CHEMISTRY

BOOKS - MODERN PUBLICATION CHEMISTRY (KANNADA ENGLISH)

CHEMISTRY OF P - BLOCK ELEMENTS

Multiple Choice Questions Level I Basic Conceptual Qs Boron Family Group 13 Elements

1. The maximum covalency of boron in sodium borofuoride is :

A. 4

B. 6

C. 2

D. 8

Answer: A

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2. The hardest compound of boron is :

A. Boron nitride

B. Boron hydroxide

C. Boron carbide

D. Boron oxide.

Answer: C

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3. The metaboric

A. HBO_2

B. H_3BO_3

C. $H_2B_4O_7$

D. none of these.

Answer: A

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4. The halides of group III elements behave as Lewis acids. The acceptor ability is maximum for the halides of :

A. B

B. Al

C. Ga

D. In.

Answer: A

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5. Which of the three, BF_3, BCl_3 and BBr_3 is a weakest Lewis acid ?

A. BF_3

B. BCl_3

C. BBr_3

D. All are of the same strength.

Answer: A

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6. In case of group III elements, the inert pair effect is predominant in

A. Boron

B. Aluminium

C. Indium

D. Thallium.

Answer: D

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7. Which of the following has the lowest melting point?

A. B

B. Ga

C. Al

D. Tl.

Answer: B

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8. On heating orthoboric acid to red hot, the reidue is :

A. Boron

B. Meta boric acid

C. Boron oxide.

D. Borax.

Answer: C

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9. In the structure of diborane :

A. the $B - H$ bonds are ionic

B. there are two three - centred two electrons bonds

C. there is a $B - B$ bond

D. there are two - centred three electron

Answer: B

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10. Orthoboric acid contains discrete units of :

A. BO_2^-

B. BO_3^{3-}

C. BO_4^{3-}

D. $B(OH)_3$.

Answer: B

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11. Which of the following statements is not correct regarding halides of group 13 elements ?

A. BF_3 is a weaker Lewis acid than BCl_3

B. Boron halides act as Lewis acids.

C. The tendency of form $p\pi - p\pi$ double bond is less in BF_3 than in BCl_3.

D. Aluminium halides exist as dimers but corresponding boron halides are monomers.

Answer: C

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12. Diborane hydrolyses to give :

A. B_2O_3

B. H_3BO_3

C. HBO_2

D. does not hydrolyse.

Answer: B

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13. Borax bead test depends upon the formation of :

A. boron oxide

B. metal borides

C. elemental boron

D. metal meta borates.

Answer: D

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14. Oxide of boron dissolves is strong alkalies to give :

A. boric acid

B. borates

C. meta borates

D. boron hydroxide.

Answer: C

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15. Which of the following has three centre electron pair bond ?

A. $[BF_4]^-$

B. B_2H_6

C. H_3BO_3

D. $Al(OH)_4^-$

Answer: B

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16. Which of the following is acidic ?

A. $In(OH)_3$

B. $Al(OH)_3$

C. $Tl(OH)_3$

D. $B(OH)_3$.

Answer: D

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17. The inorganic benzene is name given to to :

A. $B_3N_3H_6$

B. $(BN)_x$

C. $Na[BH_4]$

D. $\left[(NH_3)_2BH_2\right]^+[NH_4]^-$

Answer: A

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18. The tendency of group IV elements to form catenated compounds is greatest in case of

A. C

B. Si

C. Ge

D. Sn.

Answer: A

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19. Which $M - M$ bond has highest bond energy?

A. $Sn - Sn$

B. $Ge - Ge$

C. $C - C$

D. $Si - Si.$

Answer: C

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20. Which of the following cannot act as Lewis acid?

A. BCl_3

B. $SiCl_4$

C. SiF_4

D. CCl_4.

Answer: D

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21. Which of the following dioxide of group 14 elements is not solid ?

A. SnO_2

B. GeO_2

C. SiO_2

D. CO_2.

Answer: D

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22. An example of covalent carbide is :

A. CaC_2

B. Al_4C_3

C. SiC

D. W_2C.

Answer: C

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23. The non - existence of PbI_4 is because of :

A. highly oxidising nature of Pb^{4+}

B. highly reducing nature of I^-

C. small size of Pb^{4+} and large size of I^- ions

D. low electronegativity of iodine.

Answer: D

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24. The high temperature polymers of Si are called :

A. Silicates

B. Silicones

C. Silanes

D. Silicon halides.

Answer: B

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25. Diamond has each of the following properties except :

A. high melting point

B. ability to conduct electricity

C. inertness to chemicals

D. extreme hardness.

Answer: B

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26. The main reason as the why CCl_4 is not hydrolysed is :

A. absence of d - orbitals of low energy

B. covalent bonding in CCl_4

C. CCl_4 is insoluble in water.

D. CCl_4 has zero dipole moment.

Answer: A

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27. Graphite has each of the following properties except:

A. ability to conduct electricity

B. grey black colour

C. hardness

D. metallic lustre.

Answer: C

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28. Group 14 elements exhibit $+2$ and $+4$ oxidation states. $+2$ oxidation states is more stable than $+4$ in case of :

A. C

B. Pb

C. Sn

D. Si.

Answer: B

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29. Which of the following is called carborundum?

A. Be_4C

B. CaC_2

C. Al_4C_3

D. SiC

Answer: D

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30. Poisonous gas present in the exhaust fumes of automobiles is :

A. C_2H_2

B. CO

C. CH_4

D. CO_2.

Answer: B

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31. Lead pencils contains :

A. Lead nitrate

B. Pb

C. Graphite

D. Mixture of lead and carbon.

Answer: C

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32. Which of the following compounds has peroxide linkage?

A. Pb_2O_3

B. CO_2

C. SiO_2

D. PbO_2.

Answer: D

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33. A gas which burns with blue flame is :

A. O_2

B. CO_2

C. N_2

D. CO.

Answer: D

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34. Water gas is a mixture of

A. CO and N_2

B. CO and H_2

C. CO_2 and H_2

D. CO_2 and N_2.

Answer: B

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35. The strongest oxidant among the following is :

A. SiO_2

B. GeO_2

C. PbO_2

D. SnO_2

Answer: C

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36. Which of the following halides does not exist ?

A. NF_3

B. $SbCl_3$

C. PI_5

D. PF_5

Answer: C

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37. Which oxide of nitrogen is obtained on heating ammonium nitrate at $250^\circ C$?

A. N_2O

B. NO

C. N_2O_3

D. NO_2.

Answer: A

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38. Which of the following hydrides of group 15 has maximum basic character?

A. NH_3

B. BiH_3

C. AsH_3

D. PH_3

Answer: A

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39. Among the following the least thermally stable is :

A. NH_3

B. SbH_3

C. PH_3

D. AsH_3.

Answer: B

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40. Phophorus exists in the following alloptropic forms except:

A. white phosphorus

B. blue phosporus

C. red phosphorus

D. black phosphorus.

Answer: B

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41. An oxy acid of phosphorus is a white deliquescent crystalline solid. It can be prepared by the hydrolysis of P_2O_3 or PCl_3 and its formula is :

A. H_3PO_4

B. H_3PO_3

C. H_3PO_2

D. $H_4P_2O_7$.

Answer: B

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42. Which of the following elements does not form oxy acids?

A. P

B. N

C. Cl

D. F.

Answer: D

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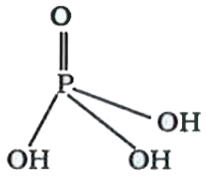
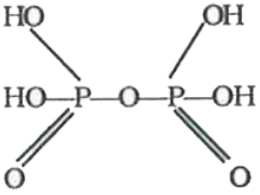
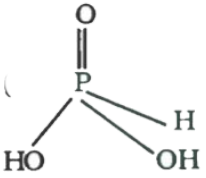
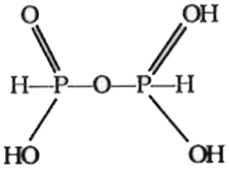
43. The structure of pyrophosphoric acid is :

A. 

