CHEMISTRY

BOOKS - PATHFINDER CHEMISTRY (BENGALI ENGLISH)

P-BLOCK ELEMENTS

Question Bank

1. $AlCl_3$ forms a dimer but BCl_3 does not form dimer.Explain.

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2. No visible reaction occurs when aluminium is left in contact with concentrated nitric acid.

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3. Carbon monoxide is poisonous. Explain.

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4. Producer gas is less efficient fuel than water gas, why ?

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5. BCl_3 does not exist as dimer but BH_3 exist as dimer (B_2H_6) because :

A. Chlorine is more electronegative than hydrogen

B. there is $p\pi - d\pi$ back bonding in BCl_3 but BH_3 does not contain such multiple bonding

C. large sized chlorine atoms do not fit in between the small boron atoms whereas small sized hydrogen atoms get fitted between boron atoms

D. none of these

Answer: C

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6. Aluminium does not react with :

A. NaOH

B. HCl

C. N_2

D. HNO_3

Answer: D

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7. Which is used in high temperature thermometry ?

A. Na

B. Ti

C. Ga

D. Hg

Answer: C

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8. Discuss the change in coordination number when crystalline $AlCl_3$ is heated.

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9. B_2H_6 reacts with NH_3 to form different products. Write the products.

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10. Which element of gp. 14 forms only one hydride ?

A. C

B. Si

C. Sn

D. Pb

Answer: D

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11. R_3SiCl on hydrolysis forms :

A. R_3SiOH

B. $R_3Si - O - SiR_3$

C. $R_2Si = O$

D. None of these

Answer: B

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12. Why are pb (IV) salts less abundant ?

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13. CO_2 is an acidic anhydride while PbO_2 is basic anhydride. Explain.

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14. $SnCl_2.2H_2O$ readily loses one molecule of water at $80^\circ C$. Why ?

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15. H_3BO_3 is:

A. monobasic and weak Bronsted and as well as 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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16. Boron forms BX_3 type of halides. The correct increasing order of Lewis-acid strength of these haides is

A. $BF_3 > BCl_3 > BBr_3 > Bl_3$

B. $Bl_3 > BBr_3 > BCl_3 > BF_3$

C. $BF_3 > Bl_3 > BCl_3 > BBr_3$

D. $BF_3 > BCl_3 > Bl_3 > BBr_3$

Answer: B

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17. Me_3B, BH_3 and BF_3 are three Lewis acids. Which one of the following is the correct sequence of these acids in order of their increasing acid strength ?

A. $Me_3B < BH_3 < BF_3$

B. $Me_3B < BF_3 < BH_3$

C. $BF_3 < Me_3B < BH_3$

D. $BF_3 < BH_3 < Me_3B$

Answer: A

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

How can this reaction is made to proceed in forward direction ?

A. addition of cis 1, 2 diol

B. addition of borax

C. addition of trans 1, 2 diol

D. addition of Na_2HPO_4

Answer: A

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19. $AlCl_3$ exist as dimer because of

A. High charge in nucleus

B. Al has greater ionisation potential

C. Al has large radius

D. Incomplete p - subshell

Answer: D

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20. Which of the following is not true for potash alum ?

A. Its aqueous solution is acidic in nature

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

C. On heating, it melts in its water of crystallisation

D. It is used in dyeing industry

Answer: C

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21. Thermite is mixture of X parts of ferric oxide and Y parts of aluminium powder. X, Y are respectively :

A. 3,1

B. 3,2

C. 1,1

D. 2,3

Answer: A

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22. Heating an aqueous solution of aluminium chloride to dryness will give:

A. $AlCl_3$

B. Al_2Cl_6

C. Al_2O_3

D. $Al(OH)Cl_2$

Answer: C

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23. While testing BO_3^3, there is a green edged flame on heating the salt with conc. H_2SO_4 and CH_3OH, green colour is of

A. $(CH_3)_3B$

B. $(CH_3O)_3B$

C. B_2O_3

D. H_2BO_3

Answer: B

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24. Borax is actually made of two tetrahedral and two triangular units joined together and should be written as: $Na_2\left[B_4O_5(OH)_4\right].8H_2O$ Consider the following statements about borax:

