **(a)**

It is a fact.

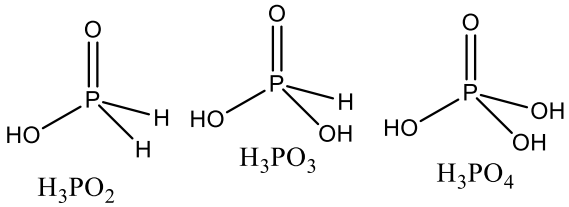
625 **(c)**

The strongest oxidizing agent among all elements i

626 **(d)**

All the elements of gp. 16 show polymorphism or allotropy.

627 **(c)**



H_3PO_2 H_3PO_3 H_3PO_4

Although thre number of –OH groups is increasing in H_3PO_2 (1 OH group), H_3PO_3 (2 OH group) and H_3PO_4 (3 OH group), yet acidity does not increase much. This is due to the fact that the number of unprotonated oxygen, responsible for enhancement of acidity due to inductive effect, remains the same, as a result dissociation constant also remains nearly same.

628 **(d)**

$6HNO_3 + S \longrightarrow H_2SO_4 + 6NO_2 + 2H_2O$

629 **(a)**

In liquid state, HF shows proton donor tendency and HCl acts as proton acceptor.

630 **(d)**

It is a reason for the given fact.

631 **(d)**

Rest all acids have +5 oxidation state as in P_2O_5. In H_3PO_3 oxidation state of P is +3.

632 **(c)**

NO_2 is converted into liquid state.

633 **(c)**

Rest all halogens react with Sulphur.

634 **(b)**

$Na_2SO_3 \xrightarrow{[O]} Na_2SO_4$

635 **(b)**

Xe in XeF_4 has sp^3d^2-hybridisation with two lone pair of electrons giving rise to square planar geometry.

636 **(d)**

It is a fact. Follow fixation of N_2.

637 **(a)**

$P_4 + 20HNO_3 \longrightarrow 4H_3PO_4 + 20NO_2 + 4H_2O$

638 **(b)**

Theacidic nature increases from H_2O to H_2Te. The increase in acidic character of hydrides on moving down the group may be explained in terms of bond length of H—M bond, larger is bond length lesser is bond energy and thus easier is ionization of H—M bond or easier is proton donor nature. Hence,

$H_2O < H_2S < H_2Se < H_2Te$

639 **(a)**

Chlorine heptaoxide (Cl_2O_7) is the anhydride of perchloric acid.

$2HClO_4 \xrightarrow{\Delta} Cl_2O_7 + H_2O$

640 **(a)**

The inorganic nitrogen exists in the form of ammonia .which may be lost as gas to atmosphere may be acted upon by nitrifying bacteria or may be taken up directly by plants.

641 **(b)**

F has smallest size.

642 **(a)**

F_2 and Cl_2 have no action on starch solution; Br_2 t

643 **(b)**

$2KMnO_4 + 5H_2S + 3H_2SO_4 \longrightarrow K_2SO_4 + 2MnSO_4 + 8H_2O + 5S$

644 **(a)**

$PH_3 + 4Cl_2 \rightarrow PCl_5 + 3HCl$

645 **(b)**

Bleaching powder liberates Cl_2 on standing.

646 **(c)**

Hyponitrous acid is $H_2N_2O_2$ or HNO.

647 **(b)**

This is the laboratory method of preparing phosphine gas.

$P_4+3NaOH+3H_2O \longrightarrow \underset{\text{phosphine}}{PH_3}+3NaH_2PO_2$

648 **(c)**

$Cl_2 + H_2O \longrightarrow HOCl + HCl$

(X)

$AgNO_3 + HCl \longrightarrow AgCl + HNO_3$

$Mg + 2HCl \longrightarrow MgCl_2 + H_2$

(Y)

649 **(c)**

Each element on two sides of change has same oxidation no.

650 **(d)**

$2KMnO_4 \xrightarrow{\Delta} K_2MnO_4 + 4MnO_2 + O_2$

651 **(c)**

A gas is converted into liquid or solid state by increasing van der Walls' forces.

652 **(b)**

$2MnO_2 + 4KOH + O_2 \longrightarrow K_2MnO_4 + 2H_2O$

653 **(b)**

Phosphorus pentoxide acts as a powerful dehydrating agent. It dehydrates HNO_3 to N_2O_5, H_2SO_4 to SO_3, $HClO_4$ to Cl_2O_7 etc.

$4\ HNO_3 + P_4O_{10} \longrightarrow 2N_2O_5 + 4HPO_3$

$2H_2SO_4 + P_4O_{10} \longrightarrow 2SO_3 + 4HPO_3$

$4\ HClO_4 + P_4O_{10} \longrightarrow 2Cl_2O_7 + 4\ HPO_3$

654 **(c)**

H_2SO_4 acts as dehydrating agent in following reaction

$HCOOH \xrightarrow{H_2SO_4} CO + H_2O$

655 **(d)**

All these are hydrolysed in presence of water.

656 **(c)**

$2CaO \cdot MnO_2$ is called weldon mud.

657 **(d)**

It is a fact $(2H_2SO_4 + 2NO + O_2 \longrightarrow 2NO \cdot HSO_4 + 2H_2O)$

658 **(c)**

P in PCl_5 has sp^3d-hybridization.

659 **(b)**

Perhalates are strong oxidants and their oxidizing nature order is:$BrO_4^- > ClO_4^- > IO_4^-$

660 **(b)**

About 1/100th part of air is mixture of inert gases.

661 **(d)**

$3HOCI \longrightarrow 2HCl + HClO_3$

663 **(c)**

NH_4Cl sublimes and decomposes partially to smell NH_3.

664 **(c)**

S in SO_4^{2-} is sp^3-hybridized.

665 **(a)**

Dithionous acid ($H_2S_2O_4$) has sulphur in + 3 oxidation state

666 **(a)**

Oleum is $H_2S_2O_7$ which is obtained by dissolving SO_3 in H_2SO_4 and is also called as fuming sulphuric acid

667 **(c)**

$He \longrightarrow He^+$

668 **(d)**

$HNO_3 \longrightarrow 4NO_2 + 2H_2O + O_2$

669 **(b)**

Carnallite is K, Mg chloride and bromide.

670 **(b)**

O_3 is a blue coloured gas.

671 **(c)**

$N_2 + 3H_2 \xrightarrow{Fe} 2NH_3$ (Mo is promoter).

672 **(b)**

$3HCl + HNO_3 \rightarrow NOCl + 2H_2O + Cl_2$

673 **(b)**

Phosgene does not contain any metal in it. Therefore, it will not produce metal sulphide with H_2O. All others give corresponding metal sulphides such as Cds, Zns and CuS

674 **(d)**

Sulphur occurs in native form in the volcanic region.

675 **(b)**
KrF_2 is a F^- donor and form complexes with F^- acceptors where, only cationic species or Kr will be present

676 **(a)**
XeO_3 has sp^3-hybrization with trigonal pyramid geometry.

677 **(b)**
$Cl_2 + H_2S \longrightarrow 2HCl + S; \quad S^{2-} \longrightarrow S^0 + 2e.$

678 **(d)**
It is a reason for the given fact.

679 **(b)**
In F_2O the oxidation state of O is $+2$ *ie*, positive whereas, in other compounds such as CO, NO, N_2O it is -2

680 **(b)**
Poisson's ratio $\gamma = \frac{C_p}{C_v} = 1.66$, because inert gases are monoatomic.

681 **(c)**
Noble gases are present in atmosphere in minute quantities except Rn, which is radioactive and is formed by decay of Ra.

682 **(b)**
P_4has six P— P bonds, four lone pair of electrons ai

683 **(a)**
$I_2+10\ HNO_3 \xrightarrow{\Delta} 2HIO_3+10NO_2+4H_2O$
$S+6\ HNO_3 \xrightarrow{\Delta} H_2SO_4+6NO_2+2H_2O$
$P_4+20\ HNO_3 \xrightarrow{\Delta} 4\ H_3PO_4+20NO_2+4H_2O$
$C+4\ HNO_3 \xrightarrow{\Delta} CO_2+4NO_2+2H_2O$

684 **(d)**
The bond order for $He_2 = 0$ and thus molecules is non-existent.

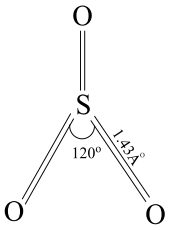
685 **(b)**
$F_2 + 2Cl^- \rightarrow Cl_2 + 2F^-$
$F_2 + 2Br^- \rightarrow Br_2 + 2F^-$
$F_2 + 2I^- \rightarrow I_2 + 2F^-$

686 **(b)**
Due to the less reactivity, red phosphorus is most stable

687 **(d)**
$9O_3 + 2I_2 \longrightarrow I_4O_9 + 9O_2$

688 **(c)**
Yellow colour is complementary colour to violet.

689 **(a)**
SO_3 has sp^2-hybridization on S atom having geometry.



690 **(d)**
$Ca_3P_2 + 6H_2O \rightarrow 3Ca(OH)_2 + 2PH_3$
PH_3 contain P_2H_4 an as impurity which on burning gives P_2O_5 and white smoke

691 **(c)**
It is a fact.

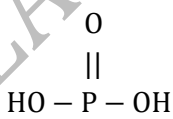
692 **(b)**
An important reaction of PCl_5 is to replace OH gp. by Cl.

693 **(d)**
Chalcogens are ore forming elements.

694 **(c)**
$Ca_3P_2 + 6H_2O \rightarrow 3Ca(OH)_2 + 2PH_3$

695 **(c)**
Ar is more soluble in water than O_2 and N_2 and also He

696 **(c)**



it ionizes in three steps because three – OH groups are present

697 **(a)**
$2KMnO_4 + 16HCl \longrightarrow 2KCl + 2MnCl_2 + 8H_2O + 5Cl_2$

698 **(d)**
All other oxides of nitrogen except N_2O and NO are acidic nature.

699 **(d)**
Pseudohalide ion and pseudohalognes There are certain monovalent negative ions made up of two or more electronegative atoms which exhibit properties similar to these of halide ions. Such ions are known as pseudohalide ions. Just as halide ions, pseudohalide ions have also corresponding dimeric molecules these are called pseudohalogens and show properties similar to those of halogens, *e*g, Cl^- and CN^-

700 **(d)**
Nessler's reagent is K_2HgI_4.

701 **(d)**
Due to smaller electronegativity differences in

between two halogens.

702 **(a)**
It is a reason for the given fact.

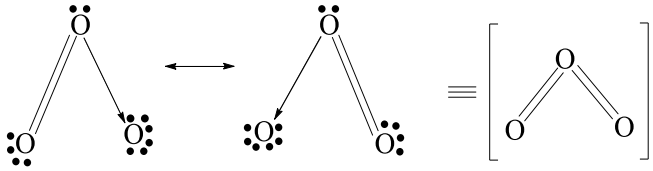
703 **(c)**
As acts as poison for Pt in contact process.

704 **(d)**
$I_2 + 2KI \longrightarrow 2KI_3$ (Water soluble).

705 **(a)**
Traces of iodine accelerate the transformation of white P into red P at relatively lower temperature.

707 **(c)**
$2NO_2 + H_2O \rightarrow HNO_3 + HNO_2$

712 **(a)**
O_3 is a resonance hybrid of



713 **(c)**
$2KI + Br_2 \longrightarrow 2KBr + I_2$
Starch $+I_2 \longrightarrow$ Blue colour.

714 **(a)**
$3Cu + 8HNO_3 \rightarrow 3Cu(NO_3)_2 + 4H_2O + 2NO$

715 **(a)**
$S_R \xrightarrow{95.6^{\circ}C} S_M$

716 **(a)**

708 **(a)**
It is a use of He.

709 **(b)**
N_2O has anaesthetic nature used in dental surgery.

710 **(b)**
Rest all acids act as oxidant and oxidise Cu and Ag. Note Cu and Ag are placed below H in electrochemical series and do not liberate H_2 from acids.

711 **(b)**
O^{16}, O^{17}, and O^{18}

717 **(c)**
It is a fact.

718 **(b)**
$Na_2SO_3 + Cl_2 + H_2O \longrightarrow Na_2SO_4 + 2HCl$

719 **(c)**
Mn in $KMnO_4$ can be reduced; because only $KMnO_4$ is oxidant.

720 **(a)**
NO_2 is given out during the process which is responsible for yellow colour of HNO_3.

721 **(d)**
Chlorine can replace bromine from KBr solution. as it is placed above bromine in VIIA group in periodic table.
$Cl_2 + 2KBr \rightarrow 2KCl + Br_2$

722 **(a)**
AgF is water soluble.

723 **(b)**
$NaF + HF \longrightarrow NaHF_2$

725 **(d)**
An oxygen-helium mixture is used for artificial respiration in deep sea diving instead of air because nitrogen present in air dissolves in blood under high pressure when sea diver goes into deep sea. When he comes to the surface, nitrogen bubbles out of the blood due to decrease in pressure, causing pains. This disease is called bends

726 **(d)**
HBr is reducing agent, H_2SO_4 is oxidizing agent.

727 **(b)**
It is a reason for the given fact.

728 **(d)**
$2HI + 2HNO_3 \longrightarrow I_2 + 2NO_2 + 2H_2O$

729 **(b)**
$H_3PO_4 + 21HNO_3 + 12(NH_4)_2MoO_3 \longrightarrow (NH_4)_3[PMo_{12}O_{40}] + 21NH_4NO_3 + 12H_2O$

730 **(b)**
Air contains 1% argon which is heavier than N_2.

731 **(b)**
It is the nature and use of antichlor.

732 **(a)**
F_2 on reaction with hot and conc. Alkali gives sodium fluoride and oxygen.
$2F_2 + 4NaOH \rightarrow 4NaF + O_2 + 2H_2O$

733 **(b)**
$XeOF_4$ gives sp^3d^3 hybridisation. Due to presence of one lone pair it gives square pyramidal geometry

734 **(c)**
Due to inert pair effect.

Oleum is obtained by dissolving sulphur trioxide in H_2SO_4

$SO_3 + H_2SO_4$ (conc.) $\longrightarrow H_2S_2O_7$

oleum

Oleum is also called fuming sulphuric acid because it fumes in moist air due to sulphur trioxide.