B. 

C. 

D. 

Answer: B

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44. Which of the following has smallest bond angle ?

A. PF_3

B. PBr_3

C. PCl_3

D. PI_3.

Answer: C

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45. Dinitrogen pentoxide dissolve in water to give :

A. HNO_2

B. $H_2N_2O_2$

C. NO_2

D. HNO_3.

Answer: D

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46. Which of the following hybrides of group 15 has the lowest boiling point?

A. NH_3

B. SbH_3

C. PH_3

D. AsH_3.

Answer: C

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47. Which is most explosive?

A. PCl_3

B. $AsCl_3$.

C. BCl_3

D. NCl_3.

Answer: D

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48. Which is most explosive?

A. PCl_3

B. NH_3

C. AsH_3

D. SbH_3.

Answer: B

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49. Which of the following halides does not exist?

A. SbF_5

B. PF_5

C. NF_5

D. AsF_5.

Answer: C

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50. Phosphorus forms five bonds due to sp^3d hydridisation but nitrogen does not form pentahalides

due to :

A. small size of N atom

B. high ionisation energy of N

C. absence of d - orbitals in valence shell

D. its tendency to form multiple bonds.

Answer: C

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51. Yellow colour of usual nitric acid is due to the presence of :

A. NO_2

B. NO

C. N_2O

D. N_2O_5

Answer: A

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52. Laughing gas is prepared by heating :

A. NH_4NO_3

B. $(NH_4)_2SO_4$

C. $NaNO_2 + NH_4Cl$

D. HNO_3.

Answer: A

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53. White phosphorus contains :

A. P_2 molecules

B. P_4 molecules

C. P_6 molecules

D. one $P - P$ bond.

Answer: B

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54. Which of the following oxides of nitrogen is colourless solid ?

A. NO

B. N_2O

C. N_2O_4

D. N_2O_5.

Answer: D

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55. The reddish brown gas formed when nitric oxide is oxidised by air is :

A. N_2O_5

B. N_2O_4

C. NO_2

D. N_2O_3.

Answer: C

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56. Which of the following trihalide of nitrogen is the least basic ?

A. NF_3

B. NCl_3

C. NBr_3

D. NI_3.

Answer: C

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57. The gas evolved on heating $(NH_4)_2Cr_2O_7$ is :

A. NH_3

B. N_2

C. N_2O

D. O_2.

Answer: B

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58. Which of the following properties is not correct regarding red phosphorus?

A. Non - poisonous nature

B. Soluble in CS_2

C. Does not undergo oxidation at room temperature.

D. Less reactive than white phosphorus.

Answer: D

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59. Nitrogen dioxide cannot be obtained by heating :

A. KNO_3

B. N_2O_4

C. $Pb(NO_3)_2$

D. N_2O_5.

Answer: A

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60. Phosphorus is kept in :

A. cold water

B. alcohol

C. kerosene

D. ammonia.

Answer: A

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61. Which of the following is blue solid?

A. NO

B. N_2O_3

C. N_2O_4

D. N_2O_5.

Answer: B

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62. Which is most basic ?

A. NH_3

B. PH_3

C. SbH_3

D. AsH_3.

Answer: A

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63. Which one is Lewis acid ?

A. PCl_3

B. $AlCl_3$

C. NCl_3

D. $AsCl_3$.

Answer: B

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64. The number of $P-H$ bonds hypophosphorous acid is :

A. 1

B. 2

C. 3

D. 4

Answer: B

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65. Which of the following is a cyclic oxo acid ?

A. $H_4P_2O_7$

B. $H_4P_2O_6$

C. $H_3P_3O_9$

D. $H_5P_5O_{15}$.

Answer: C

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66. White phosphorus contains :

A. P_2 molecules

B. P_6 molecules

C. P_4 molecules

D. P_8 molecules.

Answer: C

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67. Conc. HNO_3 oxidises cane sugar to :

A. CO_2 and H_2O

B. CO and H_2O

C. CO, CO_2 and H_2O

D. Oxalic acid and water.

Answer: D

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68. Which of the following is a tribasic acid?

A. Orthosphoric acid

B. Phosphorous acid

C. Meta phosphoric acid

D. Pyrophosphoric acid.

Answer: A

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69. The tendency of group IV elements to form catenated compounds is greatest in case of

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70. The minimum bond angle in the hydrides of group 16 elements is in :

A. H_2O

B. H_2Te

C. H_2Se

D. H_2S.

Answer: B

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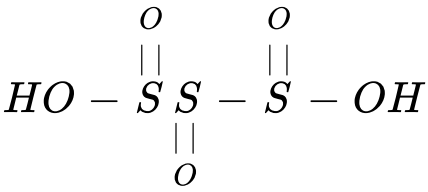
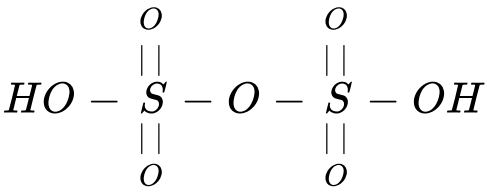
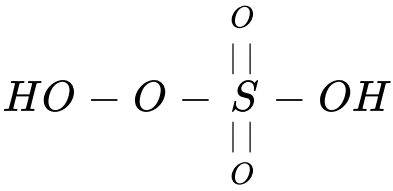
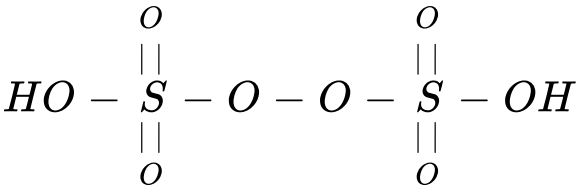
71. The structure of pyrosulphuric acid is :

A. 

B. 

C. 

D. 

Answer: B

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72. The boiling points of hydrides of group 16 elements are in the order :

A. $H_2O > H_2S > H_2Te > H_2Se$

B. $H_2Te \geq H_2Se > H_2S > H_2O$

C. $H_2O > H_2Te > H_2Se > H_2S$

D. $H_2Te > H_2O$

Answer: C

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73. The most acidic among the followingis :

A. TeO_2

B. SeO_2

C. SO_2

D. PoO_2

Answer: C

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74. Which of the following has lowest reducing character?

A. H_2O

B. H_2S

C. H_2Te

D. $H_2Se.$

Answer: A

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75. Sulphuric acid reacts with formic acid to give the main product :

A. CO_2 and CO

B. C

C. $HCHO$

D. CO.

Answer: D

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76. Which of the following has highest bond energy?

A. $O - O$

B. $S - S$

C. $Se - Se$

D. $Te - Te.$

Answer: B

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77. Oxygen exhibits positive oxidation state in

A. CO

B. F_2O

C. NO

D. N_2O

Answer: B

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78. Which of the following dissolves in H_2SO_4 to give oleum?

A. H_2S

B. S_2O

C. SO_2

D. SO_3.

Answer: D

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79. Bleaching action of SO_2 is due to :

A. reduction

B. oxidation

C. acidic nature

D. hydrolysis.

Answer: A

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80. An oxide that gives hydrogen perioxide on treatment with dilute H_2SO_4 is :

A. SnO_2

B. MnO_2

C. PbO_2

D. Na_2O_2.

Answer: D

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81. Which of the following oxy acid of sulphur has $+6$ oxidation state for sulphur?

A. Sulphurous acid

B. Peroxy disulphuric acid

C. Sulphuric acid.

D.

Answer: B

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82. Which one is known as Caro's acid ?

A. H_2SO_5

B. H_2SO_3

C. H_2SO_4

D. $H_2SO_4.NO.$

Answer: A

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83. Oxygen can be absorbed by :

A. Sodium hydroxide

B. $CuSO_4(aq)$

C. Pyrogallol

D. C_3H_5OH.

Answer: A

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84. Which of the following is the constituent of metal superoxides ?

A. O_2^-

B. O_2^{2-}

C. O^{2-}

D. O^{3-}

Answer: A

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85. Which of the following has highest energy?

