**p-Block Elements**

**JEEM (Main) Exercises**

**Single Correct Answer Type**

1. Which is true for an element present in group 13 of the periodic table?
   (a) It is gas at room temperature
   (b) It has oxidation state of 4+
   (c) It forms $R_2O_3$
   (d) It forms $RX_2$

2. Borax is prepared by treating colemanite with:
   (a) $NaNO_3$
   (b) $NaCl$
   (c) $NaHCO_3$
   (d) $Na_2CO_3$

3. On the addition of mineral acid to an aqueous solution of borax, the following compound is formed:
   (a) Boron hydride
   (b) Ortho-boric acid
   (c) Meta-boric acid
   (d) Pyro-boric acid

4. Three centered bond is present in:
   (a) $NH_3$
   (b) $B_2H_6$
   (c) $BCl_3$
   (d) $AlCl_3$

5. Boron compounds behave as Lewis acids because of their:
   (a) Acidic nature
   (b) Covalent nature
   (c) Ionic nature
   (d) Vacant orbital

6. Which of the following is not a Lewis acid?
   (a) $SiF_4$
   (b) $FeCl_3$
   (c) $BF_3$
   (d) $C_2H_4$

7. $AlCl_3$ on hydrolysis gives:
   (a) $Al_2O_2H_2O$
   (b) $Al(OH)_3$
   (c) $Al_2O_3$
   (d) $AlCl_3 \cdot 6H_2O$

8. Thallium shows different oxidation states because:
   (a) Of its high reactivity
   (b) Of inert pair of electrons
   (c) Of its amphoteric nature
   (d) It is a transition metal

9. $H_3BO_3$ is:
   (a) Monobasic and weak Lewis acid
   (b) Monobasic and weak Bronsted acid
   (c) Monobasic acid and strong Lewis acid
   (d) Tribasic acid and weak Bronsted acid

10. Which of the following compound is known as inorganic benzene?
    (a) $B_6H_6$
    (b) $C_2H_6$
    (c) $C_6H_6$
    (d) $B_3N_3H_6$

11. The structure and hybridization of $Si(CH_3)_4$ are:
    (a) Bent, $sp$
    (b) Trigonal, $sp^2$
    (c) Octahedral, $sp^3$
    (d) Tetrahedral, $sp^3$

12. Which of the following is not hydrolyzed?
    (a) $CCl_4$
    (b) $SiCl_4$
    (c) $SnCl_4$
    (d) $PbCl_4$

13. Which of the following halides is least stable and has doubtful existence?
    (a) $Cl_4$
    (b) $SnI_4$
    (c) $GeI_4$
    (d) $PbI_4$

14. The number and type of bonds between two carbon atoms in $CaC_2$ are:
    (a) One sigma and one pi bond
    (b) One sigma and two pi bonds
(c) One sigma and one and a half pi bond
(d) One sigma bond

15. The material used in solar cells contains:
(a) Si  
(b) Sn  
(c) Ti  
(d) Cs

16. Which of the following is correct composition of water gas?
(a) CO + Cl₂  
(b) CO + N₂  
(c) CO + H₂  
(d) CO + H₂ + N₂

17. What is the formula for carbon suboxide?
(a) CO  
(b) CO₂  
(c) C₂O₄  
(d) C₂O₂

18. Percentage of lead in lead pencil is:
(a) Zero  
(b) 20  
(c) 80  
(d) 70

19. CCl₄ is used as fire extinguisher because:
(a) Its m.p.t. is high  
(b) It forms covalent bond  
(c) Its b.p.t. is low  
(d) It gives incombustible vapors

20. Marsh gas contains:
(a) CH₄  
(b) CO₂  
(c) C₂H₆  
(d) N₂

21. Which of the following is most stable?
(a) Sn²⁺  
(b) Ge²⁺  
(c) Si²⁺  
(d) Pb²⁺

22. Carborundum is:
(a) Al₂O₃  
(b) SiC  
(c) BF₃  
(d) B₂C

23. The acid which contains a peroxy linkage is:
(a) Sulphurous acid  
(b) Pyrosulphuric acid  
(c) Dithionic acid  
(d) Caro's acid

24. Graphite is a soft solid lubricant extremely difficult to melt. The reason for this anomalous behavior is that graphite:
(a) Has molecules of variable molecular masses like polymers  
(b) Has carbon atoms arranged in large plated of rings of strongly bonded carbon atoms with weak interplate bonds  
(c) Is a non-crystalline substance  
(d) Is an allotropic form of diamond

25. In SiF₆²⁻ and SiCl₆²⁻, which one is known and why?
(a) SiF₆²⁻ because of small size of F  
(b) SiCl₆²⁻ because of large size of F

26. Which is likely to show inert pair effect?
(a) K  
(b) Mg  
(c) Al  
(d) Pb

27. The stability of dibalides of Si, Ge, Sn, and Pb increases steadily in the sequence:
(a) Pb₂⁺ < Sn₂⁺ < Ge₂⁺ < Si₂⁺  
(b) Ge₂⁺ < Si₂⁺ < Sn₂⁺ < Pb₂⁺  
(c) Si₂⁺ < Ge₂⁺ < Pb₂⁺ < Sn₂⁺  
(d) Si₂⁺ < Ge₂⁺ < Sn₂⁺ < Pb₂⁺

28. Diamond is hard because:
(a) All the four valence electrons are bonded to each carbon atoms by covalent bonds  
(b) It is a small molecule  
(c) It is made up of carbon atoms  
(d) It cannot be burnt

29. Products formed when Pb(NO₃)₂ is heated are:
(a) PbO₂, N₂, O₂  
(b) Pb(NO₃)₂, O₂  
(c) PbO₂, NO₂, O₂  
(d) Pb₂O₃, N₂, O₂

30. Which one of the following pairs is obtained on heating ammonium dichromate?
(a) N₂ and H₂O  
(b) H₂O and H₂O  
(c) NO₂ and H₂O  
(d) NO and NO₂

31. Silver chloride dissolves in excess of NH₄OH. The cation present in solution is:
(a) Ag⁺  
(b) [Ag(NH₃)₄]⁺  
(c) [Ag(NH₃)₂]⁺  
(d) [Ag(NH₃)₆]⁺

32. The catalyst used in the manufacture of ammonia by Haber’s process is:
(a) Pt  
(b) Fe  
(c) Mo  
(d) V₂O₅

33. Industrial preparation of nitric acid by Ostwald’s process involves:
(a) Oxidation of NH₃  
(b) Reduction of NH₃  
(c) Hydrogenation of NH₃  
(d) Hydrolysis of NH₃