735 **(a)**

It is a characteristic of white phosphorus.

736 **(c)**

Caliche is crude chile salt petre ($NaNO_3$) which contains about 0.02% iodine as sodium iodate ($NaIO_3$), from which iodine is extracted

737 **(d)**

The electron affinity of halogens decreases down the group.

738 **(a)**

Interhalogen compounds are made up of two halogen atoms.

739 **(c)**

The spontaneous inflammability of phosphine with smoky rings (vortex rings) at the time of preparation is due to the presence of highly inflammableP_2H_4.This property is used in Holme's signal.

740 **(d)**

$P + O_2 \longrightarrow$ phosphorus oxide + light, the phenomenon is called chemiluminescence, *i. e.*, the phenomenon of emitting light as a result of chemical change.

741 **(a)**

F_2O is formed.

F is more electronegative than oxygen.

Oxygen is second most electronegative element.

742 **(d)**

$(C_6H_{12}O_5)_n \xrightarrow{H_2SO_4} C + H_2O$

743 **(a)**

Ne has van der Waals' radius, whereas in O_2, covalent radius is reported.

744 **(b)**

$Ag \longrightarrow Ag^+ + e$

745 **(a)**

$Ca_3(PO_4)_2 + 2H_2SO_4 + 5H_2O \longrightarrow Ca(H_2PO_4)_2 \cdot H_2O + 2CaSO_4 \cdot 2H_2O$

746 **(c)**

Chlorine acts as oxidising and bleaching agent in the presence of moisture. Chlorine reacts with water forming HCl and HCIOz. HCIO further decomposes to give nascent oxygen which is responsible for oxidising and bleaching properties of chlorine. Thus in chlorine water, oxidising agent is HOCI.

$Cl_2 + H_2O \longrightarrow HCl + HClO$

$HClO \longrightarrow HCl + O$

$Cl_2 + H_2O \longrightarrow 2HCl + O$

747 **(a)**

$\left.\begin{matrix} F_2 \\ Cl_2 \end{matrix}\right\}$ gases

$Br_2 \rightarrow$ liquid

$I_2 \rightarrow$ solid

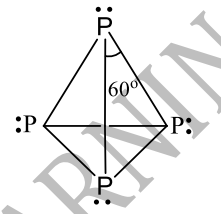
748 **(b)**

$SO_2 + 2H_2O \longrightarrow H_2SO_4 + 2H$

Coloured matter + H $\longrightarrow$ Colourless.

749 **(b)**

P_4 molecules,



Bond angle = 60°

Six P − P single bonds, lone pair = 4

750 **(a)**

N in N_2O_3 and HNO_2 has +3 oxidation state.

751 **(c)**

$2XeF_2 + 2H_2O \rightarrow 2Xe + 4HF + O_2$

752 **(d)**

—do—

753 **(a)**

ClO_3 has 41 electrons and thus, atleast one electro

754 **(a)**

The reducing power of halide ions is:

$I^- > Br^- > Cl^- > F^-$

755 **(c)**

Rest all react directly with N_2.

756 **(d)**

Perchloric acid ($HClO_4$)is the strongest acid among these because the acidic character of oxoacid increases with increasing the oxidation number of a particular halogen atom.

$\overset{+1}{HOCI} < \overset{+3}{HClO_2} < \overset{+5}{HClO_3} < \overset{+7}{HClO_4}$

757 **(b)**

Ionization potential decreases down the gp.

758 **(c)**

When phosphorus trioxide is dissolved in water phosphorous acid (H_3PO_3)is formed

$P_4O_6 + 6H_2O \longrightarrow 4H_3PO_3$

759 **(a)**
It is a fact. Air contains 20% O_2 and supports in combustion.

760 **(d)**

(a) $S_2O_4^{2-}$ $^{-}O-\overset{\overset{O}{\|}}{\underset{\underset{O}{\|}}{S}}-\overset{\overset{O}{\|}}{\underset{\underset{O}{\|}}{S}}-O^{-}$

(b) $S_2O_3^{2-}$ $^{-}O-\overset{\overset{O}{\|}}{\underset{\underset{O}{\|}}{S}}-O^{-}$

(c) $S_2O_2^{2-}$ $^{-}O-\overset{\overset{O}{\|}}{\underset{\underset{O}{\|}}{S}}-O^{-}$

(d) $S_2O_7^{2-}$ $^{-}O-\overset{\overset{O}{\|}}{\underset{\underset{O}{\|}}{S}}-O-\overset{\overset{O}{\|}}{\underset{\underset{O}{\|}}{S}}-O^{-}$

761 **(a)**
SbF_5 is a strong electron pair acceptor.

$$H_2F_2 + SbF_5 \rightleftharpoons [H_2F]^+[SbF_6]^-$$

Lewis acid Lewis base

762 **(d)**
Br_2 reacts with hot and strong NaOH solution to give NaBr, $NaBrO_3$ and H_2O.

764 **(c)**
Mn_2O_7 gives $HMnO_4$ and CrO_3 gives H_2CrO_4 with I

765 **(c)**
Pentavalency in phosphorus is more stable than that of nitrogen due to the larger size of phosphorus atom

766 **(a)**
∴ White phosphorus is most reactive and most important allotrope of phosphorus. It is insoluble in water. ∴It is kept in water to prevent it from catching fire.

767 **(b)**
$I(CH_3COO)_3$is an ionic compound.

768 **(d)**
Rest all give PH_3.

769 **(c)**
$Ar_{18} \rightarrow 2, 8, 8$

770 **(c)**
Xe reacts directly with fluorine to form fluorides.

771 **(b)**
In XeF_5^+, Xe atom has only seven electrons, $ie, 5s^2\ 5p^5$. Here, two $5p$ electrons are promoted to $5d$ sub level. Then $5s$, three $5p$ and two $5d$ orbitals hybridize to give six sp^3d^2 hybrid orbitals in an octahedral geometry. Out of these, five orbitals are singly occupied which form sigma bonds with five F atoms. The sixth hybrid orbital is occupied by a lone pair in $trans$ position giving a square pyramidal structure

772 **(d)**
It is an experimental fact.

773 **(a)**
Iodine I^- being a strong redcing agent reduces Cu^{2+} ions to Cu^+ ions and itself gets oxidized to iodine.

$2\ CuSO_4 + 4KI \longrightarrow Cu_2I_2 + I_2 + 2K_2SO_4$

774 **(d)**
The reducing power of halide ions decreases in the order

$I^- > Br^- > Cl^- > F^-$

Hence, I^- is the strongest reducing agent.

776 **(b)**
Liquid He is a unique liquid as it exists in two forms, He(I) and He(II). He(I) is a normal liquid with normal properties. On cooling to 2.19 K and 38 mm pressure it changes to He(II) with abrupt changes in many physical properties such as density, dielectric constant and specific heat. He(II) is super fluid or quantum mechanical liquid. It has very high heat of conductance (600 times of Cu), low viscosity (1/100 of H_2 gas) and flat meniscus (a low surface tension).

777 **(c)**
N_2O is linear molecule.

778 **(b)**
The acidic character of oxides increases with increase in non-metallic nature and oxidation number of central atom.

779 **(a)**
Apatite is $CaF_2.3Ca_3(PO_4)_2$. It is an ore of fluorine with calcium.

780 **(d)**
S_8 has puckered ring structure.

781 **(b)**

$$Cu + 2H_2SO_4 \rightarrow CuSO_4 + 2H_2O + SO_2$$

782 **(d)**

$$PCl_3 + Cl_2 \longrightarrow PCl_5$$

783 **(d)**
It is a fact.

784 **(a)**

The boiling point of inert gases increases with increases in molecular weight due to increase in van der Waal's forces.

$\because$ Xe has largest size, among inert gases.

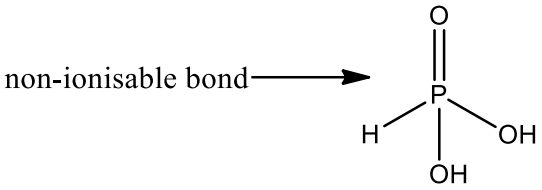
$\therefore$ Xe has highest boiling point.

785 **(b)**

HPO_3 is called metaphosphoric acid.

786 **(b)**

Structure of H_3PO_3 is



788 **(d)**

Quick lime CaO is used to dry ammonia as with other given dehydrating agents ammonia reacts.

$4NH_3+CaCl_2 \longrightarrow CaCl_2.4NH_3$

$4NH_3+2P_2O_5 \longrightarrow 4NH_4PO_3$

$Ca(OH)_2$ is never used as dehydrating agent.

789 **(d)**

The bond dissociation energy of Cl_2, Br_2,and $I_2$is as

Molecule : Cl_2 > Br_2 > I_2

Dissociation :242.6 192.8 151.1

Enthalpy (kJ mol^{-1})

790 **(c)**

$N_2 + O_2 \xrightarrow{\text{Arc}} 2NO; \Delta H = +ve.$

791 **(c)**

Liquid He is a unique liquid as it exists in two forms, He(I) and He(II). He(I) is a normal liquid with normal properties. On cooling to 2.19 K and 38 mm pressure it changes to He(II) with abrupt changes in many physical properties such as density, dielectric constant and specific heat. He(II) is super fluid or quantum mechanical liquid. It has very high heat of conductance (600 times of Cu), low viscosity (1/100 of H_2 gas) and flat maniscus (a low surface tension).

792 **(b)**

The basic character of hydrides decreases down the gp.

793 **(a)**

Lower electronegativity and lower oxidation state of the central atom favours the formation of more basic oxide of element. Therefore, Bi_2O_3 is most basic oxide

794 **(c)**

SO_2 bleaches by reduction, Cl_2 by oxidation.

795 **(d)**

$Cl_2O_6 + H_2O \longrightarrow HClO_3 + HClO_4$

796 **(c)**

$3O_2 \xrightarrow{UV} 2O_3$

798 **(b)**

The spontaneous inflammability of phosphine with smoky rings (vortex rings) at the time of preparation is due to the presence of highly inflammable P_2H_4. This property is used in Holme's signal.

$Ca_3P_2 + H_2O \longrightarrow 3Ca(OH)_2 + PH_3$

P_2H_4 is also produced.

799 **(a)**

It is a fact.

800 **(b)**

Sulphur does not form $p\pi - p\pi$ bond due to its larger size, hence does not exist as S_2 molecules.

801 **(a)**

$2NaOH + 2NO_2 \longrightarrow NaNO_2 + NaNO_3 + H_2O$

802 **(a)**

$2SO_2 + O_2 \xrightarrow{NO} 2SO_3$

804 **(d)**

$SO_2 + Br_2 + H_2O \longrightarrow SO_3 + 2HBr$

805 **(b)**

$AgCl + 2NH_3 \longrightarrow Ag(NH_3)_2Cl$

806 **(c)**

The pair of SO_2 and Cl_2 has bleaching property.

In presence of moisture, SO_2 acts as a bleaching agent.

$SO_2+2H_2O \longrightarrow H_2SO_4+2[H]$

The nascent hydrogen bleaches the colour of the substance, thus SO_2 bleaches by reduction while Cl_2 bleaches by oxidation.

$H_2O + Cl_2 \longrightarrow HCl + HClO$

$HClO \longrightarrow HCl + [O]$

[O] + coloured substance $\longrightarrow$colourless substances

807 **(a)**

HCl is better called chloride.

808 **(c)**

Iron is oxidized to ferrous nitrate and nitric acid is changed to ammonium nitrate.

$4Fe+10\ HNO_3 \longrightarrow 4Fe(NO_3)_2+NH_4NO_3+3H_2O$ (dil.)

809 **(a)**

Members of group 15 or VA of periodic table are called pnicogens .they include N, P, As, Sb and Bi.

810 **(b)**

It is a fact.

812 **(c)**

$F_2 + H_2O \longrightarrow 2HF + \frac{1}{2}O_2$

813 **(a)**
It is a reason for given fact.

814 **(b)**
It is a fact.

815 **(d)**
Each has one lone pair on Xe atom.

816 **(d)**
HClO
$\longrightarrow$ HCl
+ [O]. Thus, oxidizing and bleaching agents.

817 **(a)**
$2Sb + 3Cl_2 \longrightarrow 2SbCl_3$

818 **(d)**
Bromargyrite is a mineral of bromine.

819 **(b)**
He is lightest (after H_2), non-inflammable gas.

820 **(c)**
When phosphorus trichloride reacts with phenyl magnesium bromide (Grignard's reagent), all the three chlorine atoms of PCl_3 are replaced by phenyl group of phenyl magnesium bromide and triphenyl phosphine is obtained

$$PCl_3 + 3PhMgBr \longrightarrow \underset{\text{triphenyl phosphine}}{P(Ph)_3} + 3Mg\begin{matrix}Cl\\ \\ Br\end{matrix}$$

821 **(d)**
Rest all reacts with water to give NH_3.

822 **(a)**
Bond length increases with size of the atom involved in bonding.

823 **(c)**
N≡N. This possesses high bond energy.

824 **(b)**
$2KI + Cl_2 \longrightarrow 2KCl + I_2$; $I_2 + CCl_4$
$\longrightarrow$ Violet colour
(lower layer because CCl_4 is heavier than water).

826 **(d)**
Cl_2 reacts with C_2H_2 to give westron and westroso

827 **(d)**
Each member of gp. 16 show polymorphism.

828 **(d)**
$4Fe + 10HNO_3 \longrightarrow 4Fe(NO_3)_2 + N_2O + 5H_2O$
dil.

829 **(d)**
The abundance ratio is: Ar (0.93%); Ne (0.0018%); He (0.0005%); Kr (0.0001%); Xe (0.00001%); Rn much less.

830 **(c)**
$H_3PO_4 \rightleftharpoons H^+ + H_2PO_4^-$
$H_2PO_4^- \rightleftharpoons HPO_4^{2-} + H^+$
$HPO_4^{2-} \rightleftharpoons H^+ + PO_4^{3-}$

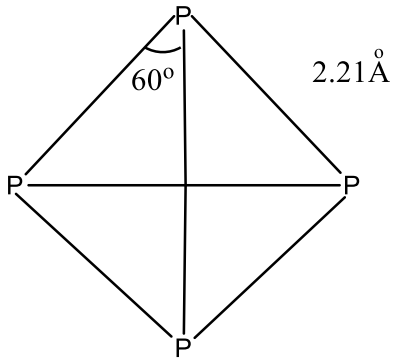
832 **(a)**
The solubility of alkaline earth metal fluorides decreases down the group.