A. $Se - Se$

B. $Te - Te$

C. $S - S$

D. $O - O.$

Answer: C

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86. Ozone oxidises aqueous iodine to :

A. I_3^-

B. HIO_3

C. I_2O_5

D. $ICl.$

Answer: B

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87. Which of the following statements is not correct regarding ozone?

A. It is light blue colour having pungent odour

B. It acts as bleaching agent

C. It is lighter than air

D. It liquefies to a deep blue liquid at 173 K.

Answer: C

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88. The halogen with the highest electron affinity is :

A. F

B. Cl

C. Br

D. I.

Answer: B

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89. The halide ion easiest to oxidise is :

A. F^-

B. Cl^-

C. Br^-

D. I^-

Answer: D

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90. The least non - metallic halogen is :

A. F

B. Cl

C. Br

D. I.

Answer: D

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91. The low bond energy of F_2 is explained by :

A. the attainment of noble gas configuration $\left(F^-\right)$

B. the low electron affinity of F

C. repulsion by electron pairs on F

D. the small size of F.

Answer: C

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92. Iodine can be liberated as a result of :

A. oxidising Cl_2 by I_2

B. oxidising I^- by Cl^-

C. oxidising I^- by Cl_2.

D. none

Answer: D

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93. The halogen with the highest heat of vaporisation is :

A. F_2

B. Cl_2

C. Br_2

D. I_2.

Answer: D

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94. The oxo acid of halogen with maximum acidic character is :

A. $HClO_4$

B. $HClO_3$

C. $HClO_2$

D. $HClO.$

Answer: A

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95. Which of the polyhalide ions is not known?

A. F_3^-

B. Br_2^-

C. Cl_3^-

D. I_3^-

Answer: A

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96. The formation of the complex $[pyINO_2]$ of iodine shows the existence of :

A. I^-

B. I^+

C. I^{3+}

D. I_2.

Answer: B

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97. Which of the following reactions will not occur spontaneously?

A. $F_2 + 2Cl^- \rightarrow 2F^- + Cl_2$

B. $I_2 + 2Br^- \rightarrow 2I^- + Br_2$

C. $Br_2 + 2I^- \rightarrow 2Br^- + I_2$

D. $2I^- + Cl_2^- \rightarrow 2Cl^- + I_2$

Answer: B

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98. Which of the following reactions will not occur?

A. $2Cu + 4I^- \rightarrow 2CuI + I_2$

B. $2Fe + 6I^- \rightarrow 2Fe^{2+} + 4I^- + I_2$

C. $2Cu^{++} + 4Cl^- \rightarrow 2CuCl + Cl_2$

D. None of the three.

Answer: C

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99. the high viscosity and high boiling point of HF is due to :

A. low dissociation energy of F_2 molecules

B. associated nature due to hydrogen bonding

C. ionic character of HF

D. high electronegativity of fluorine.

Answer: B

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100. Which of the following does not exist?

A. IF_3

B. ClF_3

C. IF_7

D. FCl_3.

Answer: D

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101. The strongest oxidising agent is :

A. $HClO_4$

B. $HClO_3$

C. $HClO_2$

D. $HClO$.

Answer: D

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102. Which shows only -1 oxidation state?

A. I

B. F

C. Cl

D. Br.

Answer: B

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103. Which of the following hydrogen halides has the lowest boiling point?

A. HF

B. HCl

C. HI

D. HBr.

Answer: B

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104. Which of the following is a pseudo halide?

A. Cl^-

B. CN^-

C. ICl_2^-

D. $ICl.$

Answer: B

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105. On heating a metal chloride with $K_2Cr_2O_7$ and conc. H_2SO_4, the gas evolved is :

A. Cl_2

B. CrO_2Cl_2

C. H_2CrO_2

D. CrO_3.

Answer: B

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106. Which of the following halogens shows maximum affinity for hydrogen?

A. Fluorine

B. Chlorine

C. Bromine

D. Iodine.

Answer: A

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107. The oxide containing chloride in the highest oxidation state is :

A. ClO_2

B. ClO_3

C. Cl_2O_7

D. Cl_2O.

Answer: C

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108. Which of the following is strongest reducing agent?

A. HCl

B. HI

C. HBr

D. HF.

Answer: B

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109. Bleaching powder is obtained by the action of Cl_2 on :

A. $CaCl_2$

B. CaO

C. $CaCO_3$

D. $Ca(OH)_2$.

Answer: D

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110. Which of the following gives blue colour with starch solution?

A. F_2

B. Cl_2

C. Br_2

D. I_2.

Answer: D

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111. The most stable oxy acid of chlorine is :

A. $HClO_4$

B. $HClO_3$

C. $HClO_2$

D. $HClO$.

Answer: A

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112. Bromine is liberated when an aqueous solution of KBr is treated with :

A. I_2

B. HI

C. Cl_2

D. SO_2

Answer: C

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113. Iodine is soluble in water in the presence of :

A. KI

B. Cl_2

C. Br_2

D. $KBr.$

Answer: A

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114. Which of the following is an anhydride of $HClO_4$?

A. ClO_2

B. Cl_2O_6

C. Cl_2O_7

D. Cl_2.

Answer: C

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115. Ozone oxidises aqueous iodine to :

A. HI

B. HIO_3

C. I_2O_5

D. IF_5.

Answer: B

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116. Which of the following has largest bond dissociation energy?

A. HF

B. HCl

C. HI

D. $HBr.$

Answer: A

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117. Which of the following has highest melting point?

A. Cl_2

B. Br_2

C. I_2

D. F_2.

Answer: C

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118. Which of the following oxides of halogen has maximum oxidation state of halogen atom?

A. I_2O_5

B. I_2O_4

C. ClO_2

D. BrO_3.

Answer: D

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119. Which of the following is strongest acid?

A. Hypochlorous acid

B. Chlorous acid

C. Chloric acid

D. Perchloric acid.

Answer: D

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120. The chlorine atom in ClF_5 involves

A. sp^3 hybridisation

B. sp^3d hybridisation

C. sp^3d^2 hybridisation

D. sp^3d^3 hybridisation.

Answer: C

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121. Which of the following has maximum boiling point

A. HF

B. HCl

C. HBr

D. HI.

Answer: A

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122. In ClO_3^- ion, Cl atom undergoes :

A. sp^2 hybridisation

B. sp^3 hybridisation

C. sp^3d hybridisation

D. sp^3d^2 hybridisation.

Answer: B

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123. Which of the following is strongest oxidising agent?

A. F

B. Cl

C. Br

D. I.

Answer: A

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124. Which of the following is an anhydride of $HClO_4$?

A. Cl_2O

B. ClO_2

C. Cl_2O_7

D. Cl_2O_6

Answer: C

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125. The type of hybrid orbitals used by the chlorine atom in ClO_2^- ion is :

A. sp^3 hybridisation

B. sp^2

C. sp

D. None of these.

Answer: B

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126. The solubility of iodine in water may be increased by adding :

A. Potassium iodide

B. Chloroform

C. Carbon disulphide

D. Sodium thiosulphate.

Answer: C

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127. Which of the following halogens shows least number of oxidation states?

A. Fluorine

B. Chlorine

C. Iodine

D. Bromine.

Answer: A

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128. Halogens are volatile because :

A. they are all covalent molecules

B. they possess high boiling points

C. they are held together by weak van der Waals forces

D. they are stable at room temperature.

Answer: C

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129. Iodine can exist in the oxidation states :

A. $-1,\ +1,\ +3,\ +5$

B. $-1, +1, +3$

C. $+3, +5, +7$

D. $-1, +1, +3, +5, +7.$

Answer: A

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130. Which of the following has smallest bond bond angle?