Each boron atom has four B-O bonds

Each boron atom has three B-O bonds

Two boron atoms have four B-O bonds while other two have three B-O bonds

Each boron atom has one - OH groups

A. a,b

B. b,c

C. c,d

D. a,c

Answer: C

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25. Specify the coordination geometry around and hybridization of N and B atoms in 1:1 complex of BF_3 and NH_3

A. N : tetrahedral, sp^3, B : tetrahedral,sp^3

B. N : pyramidal, sp^3, B : pyramidal,sp^3

C. N : pyramidal, sp^3, B : planer,sp^2

D. N : pyramidal, sp^3, B : tetrahedral,sp^3

Answer: A

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26. Which of the following statements is correct?

A. BCl_3 and $AlCl_3$ are both Lewis acids & BCl_3 is stronger than $AlCl_3$

B. BCl_3 and $AlCl_3$ are both Lewis acids and $AlCl_3$ is stronger than BCl_3

C. BCl_3 and $AlCl_3$ are both equally strong Lewis acids

D. Both BCl_3 and $AlCl_3$ are not Lewis acids

Answer: B

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27. Fluorine is more electronegative than either boron or phosphorus. What conclusion can be drawn from the fact that BF_3 has no dipole moment but PF_3 does ?

A. BF_3 molecule must be linear

B. BF_3 is not spherically symmetrical but PF_3 is

C. The atomic radius of P is larger than that of B

D. The BF_3 molecule must be planar triangular

Answer: D

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

A. Al belongs to third group

B. Al has high ionisation energy

C. It cannot form a trimer

D. Higher coordination can be achieved by Al

Answer: D

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29. Structure of $Na_2B_4O_{7.10}H_2O$ contains

A. Two triangular and two tetrahedral units

B. Three triangular and one tetrahedral unit

C. All tetrahedral units

D. All triangular units

Answer: A

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30. Which of the following compounds is formed in borax bead test?

A. metaborates

B. tetraborates

C. double oxides

D. orthoborates

Answer: A

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31. The shape of gaseous $SnCl_2$ is

A. Tetrahedral

B. Linear

C. Angular

D. T - shaped

Answer: C

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32. The percentage of lead in lead pencil is

A. Zero

B. 20

C. 80

D. 70

Answer: A

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33. Which oxide of lead is used in lead storage batteries, in safety matches and is a powerful oxidising agent.

A. PbO

B. PbO_2

C. Pb_3O_4

D. $2PbO.PbO_2$

Answer: B

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34. Ge (II) compounds are powerful reducing agents whereas Pb (IV) compounds are strong oxidants. It can be because to

A. $Pb > Ge$ (w.r.t electropositively)

B. $Pb < Ge$ (ionisation potential)

C. Ionic radii of Pb^{2+} & Pb^{4+} are larger than those of Ge^{2+} and Ge^{4+}

D. inert Pair effect is more prominent in Lead than in Germanium

Answer: D

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35. $PbCl_4$ exist while $PbBr_4$ and PbI_4 do not exist.-Explain.

A. Inability of bromine and iodine to oxidise Pb^{2+} to Pb^{4+}

B. Br^e and I^e are bigger in size

C. More electropositive nature of bromine and iodine

D. Chlorine is a gas

Answer: A

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36. Which of the following is most stable?

A. Sn^{2+}

B. Ge^{2+}

C. Si^{2+}

D. Pb^{2+}

Answer: D

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37. Bio gas and producer gas are made up of

A. biogas contains CO_2 but producer gas does not

B. producer gas contains CO but not CO_2

C. both biogas and producer gas have N_2

D. all the three above

Answer: D

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

A. Pyrosilicate

B. Sheet silicate

C. Linear chain silicate

D. Three dimensional silicate

Answer: B

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39. When excess of $SnCl_2$ is added to $HgCl_2$, the substance formed is

A. Hg_2Cl_2

B. Sn

C. Hg

D. Cl_2

Answer: C

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40. Mg_2C_3 has the following characteristics