34. White phosphorus reacts with caustic soda. The products are PH₃ and NaH₂PO₂. This reaction is an example of:
(a) Oxidation  
(b) Reduction  
(c) Neutralization  
(d) Disproportionation

35. Which one of the following is the strongest base?
(a) AsH₃  
(b) SbH₃  
(c) PH₃  
(d) NH₃
36. When zinc reacts with very dilute nitric acid it produces:
   (a) NH₄NO₃  (b) NO
   (c) NO₂     (d) H₂
37. Nitrogen molecule is chemically less active because of its:
   (a) small atomic energy  (b) high dissociation energy
   (c) high electronegativity  (d) stable electronic configuration
38. Which of the following oxides of nitrogen is the anhydride of nitrous acid?
   (a) NO    (b) N₂O₃
   (c) N₂O₄   (d) N₂O₅
39. Which of the following fluorides does not exist?
   (a) NF₂   (b) PF₅
   (c) AsF₅   (d) SbF₅
40. When ammonia is passed over heated CuO, it is oxidized to:
   (a) HNO₂   (b) N₂O
   (c) N₂      (d) NO₂
41. The CN⁻ ion and N₂ are iso-electronic. But in contrast to CN⁻, N₂ 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
42. Which oxide does not act as a reducing agent?
   (a) NO    (b) NO₂
   (c) N₂O    (d) N₂O₃
43. When AgNO₃ is heated strongly, the products formed are:
   (a) NO and NO₂  (b) NO₂ and N₂O
   (c) NO and N₂O  (d) NO and O₂
44. Aqueous solution of ammonia consists of:
   (a) H₂O only  (b) OH⁻ only
   (c) NH₄⁺ only  (d) NH₄⁺ and OH⁻
45. Which of the following species is paramagnetic?
   (a) O₂⁻     (b) NO
   (c) CO       (d) CN
46. The BCl₃ is a planar molecule, whereas NCl₃ is pyramidal because:
   (a) N—Cl bond is more covalent than B—Cl bond
   (b) B—Cl bond is more polar than N—Cl bond
   (c) Nitrogen atom is smaller than boron
   (d) BCl₃ has no lone pair but NCl₃ has a lone pair of electron
47. The hybridization of atomic orbitals of nitrogen in NO₂⁺, NO₃⁻, and NH₄⁺ are:
   (a) sp, sp³ and sp³ respectively
   (b) sp, sp³ and sp³ respectively
   (c) sp³, sp and sp³ respectively
   (d) sp³, sp² and sp³ respectively
48. In which of the following the bond angle is maximum?
   (a) NH₃    (b) NH₄⁺
   (c) PCl₅    (d) SCl₂
49. The hybridization state of the central atom in PCl₅ is:
   (a) sp³d    (b) sp²d²
   (c) sp⁵     (d) d⁵sp³
50. Cl—P—Cl bond angles in PCl₅ molecule are:
   (a) 120° and 90°  (b) 60° and 90°
   (c) 60° and 120°  (d) 120° and 90°
51. Phosphine acetylene and ammonia can be formed by treating water with:
   (a) Mg₂P₂, Al₄C₃, Li₃N
   (b) Ca₃P₂, Ca₃C₂, Mg₃N₂
   (c) Ca₃P₂, Ca₃C₂, CaCN₂
   (d) Ca₃P₂, Mg₃C, NH₄NO₃
52. The shape of PCl₅ molecule is:
   (a) Trigonal bipyramidal  (b) Tetrahedral
   (c) Pyramidal  (d) Square planar
53. Atoms in P₄ molecule of white phosphorus are arranged regularly in the following way:
   (a) At the corners of a cube  (b) At the corners of an octahedron
   (c) At the corners of a tetrahedron  (d) At the center and corners of a tetrahedron
54. Correct order of bond angles for the following is:
   (a) NH₃ > PCl₃ > BCl₃  (b) BCl₃ > CH₄ > PCl₃
   (c) BCl₃ > PCl₅ > NH₃  (d) PCl₅ > BCl₃ > NH₃
55. The reaction of elemental P₄ in aqueous NaOH gives:
   (a) PH₃, NaH₂PO₃  (b) PH₃, Na₃PO₄
   (c) NaH₂PO₄, Na₃PO₄  (d) Na₃P, Na₃PO₄
56. Which of the following oxides is amphoteric in character?
   (a) CaO    (b) CO₂
   (c) SiO₂    (d) SnO₂
57. The geometry of H₂S and its dipole moment are:
   (a) Angular and non-zero  (b) Angular and zero
   (c) Linear and zero  (d) Linear and non-zero
58. The oxidation number of sulphur in $S_8$, $S_2F_2$, $H_2S$ respectively, are:
(a) 0, +1 and -2
(b) +2, +1 and -2
(c) 0, +1 and +2
(d) -2, +1 and -2

59. Which of the following has $\pi - d\sigma$ bonding?
(a) $NO_3^-$
(b) $SO_3^{2-}$
(c) $BO_3^{3-}$
(d) $CO_3^{2-}$

60. In the species $O_2$, $O_2^+$, $O_2^-$ and $O_2^{2-}$, the correct decreasing order of bond strength is:
(a) $O_2 > O_2^+ > O_2^- > O_2^{2-}$
(b) $O_2^- > O_2 > O_2^+ > O_2^{2-}$
(c) $O_2^- > O_2 > O_2^+ > O_2^{2-}$
(d) $O_2^- > O_2^- > O_2^+ > O_2^{2-}$

61. The correct order of O—O bond length in $O_2$, $H_2O_2$ and $O_3$ is:
(a) $O_3 > H_2O_2 > O_2$
(b) $O_2 > H_2O_2 > O_3$
(c) $O_2 > O_3 > H_2O_2$
(d) $H_2O_2 > O_2 > O_3$

62. Oxidizing action increases in the following order:
(a) $Cl < Br < I < F$
(b) $Cl < I < Br < F$
(c) $I < F < Cl < Br$
(d) $I < Br < Cl < F$

63. Which of the following statements is correct for CsBr$_3$?
(a) It is a covalent compound
(b) It contains Cs$^{3+}$ and Br$^{-}$ ions
(c) It contains Cs$^+$ and Br$_3^-$ ions
(d) It contains Cs$^+$, Br$^{-}$ ions and lattice Br$_2$ molecules

64. When iodine is dissolved in $CCl_4$, the color that results is:
(a) Brown
(b) Bluish green
(c) Violet
(d) Colorless

65. Hydrogen bonding does not play any role in the boiling point of:
(a) NH$_3$
(b) H$_2$O
(c) HI
(d) HF

66. The following acids have been arranged in 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

67. Hydrogen fluoride is a liquid unlike other hydrogen halides because:
(a) II—F bond is strong
(b) F-atom is small in size
(c) Hydrogen bonding is present
(d) HF is a weak acid