833 **(c)**
Nitrogen dioxide (NO_2) exists as a dimer N_2O_4. When it is dissolved in sodium hydroxide or any other alkali, a mixture of nitrate and nitrite is obtained.
$2NO_2 + 2NaOH \longrightarrow \underset{\text{Sodium nitrate}}{NaNO_2} + \underset{\text{Sodium nitrate}}{NaNO_3} + H_2O$

834 **(c)**
O atom in each has sp^3-hybridisation. Due to increase in electronegativity of halogen from Br to F, the lone pair-bond pair repulsion causes decrease in bond angle.

835 **(b)**
XeF_4 has sp^3d^2–
hybridization of Xe atom having two positions occu
electrons.

836 **(b)**
White phosphate has the molecular formula p_4 both in solid and vapour state at moderate temperature. The four atoms present in the molecule are arranged at the corners of tetrahedron so the ppp bond angle is 60°. At higher temperature(above 700°C)it dissociates to give diatomic molecules as



837 **(d)**
$4P + 5O_2 \longrightarrow P_4O_{10}$ + light. This phenomenon is called chemiluminescence

838 **(c)**
Oxidising agent such as NO_3^-, SO_3^{2-} oxidise H_2S to give turbidity of S (colloidal) in water.

839 **(d)**
$2S_2O_3^{2-} + I_2 \longrightarrow S_4O_6^{2-} + 2I^-$

840 **(b)**
It is a fact.

841 **(b)**
$P_2O_5 + 3H_2O \longrightarrow 2H_3PO_4$

842 **(c)**
Order of increasing enthalpy of vaporisation is $PH_3 < AsH_3 < NH_3$
The enthalpy of NH_3 is higher due to the H-bonding.

843 **(c)**
Lavoisier named it as muriatic acid. Cl_2 was named as oxymuriatic gas or acid.

844 **(d)**
ZnO is amphoteric.

845 **(c)**
$FeSO_4 + 2H_2O \longrightarrow Fe(OH)_2 + H_2SO_4$; addition of H_2SO_4 to this solution reverses back the hydrolysis of $FeSO_4$.

846 **(b)**
Because of very low ignition temperature (303 K) of phosphorus it is always kept under water

848 **(b)**
$Cl_2O + H_2O \longrightarrow 2HClO$; Cl has + 1oxidation state in Cl_2O and HOCl.

849 **(b)**
$(NH_4)_2Cr_2O_7 \longrightarrow N_2 + Cr_2O_3 + 4H_2O$
(Green)

850 **(a)**
SO_2 is a gas anhydride of H_2SO_3; P_2O_3 and P_2O_5 are solids.

851 **(a)**
PCl_3 and cold water reacts to produce *ortho* phosphorus acid (phosphorus acid)H_3PO_3
$PCl_3 + 3HOH \longrightarrow H_3PO_3 + 3HCl$

853 **(b)**
H_3PO_3 is dibasic acid forming NaH_2PO_3 and Na_2HI

854 **(c)**
It is a fact.

855 **(d)**
Fluorine is the stronger oxidizing agent. It will oxidise other halide ions to halogens in solution or even dry
$F_2 + 2X^- \rightarrow 2F^- + X_2$

856 **(b)**
If 20 g N then wt. is 100.
If 14 g N then wt. is $\frac{100\times14}{20} = 70$
Atleast one N atom in one molecule should be present to give minimum mol. wt.

857 **(d)**
Sulphides of As, Sb, Sn are soluble in yellow ammonium sulphide.

858 **(a)**
Stronger is acid, weaker is its conjugate base. The acidic character (on the basis of bond length) of halogen acids is:
$HF < HCl < HBr < HI$.

859 **(c)**
$\underbrace{P_2O_3 \quad A_2O_3 \quad B_2O_3}_{\text{Acidic oxides}} \qquad \underbrace{Bi_2O_3}_{\text{Alkaline}}$

860 **(b)**
$F_2 + 2HSO_4^- \longrightarrow S_2O_8^{2-} + 2HF$

861 **(c)**
Oleum is chemically $H_2S_2O_7$ (pyrosulphuric acid).

862 **(b)**
Chlorine forms maximum (six) oxides.

863 **(c)**
Ar is most abundant noble gas in air.

864 **(a)**
It is a use of freons.

865 **(d)**
S exists as octa-atomic in nature.

866 **(d)**
Noble gases are adsorbed by coconut charcoal. the adsorption of different noble gases occur at different temperatures, hence charcoal is used to separate these gases.
Helium is not adsorbed by charcoal (as it is very difficulty liquefiable gas).

867 **(c)**
It is a reason for the given fact.

869 **(d)**
Chloro-fluoro carbons are called freons.

870 **(d)**
Analytical reagent grade H_2SO_4 has normality = 36 *N*.

872 **(c)**
5 of P and 3 of Cl· = 8.

873 **(a)**
N_3H is hydrazoic acid. It easily gives a proton. Its salts are called azides (N_3^-).

875 **(d)**
Ionisation energy increases along the period.

876 **(c)**
K_2HgI_4 gives brown ppt. with NH_4^+.

877 **(c)**
NH_2CONH_2 is urea; 60 g urea has 28 g nitrogen.

878 **(b)**

Phosphate mineral is phosphorite, $Ca_3(PO_4)_2$.

879 **(a)**
S forms two thionic acids. Dithionic acid $H_2S_2O_6$and polythionic acid $H_2S_nO_6$ (n=3, 4, 5, 6).

880 **(b)**
The disease caused by the constant touch with white phosphorus is called phossy jaw

881 **(c)**
$PbSO_4$ is insoluble in water and acids.

882 **(c)**
$H_2S_2O_3$

$$HO-\overset{\overset{O}{\|}}{S}-S-OH$$

883 **(c)**
N atom on NH_3 has one lone pair of electrons on it for coordination.

884 **(c)**
$2KBr+Cl_2 \longrightarrow 2KCl+Br_2$
Hence, by the action of chlorine with KBr, bromine gas can be produced.

885 **(c)**
The oxidation state of Xe in XeO_3 can be calculated as
$XeO_3, x+(-2\times 3)=0$
$X=+6$
XeO_3 has Sp^3 hybridisation with bond angle $=103°$.

886 **(a)**
$NH_4NO_3(s) \xrightarrow{\Delta} 2H_2O\uparrow + N_2O\uparrow$
$NaNO_3(s) \xrightarrow{\Delta} NaNO_2 + O_2\uparrow$
$2AgNO_3(s) \xrightarrow{\Delta} 2Ag(s) + 2NO_2(g) + O_2(g)$
Lunar caustic
$2Pb(NO_3)_2 \rightarrow 2PbO + 4NO_2\uparrow + O_2\uparrow$

887 **(b)**
$NH_3 + HCl \longrightarrow NH_4Cl$
$PH_3 + HCl \longrightarrow PH_4Cl$

888 **(a)**
POX_3 has sp^3-hybridized, P having vacant d-orbitals. p-of O atom and d- of P undergoes $p\pi - d\pi$ bonding.

889 **(d)**
Nitrochloroform $CCl_3 \cdot NO_2$ is called tear gas.

890 **(d)**
All are the characteristics of $(CN)_2$.

891 **(c)**
Ammonium salts on heating with NaOH, give ammonia gas which has characteristic smell.
$NH_4Cl+NaOH \xrightarrow{\Delta} NH_3\uparrow+H_2O+NaCl$

892 **(b)**
$3AgNO_3 + PH_3 \longrightarrow Ag_3P + 3HNO_3$

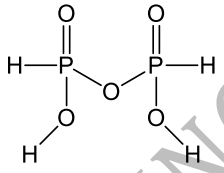
893 **(c)**
$H_2S_2O_6 + H_2O \longrightarrow H_2SO_4 + H_2SO_5$

894 **(d)**
Ti has configuration $1s^2, 2s^2 2p^6, 3s^2 3p^6 3d^2, 4s^2$.
Thus, Ti^{4+} has configuration
$1s^2, 2s^2 2p^6, 3s^2 3p^6$, *i*.e., of Ar.

895 **(b)**
It is a fact.

896 **(d)**
Strongest oxidant is F_2.

898 **(c)**
Pyrophosphorous acid is $H_4P_2O_5$,



899 **(b)**
A mixture of calcium cyanmide $CaCN_2$ and coke (C) is called nitrolim. It is used as fertilizer and can be prepared by passing nitrogen on CaC_2.
$CaC_2+N_2 \xrightarrow{1100°C} CaCN_2+C$
nitrolim

900 **(d)**
NF_3 is not hydrolysed because neither N nor F has d-orbitals.

901 **(d)**
When the mixture of noble gas is cooled in a coconut bulb at 173 k then Ar, Kr and Xe are adsorbed on charcoal while He and Ne are not adsorbed.

902 **(a)**
$H_2S + O_3 \longrightarrow H_2O + O_2 + S$

903 **(a)**

$$PCl_5 + HO-\overset{\overset{O}{\|}}{\underset{\underset{O}{\|}}{S}}-OH \longrightarrow Cl-\overset{\overset{O}{\|}}{\underset{\underset{O}{\|}}{S}}-Cl + POCl_3 + H_2O$$

PCl_5 attacks —OH group and replace it by —Cl group. Hence, reaction of PCl_5 with H_2SO_4 shows the presence of two —OH group in H_2SO_4.

904 **(a)**
Caliche is $NaNO_3 + NaIO_3(0.2\%)$.

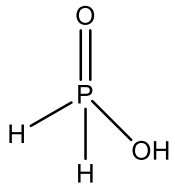
905 **(a)**
O_2 molecule has total number of 16 electrons out of which two electrons are unpaired giving a paramagnetic nature while 14 electrons are paired

906 **(b)**
Follow text.

907 **(a)**
$2H_2O + SO_2 \rightarrow H_2SO_4 + 2[H]$
[nascent hydrogen]
Coloured flower + 2[H] → Colourless flower

908 **(a)**
$NaNO_2 + NH_4Cl \xrightarrow{\Delta} NaCl + N_2 + 2H_2O$

909 **(a)**
The formula of hypophosphorus acid is H_3PO_2.



910 **(b)**
Commercially chlorine dioxide is prepared by passing SO_2 gas into a mixture of sodium chloride and H_2SO_4 having NaCl in traces.

$$\underset{\text{solium chlorate}}{2NaClO_3} + SO_2 + H_2SO_4 \xrightarrow[NaCl]{\text{Trace}} \underset{\text{chlorine dioxide}}{2ClO_2} + 2NaHSO_4$$

911 **(b)**
Oxygen due to its smaller size has more electron density in H_2O and thus, has more tendency to donate its lone pair for complex formation

912 **(a)**
Only He forms interstitial compounds since, the atomic size of He is smallest and matches the size of the interstices available is the lattice of most of the heavy metals

913 **(b)**
$2NaIO_3 + 5NaHSO_3 \longrightarrow 2Na_2SO_4 + 3NaHSO_4 + I_2 + H_2O$

914 **(d)**
Na_2O_2 is peroxide.

915 **(a)**
$2SO_2 + O_2 \xrightarrow{NO} 2SO_3$

916 **(d)**
$2Cu^{2+} + 2I^- \longrightarrow Cu_2^{2+} + I_2$

917 **(b)**
Both He and Na give yellow lines but of different wavelengths.

918 **(b)**
White phosphorus on reaction with limited supply of oxygen gives lower oxide P_4O_6.
Therefore, air($O_2 + N_2$) is a good source for controlled supply of oxygen and the best choice for controlled oxidation of white phosphorus into lower oxide P_4O_6.

919 **(a)**
$PH_4I + NaOH \longrightarrow NaI + PH_3 + H_2O$

920 **(d)**
HF is formed which is liquid.

921 **(a)**
A characteristic of alkaline pyrogallol is to absorb (

922 **(d)**
Freons (chlorofluoro carbons) are used as refrigerant.

923 **(b)**
Red P does not react with NaOH.

924 **(c)**
N_2O, NO, N_2O_3, N_2O_4 and N_2O_5.

925 **(a)**
$NH_3 + HCl \longrightarrow NH_4^+ + Cl^-$

926 **(b)**
In household refrigeration, SO_2 is used as refrigerant. It is condensed by compression and cooling is caused when liquid SO_2 is allowed to evaporate.

927 **(c)**
$2CaOCl_2 \xrightarrow{CoCl_2} 2CaCl_2 + O_2$

928 **(c)**
When nitrogen and hydrogen in the ratio of 1:3 are mixed at high temperature(750 K) at 200-250 atm pressure and in the presence of Fe and Mo, ammonia is obtained . This process is called Haber's process.

$$N_2(g) + 3H_2(g) \underset{750K,\ 200\text{-}250\ atm}{\overset{Fe.Mo}{\rightleftharpoons}} 2NH_3(g)$$

In this process finely divided iron (Fe) acts as catalyst and molybdenum (Mo) acts as catalyst promoter.

929 **(d)**
These are uses of F_2.

930 **(b)**
The spontaneous inflammability of phosphine with smoky rings (vortex rings) at the time of preparation is due to the presence of highly inflammableP_2H_4. This property is used in Holme's signal.

931 **(a)**
$FeSO_4 + NO \rightarrow FeSO_4 \cdot NO$
(brown)

932 **(d)**
$3SO_2 + O_3 \longrightarrow 3SO_3$. In rest all cases O_2 is given out.

933 **(c)**

$HClO_4$ is strong acid:

$HClO_4 + H_2SO_4 \longrightarrow ClO_4^- + H_3SO_4^+$

934 **(c)**

$SO_2 + 2CuCl_2 + 2H_2O \xrightarrow{KCNS} Cu_2Cl_2 + H_2SO_4 + 2HCl$

White

935 **(a)**

All ammonium salts on heating with any alkali give NH_3.