A. It is called magnesium allyide

B. It contains Mg^{2+} and C_4^{3-} ions

C. It on hydrolysis gives propyne

D. all the the above

Answer: D

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41. 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 bond

C. One sigma and a half pi bond

D. One sigma bond

Answer: B

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42. Carbogen has $X\ \%$ of CO_2 and is used as an antidote for poisoning of Y. Then, X and Y are

A. $X = 95\ \%$ and Y = lead poisoning

B. $X = 5\ \%$ and Y = CO poisoning

C. $X = 30\ \%$ and Y = CO_2 poisoning

D. $X = 45\ \%$ and Y = CO poisoning

Answer: B

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43. $PbF_4, PbCl_4$ exists but $PbBr_4$ and Pbl_4 do not exist because of

A. large size of Br^- and I^-

B. strong oxidising character of Pb^{4+}

C. strong reducing character of Pb^{4+}

D. low electronegativity of Br^- and I^-

Answer: B

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44. Anhydrous $AlCl_3$ is covalent however, when it is dissolved in water hydrated ionic species are formed.This transformation is owing to :

A. the trivalent state of Al

B. the large hydration energy of Al^{3+}

C. the low hydration energy of Al^{3+}

D. the polar nature of water

Answer: B

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45. Consider the following statement for diborane:

Boron is approximately sp^3 hybridized

B-H-B angle is 180°

There are two termine B-H bonds for each boron atom

There are only 12 bonding electrons available

of these statements :

A. i,iii,and iv are correct

B. i,ii,and iii are correct

C. ii,iii,and iv are correct

D. i,ii,and iv are correct

Answer: A

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46. The dissolution of $Al(OH)_3$ by a solution of NaOH results in the formation of :

A. $\left[Al(H_2O)_4(OH)_2\right]^+$

B. $\left[Al(H_2O)_3(OH)_3\right]$

C. $\left[Al(H_2O)_2(OH)_4\right]^-$

D. $\left[Al(H_2O)_6(OH)_3\right.$

Answer: C

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47. Which is not true about borax ?

A. It is useful primary standard for titrating against acids

B. One mole of borax can be used as a buffer

C. Aqueous solution of borax can be used as buffer

D. it is made up of two triangular BO_3 units and two tetrahedral BO_4 units.

Answer: B

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48. $(Si_2O_5)_n^{2n-}$ anion is obtained when :

A. no oxygen of a SiO_4^{4-} tetrachedron is shared with another SiO_4^{4-} tetrahedron

B. one oxygen of a SiO_4^{4-} tetrahedron is shared with another SiO_4^{4-} tetrahedron

C. two oxygen of a SiO_4^{4-} tetrahedron is shared with another SiO_4^{4-} tetrahedron

D. three oxygen of a SiO_4^{4-} tetrahedron is shared with anotherSiO_4^{4-} tetrahedron

Answer: D

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49. Amphibole silicate structure has 'x' number of corner shared per tetrahedron. The value of 'x' is :

A. 2

B. 2 1/2

C. 3

D. 4

Answer: B

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

A. It exists as $AlCl_3$ molecule in vapour

B. It is a strong Lewis base

C. it sublimes at $100^\circ C$ under vacuum

D. it is not easily hydrolysed

Answer: C

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51. Borax in its crystal posses :

A. 3 tetrahedral unit

B. 2 tetrahedral and 2 planar triangular units

C. 3 tetrahedral and 2 planar triangular units

D. all tetrahedral units

Answer: B

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52. Borazine is called 'inorganic benzene' which contains ring structure with alternate BH and NH groups. Which of the following statements is correct about borazine ?

