12. The p-Block Elements (Boron and Carbon Family) – Multiple Choice Questions

1. Boron Family

1. In IIIA group, *Tl* (thallium) shows +1 oxidation state while other members show +3 oxidation state. Why

(a) Presence of lone pair of electron in *Tl*

(b) Inert pair effect

(c) Large ionic radius of *Tl* ion

(d) None of these

2. The exhibition of highest coordination number depends on the availability of vacant orbitals in the central atom. Which of the following elements is not likely to act as central atom in MF_6^{3-}

(a) *B* (b) *Al*

(c) *Ga* (d)

3. *In* Which of the following is non-existent

(a) AlF_6^{3-} (b) CoF_6^{3-}

(c) BF_6^{3-} (d) SiF_6^{2-}

4. The element which exists in liquid state for a wide range of temperature and can be used for measuring high temperature is

(a) *B* (b) *Al*

(c) *Ga* (d) *In*

5. Ionisation enthalpy ($\Delta_i H$ $kJ\,mol^{-1}$) for the elements of group 13 follows the order

(a) $B > Al > Ga > In > Tl$ (b) $B < Al < Ga < In < Tl$

(c) $B < Al > Ga < In > Tl$ (d) $B > Al < Ga > In < Tl$

6. The most acidic of the following compounds is

(a) P_2O_3 (b) Sb_2O_3

(c) B_2O_3 (d) As_2O_3

7. Which of the following does not exist in free form

(a) BF_3 (b) BCl_3

(c) BBr_3 (d) BH_3

(e) None of these

8. The product/s formed when diborane is hydrolysed is/are

(a) B_2O_3 and H_3BO_3 (b) B_2O_3 only

(c) H_3BO_3 and H_2 (d) H_3BO_3 only

(e) B_2O_3 and H_2

9. In which of the following molecules is hydrogen bridge bond present

(a) Water (b) Inorganic benzene

(c) Diborane (d) Methanol

10. The geometry of a complex species can be understood from the knowledge of type of hybridisation of orbitals of central atom. The hybridisation of orbitals of central atom in $[B(OH_4)]^-$ and the geometry of the complex are respectively

(a) sp^3, tetrahedral (b) sp^3, square planar

(c) Sp^3d^2, octahedral (d) dsp^2, square planar

11. Identify the statement that is not correct as far as structure of diborane is concerned

(a) There are two bridging hydrogen atoms in diborane

(b) Each boron atom forms four bonds in diborane

(c) The hydrogen atoms are not in the same plane in diborane

(d) All *B* - *H* bonds in diborane are similar

12. The hardest substance amongst the following is

(a) Be_2C (b) Graphite

(c) Titanium (d) *SiC*

(e) B_4C

13. An aqueous solution of borax is

(a) Neutral (b) Acidic

(c) Basic (d) Amphoteric

14. Boric acid is an acid because its molecule

(a) Contains replaceable H^+ ion

(b) Gives up a proton

(c) Accepts OH^- from water releasing proton

(d) Combines with proton from water molecule

15. A compound *X*, of boron reacts with NH_3 on heating to give another compound *Y* which is called inorganic benzene. The compound *X* can be prepared by treating BF_3 with lithium aluminium hydride. The compounds *X* and *Y* are represented by the formulas

(a) B_2H_6, $B_3N_3H_6$ (b) B_2O_3, $B_3N_3H_6$

(c) BF_3, $B_3N_3H_6$ (d) $B_3N_3H_6$, B_2H_6

16. The number of isomers possible for disubstituted borazine, $B_3N_3H_4X_2$ is

(a) 3 (b) 4

(c) 6 (d) 2

(e) 5

17. In the structure of diborane,

(a) All hydrogen atoms lie in one plane and boron atoms lie in a plane perpendicular to this plane

(b) 2 boron atoms and 4 terminal hydrogen atoms lie in the same plane and 2 bridging hydrogen atoms lie in the perpendicular plane

(c) 4 bridging hydrogen atoms and boron atoms lie in one plane and two terminal hydrogen atoms lie in a plane perpendicular to this plane