936 **(d)**

$4NH_3 + 5O_2 \xrightarrow{\text{Pt gauze}} 4NO + 6H_2O$

937 **(d)**

S_2Cl_2 is used in vulcanisation of rubber and as chlc

938 **(c)**

$Ca_3(PO_4)_2 + 2H_2SO_4 + 5H_2O \longrightarrow Ca(H_2PO_4)_2 \cdot H_2O + 2CaSO_4 \cdot 2H_2O$

939 **(a)**

P_4O_{10} and H_3PO_4 both have + 5 oxidation state for P.

940 **(a)**

H_2F_2 being weak acid is slightly ionized.

941 **(c)**

Oleum is $H_2S_2O_7$.

942 **(a)**

$Cr + H_2SO_4[Cr(H_2O)_6^{2+}]SO_4$; $Cr(H_2O)_6^{2+}$ is blue.

Dil.

944 **(d)**

SO_2 acts as bleaching agent due to its reducing property.

$SO_2 + 2H_2O \longrightarrow H_2SO_4 + 2H$

Coloured matter + [H] $\longrightarrow$ colourless matter.

945 **(d)**

$HClO_3$ and ClO_3^- both possess these properties.

$ClO_3^- \longrightarrow Cl^-$

$+\frac{3}{2} O_2$} oxidation and bleaching properties

$\left.\begin{matrix} Cl^{5+} \longrightarrow Cl^{7} + 2e \\ 6e + Cl^{5+} \longrightarrow Cl^{-} \end{matrix}\right\}$ Disproportionation

946 **(c)**

Suppose the oxidation state of Xe in $XeOF_2$ is x

$x + (-2) + 2(-1) = 0;$

$x - 2 - 2 = 0$

$\Rightarrow x = +4$

947 **(c)**

Only Mg and Mn liberate H_2 from dil. HNO_3.

948 **(b)**

$2AgClO_3 + Cl_2 \longrightarrow 2AgCl + ClO_2 + O_2$

949 **(a)**

$2FeCl_3 + SO_2 + 2H_2O \longrightarrow 2FeCl_2 + H_2SO_4 + 2HCl$

950 **(c)**

$KClO_3$ is known as Berthelot's salt

951 **(a)**

Pb reacts with dilute HNO_3 to produce NO

$3Pb + 8\ HNO_3 \longrightarrow 3Pb(NO_3)_2 + 2NO + 4H_2O$

dil.

952 **(d)**

Liquid NH_3; due to high heat of evaporation.

953 **(c)**

(i)enantiotropy when two forms of a solid substance exist together in equilibrium with each other at a particular temperature under normal pressure e,g,

$S_R \rightleftharpoons S_M$

(ii)dynamic allotropy if different allotropic forms exist in equilibrium over a range of temperature.

(iii)monotropy if an allotropic form change slowly to a stable form e.g.,

$O_3 \longrightarrow O_2$

∴ Monotropy is correct answer.

954 **(c)**

These are facts.

955 **(b)**

Xe reacts with P and O, the most electronegative elements.

956 **(c)**

Azeotropic mixture of H_2SO_4 + H_2O contains 98.3% H_2SO_4.

957 **(b)**

$2CuSO_4 + 4KI \longrightarrow Cu_2I_2 + 2K_2SO_4 + I_2$

$I_2 + 3Na_2S_2O_3 \longrightarrow 2Na_2S_4O_6 + 2NaI$

958 **(a)**

As a refrigerant.

959 **(c)**

BiOCl is formed.

961 **(a)**

10 g bleaching powder will produce 4.9 g $Cl_2 = \frac{4.9 \times 22.4}{71}$ litre Cl_2.

962 **(c)**

In $Ca(NO_3)_2$; % of $N = \frac{20}{164} \times 100 = 17.07\%$

In $(NH_4)_2SO_4$; % of $N = \frac{28}{132} \times 100 = 21.21\%$

In NH_2CONH_2; % of $N = \frac{28}{60} \times 100 = 46.66\%$

In NH_4NO_3; % of $N = \frac{28}{80} \times 100 = 35.00\%$

963 **(a)**

$NaClO + H_2O \longrightarrow NaOH + HClO$; the HClO is weakest acid among halogen oxo-acids and thus, pH is maximum.

964 **(d)**

Anhydrous $CaCl_2$ can be used as dehydrating agent.

965 **(c)**

It is a characteristic of XeF_6:

$$2XeF_6 + SiO_2 \longrightarrow 2XeOF_4 + SiF_4;$$
$$2XeOF_4 + SiO_2 \longrightarrow 2XeO_2F_2 + SiF_4;$$
$$2XeO_2F_2 + SiO_2 \longrightarrow 2XeO_3 + SiF_4.$$

966 **(b)**

$4K + 3SO_2 \longrightarrow K_2SO_3 + K_2S_2O_3$

967 **(d)**

It is an acid. $HClO \longrightarrow ClO^- + H^+$.

968 **(a)**

Nitrogen gas is major component of air.

969 **(a)**

H_3PO_2 is monobasic acid and only one H is replaceable.

970 **(a)**

It is a reason for the given fact.

971 **(b)**

Arsenic purifier chamber in contact process possesses $Fe(OH)_3$ which reacts with As_2SO_3.

972 **(a)**

H_2SO_4 is hygroscopic agent.

973 **(d)**

Rest all react with water.

974 **(c)**

The basic character of hydrides down the group.

975 **(d)**

It is a fact.

976 **(b)**

Cl is sp^3-hybridized having electrons in d-orbitals and p-electrons of oxygen, gives rise to $p\pi$-$d\pi$ bonding to Cl—O bond.

977 **(b)**

Arsenic acid is H_3AsO_4.

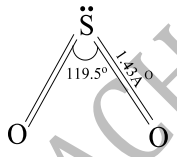
978 **(d)**

$F + e \longrightarrow F^-$

E^0_{RP} is maximum for fluorine.

979 **(b)**

SO_2 has sp^2-hybridization with one lone pair on S atom having geometry.



980 **(b)**

Phosphorus, element of nitrogen family(V group), produces maximum number of oxy acids.

e.g.,

$H_3PO_2, HPO_2, H_3PO_3, H_4P_2O_5, HPO_3, H_3PO_4, H_4P_2O_$

981 **(d)**

Each member of gp. 17 possesses ns^2np^5 configuration.

982 **(a)**

NOCl is nitrosyl chloride.

983 **(b)**

N is most electronegative among N-family.

984 **(b)**

This is a reason for the given fact.

986 **(c)**

F has more electronegativity than other halogens.

987 **(b)**

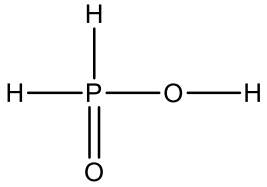
On long standing it undergoes auto-oxidation as , $6CaOCl_2 \longrightarrow Ca(ClO_3)_2 + 5CaCl_2$.

988 **(b)**

NH_3 is pyramidal.

989 **(c)**

Hypophosphorus acid($H_3\ PO_2$) is amonobasic acid and has only one ionisable H two Hatoms are directly attached to phosphorus thus the correct statement is (c).



990 **(d)**

Rest all form complex with $NH_3, e.g., Ag(NH_3)_2^+; Cu(NH_3)_4^{2+}; Cd(NH_3)_4^{2+}$.

991 **(c)**

In laboratory ,H_2S is prepared by treating ferrous sulphide(black lumps) with dil .H_2SO_4

$FeS + H_2SO_4 \longrightarrow FeSO_4 + H_2S$

992 **(c)**

$_1H^2 + {}_1H^2 \rightarrow {}_2He^4$

993 **(d)**

PH_6^+ is not known.

994 **(c)**

In a group, $\Delta Gf°(HX)$ changes from negative to positive downwards.

$HF(g) \Delta G = -273.20\ kJ\ mol^{-1} 1$

$HF(g) \Delta G = +1.72\ kJ\ mol^{-1}$

Thus HF is thermally stable and HI not.

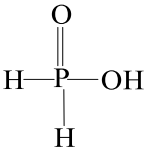
Thus,s HF>HCI>HBr>HI.

995 **(c)**

Coconut charcoal possesses characteristic property for adsorbing different noble gases at different temperatures.

996 **(d)**

Hypophosphorus acid is monoprotic acid as only o Attached on O are ionisable.



997 **(b)**

It also exhibits +1 oxidation states like Cl, Br and I.

998 **(d)**

Metallic character increases down the group.

999 **(a)**

The reactivity of halogens decreases down the gp.

100 **(b)**

0 It is a fact.

100 **(a)**

1 Clathrates are non-stoichiometic compounds where the ratio of guest and host molecules does not correspond to ideal chemical formula

100 **(a)**

2 Both possess pungent odour and act as bleaching agents.

100 **(a)**

3 It is a fact.

100 **(d)**

4 The metallic character is developed to a considerable extent in I_2. It is violet crystalline, lustrous solid having the tendency to form I^{3+} cation.

100 **(c)**

5 Potassium chlorate ($KCLO_3$) is known as Berthelot's salt. It is the salt of chlorine acid, $HCIO_3$.

100 **(c)**

6 $NH_4NO_3 \xrightarrow{\Delta} N_2O(g) + 2H_2O(g)$

100 **(b)**

7 $PH_3 + HBr \longrightarrow PH_4Br$

100 **(c)**

8 Simple representation of bleaching powder is $CaOCl_2$. It is a mixture of $Ca(OCl)_2 + CaCl_2 \cdot Ca(OH)_2 \cdot H_2O$, *i. e.*, calcium chlorohypochlorite.

100 **(b)**

9 $6O_2 \longrightarrow 4O_3$

101 **(c)**

0 $2Na_2S_2O_3 + I_2 \longrightarrow Na_2S_4O_6 + 2NaI$

101 **(c)**

1 $3SO_2 + O_3 \longrightarrow 2SO_3$

$2Hg + O_3 \longrightarrow Hg_2O + O_3$

$2HCl + O_3 \longrightarrow Cl_2 + O_2 + H_2O$

$PbS + 4O_3 \longrightarrow PbSO_4 + 4O_2$

101 **(c)**

2 $CaS + 4H_2S \longrightarrow \underset{\text{Polysulphide}}{CaS_5} + 4H_2$

101 **(c)**

3 H_2SO_4 is oxidant and HI is strong reductant.

101 **(d)**

4 Decomposition involves breaking up of a molecule into its fragments.

$Pb(NO_3)_2 \longrightarrow PbO + NO_2 + \frac{1}{2}O_2$

101 **(b)**

5 Basic character of hydrides decreases down the gp.

101 **(a)**

6 Fluorine forms Xe fluorides.

101 **(a)**

7 It is a fact.

101 **(c)**

8 Alkali metal oxides are saline oxides.

101 **(a)**

9 All are non-metals and possess strong electronegative nature.

102 **(d)**

0 N_2O_3 is blue coloured.

102 **(c)**

1 $Cl_2 + 2NaOH \longrightarrow NaCl + NaClO + H_2O$

Cold,dil.

Chlorine reacts with cold and dilute NaOH to give sodium hypochlorite.

102 **(a)**

2 These are characteristics of H_2O.

102 **(d)**

3 In VA group the thermal stability of hydrides decreases from NH_3 to BiH_3 hence, BiH_3 is the most unstable hydride.

$NH_3 > PH_3 > AsH_3 > SbH_3 > BiH_3$

102 **(b)**

4 Both P^{3-} and Cl^- has $1s^2, 2s^2 2p^6, 3s^2 3p^6$ configuration.

102 **(b)**

5 Divers use $He + O_2$ mixture for respiration in place of $N_2 + O_2$. The N_2 was found to dissolve in blood at high pressure during diving and after it, the N_2 gas comes out from blood causing painful nerve

bursting. The mixture is also used for respiration by asthma patients.

102 **(a)**

6 SO_2 is soluble in water

$H_2O + SO_2 \rightarrow H_2SO_3$

sulphurous acid

102 **(a)**

7 Due to less reactivity of red phosphorus, it is used in the manufactures of safe matchsticks

102 **(c)**

8 It is a fact.

103 **(d)**

0 Due to absence of *d*-orbitals in N-atom, it cannot accept electrons from H_2O for hydrolysis of NF_3

103 **(c)**

1 It is a reason for the given fact.

103 **(c)**

2 General valence shell electronic configuration of 15 th group elements is $ns^2\ np^3$ where n=period number.

103 **(b)**

3 K_2HgI_4 gives brown ppt. with NH_3.

103 **(b)**

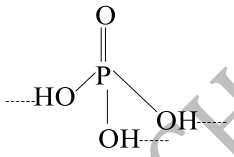
4 Except Bi, rest all VA members show allotropy.

103 **(d)**

5 Pyrophosphoric acid is $H_4P_2O_7$ having 4H attached on 4 oxygen atoms.

103 **(c)**

6 H_3PO_4 is syrupy liquid due to more sites available for H-bonding.



103 **(b)**

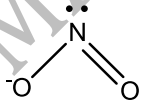
7 $NO + NO_2 \xrightarrow{253°C} N_2O_3$

(X)

$N_2O_3 + H_2O \longrightarrow 2HNO_2$

(X) *(Y)*

∴ Anion of y is NO_2^-



Its shape is triangular planar.

103 **(d)**

8 $XeF_2, XeOF_2, XeF_4, XeOF_4, XeF_6, XeO_3$

103 **(a)**

9 When conc. H_2SO_4 is heated with P_2O_5, the acid is converted into sulphur trioxide.

$2\ H_2SO_4 + 2\ P_2O_5 \longrightarrow\ 2SO_3 + 4HPO_3$

sulphur trioxide

104 **(b)**

0 The reactivity of yellow or white phosphorus is maximum.

104 **(b)**

1 Metaphosphoric acid is HPO_3;

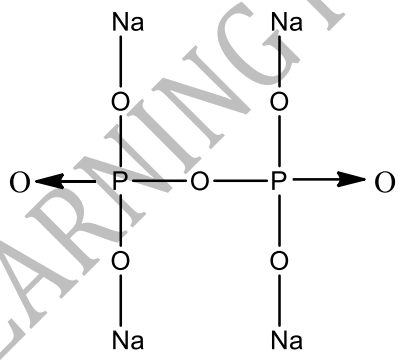
$P_2O_5 + H_2O \longrightarrow 2HPO_3$

104 **(c)**

2 Sodium pyrophosphate is represented by $Na_4P_2O_7$.It is sodium salt of pyrophosphoric acid ($H_4P_2O_7$). Which may be considered to be made up by two molecules of *ortho* phosphoric acid eliminating one molecule of H_2O.