68. Which of the following possesses the highest bond energy?
(a) $F_2$
(b) $Cl_2$
(c) $Br_2$
(d) $I_2$

69. Order of boiling point is:
(a) HF > HI > HBr > HCl
(b) HF > HBr > HI > HCl
(c) HCl > HBr > HI > HF
(d) HCl > HI > HBr > HF

70. Which of the following is a pseudohalogen?
(a) $IF_7$
(b) $CN^-$
(c) $ICl_2$
(d) $I_2$

71. Which of the following is the strongest acid?
(a) HBr
(b) $HF$
(c) $H_2S$
(d) $PH_3$

72. Which is formed when $K_2Cr_2O_7$, $CaCl_2$, and zinc $H_2SO_4$ are heated?
(a) $Cr_2(SO_4)_3$
(b) $CrCl_3$
(c) $CrO_2Cl_2$
(d) $K_2CrO_4$

73. On heating $KClO_3$ we get:
(a) $KClO_2$ + $O_2$
(b) $KCl$ + $O_2$
(c) $KCl$ + $O_1$
(d) $KCl$ + $O_2$ + $O_3$

74. The correct order of thermal stability of hydrogen halides (H—X) is:
(a) HI > HBr > HCl > HF
(b) HF > HCl > HBr > HI
(c) HCl > HF > HBr > HI
(d) HCl > HI > HBr > HF

75. The set with correct order of acidity is:
(a) $HClO < HClO_2 < HClO_3 < HClO_4$
(b) $HClO_4 < HClO_3 < HClO_2 < HClO$
(c) $HClO < HClO_2 < HClO_3 < HClO_4$
(d) $HClO_4 < HClO_2 < HClO_3 < HClO$

76. The reaction:
$$3ClO^-_{(aq)} \rightarrow ClO_3^-_{(aq)} + 2Cl^-_{(aq)}$$
is an example of:
(a) Oxidation reaction
(b) Reduction reaction
(c) Disproportionation
(d) Decomposition reaction

77. Hydrogen bond is strongest in:
(a) F—H—O
(b) F—H—N
(c) F—H—F
(d) All are equally strong

78. Which of the following has highest bond strength?
(a) HI
(b) HCl
(c) HF
(d) HBr
79. Shape and hybridization of \( \text{IF}_5 \) respectively are:
   (a) Trigonal bipyramidal, \( sp^d_2 \)
   (b) See-saw, \( sp^d_2 \)
   (c) Square pyramidal, \( sp^d_2 \)
   (d) Pentagonal pyramidal, \( sp^d_2 \)

80. The oxidation states of iodine in \( \text{HIO}_4 \), \( \text{H}_2\text{IO}_6 \), and \( \text{H}_3\text{IO}_9 \) are respectively:
   (a) \(+1, +3, +7\)    (b) \(+7, +7, +3\)
   (c) \(+7, +7, +3\)    (d) \(+7, +5, +3\)

81. The electron affinity values (in kJ mol\(^{-1}\)) of three halogens \( X, Y \), and \( Z \) are respectively -349, -333 and -325. \( X, Y \), and \( Z \) respectively are:
   (a) \( \text{F}_2 \), \( \text{Cl}_2 \), \( \text{Br}_2 \)
   (b) \( \text{Cl}_2 \), \( \text{F}_2 \) and \( \text{Br}_2 \)
   (c) \( \text{Cl}_2 \), \( \text{Br}_2 \), \( \text{F}_2 \)
   (d) \( \text{Br}_2 \), \( \text{Cl}_2 \) and \( \text{F}_2 \)

82. Which one of the following reactions does not occur?
   (a) \( \text{F}_2 + 2\text{Cl}^- \longrightarrow 2\text{F}^- + \text{Cl}_2 \)
   (b) \( \text{Cl}_2 + 2\text{F}^- \longrightarrow 2\text{Cl}^- + \text{F}_2 \)
   (c) \( \text{Br}_2 + 2\text{l}^- \longrightarrow 2\text{Br}^- + \text{l}_2 \)
   (d) \( \text{Cl}_2 + 2\text{Br}^- \longrightarrow 2\text{Cl}^- + \text{Br}_2 \)

83. Select the correct order from the following:
   (a) \( \text{N}_2\text{O} < \text{N}_2\text{O}_3 < \text{NO} \); Acidic character
   (b) \( \text{MgO} > \text{Al}_2\text{O}_3 > \text{SiO}_2 \); Basic character
   (c) \( \text{Fe}^{2+} < \text{Fe}^{3+} < \text{Mn}^{2+} \); Ionic radius order
   (d) \( \text{Sc} > \text{La} > \text{Y} \); Ionisation energy order

84. Which of the following is the correct order of strength of H-bonding in the given compound?
   (a) \( \text{HF} < \text{NH}_3 \)    (b) \( \text{H}_2\text{O} > \text{H}_2\text{O}_2 \)
   (c) \( \text{H}_2\text{O}_2 > \text{H}_2\text{O} \)    (d) \( \text{NH}_3 > \text{H}_2\text{O} \)

85. In which of the following molecules central atom involve expansion of octet?
   (a) \( \text{PCl}_3 \)    (b) \( \text{NCI}_3 \)
   (c) \( \text{Cl}_2 \)    (d) None of these

86. If pure \( \pi \) orbitals are involved in molecule formation, then the shape of \( \text{H}_2\text{O}^+ \) will be:
   (a) Pyramidal    (b) Tetrahedral
   (c) Angular    (d) Planar

87. Select the correct statement:
   (a) \( \text{NH}_3 \) has higher bond dipole than \( \text{NF}_3 \)
   (b) \( \text{CCl}_4 \) is polar molecule
   (c) \( \text{SF}_4 \) is polar molecule
   (d) \( \text{IF}_5 \) is polar molecule

88. Arrange the following species according to their bond angle order:
   (I) \( \text{O}_2 \)    (II) \( \text{NO}_2^- \)    (III) \( \text{FNO} \)
   (a) \( \text{I} > \text{II} > \text{III} \)    (b) \( \text{II} > \text{I} > \text{III} \)
   (c) \( \text{III} > \text{II} > \text{I} \)    (d) \( \text{II} > \text{III} > \text{I} \)

89. The species which is not tetrahedral in shape is:
   (a) \( \text{ICl}_4^- \)    (b) \( \text{BF}_4^- \)
   (c) \( \text{AlH}_4^- \)    (d) \( \text{NF}_4 \)