(d) All the atoms are in the same plane

18. Aluminium hydroxide is soluble in excess of sodium hydroxide forming the ion

(a) AlO_2^{+3} (b) AlO_2^{-3}

(c) AlO_2^- (d) AlO_3^-

19. Bauxite has the composition

(a) Al_2O_3 (b) $Al_2O_3 \cdot H_2O$

(c) $Al_2O_3 \cdot 2H_2O$ (d) None of these

20. Aluminium is more reactive than iron. But aluminium is less easily corroded than iron because

(a) Aluminium is a noble metal

(b) Oxygen forms a protective oxide layer

(c) Iron undergoes reaction easily with water

(d) Iron forms mono and divalent ions

21. Aluminium vessels should not be washed with materials containing washing soda since

(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

22. Common alum is

(a) $K_2SO_4.Al_2(SO_4)_3.24H_2O$

(b) $K_2SO_4.Cr_2(SO_4)_3.24H_2O$

(c) $K_2SO_4.Fe_2(SO_4)_3.24H_2O$

(d) $(NH_4)_2SO_4.FeSO_4.6H_2O$

23. Which of the following is not true about potash alum

(a) Its empirical formula is $KAl(SO_4)_2.12H_2O$

(b) Its aqueous solution is basic

(c) It is used in dyeing industries

(d) On heating it melts in its water of crystallization

24. $AlCl_3$ is

(a) Anhydrous and covalent (b) Anhydrous and ionic

(c) Covalent and basic (d) Coordinate and acidic

25. Aluminium is not used

(a) In silvery paints (b) For making utensils

(c) As a reducing agent (d) As oxidizer in metallurgy

26. Which of the processes is used in thermite welding

(a) $TiO_2 + 4Na \rightarrow Ti + 2Na_2O$

(b) $2Al + Fe_2O_3 \rightarrow Al_2O_3 + 2Fe$

(c) $SnO_2 + 2C \rightarrow Sn + 2CO$

(d) $Cr_2O_3 + 2Al \rightarrow Al_2O_3 + 2Cr$

27. Anhydrous $AlCl_3$ cannot be obtained from which of the following reactions

(a) Heating $AlCl_3.6H_2O$

(b) By passing dry HCl over hot aluminium powder

(c) By passing dry Cl_2 over hot aluminium powder

(d) By passing dry Cl_2 over a hot mixture of alumina and coke

28. In Goldschmidt aluminothermic process, thermite contains

(a) 3 parts of Al_2O_3 and 4 parts of Al

(b) 3 parts of Fe_2O_3 and 2 parts of Al

(c) 3 parts of Fe_2O_3 and 1 part of Al

(d) 1 part of Fe_2O_3 and 1 part of Al

29. Aluminium reacts with $NaOH$ and forms compound 'X'. If the coordination number of aluminium in 'X' is 6, the correct formula of X is