A. OF_2

B. Cl_2O

C. OBr_2

D. H_2O

Answer: A

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131. Chlorine cannot be used :

A. as a bleaching agent.

B. in sterilisation

C. in preparation of antiseptic

D. for extraction of copper and silver.

Answer: D

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132. Strength of halogen acids, HF, HCl, HBr and HI varies as :

A. $HF > HCl > HBr > HI$

B. $HF > HBr > HIHCl$

C. $HBr > HI > HCl > HF$

D. $HI > HBr > HCl > HF.$

Answer: D

Watch Video Solution

133. Which one of the following is most basic ?

A. F^-

B. Cl^-

C. Br^-

D. I^-

Answer: A

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134. Cl_2O_7 dissolves in water to give :

A. $HClO_3$

B. $HClO_4$

C. $HClO + ClO_2$

D. $ClO_2 + ClO.$

Answer: B

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135. Which of the the order of acidic strength is not correct?

A. $HI > HBr > HCl$

B. $HCl < HClO < HClO_2 < HClO_3$

C. $HClO_2 < HClO_3 < HClO_4 < HClO.$

D.

Answer: B

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136. 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. $HF > H_2O > NH_3$

Answer: B

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137. Which noble gas has lowest boiling point?

A. He

B. Ne

C. Ar

D. $Kr.$

Answer: A

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138. Name the first noble gas compound prepared by Neil Bartlett?

A. XeF_2

B. XeO_3

C. $XePtF_6$

D. KrF_2.

Answer: C

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139. Which of the following forms maximum number of compounds?

A. Ne

B. Kr

C. Xe

D. $Rn.$

Answer: C

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140. XeF_2 molecule is :

A. Trigonal planar

B. Square planar

C. Linear

D. Pyramidal

Answer: C

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141. The shape of XeF_4 is

A. Square planar

B. Tetrahedral

C. Trigonal planar

D. Pyramidal.

Answer: A

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142. Most of the compounds formed by noble gases are with :

A. Fluorine

B. Oxygen

C. Fluorine and oxygen

D. Fluorine and chlorine.

Answer: C

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143. Noble gases are only sparingly soluble in water due to :

A. dipole - dipole interactions

B. induced dipole - induced dipole interaction

C. dipole - induced dipole interactions

D. hydrogen bonding.

Answer: A

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144. The noble gas compound iso - structure with bromate ion is :

A. XeO_3

B. XeF_4

C. XeF_2

D. $XeOF_2$.

Answer: A

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145. Among the following the square planar shape is for:

A. $XeOF_4$

B. XeF_4

C. XeF_2

D. XeO_3

Answer: B

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146. The shape of $XeOF_2$ is :

A. Pyramidal

B. T - shaped

C. Octahedral

D. Tetrahedral.

Answer: B

Watch Video Solution

147. Partial hydrolysis of XeF_6 with one molecule with water gives :

A. $XeOF_4$

B. XeO_3

C. XeO_2F_2

D. $XeOF_2$.

Answer: A

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148. Highly explosive xenon compound is :

A. XeF_6

B. XeO_3

C. $XeOF_2$

D. XeF_4

Answer: B

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Multiple Choice Questions Level Ii Comprehensive Qs

1. The main reason that $SiCl_4$ is easily hydrolysed as compared to CCl_4 is that

A. $Si - Si$ bond is weaker

B. $SiCl_4$ can form hydrogen bonds

C. Si can extend its coordination number beyond four.

D. $SiCl_4$ is ionic.

Answer: C

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2. Which of the following species does not exist ?

A. $[SnCl_6]^{2-}$

B. $[SiCl_6]^{2-}$

C. $[CCl_6]^{2-}$

D. $[GeCl_6]^{2-}$

Answer: C

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3. Which of the following statements about anhydrous aluminium chloride is correct?

A. It exists as $AlCl_3$ molecules in vapour.

B. It is not easily hydrolysed.

C. It sublimes at $100^\circ C$ under vaccum.

D. It is a strong Lewis base.

Answer: C

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4. Br^- can be converted to Br_2 by using

A. Cl_2

B. Conc. HCl

C. HBr

D. H_2S.

Answer: A

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5. Which of the following has a pyramidal structure?

A. ClO_2

B. ClO_2^-

C. ClO_3^-

D. ClO_4^-

Answer: A

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6. There is no $S-S$ bond in :

A. $S_2O_4^{2-}$

B. $S_2O_5^{2-}$

C. $S_2O_3^{2-}$

D. $S_2O_7^{2-}$.

Answer: C

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7. Which of the following is the strongest acid?

A. $ClO_2(OH)$

B. $ClO_3(OH)$

C. $SO(OH)_2$

D. $SO_2(OH)_2$.

Answer: D

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8. The stability of $+2$ oxidation state of lead in comparison to $+4$ can be explained on the basis of :

A. electronic configuration

B. resonance

C. inert pair effect

D. small size of Pb^{2+}.

Answer: A

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9. Which of the following properties does not correspond to the order?

$HI < HBr < HCl < HF$

A. Reducing power

B. Thermal stability

C. Dipole moment

D. Ionic character.

Answer: D

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10. The oxide which gives H_2O_2 with dil. HCl is :

A. PbO_2

B. Na_2O_2

C. MnO_2

D. SnO_2.

Answer: B

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11. Which of the following is strongest oxidising agent?

A. O_2

B. Cl_2

C. O_3

D. F_2.

Answer: A

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12. Fluorine does not show variable oxidation state due to :

A. small size of its atoms

B. low bond dissociation energy

C. non - availability of d - orbitals

D. its high electronegativity.

Answer: D

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13. Which of the following halides is not oxidised by MnO_2?

A. F^-

B. Cl^-

C. Br^-

D. I^-.

Answer: C

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14. Mark the wrong statement. Carbon differs from other elements due to :

A. its ability to form multiple bonds

B. its tendency to catenation

C. its ability to extend its octet.

D. its tendency to form ring compounds.

Answer: A

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15. Bismuth chloride on hydrolysis forms a white ppt of

:

A. Bismuth oxychloride

B. Bismuth hydroxide

C. Bismuth oxide

D. Bismuth.

Answer: A

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16. Which of the following does not contain peroxy linkage?

A. $H_2S_2O_8$

B. $HClO_4$

C. H_3PO_5

D. HNO_4.

Answer: B

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17. Hydrogen iodide cannot be prepared by the action of conc. H_2SO_4 on KI because :

A. HI is stronger than H_2SO_4

B. HI is more volatile than H_2SO_4

C. H_2SO_4 is an oxidising agent

D. H_2SO_4 forms complex.

Answer: C

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18. Which of the following is paramagnetic ?

A. O_2

B. He

C. N_2

D. NH_3.

Answer: A

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19. Which of the following chlorides is explosive?

A. PCl_3

B. $AsCl_3$.

C. $SbCl_3$

D. NCl_3.

Answer: D

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20. Which of the following is very strongly acidic oxide?

A. P_2O_5

B. Al_2O_3

C. Cl_2O_7

D. B_2O_3.

Answer: C

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21. The main factor of shorter $B - F$ bonds in BF_3 is :

A. ionic - covalent resonance in BF_3

B. large electronegativity of fluorine

C. $d\pi - p\pi$ back bonding

D. $p\pi - p\pi$ back bonding.

Answer: D

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22. Which of the following statements is true about trisilylamine (A) is comparison to trimethylamine (B)?

A. A is nonplanar while B is planar

B. A is stronger base than B

C. Both A and B have same structure

D. A involves $d\pi - p\pi$ bonds while B does not..

Answer: C

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23. N_2O_3 exists pure only in the solid state at low temperature. Above its melting point, it dissociates to :

A. NO and NO_2

B. N_2O_5 and O_2

C. N_2O and NO_2

D. N_2O and O_2.

Answer: A

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24. Pyrophosphoric acid on heating to $600^{\circ}C$ gives :

A. HPO_3

B. H_3PO_5.

C. H_3PO_3

D. $H_4P_2O_6$.

Answer: A

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25. Which of the following has $-O-O-$ linkage ?