90. Which of the following statements are correct regarding \( \text{IF}_5 \) molecule?
   (I) There is only one lone pair present in equatorial
   (II) All \( \angle \text{IF}_5 \) angles are identical
   (III) There are eight faces in this molecule
   (IV) The number of \( \angle \text{IF}_5 \) angles less than 90° is 8
   (a) I, II, and III
   (b) I, II, III, and IV
   (c) III and IV
   (d) I, II, and IV

91. When a solution of sodium hydroxide is added in excess to the solution of potash alum, we obtain:
   (a) A white precipitate
   (b) Bluish white precipitate
   (c) A clear solution
   (d) A crystalline mass

92. B—H—B bridge in \( \text{B}_2\text{H}_6 \) is formed by the sharing of:
   (a) 2 electrons
   (b) 4 electrons
   (c) 1 electron
   (d) 3 electrons

93. The bonds present in borazole are:
   (a) \( 12\sigma, 3\pi \)
   (b) \( 9\sigma, 6\pi \)
   (c) \( 6\sigma, 6\pi \)
   (d) \( 9\sigma, 9\pi \)

94. \( \text{BCl}_3 \) does not exist as dimer but \( \text{BH}_3 \) exists as dimer \( \text{(B}_2\text{H}_6 \) because:
   (a) Chlorine is more electronegative than hydrogen
   (b) There is \( \rho \alpha - \rho \beta \) back bonding in \( \text{BCl}_3 \), but \( \text{BH}_3 \) does not contain such multiple bonding
   (c) Large-sized chlorine atoms do not fit in between the small boron atoms, whereas small-sized hydrogen atoms fit between boron atoms
   (d) None of these

95. Lead chromate is:
   (a) Red
   (b) Yellow
   (c) White
   (d) Black

96. Which of the following is methanide:
   (a) \( \text{Be}_2\text{C} \)
   (b) \( \text{CaC}_2 \)
   (c) \( \text{Mn}_2\text{C} \)
   (d) \( \text{MgC}_2 \)

97. Red lead is:
   (a) \( \text{PbO} \)
   (b) \( \text{Pb}_3\text{O}_4 \)
   (c) \( \text{PbO}_2 \)
   (d) \( \text{HgS} \)

98. Laborer's working with phosphorus suffer from a disease in which bones decay. It is known as:
99. Pure phosphine is not combustible while impure phosphine is combustible; this combustibility is due to the presence of:
(a) $\text{P}_2\text{H}_4$  (b) $\text{N}_2$
(c) $\text{PH}_3$  (d) $\text{P}_2\text{O}_5$

100. Bond energies in $\text{NO}$, $\text{NO}^+$, and $\text{NO}^-$ are such that:
(a) $\text{NO} > \text{NO}^+ > \text{NO}^-$  (b) $\text{NO}^- > \text{NO} > \text{NO}^+$
(c) $\text{NO}^+ > \text{NO} > \text{NO}^-$  (d) $\text{NO}^+ > \text{NO}^- > \text{NO}^-$

101. Which of the following are not known?
(a) $\text{PH}_3$  (b) $\text{Pl}_3$
(c) $\text{NCl}_3$  (d) All of these

102. The most stable and basic hydride of 15th group is:
(a) $\text{NH}_3$  (b) $\text{PH}_3$
(c) $\text{AsH}_3$  (d) $\text{BiH}_3$

103. The gas which is supposed to be acidic anhydride:
(a) $\text{NO}_2$  (b) $\text{CO}$
(c) $\text{N}_2\text{O}_5$  (d) $\text{NO}$

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

105. $\text{P}_4\text{O}_{10}$ on reacting with water does not form:
(a) Tetra metaphosphoric acid
(b) Phosphorous acid
(c) Orthophosphoric acid
(d) Pyrophosphoric acid

106. The number of $\text{P}—\text{O}—\text{P}$ bonds in cyclic metaphosphoric acid is:
(a) Zero  (b) Two
(c) Three  (d) Four

107. The correct order for acid strength is:
(a) $\text{Al}_2\text{O}_3 < \text{SiO}_2 < \text{P}_2\text{O}_5 < \text{SO}_2$
(b) $\text{SiO}_2 < \text{SO}_2 < \text{Al}_2\text{O}_3 < \text{P}_2\text{O}_5$
(c) $\text{Al}_2\text{O}_3 < \text{SiO}_2 < \text{SO}_2 < \text{P}_2\text{O}_5$
(d) $\text{SO}_2 < \text{P}_2\text{O}_5 < \text{SiO}_2 < \text{Al}_2\text{O}_3$

108. The number of $\text{S}—\text{S}$ bonds in sulphur trioxide trimer ($\text{S}_3\text{O}_4$) is:
(a) 3  (b) 2
(c) 1  (d) 0

109. $\text{NH}_4$ cannot be obtained by:
(a) Heating of $\text{NH}_4\text{NO}_3$ or $\text{NH}_4\text{NO}_2$
(b) Heating of $\text{NH}_4\text{Cl}$ or ($\text{NH}_4)_2\text{CO}_3$
(c) Heating of $\text{NH}_4\text{NO}_3$ with $\text{NaOH}$
(d) Reaction of $\text{AlN}$ or $\text{Mg}_2\text{N}_2$ or $\text{CaCN}_2$ with $\text{H}_2\text{O}$

110. An aqueous solution of $\text{BCl}_3$ is:
(a) Weak acid  (b) Weak base
(c) Neutral  (d) Strong base

111. In diborane:
(a) 4 bridged hydrogens and two terminal hydrogens are present
(b) 2 bridged hydrogens and four terminal hydrogens are present
(c) 3 bridged hydrogens and three terminal hydrogens are present
(d) None of the above

112. Which of the following metals burns in air at high temperature with the evolution of much heat?
(a) Cu  (b) Hg
(c) Pb  (d) Al

113. Aluminium (III) chloride forms a dimer because aluminium:
(a) Cannot form a trimer
(b) Has high ionization energy
(c) Belongs to third group
(d) Can have higher coordination number

114. Alum helps in purifying water by:
(a) Forming Si complex with clay particles
(b) Sulphate part which combines with the dirt and removes it
(c) Aluminium which coagulates the mud particles
(d) Making the mud, water soluble

115. The ion(s) that acts as oxidizing agent in solution is/are:
(a) $\text{Ti}^{3+}$ and $\text{Al}^{3+}$
(b) $\text{B}^{3+}$ and $\text{Al}^{3+}$
(c) $\text{Ti}^{3+}$ only
(d) $\text{B}^{3+}$ only

116. The stability of +1 oxidation state increases in the sequence:
(a) $\text{Ti} < \text{In} < \text{Ga} < \text{Al}$
(b) $\text{In} < \text{Ti} < \text{Ga} < \text{Al}$
(c) $\text{Ga} < \text{In} < \text{Al} < \text{Ti}$
(d) $\text{Al} < \text{Ga} < \text{In} < \text{Ti}$