A. Each B and N atom is sp^2 hybridised

B. Borazine satisfies the (4n+2) Huckel's rule

C. Like organic benzene, borazine does not give addition product with HCl

D. Borazine contains dative $p\pi - p\pi$ bond

Answer: A::B::D

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53. Identify the correct statement about orthoboric acid :

A. It has a layer structure in which planar BO_3 units are joined by hydrogen bonds

B. Orthoboric acid (H_3BO_3) is weak monobasic Lewis acid

C. On heating ortho-boric acid form meta-boric acid and on further heating to red hot, forms boric acid anhydride

D. It is obtained by reacting borax with HCl using phenolphthalein as in indicator

Answer: A::B::C

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54. On strong heating $Pb(NO_3)_2$ gives :

A. PbO

B. NO_2

C. O_2

D. NO

Answer: A::B::C

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55. Heating of oxalic acid with conc. H_2SO_4 evolves:

A. CO

B. CO_2

C. SO_2

D. SO_3

Answer: A::B

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56. Which of the following statement (s) is/are incorrect about borazine (inorganic benzene) ?

A. It contains $p\pi - d\pi$ back bond

B. It does not give addition product with HCl like organic benzene

C. Each boron and nitrogen atom is sp^2 - hybridised

D. Its disubstituted derivatives gives equal no. of ortho, meta and para derivatives like disubstituted organic benzene

Answer: A::B::D

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57. Which of the given compound(s) can act as Lewis acid in both monomer and dimer form ?

A. BH_3

B. $BeCl_2$

C. BeH_2

D. $AlCl_3$

Answer: A::B::C

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58. Select the correct statement(s) regarding structure of $Al_2(CH_3)_6$:

A. All carbon atoms of $-CH_3$ groups do not lie in the same plane

B. One vacant orbital of each Al-atom is involved in sp^3-hybridisation

C. There are only 8 sp^3-hybridised atoms are present

D. There are total 48 bonding electrons are available

Answer: A::B::C::D

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59. Which of the following molecules have a dative bonding $(p\pi - d\pi)$?

A. P_4O_{10}

B. $(SiH_3)_3N$

C. P_4O_6

D. N_2O_5

Answer: A::B

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60. Which of the following is/are correct for groups 14 elements ?

A. The stability of dihalides are in the order

$$CX_2 < SiX_2 < GeX_2 < SnX_2 < PbX_2$$

B. The ability to form $p\pi - p\pi$ multiple bonds among themselves increases

down the group

C. The tendency for catenation decreases down the group

D. They all form oxides with the formula MO_2

Answer: A::C::D

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61. Aqueous solution of boric acid is treated with salicylic acid. Which of the following statements is/are incorrect for the product formed in the above reaction ?

A. no product will be formed because both are acid

B. product is 4-coordinated complex and optically resolvable

C. product is 4-coordinated complex and optically non-resolvable

D. there are two ring only which are six membered

Answer: A::C::D

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62. Formation of a bridge bond is best explained by M.O.T. According to which a bridge bond is formed by filling electrons into molecular orbital, which spread over three nuclei, hence such bonds are specified as three

centered bond.

Which of the following compound is not possible ?

A. B_2H_6

B. $B_2(CH_3)_6$

C. $B_2H_2(CH_3)_4$

D. $B_2H_4(CH_3)_2$

Answer: B

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63. Formation of a bridge bond is best explained by M.O.T. According to which a bridge bond is formed by filling electrons into molecular orbital, which spread over three nuclei, hence such bonds are specified as three centered bond.

Hybridization of B in diborane is

A. sp

B. sp^2

C. sp^3

D. None

Answer: C

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64. Silicon is second most abundant element occurring in earth crust. It is always found in combined state. Silicon exists in two allotropic forms,amorphous & crystalline. The compounds of silicon are carborundum, silicon, silicate,glass etc.

Silicones are organosilicon polymer & silicates are metal derivatives of silicic acid. While

carborundum are obtained by heating mixture of sand, carbon & common salt.

The structural unit of silicates is

A. SiO_2

B. SiO_4^{4-}

C. SiO_3^{2-}

D. SiO_2^{2-}

Answer: B

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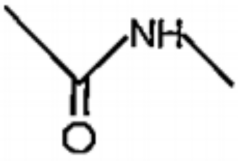
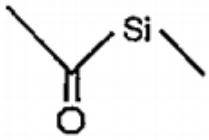
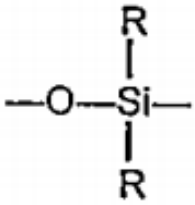
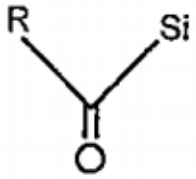
Silicones are organosilicon polymer & silicates are metal derivatives of silicic acid. While carborundum are obtained by heating mixture of sand, carbon & common salt.