A. $H_4P_2O_8$

B. $H_4P_2O_7$

C. H_2PO_4

D. $(HPO_3)_n$.

Answer: A

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26. The oxidation state of nitrogen in peroxynitric acid is :

A. $+3$

B. $+2$

C. $+7$

D. $+5$.

Answer: C

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27. Which of the following is a paramagnetic molecules?

A. ClO_2

B. OCl_2

C. Cl_2O_7

D. OF_2.

Answer: A

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28. Solid PCl_5 exists as :

A. PCl_5

B. PCl_6^-

C. $PCl_4^+ + PCl_6^-$

D. $PCl_3 + P.$

Answer: C

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29. When thisoulphate is oxidised by iodine, which of the following is produced ?

A. $S_4O_6^{2-}$

B. SO_6^{2-}

C. $S_2O_6^{2-}$

D. SO_3^-.

Answer: A

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30. Which one of the following chlorides will not fume in air?

A. $BiCl_3$

B. CCl_4

C. PCl_5

D. None of these.

Answer: B

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31. Iodine oxidises the $S_2O_3^{2-}$ ion to :

A. SO_3^{2-}

B. SO_2^{2-}

C. $S_4O_6^{2-}$

D. S^{2-}.

Answer: C

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32. Which of the following is the hardest compound of boron?

A. Boron oxide

B. Boron nitride

C. Boron carbide

D. Boron hydroxide.

Answer: C

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33. Nitrogen can be purified from the impurities of oxides of nitrogen and ammonia by passing through :

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34. Phosphine prepared by the action of caustic soda on white phophorus is highly inflammable because it

contains small amounts of :

A. hydrogen

B. vapour of white phosphorus

C. vapour of phosphorus trioxide

D. Phosphorus dihydride.

Answer: D

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35. A gas that cannot be collected over water is :

A. N_2

B. SO_2

C. O_2

D. PH_3.

Answer: B

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36. Aluminium (III) chloride forms a dimer because :

A. aluminium has high ionisation energy

B. it cannot form higher

C. higher coordination number can be achieved by aluminium

D. aluminium belongs to III group.

Answer: C

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37. Which element out of the following He, Ar, Kr and Xe forms least number of compounds ?

A. Ar

B. Kr

C. Xe

D. He.

Answer: D

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38. The acid which forms two series of salts is :

A. H_3PO_4

B. H_3PO_3

C. H_3BO_3

D. H_3PO_2.

Answer: B

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39. The partial hyddrolysis of XeF_4 at low temperature gives :

A. XeO_3

B. $XeOF_2$

C. $XeOF_4$

D. XeF_2.

Answer: B

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40. Which of the following is not used as a pigment in paints?

A. Lead dioxide

B. White lead

C. Lead chromate

D. Pb_3O_4.

Answer: C

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41. Hydrolysis of one mole of peroxodisulphuric acid produces :

A. two moles of sulphuric acid

B. two moles of peroxomonosulphuric aicd

C. one mole of sulphuric acid and one mole of peroxomonosulphuric acid

D. one mole of sulphuric acid, one mole of peroxomono sulphuric acid and one mole of hydrogen peroxide.

Answer: C

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42. Basicity of orthophosphoric acid is :

A. 2

B. 3

C. 4

D. 1

Answer: B

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43. White phosphorus (P_4) does not have :

A. six $P-P$ single bonds

B. four $P-P$ single bonds

C. four lone pairs of electrons

D. PPP angle of 60°.

Answer: B

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44. Which of the following is not correct order of the property mentioned?

A. Oxidising power : $BrO_4^- > IO_4^- > ClO_4^-$

B. Bond energy : $Cl_2 > Br_2 > F_2$

C. Thermal stability : $NH_3 > AsH_3 > PH_3$

D. Electron affinity : $Cl > F > Br$.

Answer: C

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45. PBr_5 in solid state exists as :

A. $[PBr_6]^-[PBr_4]^+$

B. $[PBr_4]^+[Br]^-$

C. $[PBr_6]^+[Br_4]^-$

D. $(PBr_5)_2$.

Answer: B

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46. XeF_4 reacts with water at $-80^\circ C$ to give :

A. $XeOF_2$

B. $XeOF_4$

C. XeO_3

D. XeO_2F_2.

Answer: A

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47. Which of the following set does not have oxidation state $+6$ for S?

A. Sulphuric acid, Peroxodisulphuric acid

B. Pyrosulphuric acid, Peromomonosulphuric acid

C. Peroxodisulphuric acid, Peroxomonosulphuric acid

D. Pyrosulphuric acid, Thisosulphuric acid.

Answer: D

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48. Which of the following has highest basicity?

A. Pyrophosphorous acid

B. Metaphosphoric acid

C. Hypophosphoric acid

D. Peroxomonophosphoric acid.

Answer: C

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49. Which of the following reaction does not produce phosphine?

A. $Ca_3P_2 + H_2O \rightarrow$

B. $AlP + HCl \rightarrow$

C. $PH_4I + NaOH \rightarrow$

D. $H_3PO_4 \xrightarrow{\text{Heat}}$

Answer: D

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50. The hybridisation of I in ICl_2^-, ICl_4^- are respectively:

A. sp^3, sp^3

B. sp^3d, sp^3d^2

C. sp^3d, sp^3

D. dsp^2, sp^3d^2

Answer: B

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51. ICl_3 conducts electricity because on electrolysis it ionises as :

A. $2ICl_3 \Leftrightarrow I^+ + ICl_5^-$

B. $ICl_3 \Leftrightarrow I^+ + 3Cl^-$

C. $2ICl_3 \Leftrightarrow ICl_2^+ + ICl_4^-$

D. $2ICl_3 \Leftrightarrow ICl_4^+ + ICl_2^-$

Answer: C

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52. Which of the following is not true?

A. Amog halides ions, iodide ion is the most powerful reducing agent.

B. Fluorine is the only halogen which does not show a variable oxidation state.

C. $HOCl$ is stronger acid than $HOBr$.

D. HF is a stornger acid than HCl.

Answer: D

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53. Which one of the following oxides is expected to exhibit paramagnetic behaviour?

A. CO_2

B. SiO_2

C. SO_2

D. ClO_2

Answer: D

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54. The distillation of HNO_3 with P_2O_5 gives :

A. N_2O

B. N_2O_3

C. N_2O_5

D. N_2O_4.

Answer: C

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55. H_2S combines with O_2F_2 to give:

A. SF_6, OF_2, HF

B. HF, O_2, SF_6

C. OF_2, SO_2, HF

D. HF, SO_2, SF_2

Answer: B

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56. Which one has highest percentage of nitrogen?

A. Urea

B. CAN

C. Ammonium nitrate

D. Calcium nitrate

Answer: A

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57. In Birkeland and Eyde process, the raw material used is :

A. air

B. NH_3

C. NO_2

D. HNO_3.

Answer: A

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58. $P-O-P$ bond is present in :

A. Metaphosphoric acid

B. Pyrophosphoric acid

C. Peroxomonophosphoric acid

D. Hypophosphoric acid.

Answer: B

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59. Fluorine is a constituent of each of the following except :

A. Teflon

B. Fluorocarbons

C. Chloroform

D. Freon.

Answer: C

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60. Which of the following reacts with glass ?

A. H_2SO_4

B. HF

C. $K_2Cr_2O_7$

D. HNO_3.

Answer: B

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61. The manufacture of fluorine is carried out by :

A. electrolysis of aqueous HF

B. heating anhydrous HF and MnO_3

C. electrolysis of anhydrous KF and MnO_2

D. electrolysis of anhydrous HF mixed with KHF_2

Answer: C

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62. An important method for fixing of atmospheric N_2 is :

A. Fische Tropsch process

B. Haber process

C. Frasch process

D. Solvay process.

Answer: B

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63. In which of the following molecules are all the bonds not equal ?

A. BF_3

B. AlF_3

C. NF_3

D. ClF_3.

Answer: D

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64. Which of the following is the most basic oxide?

A. Sb_2O_3

B. Bi_2O_3

C. SeO_2

D. Al_2O_3.

Answer: B

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65. Which of the following species has a linear shape ?