$2\ H_3PO_4 \xrightarrow{-H_2O} H_4P_2O_7$

pyrophosphoric acid



sodium pyrophosphate

104 **(d)**

3 $(NH_4)_2Cr_2O_7 \xrightarrow{\Delta} N_2 + Cr_2O_3 + 4H_2O$

$Ba(N_3)_2 \xrightarrow{\Delta} 3N_2 + Ba$

$NH_4NO_3 \xrightarrow{\Delta} N_2O + 2H_2O$

104 **(b)**

4 It is a fact.

104 **(d)**

5 $2AgNO_3 \rightarrow 2AgNO_2 + O_2$

$\downarrow$

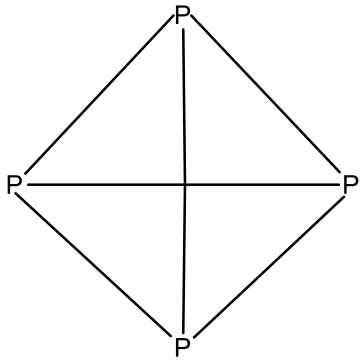
$2Ag + 2NO_2$

104 **(c)**

7 P_4O_{10} is a dehydrating agent.

104 **(a)**

8 ∴ Bondings electrons in white phosphorus = 6



Structureof white phosphorus

104 **(b)**

9 Compounds of Ar with fluorine are not known because of higher ionization energy of Ar.

105 **(d)**

0 SO_2 dissolves in H_2O in presence of oxygen to give $H_2SO_4 2SO_2 + 2H_2O + O_2 \longrightarrow 2H_2SO_4$
H_2SO_4 or H_2SO_3 (solution of SO_2 in H_2O) reacts with marble to damage it as well as responsible for cough and choking in human body.

105 **(b)**

1 The hypochlorites disproportionate on heating as follows.
$3ClO^- \longrightarrow 2Cl^- + ClO_3^-$

105 **(d)**

2 $SiO_2 + 4HF \longrightarrow SiF_4 + 2H_2O$
$SiF_4 + 2HF \longrightarrow H_2SiF_6$

105 **(b)**

3 Cl_2 acts as permanent bleaching agent because its bleaching action is due to oxidation
$Cl_2 + H_2O \longrightarrow 2HCl + [O]$
Organic colouring matter $+[O] \longrightarrow$ colourless matter.
While SO_2 acts as temporary bleaching agent because its bleaching action is due to reduction.
$SO_2 + 2H_2O \longrightarrow H_2SO_4 + 2[H]$
Colouring matter $+2[H] \longrightarrow$ colourless matter.

105 **(b)**

4 If not cooled properly, on opening the cork, the liquid will bump out.

105 **(a)**

5 $CaC_2 + \frac{5}{2}O_2 \longrightarrow CaO + 2CO_2$
$CaC_2 + N_2 \longrightarrow Ca(CN)_2$.

105 **(c)**

6 $FeSO_4 \cdot 7H_2O \xrightarrow{\Delta} FeSO_4 + 7H_2O$;
$2FeSO_4 \xrightarrow{\Delta} Fe_2O_3 + SO_2 + SO_3$

105 **(b)**

7 With progressive increase in atomic number, the reduction potential of halogen decreases thus oxidizing power also decreases. Hence a halogen with lower atomic number will oxidise the halide ion of higher atomic number and therefore will liberate them from their salt solution.
$Cl_2 + 2F^- \longrightarrow 2Cl^- + F_2$
is not possible.

105 **(d)**

8 $P_4 + 6H_2SO_4 \rightarrow 4H_3PO_4 + 6SO_2$

105 **(c)**

9 ZnO reacts with acids and alkalies both.

106 **(d)**

0 Nitrogen in both N_2O_5 and HNO_3 possesses $+5$oxidation state.

106 **(b)**

1 $SiO_2 + 6HF \longrightarrow [SiF_6]^{2-} + 2H^+ + 2H_2O$

106 **(d)**

2 Rest all three properties are shown by white phosphorus.

106 **(d)**

3 $2KMnO_4 + 3H_2SO_4 + 10HCl \rightarrow K_2SO_4 + 2MnSO_4 + 8H_2O + 5Cl_2$

106 **(d)**

4 This is a reason for the given fact.

106 **(c)**

5 Bi is metal.

106 **(c)**

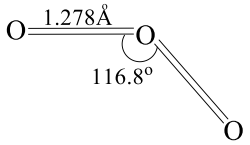
7 It is a method to get Cl_2.

106 **(a)**

8 Acidic character of oxides increases along the period.

106 **(b)**

9 O_3 has no unpaired electron in its structure.



107 **(d)**

0 O_3 is used as dry bleaching agent.

107 **(a)**

1 The oxidizing power of HNO_3 is maximum among all.

107 **(c)**

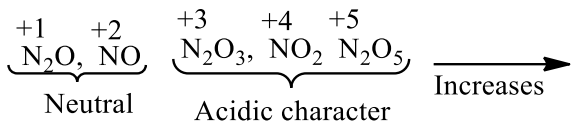
2 -3 in PH_3 and $+5$ in PCl_5.

107 **(b)**

3 Sulphur exists as S_8.

107 **(b)**

4 The acidic character of oxides increases with increase in the oxidation number of element.



107 **(a)**

5 Bleaching powder is $CaOCl_2$ having Ca^{2+} , Cl^- and (

107 **(a)**

6 $B > P > As > Bi$

As we go down the group, bond angle decreases, since the repulsion between the bonded pairs of electrons decrease

107 **(a)**

7 $CaOCl_2 + H_2O \longrightarrow Ca(OH)_2 + HOCl + HCl$

$HOCl \longrightarrow HCl + [O]$

107 **(b)**

8 $Ca_3P_2 + 3H_2O \rightarrow 3Ca(OH)_2 + 2PH_3$

107 **(a)**

9 Due to highest IP, electrons are more tightly held with nucleus.

108 **(c)**

0 It is a fact.

108 **(d)**

1 $X = I_2, Y = HI$

$3I_2 + 2NH_3 \rightarrow NH_3 \cdot NI_3$

(explosive)

$8NI_3 \cdot NH_3 \rightarrow 5N_2 + I_2 + 6NH_4I$

$I_2 + H_2 \rightarrow 2HI$

(Y)

$3NaI + H_3PO_4 \xrightarrow{\Delta} Na_3PO_4 + 3HI$

108 **(b)**

2 V_2O_5 (vanadium pentaoxide) is used as a catalyst in the manufacture of H_2SO_4 by contact process since, it is not easily poisoned.

108 **(c)**

4 (i) carbon monoxide is neutral and SO_3 is acidic.

(ii)aluminium and zinc oxides are amphoteric , so aluminium and zinc oxides react with both as acid and base.

$Al_2O_3 + 6HCl \longrightarrow 2AlCl_3 + 3H_2O$(with acid)

$Al_2O_3 + 2NaOH + 3H_2O \longrightarrow 2NaAl(OH)_4$(with base)

$ZnO + H^+ \longrightarrow Zn^{2+} + H_2O$(in acid)

$ZnO + 2OH^- + H_2O \longrightarrow [Zn(OH)_4]^{2-}$(in base)

Hence, (i) and (iii) are correct.

108 **(a)**

5 It is a fact.

108 **(d)**

6 Among halides of hydrogen intermolecular H-bonding is present. So when we go top to bottom in halogen group, size of I^- ion increases and the intermolecular H- bonding becomes weak and easily gives H^+ in aqueous solution. So, it works as a strong acid.

Acidity decreases in the order

HI>HBr>HCI>HF

108 **(a)**

7 Rest all gives O_2 on heating .

108 **(a)**

8 This was a reason for late discovery of F_2.

108 **(c)**

9 H_2SO_5 (Caro's acid) and $H_2S_2O_8$ (Marshall's acid) contain one peroxyacids $-O-O-$ linkage

109 **(b)**

0 F_2 is pale-yellow; Cl_2 is green-yellow; Br_2 is dark yellow-brown; $I_2$is violet .

109 **(c)**

1 $(CN)_2$is called pseudohalogen.

109 **(c)**

2 $CS_2 + 3Cl_2 \xrightarrow{I_2} CCl_4 + S_2Cl_2$

109 **(c)**

4 $2NaI + 2H_2SO_4 \longrightarrow Na_2SO_4 + SO_2 + H_2O + I_2$

109 **(b)**

5 $KNO_3 \xrightarrow{\Delta} KNO_2 + \frac{1}{2}O_2$

109 **(b)**

6 H_2SO_4 is a very good hygroscopic agent.

109 **(c)**

7 NO (Nitric oxide) is synthesized in lab by copper with cold and dilute HNO_3.

$3Cu + 8\,HNO_3 \longrightarrow 3Cu(NO_3)_2 + 2NO + 4H_2O$

dil. Nitric oxide

109 **(a)**

8 XeO_4 is formed by promoting one $5s$ and there $5p$-electrons of Xe to higher energy. $5d$ orbitals giving eight unpaired orbitals hybridize to give sp^3 hybridisation which form sigma bonds with four O atoms. The four unhybridised singly occupied $5d$ orbitals form four $p\pi - d\pi$ bonds with oxygen atoms

110 **(c)**

0 $2KClO_3 + 4HCl \longrightarrow 2KCl + Cl_2 + 2ClO_2 + 2H_2O$

110 **(a)**

1 H-bonding in H_2O develops abnormal properties.

110 **(b)**

2 It is a fact.

110 **(c)**

3 It is a mixture of $Ca(OCl)_2 \cdot 4H_2O + CaCl_2Ca(OH)_2 \cdot H_2O$

110 **(d)**

4 $H_2S + 2HNO_3 \rightarrow 2NO_2 + S + 2H_2O$

(colloidal sulphur)

110 **(d)**

5 It is a fact.

110 **(c)**

6 Alcoholic solution of I_2 is brown.

110 **(d)**

7 It is a use of Ne.

110 **(b)**

8 Fluorine exhibits an oxidation state of only -1 because it is very strongly electronegative element (maximum electronegativity in the periodic table)..

110 **(a)**

9 $2Na_2SO_3 + O_2 \longrightarrow 2Na_2SO_4$

111 **(d)**

0 F_2 reacts with CH_4 even in dark to show substituti

111 **(d)**

1 NO_2 is brown gas and N_2O_3 is blue-coloured liquid.

111 **(d)**

2 $H_2C_2O_4 \xrightarrow{H_2SO_4} H_2O + CO + CO_2$

111 **(c)**

4 $SO_2 + Cl_2 \longrightarrow SO_2Cl_2$

111 **(d)**

6 Perchloric acid is not a peroxy acid while perphosphoric acid, pernitric acid and perdisulphuric acid are the example of peroxy acid.

111 **(a)**

8 $2NaI + 2H_2SO_4 \longrightarrow Na_2SO_4 + I_2 + SO_2 + 2H_2O$

111 **(a)**

9 Ozone undergoes addition reactions at C—C unsaturation.

112 **(c)**

0 $NO(g) + NO_2(g) \rightarrow N_2O_3(l)$

112 **(d)**

1 $P_4 + 5O_2 \rightarrow P_4O_{10}$; white phosphorus gets easily oxidised because it is highly reactive

112 **(a)**

2 Red phosphorus is less reactive.

112 **(b)**

3 P forms tetra-atomic molecule.

112 **(a)**

4 $H_2S \rightleftharpoons H^+ + HS^-$

$HS^- \rightleftharpoons H^+ + S^{2-}$

112 **(c)**

5 $S + H_2O + 3O_3 \longrightarrow H_2SO_4 + 3O_2$

112 **(d)**

6 All show +5 covalency.

112 **(c)**

7 Xenon hexafluoride reacts with silica to form $XeOF_4$ as

$2\,XeF_6 + SiO_2 \longrightarrow XeOF_4 + SiF_4$

The oxidations state of xenon in $XeOF_4$ is calculated as

x -2-1

$XeOF_4$

$x+(-2)+4\times(-1) = 0$

x-2-4=0

x=+6

112 **(d)**

8 These are reasons for the given fact.

112 **(c)**

9 Halogen's d-orbital forms π-bonds with p-orbital of oxygen.

113 **(a)**

0 It is a fact.

113 **(c)**

1 $2NaCl + K_2Cr_2O_7 + 4H_2SO_4 \longrightarrow Na_2SO_4 + 2KHSO_4 + CrO_2Cl_2 + H_2O$

113 **(c)**

2 Ozone is used for purifying water because ozone kills bacteria, cysts, mold ,parasites ,viruses, contaminates etc. It is one of the effective way of eliminating microorganism in the water. Ozone is most effective oxidant. It inactivates and oxidises organic matter, contaminates, pesticides, viruses and bacteria faster than chlorine. Ozone do not form TMH which have unpleasant odour and also carcinogenic. Ozone is very good biocide, ozone also absorts UV radiation.

113 **(d)**

3 Due to N≡N bond.

113 **(d)**

4 In disproportionation reaction, compounds are simultaneously formed that contain a given element in a more oxidised and more reduced state than the intial one. ClO_4^- In oxidation number of Cl is +7 and it cannot increases it further so ClO_4^- will not get oxidized and so will not undergo disproportionation reaction.