117. An example of major air pollutant is:
(a) $\text{O}_3$
(b) $\text{CO}_2$
(c) $\text{CO}$
(d) $\text{He}$

118. The color imparted by $\text{Co}^{2+}$ compounds to glass is:
(a) Deep blue
(b) Green
(c) Yellow
(d) Red

119. When $\text{PbO}_2$ reacts with conc. $\text{HNO}_3$, the gas evolved is:
120. Graphite is soft and lubricant, extremely difficult to melt. The reason for this anomalous behavior is that graphite:
(a) Has carbon atoms arranged in large plates of rings of strongly bound carbon atoms with weak interplanar bonds
(b) Is a non-crystalline substance
(c) Is an allotrope form of carbon
(d) Has molecules of variable molecular masses like polymers

121. Which one of the following is present in the chain structure of silicates?
(a) \( \text{Si}_2 \text{O}_3^2^- \)
(b) \( \text{SiO}_3^2^- \)
(c) \( \text{SiO}_4^4^- \)
(d) \( \text{Si}_2 \text{O}_5^2^- \)

122. Which of the following has the highest calorific value?
(a) Coal gas
(b) Water gas
(c) Producer gas
(d) Carbon dioxide gas

123. Among the following substituted silanes the one which will give rise to cross-linked silicone polymer on hydrolysis is:
(a) \( \text{R}_2 \text{SiCl} \)
(b) \( \text{R}_4 \text{Si} \)
(c) \( \text{R}_2 \text{SiCl}_2 \)
(d) \( \text{R}_2 \text{SiCl}_3 \)

124. \( C-C \) bond length is maximum in:
(a) Diamond
(b) Graphite
(c) Naphthalene
(d) Fullerene

125. \( \text{NH}_3 \) has much higher boiling point than \( \text{PH}_3 \) because:
(a) \( \text{NH}_3 \) has much higher molecular mass
(b) \( \text{NH}_3 \) forms hydrogen bonds
(c) \( \text{NH}_3 \) contains ionic bonds while \( \text{PH}_3 \) contains covalent bonds
(d) \( \text{NH}_3 \) undergoes umbrella inversion

126. By the action of conc. \( \text{H}_2\text{SO}_4 \), phosphorus changes to:
(a) Phosphorus acid
(b) Metaphosphoric acid
(c) Orthophosphoric acid
(d) Pyrophosphoric acid

127. Among the following oxides, the lowest acidic is:
(a) \( \text{P}_2\text{O}_5 \)
(b) \( \text{P}_2\text{O}_6 \)
(c) \( \text{As}_2\text{O}_5 \)
(d) \( \text{As}_2\text{O}_6 \)

128. The basic character of the hydrides of Vth group elements decreases in the order:
(a) \( \text{NH}_3 > \text{PH}_3 > \text{AsH}_3 > \text{SbH}_3 \)
(b) \( \text{SbH}_3 > \text{AsH}_3 > \text{PH}_3 > \text{NH}_3 \)
(c) \( \text{NH}_3 > \text{SbH}_3 > \text{PH}_3 > \text{AsH}_3 \)
(d) \( \text{SbH}_3 > \text{PH}_3 > \text{AsH}_3 > \text{NH}_3 \)

1. Nitrogen forms \( \text{N}_2 \) but phosphorus is converted into \( \text{P}_4 \) from \( \text{P}_2 \). The reason for this is:
(a) Triple bond is present between phosphorus atoms
(b) \( \text{p}-\text{p} \) bonding is weak
(c) \( \text{p}-\text{p} \) bonding is strong
(d) Multiple bond is formed easily

2. The element which forms oxides in all the oxidation states from +1 to +5 is:
(a) \( \text{N} \)
(b) \( \text{P} \)
(c) \( \text{As} \)
(d) \( \text{Sb} \)

3. \( \text{N}_2 \) forms \( \text{NCl}_3 \), whereas \( \text{P} \) can form both \( \text{PCl}_3 \) and \( \text{PCl}_5 \). Why?
(a) \( \text{P} \) has \( d \)-orbitals which can be used for bonding but \( \text{N}_2 \) does not have
(b) \( \text{N} \) atom is larger in size than \( \text{P} \)
(c) \( \text{P} \) is more reactive towards \( \text{Cl} \) than \( \text{N} \)
(d) None of the above

4. Which of the following compound is responsible for catching fire spontaneously in Holme's singal?
(a) \( \text{P}_2\text{H}_2 \)
(b) \( \text{PH}_3 \)
(c) \( \text{C}_2\text{H}_2 \)
(d) All of these

5. Which is in the decreasing order of boiling points of Vth group hydrides?
(a) \( \text{NH}_3 > \text{PH}_3 > \text{AsH}_3 > \text{SbH}_3 \)
(b) \( \text{SbH}_3 > \text{AsH}_3 > \text{PH}_3 > \text{NH}_3 \)
(c) \( \text{PH}_3 > \text{NH}_3 > \text{AsH}_3 > \text{SbH}_3 \)
(d) \( \text{SbH}_3 > \text{NH}_3 > \text{AsH}_3 > \text{PH}_3 \)

6. Which compound acts as an oxidizing as well as a reducing agent?
(a) \( \text{SO}_2 \)
(b) \( \text{Mn}_2\text{O}_7 \)
(c) \( \text{Al}_2\text{O}_3 \)
(d) \( \text{Cr}_2\text{O}_7 \)

7. Hydrolysis of one mole of peroxydisulphuric acid produces:
(a) Two moles of sulphuric acid
(b) Two moles of peroxydisulphuric acid
(c) One mole of sulphuric acid and one mole of peroxydisulphuric acid
(d) One mole of sulphuric acid, one mole of peroxydisulphuric acid, and one mole of hydrogen peroxide

8. Which of the following is the most powerful oxidizing agent?
9. The most powerful oxidizing agent is:
(a) Fluorine  (b) Chlorine  
(c) Bromine  (d) Iodine  

10. Which one of the hydrazides does not form any precipitate with AgNO₃?
(a) HF  (b) HCl  
(c) HBr  (d) HI  

11. The strongest reducing agent is:
(a) F⁻  (b) Cl⁻  
(c) Br⁻  (d) I⁻  

12. HBr and HI can reduce H₂SO₄. HCl can reduce KMnO₄, and HF can reduce:
(a) K₂Cr₂O₇  (b) KMnO₄  
(c) H₂SO₄  (d) None of these  