A. SO_2

B. NO_2^+

C. O_3

D. NO_2^- .

Answer: B

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66. Al_2O_3 can be converted to anhydrous $AlCl_3$ by heating :

A. Al_2O_3 with $NaCl$ in solid state

B. a mixture of Al_2O_3 and carbon in dry Cl_2 gas

C. Al_2O_3 with Cl_2 gas

D. Al_2O_3 with HCl gas.

Answer: B

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67. Which of the following is not isostructural with $SiCl_4^{4-}$?

A. SO_4^{2-}

B. PO_4^{3-}

C. NH_4^+

D. SCl_4.

Answer: D

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68. In which of the following pairs, the two species are iso - structural?

A. SO_3^{2-} and NO_3^-

B. BF_3 and NF_3

C. BrO_3^- and XeO_3

D. SF_4 and XeF_4.

Answer: C

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69. Which one of the following anions is present in the chain structure of silicates?

A. $\left(Si_2O_5^{2-}\right)_n$

B. $\left(SiO_3^{2-}\right)_n$

C. SiO_4^{4-}

D. $Si_2O_7^{6-}$.

Answer: B

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70. Atoms in a P_4 molecule of white phosphorous are arranged regularly in the following way:

A. At the corners of the cube

B. At the corners of an octahedron

C. At the corners of a tertrahedron

D. At the centre and corners of a tetrahedron.

Answer: C

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71. Which is not the correct order of the stated property?

A. $Ba > Sr > Mg$: Atomic radius

B. $F > O > N$: First ionisation energy

C. $Cl > F > I$: Negative electron gain enthalpy

D. $O > Se > Te$: Electronegativity.

Answer: B

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72. 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.

Answer: D

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73. Affinity for hydrogen decreases in the group from fluorine to iodine. Which of the halogen acids should have highest bond dissociation enthalpy?

A. HF

B. HCl

C. HBr

D. HI

Answer: A

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74. The oxidation state of central atom in the anion of compound NaH_2PO_2 will be _____.

A. $+3$

B. $+5$

C. $+1$

D. -3

Answer: C

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75. On addition of conc. H_2SO_4 to a chloride salt, colourless fumes are evolved but in case of iodide salt, fumes come out. This is because

A. H_2SO_4 reduces HI to I_2

B. HI is of violet colour

C. HI gets oxidised to I_2

D. HI changes to HIO_3

Answer: C

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76. Elements of group - 15 form compounds in $+5$ oxidation state. However, bismuth forms only one well characterised compound in $+5$ oxidation state. The compound is

A. Bi_2O_5

B. BiF_5

C. $BiCl_5$

D. Bi_2S_5

Answer: B

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77. On heating ammonium dichromate and barium azide separately we get

A. N_2 in both cases

B. N_2 with ammonium dichromate and NO with barium azide

C. N_2O with ammonium dichromate and N_2 with barium azide

D. N_2O with ammonium dichromate and NO_2 with barium azide

Answer: A

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78. In the preparation of compounds of Xe, Bartlett had taken $O_2^+ PtF_6^-$ as a base compound. This is because

A. both O_2 and Xe have same size.

B. both O_2 and Xe have same electron gain enthalpy.

C. both O_2 and Xe have almost same ionisation enthalpy.

D. both Xe and O_2 are gases.

Answer: C

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79. Which of the following are peroxoacids of sulphur?

A. H_2SO_5 and $H_2S_2O_8$

B. H_2SO_5 and $H_2S_2O_7$

C. $H_2S_2O_7$ and $H_2S_2O_8$

D. $H_2S_2O_6$ and $H_2S_2O_7$

Answer: A

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80. In solid state PCl_5 is a _____.

A. covalent solid

B. octahedral structure

C. ionic solid with $[PCl_6]^+$ octahedral and $[PCl_4]^-$ tetrahedral

D. ionic solid with $[PCl_4]^+$ tetrahedral and $[PCl_6]^-$ octahedral

Answer: D

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81. Which of the following is isoelectronic pair?

A. ICl_2, ClO_2

B. BrO_2^-, BrF_2^+

C. ClO_2, BrF

D. CN^-, O_3

Answer: B

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82. Dehydration of formic acid with sulphuric acid gives

A. CO

B. C

C. CO and CO_2

D. $C_2H_4O_4$

Answer: A

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83. Nitric acid (conc.) oxidises phosphorus to

A. H_3PO_4

B. P_2O_5

C. H_3PO_3

D. $H_4P_2O_7$.

Answer: A

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84. Pure nitrogen gas is obtained from

A. $NH_3 + NaNO_2$

B. $NH_4Cl + NaNO_2$

C. $N_2O + Cu$

D. $(NH_4)_2Cr_2O_7.$

Answer: B

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85. Calcium phosphide gets hydrolysed and give

A. $Ca_3(PO_4)_2$

B. PH_3

C. H_3PO_4

D. $(HPO_3)_n$.

Answer: B

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86. Ozone gives brown colour with

A. benzidine paper

B. lead acetate paper

C. starch iodide paper

D. tetramethyl base.

Answer: A

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87. The number of $S-S$ bonds in sulphur trioxide trimer (S_3O_9) is

A. three

B. two

C. one

D. zero.

Answer: D

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88. For H_3PO_3 and H_3PO_4 the correct choice is

A. H_3PO_3 is dibasic and reducing agent

B. H_3PO_3 is dibasic and non - reducing

C. H_3PO_4 is tribasic and reducing

D. H_3PO_4 is tribasic and non - reducing.

Answer: A

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89. Which of the following species has a linear shape ?

A. SO_2

B. NO_2^+

C. O_3

D. NO_3^-

Answer: B

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90. Among the following the pair in which the two species are not iso - structural is

A. IO_3^- and XeO_3

B. PF_6^- and SF_6

C. BH_4^- and NH_4^+

D. SiF_4 and SF_4

Answer: D

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91. The correct order of acidic nature of oxides is in the order

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. $N_2O_5 < N_2O_3 < NO_2 < NO < N_2O$

Answer: B

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92. $Na_2S_2O_3$ is oxidised by I_2 to

A. Na_2S

B. Na_2SO_4

C. $NaHSO_3$

D. $Na_2S_4O_6$

Answer: D

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93. Which one statement about sulphur dioxide gas is incorrect?

A. It has an angular shape.

B. It decolourises acidified potassium permanganate solution.

C. Two $S - O$ bonds are equal.

D. It is a dehydrating agent.

Answer: D

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94. The correct order of increasing bond angles in the following species is :

A. $Cl_2O < ClO_2^- < ClO_2$

B. $ClO_2^- < Cl_2IO < ClO_2$

C. $Cl_2O < ClO_2 < ClO_2^-$

D. $ClO_2 < Ckl_2O < ClO_2^-$

Answer: B

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95. The paramagnetic oxides of nitrogen are

A. dinitrogen monoxide and nitrogen monoxide

B. nitrogen monoxide and nitrogen dioxide.

C. nitrogen dioxide and dinitrogen trioxide.

D. dinitrogen trioxide and dinitrogen tetraoxide.

Answer: B

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96. The least stable hydride of 15th group elements is

A. NH_3

B. PH_3

C. AsH_3

D. BiH_3

Answer: D

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97. When Br_2 is treated with aqueous solutions of $NaF, NaCl$ and NaI separately

A. F_2, Cl_2 and I_2 are liberated

B. only F_2 and Cl_2 are liberatede

C. only I_2 is liberated

D. only Cl_2 is liberated

Answer: C

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98. Which of the following statements is not valid for oxoacids of phosphorus?