Which type of linkage is present in silicones ?

A. 

B. 

C. 

D. 

Answer: C

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66. Match Column-I with Column-II

Column-I		Column-II	
(A)	Borax $\xrightarrow{\Delta}$	(P)	BN
(B)	$B_2H_6 + H_2O \longrightarrow$	(Q)	B_2H_6
(C)	$B_2H_6 + NH_3$(excess) $\xrightarrow{\Delta}$	(R)	H_3BO_3
(D)	$BCl_3 + LiAlH_4 \rightarrow$	(S)	$NaBO_2 + B_2O_3$

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67. Match Column-I with Column-II

	Column-I		Column-II
(A)	$Na_2B_4O_7 \cdot 10H_2O$	(P)	Basic solution
(B)	Na_2CO_3	(Q)	Acidic solution
(C)	$K_2SO_4 \cdot Al_2(SO_4)_3 \cdot 24H_2O$	(R)	Can react with NaOH
(D)	NH_4Cl	(S)	Swells up on heating

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68. Match Column-I with Column-II

Column-I		Column-II	
(A)	Sheet silicate	(P)	$(SiO_3)_n^{2n-}$
(B)	Pyroxene chain	(Q)	$(Si_4O_{11})_n^{6n-}$
(C)	Pyrosilicate	(R)	3 – corner oxygen atom are shared
(D)	Amphibole chain	(S)	Non-plannar

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69. The number of sp^2 hybridized boron atoms in borax

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70. On combustion of 1 mole of glucose the number of moles of CO_2 produced will be

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71. The minimum number of moles of HCl required to completely react with 1 mole of borax will be

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72. In sheet silicate how many oxygen atoms of $[SiO_4]^{4-}$ are shared ?

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73. Starting from boric acid, how would you prepare (i) meta and (ii) tetraboric acids.

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74. Boron tribromide is stronger acid than boron trifluoride. Why ?

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75. Can we prepare anhydrous $AlCl_3$ by heating $AlCl_3.6H_2O$?

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76. Aluminium fluoride is ionic while $AlCl_3$ is covalent. Why ?

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77. Explain the following

"The $p\pi - p\pi$ back bonding occurs in the halides of boron and not in those of aluminium".

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78. Compound (X) on reduction with $LiAlH_4$ gives a hydride (Y) containing 21.4% hydrogen along with other products. The compound (Y) reacts with air explosively resulting in boron trioxide. Identity (X) and (Y).

Give balanced reaction involved in the formation of (Y) and its reaction with air . Draw the structure of (Y).

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79. Carbon tetrachloride is not affected but silicon tetrachloride is hydrolysed by water.

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80. Why Sn (II) is a reducing agent whereas Pb (II) is not ?

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81. Graphite is a conductor but diamond is not a conductor. Explan.

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82. $PbCl_4$ exist while $PbBr_4$ and PbI_4 do not exist.-Explain.

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83. Borax structure contains

A. two BO_4 groups & two BO_3 groups

B. four BO_4 groups only

C. four BO_3 groups only

D. three BO_4 and one BO_3 groups

Answer: A

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84. When orthoboric acid is heated strongly, it gives which of the following:

A. B_2O_3

B. $H_2B_4O_7$

C. HBO_2

D. $NaBO_2$

Answer: A

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85. Which compounds gives O_2 on moderate heating ?

A. CuO

B. HgO

C. ZnO

D. Al_2O_3

Answer: B

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86. Amorphous B on heating in air forms

A. $B(OH)_3$

B. mixture of B_2O_3 & BN

C. only B_2O_3

D. BN

Answer: B

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87. $AlCl_3$ fumes in moist air because of

A. hydrolysis

B. dehydration

C. reduction

D. oxidation

Answer: A

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88. The dissolution of $Al(OH)_3$ by a solution of NaOH results in the formation of

A. $[Al(H_2O)(OH)]^{2+}$

B. $\left[Al(H_2O)_2(OH)_4\right]^-$

C. $\left[Al(H_2O)_3(OH)_3\right]$

D. $Al(H_2O)_6(OH)_3\Big]$

Answer: B

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89. Boron carbide B_4C is widely used in

A. Making of plaster of Pairs (P.O.P)

B. Making C_2H_2

C. as a hardest substance

D. making boric acid

Answer: C

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90. Which of the following compounds is optically active ?