13. Na₂S₂O₃ is oxidized by I₂ to:
(a) Na₂S  (b) Na₂SO₄  
(c) NaHSO₃  (d) Na₂S₄O₆  

14. Which of the possible molecule/species is having maximum values for dipole moment (where “A” is the central atom)?
(a) AX₃ (having one lone pair on central atom)  
(b) AX₄ (Tetrahedral)  
(c) AX₂Y (having no lone pair on central atom)  
(d) Cannot be predicted  

15. Which of the following is incorrect match?
(a) SiF₄ : Can act as Lewis acid  
(b) Benzene : All C-atoms are sp² hybridized  
(c) PBr₃ : Non-polar  
(d) CHF = C = CHF: Nodal planes of π-bonds are not lying in same plane  

16. Which of the following molecule/species is having minimum number of lone pair on its central atom?
(a) BrF₃  (b) BrF₄⁻  
(c) XeF₅⁺  (d) I₃⁻  

17. Select the correct statement:
(a) Basicity of phosphorous acid is three
(b) Perbromic acid is having only one peroxo linkage
(c) β-SO₃₂⁻ is having cyclic structure
(d) Borazine is having zero dipole moment  

18. Which of the following statement is not correct regarding SF₂Cl₂ molecule?
(a) Two axial bond lengths are longer compared to two equatorial bond lengths
(b) Two S–F bond lengths are identical
(c) Two S–Cl bond lengths are identical
(d) Lone pair is not changing its position  

19. Select the correct statement regarding oxides:
(a) As the electronegativity of element increases, acidic character of oxide increases
(b) Down the group the acidic character of oxide increases
(c) Both B₂O₃ and Al₂O₃ are acidic oxides
(d) Nitrogen forms all the three types of oxides (neutral, basic, and acidic)  

20. Which of the following structure is non-planar?
(a) Na₂B₃O₆  
(b) I₂Cl₆  
(c) Sheet silicates  
(d) Inorganic graphite layer  

21. Alumina on heating with carbon in nitrogen atmosphere gives:
(a) Al + CO  
(b) Al₂ + CO₂  
(c) AlN + CO  
(d) Al₂ + CO + N₂  

22. Which of the following has the minimum heat of dissociation?
(a) [(CH₃)₄N] → BF₃  
(b) [(CH₃)₄N] → B(CH₃)₄F  
(c) [(CH₃)₄N] → B(CH₃)₃F  
(d) [(CH₃)₂N] → B(CH₃)₃  

23. Anhydrous AlCl₃ is obtained from:
(a) Hydrochloric acid and aluminium metal  
(b) Dry hydrogen chloride gas and aluminium metal  
(c) Alumina and chlorine gas  
(d) None of these  

24. Aluminium vessel should not be washed with materials containing washing soda because:
(a) Washing soda is expensive  
(b) Washing soda is easily decomposed  
(c) Washing soda reacts with aluminium to form soluble aluminate  
(d) Washing soda reacts with aluminium to form insoluble aluminium oxide  

25. In the reaction LiH + AlH₃ → LiAlH₄, AlH₃ and LiH act as:
(a) Lewis acid and Lewis base  
(b) Lewis base and Lewis acid  
(c) Bronsted base and Bronsted acid  
(d) None of these
26. The solution of borax in water is:
(a) Neutral  
(b) Acidic  
(c) Alkaline  
(d) Amphoteric

27. \( \text{Al}_2\text{O}_3 \) can be converted into anhydrous \( \text{AlCl}_3 \) by heating:
(a) A mixture of \( \text{Al}_2\text{O}_3 \) and carbon in dry \( \text{Cl}_2 \) gas  
(b) \( \text{Al}_2\text{O}_3 \) with \( \text{Cl}_2 \) gas  
(c) \( \text{Al}_2\text{O}_3 \) with \( \text{HCl} \) gas  
(d) \( \text{Al}_2\text{O}_3 \) with \( \text{NaCl} \) solid state

28. The reaction,
\[ \text{B(OH)}_3 + \text{NaOH} \rightarrow \text{Na[B(OH)}_4 \]
can be made to proceed in forward direction by:
(a) Adding \( \text{cis}-1,2\)-dienol  
(b) Adding borax  
(c) Adding \( \text{trans}-1,2\)-dienol  
(d) Adding \( \text{Na}_2\text{HPO}_4 \)

29. Aluminium chloride exists as dimer, \( \text{Al}_2\text{Cl}_6 \), in solid state as well as in solution of non-polar solvents such as \( \text{C}_6\text{H}_6 \). When dissolved in water it gives:
(a) \( \text{Al}_2\text{O}_3 + 6\text{HCl} \)  
(b) \( \text{Al}^{(3+)} + 3\text{Cl}^- \)  
(c) \( \text{Al}^{(3+)} + 3\text{HCl} \)  
(d) \( \text{Al}^{(3+)} + 3\text{Cl}^- \)

30. Carbon burns in air and forms two oxides CO and \( \text{CO}_2 \).
This shows that carbon has:
(a) Two allotropic forms  
(b) Two oxidation states  
(c) Two isotopes  
(d) Four electrons in valence shell

31. By addition of excess of sodium hydroxide solution to stannous chloride solution, we obtain:
(a) \( \text{Sn} \text{(OH)}_3 \)  
(b) \( \text{SnO}_2 \cdot \text{H}_2\text{O} \)  
(c) \( \text{Na}_2\text{SnO}_3 \)  
(d) \( \text{Na}_2\text{S}_2 \text{O}_2 \)

32. Man dies in an atmosphere of carbon monoxide because it:
(a) Combines with the \( \text{O}_2 \) present in the body to form \( \text{CO}_2 \).  
(b) Reduces the organic matter of tissues.  
(c) Combines with hemoglobin of blood, making it incapable of absorbing \( \text{O}_2 \).  
(d) Dries up the blood.

33. Which statement is correct with respect to the property of the elements with increase in atomic number in the carbon family?
(a) Their metallic character decreases.  
(b) The stability of \( 2+ \) oxidation state increases.  
(c) Their ionization energy increases.  
(d) Their atomic size decreases.