A. Orthophosphoric acid is used in the manufacture of triple superphosphate.

B. Hypophosphorous acid is a diprotic acid.

C. All oxoacids contain tetrahedral four coordinated phosphorus.

D. All oxoacids contain atleast one $P = O$ unit and one $P - OH$ group.

Answer: B

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99. When Cl_2 reacts with hot and concentrated soldium, the oxidation number of chlorine changes from

A. zero to $+1$ and zero to -5

B. zero to -1 and zero to $+5$

C. zero to -1 and zero to $+3$

D. zero to $+1$ and zero to -3.

Answer: B

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100. Excess of PCl_5 reacts with conc. H_2SO_4 giving

A. Chlorosulphuric acid

B. Sulphurous acid

C. Sulphurous chloride

D. sulfuryl chloride

Answer: C

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101. The oxoacid of sulphur that contains a lone pair of electrons on sulphur is

A. Sulphurous acid

B. sulphuric acid

C. peroxodisulphuric acid,

D. Pyrosulphuric acid

Answer: A

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102. The correct order of acidic stength is :

A. $Cl_2O_7 > SO_3 > P_4O_{10}$

B. $CO_2 > N_2O_5 > SO_3$

C. $Na_2O > MgO > Al_2O_3$

D. $K_2O > CaO > MgO$

Answer: A

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103. The number of σ - bonds in P_4O_{10} is :

A. 6

B. 16

C. 20

D. 7

Answer: B

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104. H_3BO_3 is :

A. Monobasic and weak Lewis acid.

B. Monobasic and weak Bronsted acid.

C. Monobasic and strong Lewis acid.

D. Tribasic and weak Bronsted acid.

Answer: A

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105. Among Al_2O_3, SiO_2, P_2O_3 and SO_2, the correct order of acid strength is :

A. $Al_2O_3 < SiO_2 < SOI_2 < P_2O_3$

B. $SiO_2 < SO_2 < Al_2O_3 < P_2O_3$

C. $SO_2 < P_2O_3 < SiO_2Al_2O_3$

D. $Al_2O_3 < SiO_2 < P_2O_3 < SO_2.$

Answer: D

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106. The correct order of bond angle (smallest first) in H_2S, NH_3, BF_3 and SiH_4 is :

A. $H_2S < NH_3 < SiH_4 < BF_3$

B. $NH_3 < H_2S < SiH_4 < BF_3$

C. $H_2S < SiH_4 < NH_3 < BF_3$

D. $H_2S < NH_3 < BF_3 < SiH_4$.

Answer: A

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107. Which one of the following has the regular tetrahedral structure ?

A. BF_4^-

B. SF_4

C. XeF_4

D. $\left[Ni(CN)_4\right]^{2-}$

Answer: A

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108. The number of hydrogen atoms attached to phsophorus atom in hypophosphorus acid is :

A. zero

B. two

C. one

D. three.

Answer: C

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109. 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. $HI > HCl > HF > HBr.$

Answer: B

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110. In silicon dioxide:

A. each silicon atom is surrounded by four oxygen atoms and each oxygen atom is bonded 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.

Answer: A

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111. The structure of dibroane (B_2H_6) contains :

A. four $2c - 2e$ bonds and two $3c - 2e$ bonds.

B. two $2c - 2e$ bonds and four $3c - 2e$ bonds.

C. two $2c - 2e$ bonds and two $3c - 2e$ bonds.

D. four $2c - 2e$ bonds and four $3c - 2e$ bonds.

Answer: A

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112. Which reaction indicates the oxidising behaviour of H_2SO_4

A. $Ca(OH)_2 + H_2SO_4 \rightarrow CaSO_4 + 2H_2O$

B. $NaCl + H_2SO_4 \rightarrow NaHSO_4 + HCl$

C.

$$2PCl_5 + H_2SO_4 \rightarrow 2POCl_3 + 2HCl + SO_2Cl_2$$

D. $2HI + H_2SO_4 \rightarrow I_2 + \circ O_2 + 2H_2O.$

Answer: D

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113. A metal M forms chlorides in its $+2$ and $+4$ oxidation states. Which of the following statements about these chlorides is correct?

A. MCl_2 is more soluble is anhydrous ethanol than MCl_4

B. MCl_2 is more ionic than MCl_4

C. MCl_2 is more easily hydrolysed than MCl_4.

D. MCl_2 is more volatile than MCl_4.

Answer: B

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114. 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.

Answer: C

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115. In which of the following molecules / ions are all the bonds not equal ?

A. SiF_4

B. XeF_4

C. BF_4^-

D. SF_4.

Answer: D

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116. The decreasing order of bond angles from NH_3 (106°) to $SbH_3(101^\circ)$ down group 15 of the periodic table is due to:

A. increasing bp - lp repulsion.

B. increasing p character in sp^3

C. decreasing lp - bp replusion.

D. decreasing electronagetivity.

Answer: C

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117. A colourless aqueous solution on adding water and on heating gave a white precipitate. The precipitate when reacted with NH_4Cl and NH_4OH in excess resulted in dissolution of some of the precipitate and a gelatinous precipitate is obtained. What is the hydroxide formed in aqueous solution?

A. $Zn(OH)_2$

B. $Mg(OH)_2$

C. $Al(OH)_3$

D. $Ca(OH)_2$.

Answer: C

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118. $Ba(OH)_3 + NaOH \Leftrightarrow Na\left[B(OH)_4\right]$:

To keep the above reaction on forward direction, which reagent should be used?

A. cis -1, 2 - diol

B. trans -1, 2 - diol

C. Borax

D. Na_2HPO_4.

Answer: A

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119. When CO_2 is passed through water, which of the following species will be present in water?

A. $H_2CO_3, CO_2, CO_3^{2-}, HCO_3^-$

B. HCO_3^-, CO_3^{2-}

C. CO_3^-, CO_2

D. H_2CO_3, CO_2

Answer: A

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120. The percentage of p - character in the orbitals forming $P-P$ bonds in P_4 is :

A. 25

B. 33

C. 50

D. 75

Answer: D

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121. Identify the incorrect statement among the following :

A. Silicon reacts with $NaOH(aq)$ in the presence of air to give Na_2SiO_3 and H_2O

B. Cl_2 reacts with excess of NH_3 to give N_2 and HCl

C. Br_2 reacts with hot and strong $NaOH$ solution to give $NaBr$, $NaBrO_4$ and H_2O

D. Ozone reacts with SO_2 to give SO_3.

Answer: C

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122. Regular use of which of the following fertilizers increases the acidity of soil?

A. Urea

B. Superphosphate of lime

C. Ammonium sulphate

D. Potassium nitrate.

Answer: C

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123. The stability of dihalides of Si, Ge, Sn and Pb increases steadily in the sequence :

A. $SiX_2 < < GeX_2 < < PbX_2 < < SnX_2$

B. $SiX_2 < < GeX_2 < < SnX_2 < < PbX_2$

C. $PbX_2 < < SnX_2 < < GeX_2 < < SiX_2$

D. $GeX_2 < < SiX_2 < < SnX_2 < < PbX_2.$

Answer: B

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Multiple Choice Questions Level Iii Question From Aieee Jee Examinations

1. In which of the following arrangements, the sequence is not strictly according to the property written against it?

A. $CO_2 < SiO_2 < SnO_2 < PbO_2$: Increasing oxidising power

B. $HF < HCl < HBr < HI$: Increasing acid strength

C. $NH_3 < PH_3 < AsH_3 < SbH_3$: Increasing basic strength

D. $B < C < O < N$: Increasing first ionisation enthalpy.

Answer: C

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2. Which of the following reaction of xenon compounds is not feasible ?

A. $XeO_3 + 6HF \rightarrow XeF_6 + 3H_2O$

B.

$$3XeF_4 + 6H_2O \rightarrow 2Xe + XeO_3 + 12HF + 1.5O_2$$

C. $2XeF_2 + 2H_2O \rightarrow 2Xe + 4HF + O_2$

D. $XeF_6 + RbF \rightarrow Rb[XeF_7].$

Answer: A

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3. Three reactions involving $H_2PO_4^-$ are given below :

(i) $H_3PO_4 + H_2O \rightarrow H_3O^+ + H_2PO_4^-$

(ii) $H_2PO_4^- + H_2O \rightarrow HPO_4^{2-} + H_3O^+$

(iii) $H_2PO_4^- + OH^- \rightarrow H_3PO_4 + O^{2-}$

In which of the above does $H_2PO_4^-$ act as an acid?