A. Boron trifluoride

B. Boron anhydride

C. Boron salicylic acid

D. Sodium tetraborate

Answer: C

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91. When a solution of NaOH is added in excess to the solution of potash alum, we obtain

A. A white precipitate

B. Bluish precipitate

C. A clear solution

D. A crystalline mass

Answer: C

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92. Inorganic graphite is

A. $B_3N_3H_6$

B. B_2H_6

C. BN

D. BF_2

Answer: C

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93. Which is the correct basicity order :

A. $Ga(OH)_3 < In(OH)_3 < TlOH$

B. $TlOH < In(OH)_3 < Ga(OH)_3$

C. $Ga(OH)_3 = In(OH)_3 < TlOH$

D. $In(OH)_3 < Ga(OH)_3 < TlOH$

Answer: A

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94. R_3SiCl on hydrolysis forms

A. R_3SiOH

B. $R_3Si - O - SiR_3$

C. $R_2Si = O$

D. None of these

Answer: B

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95. What is water glass

A. Na_2SiO_3

B. R_3SiCl

C. Na_2PbO_3

D. None of these

Answer: A

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96. Carborundum is obtained when silica is heated at high temperature with

A. Carbon

B. CO

C. CO_2

D. $CaCO_3$

Answer: A

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97. CO_2 is isostructural with

A. $HgCl_2$

B. $SnCl_2$

C. C_2H_6

D. NO_2

Answer: A

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98. Thermodynamically most stable form of carbon is

A. diamond

B. coke

C. charcoal

D. graphite

Answer: D

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99. Which of the following is/are example of interstitial carbides :

(I) SiC (II) VC (III)WC (IV) Al_4C_3

A. II

B. III, IV

C. II & III

D. II, III, IV

Answer: C

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100. On adding excess of NaOH solution to stannous chloride solution we obtain

A. $Sn(OH)_2$

B. SnO_2, H_2O

C. Na_2SnO_3

D. Na_2SnO_2

Answer: D

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101. Which of the following is not used as pigment in paints

A. $PbCrO_4$

B. PbO_2

C. White lead

D. Pb_3O_4

Answer: B

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102. Litharge is

A. PbO

B. PbO_2

C. Pb_3O_4

D. $Pb(CH_3COO)_2$

Answer: A

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103. Which statement about anhydrous $AlCl_3$ is incorrect :

A. It is exists as Al_2Cl_6 in solid state

B. It is easily hydrolysed

C. It sublimes at $180^\circ C$

D. It reacts with air

Answer: D

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104. Which fuel has highest calorific value ?

A. Coal gas

B. Water gas

C. Producer gas

D. CO_2 gas

Answer: A

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105. Main factor responsible for weak acidic nature of BF_3 is

A. large electronegativity of F

B. 3c-2e bonds in BF_3

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

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

Answer: D

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106. Which of the following is amphoteric ?

A. CO_2

B. Sb_2O_3

C. SiO_2

D. GeO_2

Answer: B

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107. Boron nitride in reacting with NaOH gives

:

A. NH_3

B. N_2O

C. $NaBO_2$

D. NO_2

Answer: A

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108. H_3BO_3 is

A. Lewis Acid

B. Lewis Base

C. Arrhenius Acid

D. None of these

Answer: A

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109. Catenation under in group 14 :

A. $C = Si > Ge > Sn > Pb$

B. $C > \ > Si = Ge > Sn > \ > Pb$

C. $C > \ > Si > Ge = Sn > \ > Pb$

D. $C > \ > Si > Ge > Sn > Pb$

Answer: D

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110. H_3BO_3 reacts with C_2H_6OH giving ethyl borate