(a) $[Al(H_2O)_4(OH)_2]^+$ (b) $[Al(H_2O)_3(OH)_3]$

(c) $[Al(H_2O)_2(OH)_4]^-$ (d) $[Al(H_2O)_6(OH)_3]$

30. Ga is below Al in the periodic table, but atomic radius of Ga is less than Al. It is because of

(a) Lanthanoid contraction

(b) Greater screening effect

(c) Inert pair effect

(d) None of these

31. Hydrated $AlCl_3$ is used as

(a) Catalyst in cracking of petroleum

(b) Catalyst in Friedel Craft reaction

(c) Mordant

(d) All of these

32. Which of the following is arranged in order of increasing density

(a) $Al < Mg < C_{(graphite)} < B$ (b) $B < Al < Mg < C_{(graphite)}$

(c) $C_{(graphite)} < Al < B < Mg$ (d) $Mg < C_{(graphite)} < B < Al$

33. When a mixture of diborane and ammonia is heated, the final product is

(a) BH_3 (b) NH_4BH_4

(c) NH_2NH_2 (d) $B_3N_3H_6$

34. All the product formed in the oxidation of $NaBH_4$ by I_2, are

(a) B_2H_6 and NaI (b) B_2H_6, H_2 and NaI

(c) BI_3 and NaH (d) $NaBI_4$ and HI

35. Al_2O_3 reacts with

(a) Only water (b) Only acids

(c) Only alkalis (d) Both acids and alkalis

36. The element that combines with oxygen to give an amphoteric oxide is

(a) N (b) P

(c) Al (d) Na

37. The Lewis acid strength of BBr_3, BCl_3 and BF_3 is in the order

(a) $BBr_3 < BCl_3 < BF_3$ (b) $BCl_3 < BF_3 < BBr_3$

(c) $BF_3 < BCl_3 < BBr_3$ (d) $BBr_3 < BF_3 < BCl_3$

38. The molecule which is not hydrolysed by water at $25°C$ is

(a) $AlCl_3$ (b) $SiCl_4$

(c) BF_3 (d) SF_6

39. Hydrolysis of BCl_3 gives X which on treatment with sodium carbonate produces $Y.X$ and Y, respectively, are

(a) H_3BO_3 and $NaBO_2$ (b) H_3BO_3 and $Na_2B_4O_7$

(c) B_2O_3 and $NaBO_2$ (d) B_2O_3 and $Na_2B_4O_7$

40. In the structure of borax, the numbers of boron atoms and $B-O-B$ units, respectively, are

(a) 4 and 5 (b) 4 and 3

(c) 5 and 4 (d) 5 and 3

2. Carbon Family

1. The ionic carbide is

(a) ZnC (b) TiC

(c) SiC (d) CaC_2

2. Formation of innumerable compounds of carbon is due to its

(a) High reactivity

(b) Catenation tendency

(c) Covalent and ionic tendency

(d) Different valency

3. Solid CO_2 is known as dry ice, because

(a) It melts at $0°C$

(b) It evaporates at $40°C$

(c) It evaporates at $-78°C$ without melting

(d) Its boiling point is more than 199°C

4. The element that does not show catenation among the following p – block elements is

(a) Carbon (b) Silicon

(c) Germanium (d) Lead

(e) Tin

5. Element showing the phenomenon of allotropy is

(a) Aluminium (b) Tin

(c) Lead (d) Copper

6. Which gas is liberated when Al_4C_3 is hydrolysed

(a) CH_4 (b) C_2H_2

(c) C_2H_6 (d) CO_2

7. Which of the following is the most stable

(a) Pb^{2+} (b) Ge^{2+}

(c) Si^{2+} (d) Sn^{2+}

8. Which species does not exist

(a) $(SiCl_6)^{2-}$ (b) $(CCl_6)^{2-}$

(c) $(GeCl_6)^{2-}$ (d) $(SnCl_6)^{2-}$

9. Catenation *i.e.*, linking of similar atoms depends on size and electronic configuration of atoms. The tendency of catenation in group 14 elements follows the order

(a) $C > Si > Ge > Sn$ (b) $C >> Si > Ge \approx Sn$

(c) $Si > C > Sn > Ge$ (d) $Ge > Sn > Si > C$

10. Suppose you have to determine the percentage of carbon dioxide in a sample of a gas available in a container. Which is the best absorbing material for the carbon dioxide