34. Which gas is essential constituent of almost all fuel gases?
(a) \( \text{CO}_2 \)  
(b) \( \text{N}_2 \)  
(c) \( \text{CO} \)  
(d) \( \text{H}_2\text{O} \)

35. Regular use of which of the following fertilizer increases the acidity of soil?
(a) Potassium nitrate  
(b) Urea  
(c) Superphosphate of lime  
(d) Ammonium sulphate

36. The oxidation state (O.S.) of \( \text{S} \) atom is \(-1\) in:
(a) \( \text{FeS} \)  
(b) \( \text{FeS}_2 \)  
(c) \( \text{Na}_2\text{S} - \text{S} - \text{ONa} \)  
(d) \( \text{Na}_2\text{O} - \text{S} - \text{S} - \text{ONa} \)

37. In silicon dioxide:
(a) Each silicon atom is surrounded by four oxygen atoms and each oxygen atom is bonded to two silicon atoms  
(b) Each silicon atom is surrounded by two oxygen atoms and each oxygen atom is bonded to two silicon atoms  
(c) Silicon atom is bonded to two oxygen atoms  
(d) There are double bonds between silicon and oxygen atoms

38. Name the structure of silicate in which three oxygen atoms of \( [\text{SiO}_3]^{4-} \) are shared:
(a) Pyrosilicate  
(b) Sheet silicate  
(c) Linear chain silicate  
(d) Three dimensional silicate

39. Which one is not an acid salt?
(a) \( \text{NaH}_2\text{PO}_4 \)  
(b) \( \text{NaH}_2\text{PO}_3 \)  
(c) \( \text{Na}_2\text{HPO}_4 \)  
(d) None of these

40. Sodium nitrate on heating with zinc dust and caustic soda gives:
(a) \( \text{NaNO}_2 \)  
(b) \( \text{NH}_3 \)  
(c) \( \text{NO}_2 \)  
(d) \( \text{N}_2\text{O}_5 \)

41. The most thermodynamically stable allotropic form of phosphorus is:
(a) Red  
(b) White  
(c) Black  
(d) Yellow

42. Which of the following statement regarding sulphur is incorrect?
(a) At 600°C, the gas mainly consists of \( \text{S}_2 \) molecules  
(b) The oxidation state of sulphur is never less than +4 in its compounds  
(c) \( \text{S}_2 \) molecule is paramagnetic  
(d) The vapor at 200°C consists mostly of \( \text{S}_8 \) rings
43. Which is an ozonide?
(a) KO₃  (b) NH₃O₃
(c) Cr₂O₃  (d) Both (a) and (b)

44. Identify the incorrect statement among the following:
(a) Ozone reacts with SO₂ to give SO₃.
(b) Silicon reacts with NaOH(aq.) in the presence of air to give Na₂SiO₃ and H₂O.
(c) Cl₂ reacts with excess of NH₃ to give N₂ and HCl.
(d) Br₂ reacts with hot and strong NaOH solution to give NaBr, NaBrO₄, and H₂O.

45. When Na₂S is added to sodium nitroprusside solution:
(a) Beautiful violet color is produced
(b) A complex [Fe(CN)₆NO]⁻ is formed
(c) The complex Na₂[Fe(CN)₆NO] is formed
(d) All of these

46. One gas bleaches the color of the flowers by reduction while the other by oxidation. The gases are:
(a) CO and CO₂  (b) H₂S and Br₂
(c) SO₂ and Cl₂  (d) NH₃ and SO₃

47. \([X] + H₂SO₄ \rightarrow [Y]\) a colorless gas with irritating smell,
\([Y] + K₂Cr₂O₇ + H₂SO₄ \rightarrow\) a green solution, \([X]\) and \([Y]\) are:
(a) SO₃²⁻, SO₂  (b) Cl⁻, HCl
(c) S²⁻, H₂S  (d) CO₃²⁻, CO₂

48. Which of the following is not oxidized by O₃?
(a) KI  (b) FeSO₄
(c) KMnO₄  (d) K₂MnO₄

49. The halide which does not give a precipitate with AgNO₃ is:
(a) F⁻  (b) Cl⁻
(c) Br⁻  (d) I⁻

50. Which ion can bring about the highest oxidation state of a transition metal?
(a) F⁻  (b) Cl⁻
(c) Br⁻  (d) I⁻

51. Which halogen can be purified by sublimation?
(a) F₂  (b) Cl₂
(c) Br₂  (d) I₂

52. The ion that cannot undergo disproportionation is:
(a) ClO₄⁻  (b) ClO₃⁻
(c) ClO₂⁻  (d) ClO⁻

53. In the reaction between Cl₂ and hot conc. NaOH, which is correct:
(a) The oxidation number of Cl₂ changes from 0 to +5 and 0 to −1
(b) Cl₂ undergoes disproportionation
(c) Cl₂ undergoes self or auto redox change
(d) All of these

54. The correct order of acidic nature is:
(a) Cl₂O₇ > SO₃ > P₂O₅  (b) CO₂ > N₂O₅ > SO₃
(c) Na₂O > MgO > Al₂O₃  (d) K₂O > CaO > MgO

55. The product of oxidation of I⁻ with MnO₄⁻ in alkaline medium is:
(a) IO₃⁻  (b) I₂
(c) IO⁻  (d) IO₄⁻

56. The number of hydrogen atoms attached to phosphorus atom in hypophosphorous acid is:
(a) Zero  (b) Two
(c) One  (d) Three

57. Which of the following is only acidic in nature?
(a) Be(OH)₂  (b) Mg(OH)₂
(c) B(OH)₃  (d) Al(OH)₃

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

59. Which products are expected from the disproportionation of hypochlorous acid?
(a) HClO₃ and Cl₂  (b) HClO₂ and HClO
(c) HCl and Cl₂O  (d) HCl and HClO₃

60. In view of the signs of \( \Delta G^\circ \) for the following reactions
\( PbO₂ + Pb \rightarrow 2 PbO, \Delta G^\circ < 0 \)
\( SnO₂ + Sn \rightarrow 2 SnO₂, \Delta G^\circ > 0 \)

Which oxidation states are more characteristic for lead and tin?
(a) For lead +4, for tin +2
(b) For lead +2, for tin +2
(c) For lead +4, for tin +4
(d) For lead +2, for tin +4

61. Select the correct statement about elements of group 15:

61. The order of stability of oxidation state for $\text{Bi}^{3+}$ is $\text{Bi}^{3+} > \text{Sb}^{5+}$ and for $\text{Sb}^{5+} < \text{As}^{3+}$.

(b) In the case of nitrogen, all oxidation states from +1 to +4 tend to disproportionate in acid solution.

(c) There is a considerable increase in covalent radius from $\text{N}$ to $\text{P}$ but from $\text{As}$ to $\text{Bi}$ only a small increase in covalent radius is observed.