113 **(c)**

5 $2MnO_4^- + 16H^+ + 10Cl^- \longrightarrow 2Mn^{2+} + 5Cl_2 + 8H_2O$

113 **(d)**

6 AsH_3 is gas.

113 **(d)**

7 P_4O_{10} is tetrahedral in nature.

113 **(b)**

8 It is a reason for the given fact.

113 **(d)**

$Cl_2O, ClO, ClO_2, Cl_2O_6, Cl_2O_7, ClO_4$ are oxides of chlc

9

114 **(d)**

0 N_2O has neither oxidant nor reductant nature.

114 **(d)**

1 By Haber's process.

114 **(a)**

2 The basic character of halides of N is:
$NF_3 < NCl_3 < NBr_3 < NI_3$.

114 **(c)**

3 H_2O_2 decolourises $KMnO_4$ but O_3 not.

114 **(c)**

4 $Cl_2 + 2KBr \rightarrow Br_2 + 2KCl$

114 **(c)**

5 It is a fact.

114 **(d)**

6 $Ba(N_3)_2 \longrightarrow Ba(s) + 3N_2(g)$
Azide salt of barium can be obtained in purest form as well as the decomposition product contain solid Ba as by product alongwith gaseous nitrogen hence to additional step of separation is required.
Other reaction are
$NH_4NO_3 \xrightarrow{Heat} N_2O + 2H_2O$
$2NH_3 + 3CuO \xrightarrow{Heat} 3Cu + 3H_2O + N_2$
$(NH_4)_2Cr_2O_7 \xrightarrow{Heat} Cr_2O_3 + 4H_2O + N_2$

114 **(b)**

7 I_2+alcohol is tincture of iodine used as antiseptic.

114 **(c)**

8 $2XeF_6 + SiO_2 \longrightarrow SiF_4 + 2XeOF_4$

114 **(c)**

9 I_2 possesses sublimation nature.

115 **(c)**

0 Electrolysis of $MgCl_2$, NaCl, KCl in fused state gives Cl_2 as byproduct. Electrolysis of Al_2O_3 in fused state gives O_2 as byproduct.

115 **(d)**

1 Rest all reacts with H_2SO_4.

115 **(b)**

2 $NaNO_3 + 8H \longrightarrow NaOH + 2H_2O + NH_3$
$Zn + 2NaOH \longrightarrow Na_2ZnO_2 + 2H$

115 **(b)**

3 Phosphine forms vortex rings of P_2O_5 when it comes in contact of air .These rings are in the form of white smoke .They are used in making smoke screen in warfare.

115 **(c)**

4 These radioactive minerals have entrapped He atoms, produced from particle, which they give on heating in **Vacuo**.

115 **(b)**

5 Rest all (ClO_3 = 41 electrons, ClO_2 = 33 electrons) have unpaired electrons.

115 **(b)**

6 SO_2 is acidic and KOH is basic.

115 **(d)**

7 $SO_2 + 2H_2S \longrightarrow 2H_2O + 3S$; S^{2-} changes to S^0.

115 **(d)**

8 In the reaction,
$2HNO_3 + P_2O_5 \longrightarrow 2HPO_3 + N_2O_5$
HNO_3 does not behave as an oxidising agent because in this reaction P_2O_5 shows dehydrating property . It removes water molecule from HNO_3

115 **(d)**

9 A mixed salt is one which gives more than one type of cations or anions, *e.* g., $Ca^{2+} + OCl^- + Cl^-$

116 **(a)**

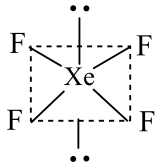
0 $4FeS + 7O_2 \longrightarrow 2Fe_2O_3 + 4SO_2$
$SO_2 + H_2O \longrightarrow H_2SO_3$
H_2SO_3 is dibasic acid.

116 **(c)**

1 $NH_3 + H_2O \longrightarrow NH_4^+ + OH^-$

116 **(d)**

3 In the formation of XeF_4, sp^3d^2 hybridisation occurs which gives the molecule an octahedral structure. The xenon and four fluorine atoms are coplanar while the two equitorial positions are occupied by the two lone pairs of electron



116 **(d)**

4 N_2O and NO are neutral oxides of N.

116 **(d)**

5 -1 due to most electronegative nature and +3, +5, +7 due to excitation of *p*-electrons to *d*-orbitals; +1 also with less electronegative elements.

116 **(c)**

6 First two are simply methods of preparation of O_3. Manufacture is done by (c) only.

116 **(d)**

7 $P_4 + O_2 \longrightarrow P_4O_{10}$ or P_4O_6

116 **(d)**

8 Rest all are uses of He. He is heavier than H_2.

116 **(c)**

9 It is a fact.

117 **(b)**

0 In N_2 and O_2, Mg will react on heating with them

and welding is not possible.

117 **(a)**

1 HNO_3 oxidizes H_2S to colloidal sulphur.
$H_2S + 2HNO_3 \longrightarrow 2NO_2 + 2H_2O + S$

117 **(a)**

2 $CS_2 + 2Cl_2 \longrightarrow CCl_4 + 2S$

117 **(a)**

3 Each member of gp. 16 or VIA has ns^2np^4 configuration with two unpaired p-electrons.

117 **(d)**

4 Krypton is used in miner's cap lamps.

117 **(b)**

5 Solution of Br_2 in CS_2 is orange in colour.

117 **(c)**

6 On long standing it undergoes auto-oxidation as,
$6CaOCl_2 \longrightarrow Ca(ClO_3)_2 + 5CaCl_2$.

117 **(d)**

7 Ar is most abundant inert gas in air.

117 **(a)**

8 $KF + HF \longrightarrow KHF_2$

117 **(d)**

9 PCl_5 produces $POCl_3$ with the following reagents
$PCl_5 + SO_2 \longrightarrow POCl_3 + SOCl_2$
$PCl_5 + H_2O \longrightarrow POCl_3 + 2HCl$
$6PCl_5 + P_4O_{10} \longrightarrow 10POCl_3$

118 **(b)**

0 On hydration, energy is given out.

118 **(b)**

1 Polyanion formation is maximum in sulphur. this is due to the fact that sulphur shows maximum catenation in the group .

118 **(c)**

2 The solubility of noble gases increases with increase in mol. wt. due to increase in van der Waals' forces. However, these are sparingly soluble.

118 **(a)**

3 It is a fact.

118 **(a)**

4 Sulphur is found in following allotropic forms :
(a)monoclinic (b)rhombic (c)plastic

118 **(c)**

5 $I_2 + 10HNO_3 \rightarrow 2HIO_3 + 10NO_2 + 4H_2O$

118 **(d)**

6 All these adsorb inert gases.

118 **(b)**

7 Potassium tetraiodo mercurate (II) ie $K_2[HgI_4]$dissolve in KOH solution to give Nessler's reagent . Nessler's reagent is used to test NH_4^+ions.

118 **(a)**

8 $F_2 + H_2O \longrightarrow 2HF + \frac{1}{2}O_2; \quad \Delta H = -\text{ve}.$

118 **(a)**

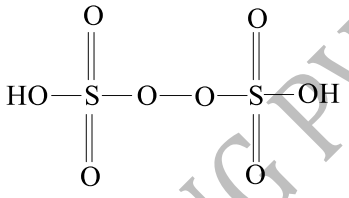
9 Pseudohalide ions combine together to form interpseudohalogen compounds. Cl_2N_3 is not an interpseudohalogen.

119 **(a)**

1 $HCOOH \xrightarrow{H_2SO_4} H_2O + CO$
$H_2C_2O_4 \xrightarrow{H_2SO_4} H_2O + CO + CO_2$

119 **(a)**

2 $H_2S_2O_8$ has O— O bond in it.



119 **(a)**

4 ClF_3, where Cl is sp^3d hybridised, has a T-shape structure due to presence of two lone pairs of electrons on Cl atom

119 **(b)**

5 $4HCl + O_2 \xrightarrow{CuCl_2} 2H_2O + 2Cl_2$(Deacon's process).

119 **(a)**

6 Nitre cake is $NaHSO_4$.

119 **(a)**

7 Helium(He) is a non-flammable(incombustible) gas and its lifting power is 93% as compared to flammable hydrogen gas, due to these reasons it is used in filling balloons and other lighter air – crafts.

119 **(a)**

8 It is a fact.

119 **(d)**

9 It is a reason for the given fact.

120 **(a)**

0 $S_2O_7 + H_2O \rightarrow H_2S_2O_8$

120 **(b)**

1 $PI_3 + 3H_2O \longrightarrow + \underset{\text{(Dibasic)}}{H_3PO_3} + \underset{\text{(Monobasic)}}{3HI}$

120 **(a)**

2 Rest all are poisonous hydrides.

120 **(b)**

4 S in SO_4^{2-} is sp^3-hybridized.

120 **(b)**

5 Only carbon reacts with conc. H_2SO_4 to give two different gases
$C + 2H_2SO_4 \longrightarrow CO_2 + 2SO_2 + 2H_2O$
While other elements react with conc. H_2SO_4 with the evolution of only one type of gas.

120 **(b)**

6 O_3 is an allotrope of O_2.

120 **(a)**

7 $Na_2SO_3 + S \rightarrow Na_2S_2O_3$

120 **(d)**

8 Each O and S has six valence electrons in it.

120 **(b)**

9 I atom in IF_7 possesses sp^3d^3-hybridisation to develop pentagonal bipyramidal shape.

121 **(d)**

0 $\overset{+7}{HClO_4} > \overset{+5}{HClO_3} > \overset{+3}{HClO_2} > \overset{+1}{HClO}$

As the oxidation number of halogen increases, acidic character increases

121 **(b)**

1 The 3 : 1 ratio of Cl^{35}: Cl^{37} gives average at. wt. of 35.5 to chlorine.

121 **(d)**

2 Zero group is called as buffer group because it lies between highly electronegative halogens and highly electropositive alkali metal elements.

121 **(a)**

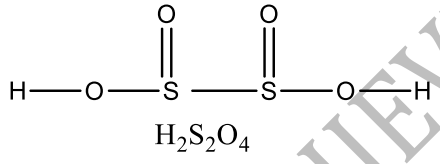
3 As the number of shells increases, size increases and the effective nuclear charge on the outermost electron decreases. Thus, IE decreases

121 **(b)**

4 $2Na_2S_2O_3 + I_2 \rightarrow 2NaI + Na_2S_4O_6$

121 **(c)**

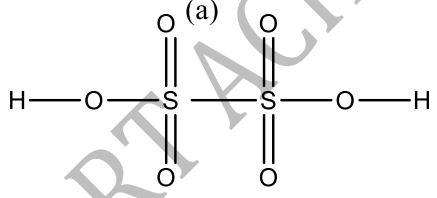
5



$H_2S_2O_4$

hyposulphurous acid

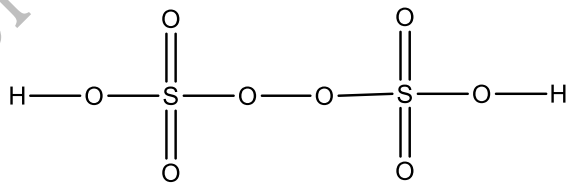
(a)



$H_2S_2O_6$

(b)

dithionic acid



$H_2S_2O_8$

(c)

Marshall's acid

.. Marshall's acid does not have s-s bond

121 **(a)**

6 Bromine is a liquid at room temperature

121 **(b)**

7 $_{84}Po$ is the only radioactive element of gp 16.

121 **(c)**

8 Oxygen and Sulphur are non-metals; Te is metalloid, Po is metal.

121 **(c)**

9 $NH_3 > PH_3 > AsH_3 > SbH_3$

On moving down the group atomic size increases and availability of lone pair decreases hence basic character decreases

122 **(c)**

0 H_2O contain hydrogen bond while no hydrogen bonding is present in H_2S

122 **(c)**

1 The acidic character decreases down the gp.

122 **(d)**

2 Rest all reacts with Cl_2.

122 **(c)**

3 Greater is electronegativity difference more is polarity. Electronegativities of N, Cl, O, F are 3.0, 3.0, 3.5 and 4.0 respectively.

122 **(d)**

4 $Na + NH_3 \longrightarrow NaNH_2 + \frac{1}{2} H_2$

122 **(c)**

5 Bartlett prepared first compound of Xe as $Xe^+[PtF_6]^-$, a red orange crystalline solid.

$Xe + PtF_6 \longrightarrow Xe^+[PtF_6]^-$

122 **(d)**

6 Oxidation number of S in H_2SO_3 is +4 which lies between minimum (-2) and maximum (+6) values and can thus increase or decrease.

122 **(b)**

7 The ease of liquefaction decreases with decrease in critical temperature. Also, critical temperature of a gas is lowered with increase in mol. mass.

122 **(d)**

8 Concentrated H_2SO_4 is less volatile, *ie*, it has high boiling point

122 **(b)**

9 $4P + 5CO_2 \longrightarrow 2P_2O_5 + 5C$

123 **(b)**

0 Silica(SiO_2) is present in the glass. This silica reacts with hydrofluoric acid.

$SiO_2 + 4HF \longrightarrow SiF_4 + 2H_2O$

$SiF_4 + 2HF \longrightarrow H_2SiF_6$

fluorosilicic acid

Note: HF is used for the etching of glass.

123 **(a)**

1 The most reactive nature of F_2 brings it the name super halogen.

123 **(b)**

2 N_2O does not burn itself but supports combustion

123 **(c)**

3 Carbon cannot expand its octet due to absence of *d*-orbitals.

123 **(b)**

4 $HgO \longrightarrow Hg + \frac{1}{2}O_2$

123 **(b)**

5 I_2 forms I_2O, I_2O_3, I_2O_5 and I_2O_7 oxides.

123 **(d)**

6 Due to (i) Small atomic size (ii) High ionization energy (iii) Absence of *d*-orbital, helium does not form any compound

123 **(b)**

7 $2HClO_4 \longrightarrow Cl_2O_7 + H_2O$

Hence, Cl_2O_7 is the anhydride of $HClO_4$

123 **(c)**

8 It is a fact.

123 **(d)**

9 Spirit of salt is a solution of HCl.

124 **(d)**

0 $2I^- \longrightarrow I_2 + 2e$

$2e + S^{6+} \longrightarrow S^{4+}$

124 **(c)**

1 Oxygen shows only -2, -1 and +2 (in F_2O) oxidation states.

124 **(d)**

2 Concentrated sulphuric acid, being a strong acid, oxidises bromides and iodides but not chlorides and fluorides since, the later are more electronegative. Hence it can be reduced only by NaBr among the given options.

$$\underset{+6}{H_2SO_4} + \underset{-1}{NaBr} \longrightarrow \underset{+6}{NaHSO_4} + \underset{-1}{HBr}$$

$$\underset{-1}{2HBr} + H_2SO_4 \longrightarrow \underset{0}{2H_2O + Br_2} + \underset{+4}{SO_2}$$

reduction

124 **(a)**

3 $S^{4+} + 4e \longrightarrow S$;

$S^{2-} \longrightarrow S + 2e$

124 **(d)**

4 The great affinity of H_2SO_4 for water is because it forms hydrates with water

124 **(d)**

5 Usually electron affinities decreases on moving down a group but fluorine due to its smaller size has a low value of electrons affinity in comparison to chlorine because the incoming electon experience greater repulsion . Thus, the order of electron affaffinity is as Cl>F>Br>I.