(a) Heated copper oxide

(b) Cold, solid calcium chloride

(c) Cold, solid calcium hydroxide

(d) Heated charcoal

11. Nitrogen gas is absorbed by

(a) Calcium hydroxide (b) Ferrous sulphate

(c) Calcium carbide (d) Aluminium carbide

12. Sodium oxalate on heating with conc. H_2SO_4 gives

(a) CO only (b) CO_2 only

(c) CO and CO_2 (d) SO_2 and SO_3

13. Noble gases are absorbed on

(a) Anhydrous $CaCl_2$ (b) Charcoal

(c) Conc. H_2SO_4 (d) Coconut

14. Carbogen is a mixture of

(a) $CO_2 + N_2$ (b) $CO + O_2$

(c) $CO_2 + O_2$ (d) $C + H_2 + N_2$

15. Diamond is harder than graphite because

(a) Graphite is planar

(b) Diamond has free electron

(c) Graphite is sp^3 hybridised

(d) None of these

16. The most commonly used reducing agent is

(a) $AlCl_3$ (b) $PbCl_2$

(c) $SnCl_4$ (d) $SnCl_2$

17. In laboratory silicon can be prepared by the reaction

(a) By heating carbon in electric furnace

(b) By heating potassium with potassium dichromate

(c) Silica with magnesium

(d) None of these

18. Colour is imparted to glass by mixing

(a) Synthetic dyes (b) Metal oxide

(c) Oxides of non-metal (d) Coloured salt

19. Carborundum is

(a) SiC (b) $AlCl_3$

(c) $Al_2(SO_4)_3$ (d) $Al_2O_3 . 2H_2O$

20. Which of the following attacks glass

(a) HCl (b) HF

(c) HI (d) HBr

21. In SiF_6^{2-} and $SiCl_6^{2-}$ which one is known and why

(a) SiF_6^{2-} because of small size of F

(b) SiF_6^{2-} because of large size of F

(c) $SiCl_6^{2-}$ because of small size of Cl

(d) $SiCl_6^{2-}$ because of large size of Cl

22. The type of glass used in making lenses and prisms is

(a) A flint glass (b) Jena glass

(c) Pyrex glass (d) Quartz glass

23. Which of the following cuts ultraviolet rays

(a) Soda glass (b) Crook's glass

(c) Pyrex (d) None of these

24. Quartz is an example of

(a) Chain silicate

(b) Sheet silicate

(c) Cyclic silicate

(d) Three dimensional network silicate

25. Which statement is wrong

(a) Beryl is an example of cyclic silicate

(b) Mg_2SiO_4 is orthosilicate

(c) Basic structural unit in silicates is the SiO_2 tetrahedron

(d) Feldspars are not aluminosilicates

26. The composition of the common glass is

(a) $Na_2O.CaO.6SiO_3$ (b) $Na_2O.Al_2O_3.SiO_2$

(c) $CaO.Al_2O_3.SiO_2$ (d) $Na_2O.CaO.6SiO_2$

27. Quartz is extensively used as a piezoelectric material, it contains.....

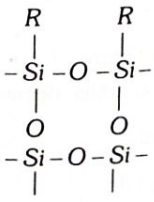
(a) Pb (b) Si

(c) Ti (d) Sn

28. On controlled hydrolysis and condensation, R_3SiCl yields

(a) $R_3Si-O-SiR_3$ (b) $\{R_3Si-O-SiR_3\}_n$

(c) R_3SiOH (d)



29. Silicon has a strong tendency to form polymers like silicones. The chain length of silicon polymer can be controlled by adding

(a) $MeSiCl_3$ (b) Me_2SiCl_2

(c) Me_3SiCl (d) Me_4Si

30. Which of the following products is formed on boiling tin with an alkali solution

(a) $Sn(OH)_2$ (b) $Sn(OH)_4$

(c) SnO_3^{2-} (d) SnO_2

31. For prevention of rusting of iron, which is used in paints

(a) PbO (b) PbO_2

(c) Pb_3O_4 (d) $PbSO_4$

32. On heating lead nitrate forms oxides of nitrogen and lead. The oxides formed are .....

(a) N_2O, PbO (b) NO_2, PbO

(c) NO, PbO (d) NO, PbO_2

33. Lead pipes are corroded quickly by

(a) Dil. H_2SO_4 (b) Conc. H_2SO_4

(c) Acetic acid (d) Water

3. IIT-JEE/ AIEEE

1. The structure of diborane (B_2H_6) contains **[2005]**

(a) Four 2c-2e bonds and two 3c-2e bonds

(b) Two 2c-2e bonds and four 3c-2e bonds

(c) Two 2c-2e bonds and two 3c-3e bonds

(d) Four 2c-2e bonds and four 3c-2e bonds

2. Which one of the following is the correct statement **[2008]**

(a) Beryllium exhibits coordination number of six

(b) Chlorides of both beryllium and aluminium have bridged chloride structures in solid phase

(c) $B_2H_6.2NH_3$ is known as 'inorganic benzene'

(d) Boric acid is a protonic acid

3. $B(OH)_3 + NaOH \rightleftharpoons NaBO_2 + Na[B(OH)_4] + H_2O$. How can this reaction is made to proceed in forward direction **[2006]**

(a) Addition of cis 1, 2 diol

(b) Addition of borax

(c) Addition of trans 1, 2 diol

(d) Addition of Na_2HPO_4

4. Aluminium chloride exists as dimer, Al_2Cl_6 in solid state as well as in solution of non-polar solvents such as benzene. When dissolved in water, it gives **[2004]**