(d) All of these

62. Aluminium chloride exists as dimer, $\text{Al}_2\text{Cl}_6$, in solid state as well as in solution of non-polar solvents such as benzene. When dissolved in water, it gives

(a) $\text{Al}^3+ + 3\text{Cl}^-\quad \rightarrow \quad [\text{Al}(\text{H}_2\text{O})_6]^{3+} + 3\text{HCl}$

(b) $\text{Al}_2\text{O}_3 + 6\text{HCl}$

63. By the action of conc. $\text{H}_2\text{SO}_4$, phosphorus changes to:

(a) Phosphorus acid
(b) Orthophosphoric acid
(c) Metaphosphoric acid
(d) Pyrophosphoric acid

64. The liquefied metal expanding on solidification is:

(a) $\text{Al}$
(b) $\text{Ga}$
(c) $\text{Zn}$
(d) $\text{Cu}$

65. A layer of coke is spread over bauxite during extraction of aluminium. This acts as a/an:

(a) Flux
(b) Slag to remove impurities
(c) Reducing agent
(d) Insulation and does not allow heat to escape

66. $\text{BF}_3$ is used as catalyst in several industrial processes due to its:

(a) Strong reducing nature
(b) Weak reducing action
(c) Strong Lewis acid nature
(d) Weak Lewis acid character

67. The chemical formula of feldspar is:

(a) $\text{KAlSi}_3\text{O}_8$
(b) $\text{Na}_2\text{Al}_2\text{O}_6$
(c) $\text{Na}_2\text{Al}_2\text{O}_6$
(d) $\text{K}_2\text{Si}_2\text{O}_5 - 4\text{Al}[(\text{OH})_4$

68. A mixture of boron trichloride and hydrogen is subjected to silent electric discharge to form $\text{B}^+$ and $\text{HCl}$. $\text{B}^+$ is mixed with $\text{NH}_3$ and heated to 200°C to form $\text{B}^-$. The formula of $\text{B}^-$ is:

(a) $\text{H}_2\text{BO}_3$
(b) $\text{B}_2\text{O}_3$
(c) $\text{B}_2\text{H}_6$
(d) $\text{B}_2\text{N}_2\text{H}_6$

69. In aluminium extraction by the Bayer's process, alumina is extracted from bauxite by sodium hydroxide at high temperature and pressure.

$$\text{Al}_2\text{O}_3(s) + 2\text{OH}^-_{(aq)} \rightarrow 2\text{AlO}_2^-_{(aq)} + \text{H}_2\text{O}_{(l)}$$

Solid impurities such as $\text{Fe}_2\text{O}_3$ and $\text{SiO}_2$ are removed and then $\text{Al}[(\text{OH})_4$ is reparticulated.

70. Solder is an alloy of:

(a) 70% Pb, 30% Sn
(b) 33% Pb, 67% Sn
(c) 80% Pb, 20% Sn
(d) 90% Cu, 10% Sn

71. Which of the following halides of carbon is used as refrigerant?

(a) $\text{CCl}_4$
(b) $\text{CF}_4$
(c) $\text{CH}_2\text{Cl}_2$
(d) $\text{CF}_2\text{Cl}_2$

72. Butter of tin is:

(a) $\text{SnCl}_2 \cdot 3\text{H}_2\text{O}$
(b) $\text{SnCl}_2 \cdot 2\text{H}_2\text{O}$
(c) $\text{SnCl}_4 \cdot 3\text{H}_2\text{O}$
(d) $\text{SnCl}_2 \cdot 5\text{H}_2\text{O}$

73. $\text{Me}_2\text{SiCl}_2$ on hydrolysis followed by polymerization will produce:

(a) $\text{Me}_2\text{Si}(-\text{OH})$
(b) $\text{Me}_2\text{Si} == \text{O}$
(c) $[-\text{O} - \text{Me}_2\text{Si} - \text{O} -$]
(d) $\text{Me}_2\text{SiClOH}$

74. Litharge is chemically:

(a) $\text{PbO}$
(b) $\text{PbO}_2$
(c) $\text{Pb}_2\text{O}_4$
(d) $\text{Pb}_{(\text{CH}_3\text{COO})_2}$

75. The straight chain polymer is formed by:

(a) Hydrolysis of $\text{CH}_3\text{SiCl}_3$ followed by condensation polymerization
(b) Hydrolysis of $\text{CH}_3\text{SiCl}_3$ followed by addition polymerization
(c) Hydrolysis of $\text{CH}_3\text{SiCl}_3$ followed by condensation polymerization
(d) Hydrolysis of $\text{CH}_3\text{SiCl}_3$ followed by condensation polymerization

76. On heating $\text{K}_2\text{Fe(CN)}_6$ with conc. $\text{H}_2\text{SO}_4$ gives the gas:

(a) $\text{SO}_2$
(b) $\text{CO}_2$
(c) $\text{CO}$
(d) $\text{NO}_2$

77. Blasting of TNT is done by mixing:

(a) $\text{NH}_4\text{Cl}$
(b) $\text{Ni}_4\text{NO}_3$
(c) $\text{NH}_4\text{NO}_3$
(d) $\text{Ni}_4\text{SO}_3$

78. Which of the following is the incorrect statement for $\text{PH}_3$?

(a) It is less basic than $\text{NH}_3$
(b) It has rotten fish smell
91. The element evolving two different gases on reaction with conc. H₂SO₄ is:
(a) P (b) C (c) Hg (d) S

92. The function of Fe(OH)₃ in the contact process is:
(a) To detect colloidal impurity (b) To remove moisture
(c) To remove dust particles (d) To remove arsenic impurity

93. Aqueous solution of Na₂S₂O₃ on reaction with Cl₂ gives:
(a) Na₂S₄O₆ (b) NaHSO₄ (c) NaCl (d) NaOH

94. In which of the following molecule, the number of possible $\angle XAY$ angles is maximum in the anionic part of their solid state? [A: Central atom; X: surrounding atom]
(a) PH₃ (b) N₂O₃ (c) Cl₂ (d) O₃

95. Which of the following compound have $X-O-X$ linkage where $X$ is the so-called central atom like P, S etc?
(a) $P_{2}O_{5}$ (b) $S_{2}O_{3}^{2-}$ (c) $SO_{3}$ (d) $S_{2}O_{5}^{2-}$

96. In which of the following type of bond, C—C bond distance will be minimum?
(a) (b) (c) (d)

97. Which of the following is pseudo alum?
(a) $(NH_4)_2SO_4 \cdot Fe_2(SO_4)_3 \cdot 24H_2O$ (b) $K_2SO_4 \cdot Al_2(SO_4)_3 \cdot 24H_2O$
(c) $MnSO_4 \cdot Al_2(SO_4)_3 \cdot 24H_2O$ (d) None of these

98. Among the halides,
1. BC₁₃ 2. AlCl₃
3. GaCl₃ 4. InCl₃
The order of decreasing Lewis acid character is:
(a) 1, 2, 3, 4 (b) 4, 3, 2, 1 (c) 3, 4, 2, 1 (d) 2, 3, 4, 1

99. Which of the following has smell resembling to bleaching powder?
(a) NO₂ (b) HNO₃ (c) HNO₃ (d) None of these