124 **(a)**

6 The correct order of acidity strength of halogen acids is HF<HCl<HBr<HI

This is due to the reason that as the size of halogen increases H—*X* bond becomes weaker and thus, H—*X* easily donate proton. Hence, HI is the strongest acid and HF is the weakest acid.

124 **(a)**

7 It is a fact.

124 **(b)**

8 $NH_4NO_3 \longrightarrow N_2O + 2H_2O$; N_2O does not burn and thus, does not supporter of combustion. Rest all nitrates give O_2 which is supporter of combustion.

124 **(d)**

9 $H_2C_2O_4 \xrightarrow{H_2SO_4} CO + CO_2 + H_2O$

125 **(b)**

0 $3Cu + 8HNO_3 \longrightarrow 3Cu(NO_3)_2 + 2NO + 4H_2O$

125 **(b)**

1 M. p. order : $\underset{158}{HCl} < \underset{186}{HBr} < \underset{190}{HF} < \underset{222K}{HI}$.

125 **(c)**

2 Basic character (the tendency to donate lone pair) is maximum in NH_3.

125 **(a)**

3 O_3 has no action with $KMnO_4$.

125 **(d)**

4 It is a method to obtain noble gases.

125 **(c)**

5 $3NaOCl \longrightarrow \underset{\text{Chlorate}}{NaClO_3} + 2NaCl$

Hypochlorite

125 **(b)**

6 Chromite ion is $Cr_2O_4^{2-}$

125 **(c)**

7 Liquor ammonia bottles are opened only after cooling because it has high vapour pressure and it is mild explosive.

125 **(a)**

8 Hydride HF HCl HBr HI

B.pt(in K) 293 189 206 238

Because of having low boiling point HCl is more volatile

125 **(b)**

9 The energy liberated when an electron is added to an isolated gaseous atom is called electron affinity. Thus, as the size increase lesser energy is liberated and hence electron affinity decrease .But

the electron affinity of Cl is higher than the electron affinity of F although F has smaller size. This is because the imcoming electron, in case of F experience a greater force of repulsion from the outer electrons of F. Thus to overcome the repulsion some relased energy is utilized . Hence lesser energy is released. Thus the electron affinity is highest for Cl.

126 **(a)**

0 Fluorine reacts with water liberating O_2 exothermally

$2F_2 + 2H_2O \rightarrow 4HF + O_2$

126 **(c)**

2 $Ca_3P_2 + 6H_2O \longrightarrow 3Ca(OH)_2 + 2PH_3$

126 **(d)**

3 P exists as P_4.

126 **(a)**

4 Aqua-regia is the mixture of 3 part conc. HCl and 1 part conc. HNO_3. It is a very strong acid which can dissolve noble metals.

126 **(c)**

5 $XeOF_4 + H_2O \rightarrow XeO_2F_2 + 2HF$

$XeF_6 + 2H_2O \rightarrow XeO_2F_2 + 4HF$

126 **(c)**

6 It is a reason for the given fact.

126 **(b)**

7 $\begin{matrix} COOH \\ | \\ COOH \end{matrix} + Conc.H_2SO_4 \longrightarrow CO + CO_2 + H_2O$

Oxalic acid

Concentrated H_2SO_4 is a strong dehydrating agent.

126 **(a)**

8 O^{16} is the most abundant isotope of oxygen.

127 **(b)**

9 On passing H_2S through an oxidant, colloidal Sulphur is formed.

126 **(b)**

9 Ramsay found it during decay of radio isotopes.

127 **(c)**

0 Group 15 members are called pnictogens, a collective name for this family.

127 **(b)**

1 $8e + 2N^{5+} \longrightarrow N_2^+$

127 **(b)**

2 $HO—SO_2—OH + 2PCl_5 \rightarrow Cl—SO_2—Cl + 2POCl_3 + 2HCl$

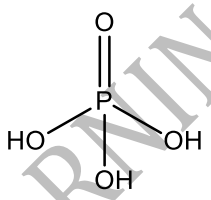
127 **(b)**

3 XeF_6 cannot be stored in glass vessels because it reacts with SiO_2 of the glass to give highly explosive XeO_3

$2XeF_6 + 3SiO_2 \rightarrow 2XeO_3 + 3SiF_4$

127 **(b)**

4 H_3PO_4 is tribasic acid.



127 **(d)**

5 $C_{12}H_{22}O_{11} \xrightarrow{H_2SO_4} 12C + 11H_2O$;

The process is called charring.

127 **(a)**

6 In case of fluorides and chlorides, HF and HCl gases are given out on heating with conc. H_2SO_4 and MnO_2. In bromides and iodides Br_2 and I_2 are given out.

127 **(d)**

8 All these tests are used to detect the presence of H_2S.

128 **(a)**

0 SO_2 is anhydride of H_2SO_3.

128 **(a)**

1 It is a fact.

128 **(d)**

2 It is a fact.

128 **(c)**

3 White phosphorus is soluble in CS_2 but red P is not.

128 **(c)**

4 The bond angles are $92^\circ, 106^\circ 51', 109^\circ 28'$ and 120°

128 **(d)**

5 In solid state PCl_5 is ionic having PCl_4^+ and PCl_6^- ions.

128 **(d)**

6 $IF_5 + F_2 \longrightarrow IF_7$

128 **(c)**

7 NH_3 is polar as well as base and thus, soluble in water.

128 **(c)**

8 IPO_4 is an ionic compound (I^{3+} PO_4^{3-}).

128 **(b)**

9 ClO_3^- has sp^3-hybridization.

129 **(d)**

0 HI being least stable decomposes with time to yield $H_2 + I_2$ .The I_2 is dissolved in HI to develop brown colour in solution.

129 **(d)**

1

$3KClO_3 + 3H_2SO_4 \longrightarrow 3KHSO_4 + HClO_4 + 2ClO_2 + H_2O$

The reaction occurs with explosion.

129 **(b)**

2 $4HNO_3 + P_4O_{10} \rightarrow 4HPO_3 + 2N_2O_5$

129 **(c)**

3 $F - F$ more strong bond compare to $F - Cl$, $F - Br$ and $Cl - Br$ bond

129 **(d)**

5 When molten sulphur is suddenly cooled by pouring into water it converts into plastic form

129 **(b)**

6 Rest all react with H_2SO_4 to give H_2.

129 **(c)**

7 The oxides are CO_2, H_2O and SO_2 respectively.

129 **(c)**

8 N_2 and O_2 present in air are allowed to react to form NO and then NO_2.

129 **(b)**

9 Both SO_3 and H_2SO_4 have Sulphur in $+6$ oxidation state.

130 **(c)**

0 It is a fact.

130 **(c)**

1 $1s^2\ 2s^2\ 2p^6 \rightarrow$ Neon

It is noble gas

130 **(a)**

2 F does not have d-orbital in 2nd shell.

130 **(d)**

3 A commercial method to prepare O_2.

130 **(c)**

4 N_2 is not supporter of life.

130 **(b)**

5 Hg reacts with O_3 to form HgO which sticks on walls.

130 **(b)**

6 He has 1l, $1s^2$ configuration.

130 **(a)**

7 SCl_4 has sp^3d –hybridization and possesses see-saw structure.

130 **(b)**

8 $PCl_3 + 3H_2O \longrightarrow H_3PO_3 + 3HCl$

130 **(a)**

9 N_2O_5 is acidic. NaOH an alkali, can absorb acidic ox

131 **(b)**

0 Notice that electron affinity of Cl is more than F.

131 **(c)**

1 $2O_3 \longrightarrow 3O_2$

131 **(d)**

None of these react directly with halogens (Cl_2, Br_2

2

131 **(c)**

3 Oleum is $H_2S_2O_4 + SO_3$.

131 **(a)**

4 N_2 forms NCl_3, while P can form both PCl_3 and PCl_5 nitrogen does not give a pentahalide due to the non availability of $2d$-orbital ,whereas p has low lying $3d$-orbital which can be used for bonding.

131 **(b)**

5 $(CN)_2$ is known as pseudohalogen

131 **(a)**

6 B.p. and m.p. decrease with decrease in mol . wt.

131 **(a)**

7 $NH_4NO_3 \longrightarrow N_2O + 2H_2O$

131 **(a)**

8 $SO_3 + HCl \longrightarrow \underset{\text{Chlorosulphonic acid}}{SO_2(OH)Cl}$

131 **(b)**

9 $NH_4CNO \xrightarrow{-H^+} \underset{\text{Urea}}{NH_2CONH_2}$

132 **(b)**

0 Salts of $HClO_2$ (ClO_2^- is chlorite) are called chlorite.

132 **(a)**

1 He gas is not adsorbed by coconut charcoal.

132 **(d)**

2 PbS is black which is oxidized to $PbSO_4$ by ozone.

132 **(b)**

3 $S + 2H_2SO_4 \longrightarrow 3SO_2 + 2H_2O$

132 **(d)**

4 CO_2 gets evaporated slowly.

132 **(b)**

5 The order of bond dissociation energy of hydrogen halide (or halogen acid) is as

Hydrogen halide dissociation HF >HCl >HBr >HI

Bond dissociation

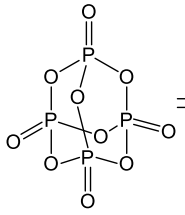
Energy KJ mol^{-1} 566 431 366 299

Bond dissociation energy $\propto$ heat of formation

As bond dissociation energy decreases the heat of formation of halogen acids also decreases. Hence, the order of heat of formation of halogen acids is HF >HCl > HBr > HI

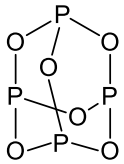
132 **(d)**

6 P_2O_5, *ie*, P_4O_{10}



$\Rightarrow$ Six P—O—P bridges

P_2O_3 *ie*, P_4O_6



⇒ Six P—O—P bridges

132 **(d)**

7 S_R and S_M are allotropic forms of Sulphur.

132 **(d)**

8 Copper turing on heating with conc.H_2SO_4 produce SO_2.

$Cu+2\ H_2SO_4 \longrightarrow CuSO_4+2H_2O+SO_2$

132 **(c)**

9 Option(c) has noble gas configuration as it has 8 electrons in valence shell.

133 **(d)**

0 The acidity of oxyacids of halogens increases with increase in oxidation state of halogen.

Oxidation state of Cl in HClO=+1

Oxidation state of Cl in $HClO_2$=+3

Oxidation state of Cl in $HClO_3$=+5

Oxidation state of Cl in $HClO_4$=+7

Hence, $HClO_4$ has highest acidity among oxyacids of chlorine.

133 **(a)**

1 LiF > LiCl > LiBr > LiI (Lattice energy)

133 **(d)**

2 Iodine readily dissolves in potassium iodide solution giving KI_3.

$KI + I_2 \longrightarrow KI_{3(aq)}$

$KI_3(aq) \rightleftharpoons K^+ +_{(aq)} + I_3^-(aq)$

Note: I_2 is more soluble in an aqueous solution of KI than in pure water, it is due to the formation of polyhalide (I_3^- ion).

133 **(c)**

3 SO_3 is colourless, crystalline transparent solid at room temperature.

133 **(d)**

4 H_2O containing H-bond due to which it have highest boiling point

133 **(c)**

5 HNO_2 can be either reduced to nitric acid (NO) or oxidised to nitric acid and hence it acts both as an oxidising as well as reducing agent

$2HNO_2 \rightarrow 2NO + H_2O + O$

$HNO_2 + O \rightarrow HNO_3$

133 **(d)**

6 NCl_3 has sp^3-hybridized N atom.

133 **(c)**

7 NH_4Cl has sublimation nature, *i. e.*, tendency to convert directly into vapour state from solid state.

133 **(b)**

8 $NH_3 + HCl \longrightarrow NH_4Cl$ (White fumes)

133 **(b)**

9 $PtCl_4 \longrightarrow PtCl_2 + Cl_2$

134 **(b)**

0 Liquid ammonia helps in cooling of things due to its high heat of vaporisation. Therefore, it is used in refrigeration.

134 **(a)**

1 As stabilizer.

134 **(b)**

2 Bi does not show allotropy while, the allotropes of other elements are as follows

N → α and β nitrogen

As → Yellow and Grey forms

P → White, Red and Black forms

Sb → Yellow and Grey forms

134 **(d)**

3 In electrothermal process silica is heated with calcium phosphate when phosphorus pentoxide is obtained .It is then reduced by coke in electric furnace to get white phosphorus.