(a) $[Al(OH)_6]^{3-} + 3HCl$ (b) $[Al(H_2O)_6]^{3+} + 3Cl^-$

(c) $Al^{3+} + 3Cl^-$ (d) $Al_2O_3 + 6HCl$

5. Which of the statements about anhydrous aluminium chloride is correct **[1981]**

(a) It exists as $AlCl_3$ molecule

(b) It is not easily hydrolysed

(c) It sublimes at 100^oC under vacuum

(d) It is a strong Lewis base

6. Heating an aqueous solution of aluminium chloride to dryness will give **[2005]**

(a) $AlCl_3$ (b) Al_2Cl_6

(c) Al_2O_3 (d) $Al(OH)Cl_2$

7. The species present in solution when CO_2 is dissolved in water are **[2006]**

(a) $CO_2, H_2CO_3, HCO_3^-, CO_3^{2-}$

(b) H_2CO_3, CO_3^{2-}

(c) CO_3^{2-}, HCO_3

(d) CO_2, H_2CO_3

8. *'Lead pencil'* contains **[1990]**

(a) PbS (b) Graphite

(c) FeS (d) Pb

9. The stability of dihalides of Si, Ge, Sn and Pb increases steadily in the sequence **[2007]**

(a) $GeX_2 \le SiX_2 \le SnX_2 \le PbX_2$

(b) $SiX_2 \le GeX_2 \le PbX_2 \le SnX_2$

(c) $SiX_2 \le GeX_2 \le SnX_2 \le PbX_2$

(d) $PbX_2 \le SnX_2 \le GeX_2 \le SiX_2$

10. The element exhibiting most stable $+2$ oxidation state among the following is **[1995]**

(a) Ag (b) Fe

(c) Sn (d) Pb

11. Name of the structure of silicates in which three oxygen atoms of $[SiO_4]^{4-}$ are shared is **[2005]**

(a) Pyrosilicate

(b) Sheet silicate

(c) Linear chain silicate

(d) Three dimensional silicate

12. In silicon dioxide **[2005]**

(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 bounded to two silicon atoms

(c) Silicon atom is bonded to two oxygen atoms

(d) There are double bonds between silicon and oxygen atoms

13. Which of the following oxides is amphoteric in character **[2005]**

(a) CaO (b) CO_2

(c) SiO_2 (d) SnO_2

14. Soldiers of Napolean army while at Alps during freezing winter suffered a serious problem as regards to the tin buttons of their uniforms. White metallic tin buttons got converted to grey powder. This transformation is related to **[2004]**

(a) A change in the partial pressure of oxygen in the air

(b) A change in the crystalline structure of tin

(c) An interaction with nitrogen of the air at very low to temperatures

(d) An interaction with water vapour contained in the humid air

15. Solder is an alloy of **[1995]**

(a) $Pb + Zn + Sn$ (b) $Pb + Zn$

(c) $Pb + Sn$ (d) $Sn + Zn$

16. Which of the following are Lewis acids **[2018]**

(a) PH_3 and $SiCl_4$ (b) BCl_3 and $AlCl_3$

(c) PH_3 and BCl_3 (d) $AlCl_3$ and $SiCl_4$

4. NEET/ AIPMT/ CBSE-PMT

1. The stability of + 1 oxidation state increases in the sequence **[2009; 2015]**

(a) $Al < Ga < In < Tl$ (b) $Tl < In < Ga < Al$

(c) $In < Tl < Ga < Al$ (d) $Ga < In < Al < Tl$

2. The increasing order of atomic radii of the following group 13 elements is **[2016; 2018]**

(a) $Al > Ga > In > Tl$ (b) $Ga < Al < In < Tl$

(c) $Al < In < Ga < Tl$ (d) $Al < Ga < Tl < In$

3. Which of the following statements about H_3BO_3 is not correct **[1994]**

(a) It is a strong tribasic acid

(b) It is prepared by acidifying an aqueous solution of borax

(c) It has a layer structure in which planar BO_3^{3-} units are joined by hydrogen bonds

(d) It does not act as proton donor but acts as a Lewis acid by accepting hydroxyl ion