A. (iii) only

B. (i) only

C. (ii) only

D. (i) and(ii).

Answer: C

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4. Boron cannot form which one of the following anions?

A. $B(OH)_4^-$

B. BO_2^-

C. BF_6^{3-}

D. BH_4^-

Answer: C

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5. Which of the following statements regarding sulphur is incorrect?

A. At $600^\circ C$ the gas mainly consists of S_2 molecules.

B. The oxidation state of sulphur is never less than $+4$ in its compounds.

C. S_2 molecule is paramagnetic.

D. The vapour at $200^\circ C$ consists mostly of S_8 rings.

Answer: B

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6. Which of the following statement is wrong?

A. Single $N-N$ bond is weaker than the single $P-P$ bond.

B. N_2O_4 has two resonance structures.

C. The stability of hydrides increases from NH_3 to BiH_3 in group 15 of the periodic table.

D. Nitrogen cannot form $d\pi - p\pi$ bond.

Answer: C

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7. Identify the incorrect statement form the following :

A. Ozone absorbs the intense ultraviolet radiation of the sun.

B. Depletion of ozone layer is because of its chemical reactions with chlorofluoro alkanes.

C. Ozone absorbs infrared radiation.

D. Oxides of nitrogen in the atmosphere can cause the depletion of ozone layer.

Answer: C

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8. The molecule having smallest bond angle is :

A. PCl_3

B. NCl_3

C. $AsCl_3$

D. $SbCl_3$.

Answer: D

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9. Which of the following is a wrong statement ?

A. $ONCl$ and PNO^- are not isoelectronic.

B. O_3 molecule is linear.

C. Ozone is violet - black in solid state.

D. Ozone is diamagnetic gas.

Answer: B

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10. Which of the following gives the correct increasing order of acidic strength ?

A. $HOCl > HClO_2 > HClO_3 > HClO_4$

B. $HClO_4 > HOCl > HClO_2 > HClO_3$

C. $HClO_4 > HClO_3 > HClO_2 > HClO$

D. $HClO_2 > HClO_4 > HClO_3 > HClO$

Answer: C

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11. Which one of the following properties is not shown by NO?

A. It is diamangetic in gaseous state.

B. It is a neutral oxide.

C. It combines with oxygen to form nitrogen dioxide.

D. Its bond order is 2.5.

Answer: A

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12. Which among the following is the most reactive?

A. Cl_2

B. Br_2

C. I_2

D. ICl

Answer: D

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13. Match the catalysts to the correct processes :

Catalyst	Process
$(A) TiCl_3$	(i) Wacker process
$(B) PdCl_2$	(ii) Ziegler - Natta polymerization
$(C) CuCl_2$	(iii) Contact process
$(D) V_2O_5$	(iv) Deacon's process

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14. Which has the highest boiling point ?

A. He

B. Ne

C. Kr

D. Xe

Answer: D

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1. 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.

Answer: D

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2. Argon is used

A. To obtain low temperature

B. In high temperature welding

C. In radio therapy for treatment of cancer

D. In filling airships

Answer: B

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3. Molecules of a noble gas do not possess vibrational energy because a noble gas

A. is monoatomic

B. is chemically inert

C. has completely filled shells

D. is diamagnetic.

Answer: A

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4. When formic acid is heated with concentrated H_2SO_4, the gas evolved is

A. only $'CO_2'$

B. only $'CO'$

C. a mixture of $'CO'$ and $'CO_2'$

D. a mixture of $'SO_2'$ and $'CO_2'$

Answer: B

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5. Excess of PCl_5 reacts with conc. H_2SO_4 giving

A. Chlorosulphuric acid

B. sulphurous acid

C. sulphuryl chloride

D. thionlyl chloride.

Answer: C

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6. The statement that is not correct is

A. Hypophosphorous acid reduces silver nitrate to silver

B. In solid state, PCl_5 exists as $\left[PCl_4^+\right]\left[PCl_6^-\right]$

C. Pure phosphine is non - inflammable

D. Phosphorous acid on heating disproportionates to give metaphosphoric acid and phosphine.

Answer: D

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7. $MnO_2 + HCl \xrightarrow{\Delta} A_{(s)}$

$A_{(g)} + F_{2(\text{excess})} \xrightarrow{573K} B_{(s)}$

$B_{(l)} + U_{(s)} \rightarrow C_{(g)} + D_{(g)}$

The gases A,B,C and D are respectively

A. Cl_2, ClF, UF_6, ClF_3

B. Cl_2, ClF_3, UF_6, ClF

C. $O_2, OF_2, U_2O_3, O_2F_2$

D. $O_2, O_2F_2, U_2O_3, OF_2.$

Answer: B

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8. For the properties mentioned, the correct trend for the different species is in

A. strength as Lewis acid

$-BCl_3 > AlCl_3 > GaCl_3$

B. inert pair effect $-Al > Ga > In$

C. oxidising property $-Al^{3+} > In^{3+} > Tl^{3+}$

D. first ionization enthalpy $-B > Al > Tl$

Answer: A

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9. On heating with concentration NaOH solution in an inert atmosphere of CO_2, white phosphorous gives a gas. Which of the following statement is incorrect about the gas ?

A. It is highly poisonous and has smell like rotten fish.

B. It is less basic than NH_3.

C. Its solution in water decomposes in the presence of light.

D. It is more basic than NH_3.

Answer: D

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10. The correct statement is

A. There is maximum $p\pi - p\pi$ back bonding in BF_3

.

B. BF_3 is the strongest Lewis acid among the other boron halides.

C. There is minimum $p\pi - p\pi$ back bonding in BF_3.

D. BI_3 is the weakest Lewis acid among the boron halides.

Answer: A

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11. The aqueous solution of following salt will have the lowest pH :

A. $NaClO_2$

B. $NaClO_3$

C. $NaClO_4$

D. $NaClO$.

Answer: C

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12. Which of the following compound of Xenon has pyramidal geometry ?

A. XeO_3

B. $XeOF_4$

C. XeF_4

D. XeF_2.

Answer: A

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13. Choose the correct statement applicable for the reaction : $2H_2O + 2F_2 \rightarrow 4HF + O_2$

A. Water is oxidized to O_2

B. F_2 is oxidized to HF

C. Water is reduced to HF

D. F_2 acts as reducing agent in the reaction.

Answer: A

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14. Which of the following reactions DOES NOT produce PH_3:

A. White phosphorus with water

B. White phosphorus with conc. $NaOH$

C. Metal phosphide with dil. HCl

D. Metal phosphides with water.

Answer: A

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15. The decreasing order of stability of oxides of halogens is :

A. $\text{Fluorine} > \text{Chlorine} > \text{Iodine} > \text{Bromine}$

B. $\text{Fluorine} > \text{Chlorine} > \text{Bromine} > \text{Iodine}$

C. $\text{Iodine} > \text{Bromine} > \text{Chlorine} > \text{Fluorine}$

D. $\text{Iodine} > \text{Chlorine} > \text{Bromine} > \text{Fluorine}.$

Answer: D

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16. N_2 DOES NOT show property of catenation because :

A. it has no 'd' orbitals in the valence shell

B. inter electronic repulsion between non bonding electrons is greater

C. $N \equiv N$ has high bond enthalpy

D. Nitrogen has very high ionization enthalpy.

Answer: B

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17. Zeolites are shape selective catalysts because of :

A. high adsorption capacity

B. three dimensional network of atoms

C. presence of aluminosilicates

D. honey comb like structure.

Answer: D

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18. Hybridized state of bromine in bromine penta fluoride is :

A. sp^3d

B. d^2sp^3

C. dsp^3

D. sp^3d^2.

Answer: B

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19. An element belonging to chalcogen group is :

A. Carbon

B. Phosphorus

C. Chlorine

D. Sulphur.

Answer: D

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20. Carbon monoxide forms volatile compound with :

A. Ni

B. Cu

C. Al

D. Si.

Answer: A

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