$2Ca_3(PO_4)_2+6SiO_2 \xrightarrow{\Delta} 6CaSiO_3+P_4O_{10}$

$P_4O_{10}+10C \xrightarrow{\Delta} P_4 + 10CO$

134 **(c)**

4 It is a reason for the given fact.

134 **(a)**

5 NH_3 is a molecular hydride.

134 **(d)**

6 $SO_2 + 2HNO_2 \longrightarrow H_2SO_4 + 2NO$

134 **(a)**

7 Reducing properties increase from F to I so, it oxidise by nitric acid

$I_2 + 10HNO_3 \rightarrow 2HIO_3 + 10NO_2 + 4H_2O$

134 **(a)**

8 Alkali metal oxides are most basic.

134 **(b)**

9 The acidic character of oxo-acids decreases down the gp.

135 **(b)**

0 $3NH_3 + OCl^- \rightarrow NH_2 - NH_2 + NH_4Cl + OH^-$

135 **(a)**

1 PO_2 and NCl_5 cannot exist

135 **(a)**

2 $3CuO + 2NH_3 \longrightarrow 3Cu + N_2 + 3H_2O$

135 **(b)**

3 It is a fact.

135 **(d)**

4 $3O_2 \longrightarrow 2O_3$

3vol O_2=2vol O_3

x vol $O_2=\frac{2}{3}x$ vol O_3

$x+\frac{2}{3}x=100$L

$\frac{5}{3}x=100$ or $x=60$L O_2

Volume of $O_3=\frac{2}{3}\times 60=40$L

135 **(b)**

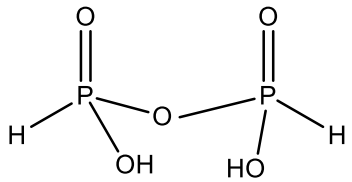
5 The correct order of occurrence in air is Ar>Ne>Kr

135 **(b)**

6 Most of the noble gases are obtained from air.

135 **(a)**

7 In pyrophosphorous acid p is in +3 oxidation state.



(Dibasic acid)

135 **(a)**

8 In the reaction SO_2 and H_2S, SO_2 acts as oxidizing agent and H_2S acts as reducing agent.

$SO_2+2H_2S \longrightarrow 2H_2O+3s\downarrow$

136 **(b)**

9 Marshall's acid is the name for $H_2S_2O_8$ or perdisulphuric acid.

137 **(a)**

0 Neon is Greek language signifies 'new'.

137 **(a)**

1 Due to one unpaired electron in it.

137 **(a)**

2 $Ca + F_2$

$\longrightarrow CaF_2$ (an insoluble compound responsible for fl

137 **(b)**

3 Nitric acid oxidises iodine into iodic acid(HIO_3).

$10HNO_3+I_2 \longrightarrow 3HIO_3+10NO_2+4H_2O$

Iodic acid

137 **(b)**

4 B.p. of molecules increases with increase in mol. wt. NH_3 however shows H-bonding and has high b.p.

135 **(d)**

9 HBr is strong reducing agent and will be oxidized b

136 **(b)**

0 About 46% N is present in urea.

136 **(c)**

1 Magnesium and dilute HNO_3reacts to produce H_2 gas.

$Mg+2\ HNO_3 \longrightarrow Mg(NO_3)_2+H_2\uparrow$

136 **(d)**

3 In HF, the molecules aggregate because of intermolecular hydrogen bonding. Hence, it has highest boiling point

136 **(a)**

4 HF is a weak acid due to intermolecular hydrogen bonding

136 **(c)**

5 Rest all are uses of chlorine.

136 **(b)**

6 The solubility of I_2 in water increase by the addition of KI due to formation of polyhalide ion, i.e. I_3^-.

$KI+I_2 \longrightarrow KI_3$

136 **(d)**

7 Platinum, palladium and iridium are not attacked by strong acids. So these are called noble metals.

136 **(b)**

8 $CaCl(OCl) \rightarrow Ca(ClO_3)_2 + CaCl_2$

137 **(a)**

5 S, Se and Te are typically tetravalent in their compounds with oxygen. They show +6 oxidation state in fluorides.

137 **(c)**

7 It is a fact.

137 **(d)**

9 These are the uses of liquid oxygen.

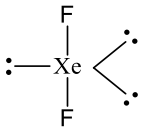
138 **(c)**

0 $CuSO_4 + 2H_2O \longrightarrow Cu(OH)_2 + H_2SO_4$;

Addition of CH_3COOH reverses the hydrolysis of $CuSO_4$.

138 **(d)**

1 XeF_2 has sp^3d hybridization with linear shape



138 **(a)**

2 I_2 is more soluble in C_6H_6 than in water.

138 **(c)**

3 $2HNO_3 \rightarrow N_2O_5 + H_2O$
Nitric acid

138 **(b)**

6 $Cu + 2H_2SO_4 \longrightarrow CuSO_4 + SO_2 + 2H_2O$

138 **(d)**

$Cl_2 + H_2O \longrightarrow 2HCl + [O]$

139 **(d)**

1 Xe in XeF_4, XeF_6, XeO_3 and XeO_4 possess sp^3d^2, sp^3d^3, sp^3 and sp^3-hybridisation respectively.

139 **(c)**

2 Polonium, the last member of oxygen family is radioactive

139 **(c)**

3 In cold solution S passes in colloidal state.

139 **(d)**

4 $XeO_3 + 6HF \longrightarrow XeF_6 + 3H_2O$ is not possible because F^- is strong reducing agent and XeO_3 is strong oxidant. However the reverse reaction occurs $XeF_6 + 3H_2O \longrightarrow XeO_3 + 6HF$

139 **(b)**

5 Equimolar amounts of NO(g) and NO_2(g) at -30°c give N_2O_3*(l)* which is ablue liquid.

$$NO(g) + NO_2(g) \xrightarrow{-30^\circ C} \underset{\text{blue}}{N_2O_3(l)}$$

139 **(b)**

6 Fluorine is the most electronegative element in Periodic Table

139 **(c)**

7 NH_3 reacts with rest of all.

139 **(b)**

8 NH_3 has one lone pair of electrons. Rest all two lone pairs on central atom. The angle contracts due to lone pair effect.

139 **(c)**

9 As the oxidation number of central atom in oxo-acids increases, acidic nature increases.

140 **(a)**

0 The bond angles and stability in hydrides decrease from N to Sb due to decreasing electronegativity of central atom.

140 **(d)**

1 $P_4 + 3NaOH + 3H_2O \rightarrow 3NaH_2PO_2 + PH_3$

140 **(a)**

2 $SO_3^{2-} + H_2SO_4 \longrightarrow \underset{\substack{\text{Burning sulphur}\\ \text{smell}}}{SO_2} + SO_4^{2-} + H_2O$

$3SO_2 + K_2Cr_2O_7 + H_2SO_4 \longrightarrow K_2SO_4 + \underset{\text{Green}}{Cr_2(SO_4)_3} + H_2O$

140 **(b)**

3 NO_2 is pungent smelling gas.

140 **(a)**

4 $NH_2CONH_2 + HNO_2 \longrightarrow 2N_2 + CO_2 + 3H_2O$

140 **(a)**

5 The —O—O—linkage is called peroxide linkage. Except for PbO_2,all the given choices have —O—O—linkage because all are peroxide.
H_2O_2 ⟶hydrogen peroxide
BaO_2 ⟶barium peroxide
SeO_2 ⟶ selenium peroxide

140 **(c)**

6 $P_4 + 3NaOH + 3H_2O \rightarrow PH_3 + 3NaH_2PO_2$

140 **(c)**

7 Rest all react with AgCl.

140 **(d)**

8 It is a reason for the given fact.

140 **(a)**

9 $F_2 + \frac{1}{2} O_2 \longrightarrow F_2O$ is endothermic in nature and F_2 is reduced here, O_2 is oxidized. In (b) Cl_2 is oxidised. In (c) no doubt F_2 is reduce but it is exothermic reaction.

141 **(c)**

0 $CaC_2 + N_2 \longrightarrow CaCN_2 + C$

THE P-BLOCK ELEMENTS

CHEMISTRY

Assertion - Reasoning Type

This section contain(s) 0 questions numbered 1 to 0. Each question contains STATEMENT 1(Assertion) and STATEMENT 2(Reason). Each question has the 4 choices (a), (b), (c) and (d) out of which **ONLY ONE** is correct.

a) Statement 1 is True, Statement 2 is True; Statement 2 **is** correct explanation for Statement 1

b) Statement 1 is True, Statement 2 is True; Statement 2 **is not** correct explanation for Statement 1

c) Statement 1 is True, Statement 2 is False

d) Statement 1 is False, Statement 2 is True

1

Statement 1: Helium and beryllium have similar outer electronic configuration of the type ns^2

Statement 2: Helium and beryllium both are chemically inert

2

Statement 1: PCl_5 and $PbCl_4$ are thermally unstable

Statement 2: They produce same gas on thermal decomposition

3

Statement 1: Among chalcogens, tendency of catenation is maximum for sulphur.

Statement 2: S-S bond dissociation energy is higher then O-O bond dissociation energy.

4

Statement 1: Oxygen is more electronegative than sulphur, yet H_2S is acidic, while H_2O is neutral

Statement 2: $H-S$ bond is weaker than $O-H$ bond

5

Statement 1: Liquid NH_3 is used for refrigeration.

Statement 2: Liquid NH_3 does not vaporize quickly.

6

Statement 1: White phosphorus is more reactive than red phosphorus.

Statement 2: red phosphorus consists of P_4 tetrahedral units linked to one another to form linear chains.

7

Statement 1: All the noble gases have ns^2np^6 electronic configuration in their outermost shell

Statement 2: In noble gases all the energy levels which are occupied are completely filled

8

Statement 1: Helium is the only substance that can't be solidified at atmospheric pressure

Statement 2: The zero point energy of helium is very high

9

Statement 1: OF_2 is named as oxygen difluoride.

Statement 2: OF_2 is oxygen is less electronegative than fluorine.

10

Statement 1: The van der Waals' forces are directly proportional to the ionisation potentials

Statement 2: Van der Waals' forces increases as the size and diffuseness of the electron clouds increases

11

Statement 1: The aqueous solution of XeF_2 is powerful oxidizing agent

Statement 2: The hydrolysis of XeF_2 is show in dilute acid but rapid in basic solution

12

Statement 1: Red phosphorus is less volatile than white phosphorus

Statement 2: Red phosphorus has a discrete tetrahedral structure

13

Statement 1: The ionization energy of gallium remains nearly same as that of aluminium.

Statement 2: This is due to shielding of outer shell electrons form the nucleus by the d electrons of gallium.

14

Statement 1: Ozone is a powerful oxidizing agent in comparison to O_2

Statement 2: Ozone is diamagnetic but O_2 is paramagnetic

15

Statement 1: PCl_5 is covalent in gaseous and liquid states but ionic in solid state

Statement 2: PCl_5 in solid state consists of tetrahedral PCl_5^+ cation and octahedral PCl_6^- anion

THE P-BLOCK ELEMENTS

CHEMISTRY

: ANSWER KEY :

1)	**c**	**2)**	**b**	**3)**	**a**	**4)**	**a**
5)	**a**	**6)**	**b**	**7)**	**d**	**8)**	**a**
9)	**a**	**10)**	**d**	**11)**	**b**	**12)**	**c**
13)	**a**	**14)**	**b**	**15)**	**b**		

THE P-BLOCK ELEMENTS

CHEMISTRY

: HINTS AND SOLUTIONS :

1 **(c)**
Helium is a noble gas but beryllium is a member of alkaline earth metal. Thus, beryllium is chemically active and helium is inactive

2 **(b)**
$PCl_5 \xrightarrow{\Delta} PCl_3 + Cl_2$

PCl_5 decomposes into PCl_3 and Cl_2 as in its structure two $P-Cl$ axial bonds are longer than other three $P-Cl$ equatorial bonds

3 **(a)**
Catenation means the tendency of an element to from chains of identical atoms which is pronounced in sulphur among chalcogens.

4 **(a)**
$H-S$ bond is weaker than $H-O$ bond hence, H_2S is more acidic than H_2O

5 **(a)**
Liquid ammonia has a large heat of vaporization (0.327 cal/g). It is therefore used in ice plants.

6 **(b)**
White P exists as discrete P_4 tetrahedral molecule having P-P-P bound angle 60°.Hence, molecule is under strain and more reactive while red P exits as P_4 tetrahedral joined together through covalent bounds giving polymeric structure.

7 **(d)**
All the noble gases except He, have ns^2np^6 electronic configuration in their outermost shell

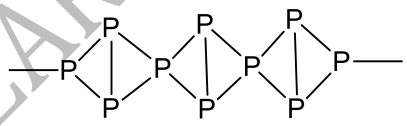
8 **(a)**
Zero point energy of helium is so high that it outweighs the weak interatomic forces which are not strong enough to bind the helium atoms into the crystalline state

9 **(a)**
The compound of oxygen and fluorine is more electronegative than oxygen fluorides as fluorine is more electronegative than oxygen

10 **(d)**
Van der Waals' forces or London forces are inversely proportional to the ionisation potential of the atoms

11 **(b)**
XeF_2 oxidise HCl to Cl_2 and Ce(III) to Ce (IV). Its oxidation potentials is $+2.64$ V

12 **(c)**
Red phosphorus is less volatile than white phosphorus because it exists in linked tetrahedral structures.



13 **(a)**
In Ga, 10-d electrons in penultimate shell shiled the nucleus change less effectively, the outer electrons is held frimly by the nucleus. As result, the ionisation energy remains nearly the same as that of aluminium in spite of the fact that atomic size increase.

14 **(b)**
Due to the ease with which it can liberate nascent oxygen, O_3 acts as a powerful oxidising agent.

$O_3 \rightarrow O_2 + O$

$O_2 \rightarrow$ Paramagnetic due to presence of two unpaired electrons

$O_3 \rightarrow$ Diamagnetic molecules

15 **(b)**
PCl_5 is trigonal bipyramidal containing sp^3d hybridised P atom in liquid and gaseous state. Whereas, in solid state it consists of tetrahedral PCl_4^+ cation and octahedral PCl_6^- anions

THE P-BLOCK ELEMENTS

CHEMISTRY

Matrix-Match Type

This section contain(s) 0 question(s). Each question contains Statements given in 2 columns which have to be matched. Statements (A, B, C, D) in **columns I** have to be matched with Statements (p, q, r, s) in **columns II.**

1. Match list I (Molecules) with list II (Boiling points) and select the correct answer

Column-I	Column- II
(A) NH_3	(p) 290K
(B) PH_3	(q) 211K
(C) AsH_3	(r) 186K
(D) SbH_3	(s) 264K
(E) BiH_3	(t) 240K

CODES :

	A	**B**	**C**	**D**	**E**
a)	r	q	t	s	p
b)	t	r	q	r	p
c)	p	s	t	q	p
d)	p	q	r	s	p

THE P-BLOCK ELEMENTS

CHEMISTRY

: ANSWER KEY :

1) **b**

THE P-BLOCK ELEMENTS

CHEMISTRY

: HINTS AND SOLUTIONS :

1 **(b)**

Except ammonia the boiling point generally increases down, the group due to increase inn magnitude of van der waals' forces. Ammonia shows intermolecular hydrogen bonding hence its boiling point is higher than AsH_3,but lower than SbH_3.