4. Which of the following is the electron deficient molecule **[2005; 2013]**

(a) B_2H_6 (b) C_2H_6

(c) PH_3 (d) SiH_4

5. The tendency of BF_3, BCl_3 and BBr_3 to behave as Lewis acid decreases in the sequence **[2010]**

(a) $BF_3 > BCl_3 > BBr_3$ (b) $BCl_3 > BF_3 > BBr_3$

(c) $BBr_3 > BCl_3 > BF_3$ (d) $BBr_3 > BF_3 > BCl_3$

6. Which of the following structure is similar to graphite **[2013]**

(a) B_2H_6 (b) BN

(c) B (d) B_4C

7. Al_2O_3 can be converted to anhydrous $AlCl_3$ by heating **[2006]**

(a) A mixture of Al_2O_3 and carbon in dry Cl_2 gas

(b) Al_2O_3 with Cl_2 gas

(c) Al_2O_3 with HCl gas

(d) Al_2O_3 with $NaCl$ in solid state

8. Which of the following statements is incorrect **[2011]**

(a) Aluminium reacts with excess $NaOH$ to give $Al(OH)_3$

(b) $NaHCO_3$ on heating gives Na_2CO_3

(c) Pure sodium metal dissolves in liquid ammonia to give blue solution

(d) $NaOH$ reacts with glass to give sodium silicate

9. Which one of the following elements is unable to form MF_6^{3-} ion **[2018]**

(a) Ga (b) Al

(c) B (d) In

10. Carbon and silicon belong to (IV) group. The maximum coordination number of carbon in commonly occurring compounds is 4, whereas that of silicon is 6. This is due to **[1994]**

(a) Large size of silicon

(b) More electropositive nature of silicon

(c) Availability of low lying d-orbitals in silicon

(d) Both (a) and (b)

11. Which of the following oxidation states are the most characteristic for lead and tin respectively **[2007]**

(a) +4, +2 (b) +2, +4

(c) +4, +4 (d) +2, +2

12. Glass reacts with HF to produce **[2000]**

(a) SiF_4 (b) H_2SiF_6

(c) H_2SiO_3 (d) Na_3AlF_6

13. Which of the following is not isostructural with $SiCl_4$ **[2006]**

(a) PO_4^{3-} (b) NH_4^+

(c) SCl_4 (d) SO_4^{2-}

14. The basic structural unit of silicates is **[2013]**

(a) SiO_4^{2-} (b) SiO^-

(c) SiO_4^{4-} (d) SiO_3^{2-}

15. Which one of the following anions is present in the chain structure of silicates **[2007]**

(a) $Si_2O_7^{6-}$ (b) $(Si_2O_5^{2-})_m$

(c) $(SiO_3^{2-})_m$ (d) SiO_4^{4-}

16. Which one of the following statements about the zeolites is false **[2004]**

(a) Zeolites are aluminosilicates having three dimensional network

(b) Some of the SiO_4^{-4} units are replaced by AlO_4^{-5} and AlO_6^{9-} ions in zeolites

(c) They are used as cation exchangers

(d) They have open structure which enables them to take up small molecules

17. Name the type of the structure of silicate in which one oxygen atom of $[SiO_4]^{4-}$ is shared **[2011]**

(a) Three dimensional (b) Linear chain silicate

(c) Sheet silicate (d) Pyrosilicate

18. Which of these is not a monomer for a high molecular mass silicone polymer **[2013]**

(a) $PbSiCl_3$ (b) $MeSiCl_3$

(c) Me_2SiCl_2 (d) Me_3SiCl

19. Which one of the following statements is not correct **[1994]**

(a) Zinc dissolves in sodium hydroxide solution

(b) Carbon monoxide reduces iron (III) oxide to iron

(c) Mercury (II) iodide dissolves in excess of potassium iodide solution

(d) Tin (IV) chloride is made by dissolving tin solution in concentrated hydrochloric acid

20. It is because of inability of ns^2 electrons of the valence shell to participate in bonding that **[2017]**

(a) Sn^{2+} is reducing while Pb^{4+} is oxidising

(b) Sn^{2+} is oxidising while Pb^{4+} is reducing

(c) Sn^{2+} and Pb^{2+} are both oxidising and reducing

(d) Sn^{4+} is reducing while Pb^{4+} is oxidizing

5. AIIMS

1. Which of the following is only acidic in nature **[2004]**

(a) $Be(OH)_2$ (b) $Mg(OH)_2$

(c) $B(OH)_3$ (d) $Al(OH)_3$

2. The liquified metal expanding on solidification is **[2004]**

(a) Ga (b) Al

(c) Zn (d) Cu

3. Colemnite is **[2015]**

(a) $Ca[B_3O_4(OH)_2].2H_2O$ (b) $Ca_2B_6O_{11}.5H_2O$

(c) $Ca(OH)_2$ (d) $Na_2B_4O_7.2H_2O$

4. In diborane, the two $H-B-H$ angles are nearly **[2005]**

(a) 60°, 120° (b) 95°, 120°

(c) 95°, 150° (d) 120°, 180°

5. Which of the following gives propyne on hydrolysis **[2005]**

(a) Al_4C_3 (b) Mg_2C_3

(c) B_4C (d) La_4C_3

6. Hydrolysis of which of the following does not occur **[1982]**

(a) VCl_4 (b) $TiCl_4$

(c) $SiCl_4$ (d) CCl_4

7. Supercritical CO_2 is used as **[2007]**

(a) Dry ice

(b) Fire fighting

(c) A solvent for extraction of organic compounds from natural sources

(d) A highly inert medium for carrying out various reactions

8. Which of the following glass is used in making wind screen of automobiles **[1999]**

(a) Crook's (b) Jena

(c) Safety (d) Pyrex

9. Non-oxide ceramics can be **[2008]**

(a) B_4C (b) SiC

(c) Si_3N_4 (d) All of these

10. Which of the following is the correct statement for red lead **[2000]**

(a) It is an active form of lead

(b) Its molecular formula is Pb_2O_3

(c) It decomposes into Pb and CO_2

(d) It decomposes into PbO and O_2

6. Assertion and Reason

Read the assertion and reason carefully to mark the correct option out of the options given below:

(a) If both assertion and reason are true and the reason is the correct explanation of the assertion.

(b) If both assertion and reason are true but reason is not the correct explanation of the assertion.

(c) If assertion is true but reason is false.

(d) If the assertion and reason both are false.

(e) If assertion is false but reason is true.

1. Assertion : $Al(OH)_3$ is insoluble in NH_4OH but soluble in $NaOH$.

Reason : $NaOH$ is strong alkali. **[AIIMS 1997]**

2. Assertion : Boron is metalloid.

Reason : Boron shows metallic nature. **[AIIMS 1997]**

3. Assertion : $[Al(H_2O)_6]^{3+}$ is a stronger acid than $[Mg(H_2O)_6]^{2+}$.

Reason : Size of $[Al(H_2O)_6]^{3+}$ is smaller than $[Mg(H_2O)_6]^{2+}$ and possesses more effective nuclear charge. **[AIIMS 2008]**

4. Assertion : Benzene is reactive while inorganic benzene is unreactive compound.

Reason : Inorganic benzene is, borazine, $B_3N_3H_6$. **[AIIMS 2002]**

5. Assertion : SiF_6^{2-} is known but $SiCl_6^{2-}$ is not.

Reason : Size of fluorine is small and its lone pair of electrons interacts with d-orbitals of Si strongly. **[AIIMS 2005]**

6. Assertion : $PbCl_2$ is more stable than $PbCl_4$.

Reason : $PbCl_4$ is powerful oxidising agent. **[AIIMS 2008]**

7. Assertion : Silicones are hydrophobic in nature.

Reason : Si –O–Si linkages are moisture sensitive. **[AIIMS 2006]**

12. The p-Block Elements (Boron and Carbon Family) – Answers Keys

1. Boron Family

1	b	2	a	3	c	4	c	5	d
6	c	7	d	8	c	9	c	10	a
11	d	12	e	13	c	14	c	15	a
16	b	17	b	18	c	19	c	20	b
21	c	22	a	23	b	24	a	25	d
26	b	27	a	28	c	29	c	30	d
31	c	32	d	33	d	34	b	35	d
36	c	37	c	38	d	39	b	40	a

2. Carbon Family

1	d	2	b	3	c	4	d	5	b
6	a	7	a	8	b	9	b	10	c
11	c	12	c	13	b	14	c	15	d
16	d	17	c	18	b	19	a	20	b
21	a	22	a	23	b	24	d	25	d
26	d	27	b	28	a	29	c	30	c
31	c	32	b	33	c				

3. IIT-JEE/ AIEEE

1	a	2	b	3	a	4	b	5	c
6	c	7	a	8	b	9	c	10	d
11	b	12	a	13	d	14	b	15	c
16	bd								

4. NEET/ AIPMT/ CBSE-PMT

1	a	2	b	3	a	4	a	5	c
6	b	7	a	8	a	9	c	10	c
11	b	12	b	13	c	14	c	15	c
16	b	17	d	18	d	19	d	20	a

5. AIIMS

1	c	2	a	3	b	4	b	5	b
6	d	7	c	8	c	9	d	10	d

6. Assertion & Reason

1	a	2	c	3	a	4	e	5	a
6	b	7	c						