A. Which is non-Volatile

B. Which burns in green flame

C. Which never catches fire

D. Which is very unstable

Answer: B

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111. Boron readily dissolves in

A. cons HCl

B. fused NaOH

C. fused $Na_2CO_3 + NaNO_3$

D. 1 : 2 mixture of

$concnHNO_3 \& concnH_2SO_4$

Answer:

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112. Good conductor of electricity is/are

A. diamond

B. Graplite

C. Fullerenes

D. Gas carbon

Answer:

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113. $AlCl_3$ exists as a dimer when

A. dissolved in water

B. dissolved in benzene

C. heated above $747^\circ C$

D. in vapour phase

Answer:

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114. $SnCl_4$ is

A. a covalent compound

B. a volatile liquid at room temperature

C. a colourless compound

D. tetrehedral in shape

Answer:

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115. SiO_2 reacts with

A. $cons^n$. HCl

B. HF

C. CO_2

D. NaOH (hot)

Answer:

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116. This question has Statement I and Statement II. Of the four choices given after the Statement, choose the one that best describes the two Statement.

Statement - I : BCl_3 is more acidic than BF_3 although the electronegativity is high for F than Cl.

Statement - II : Halogen-boron back π bonding is stronger in BF_3 than BCl_3

A. Statement - I is true, Statement - II is true, Statement - II is a correct

explanation of Statement - I

B. Statement - I is true, Statement - II is true, Statement - II is not a correct explanation of Statement - I.

C. Statement - I is true, Statement - II is false

D. Statement - I is false, Statement - II is true.

Answer: A

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117. This question has Statement I and Statement II. Of the four choices given after the Statement, choose the one that best describes the two Statement.

Statement - I : Borax solution gives a pink colour with phenolphthalein

Statement - II : Borax solution may be titrated as an alkali with HCl using methyl orange indicator.

A. Statement - I is true, Statement - II is true, Statement - II is a correct explanation of Statement - I

B. Statement - I is true, Statement - II is true, Statement - II is not a correct explanation of Statement - I.

C. Statement - I is true, Statement - II is false

D. Statement - I is false, Statement - II is true.

Answer: B

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118. This question has Statement I and Statement II. Of the four choices given after the Statement, choose the one that best describes the two Statement.

Statement - I : Banana bond is formed in B_2H_6 . in which two B-H-B bonds are formed called as 3c-2e (three centered 2 electron bond)

Statement - II : $B_2H(CH_3)_5$ does exist

A. Statement - I is true, Statement - II is true, Statement - II is a correct explanation of Statement - I

B. Statement - I is true, Statement - II is true, Statement - II is not a correct explanation of Statement - I.

C. Statement - I is true, Statement - II is false

D. Statement - I is false, Statement - II is true.

Answer: C

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119. This question has Statement I and Statement II. Of the four choices given after the Statement, choose the one that best describes the two Statement.

Statement - I : BCl_3 does not exist as dimer. But BH_3 exists as dimer (B_2H_6)

Statement - II : There is $p\pi - p\pi$ back bonding

in BCl_3, but BH_3 does not contain such multiple bonding.

A. Statement - I is true, Statement - II is true, Statement - II is a correct explanation of Statement - I

B. Statement - I is true, Statement - II is true, Statement - II is not a correct explanation of Statement - I.

C. Statement - I is true, Statement - II is false

D. Statement - I is false, Statement - II is true.

Answer: A

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120. This question has Statement I and Statement II. Of the four choices given after the Statement, choose the one that best describes the two Statement.

Statement - I : $(SiH_3)_3$ N is a weaker base than

$(CH_3)_3$ N

Statement -II : $p\pi - d\pi$ back bonding present in $(SiH_3)_3$N

A. Statement - I is true, Statement - II is true, Statement - II is a correct explanation of Statement - I

B. Statement - I is true, Statement - II is true, Statement - II is not a correct explanation of Statement - I.

C. Statement - I is true, Statement - II is false

D. Statement - I is false, Statement - II is true.

Answer: A

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121. This question has Statement I and Statement II. Of the four choices given after the Statement, choose the one that best

describes the two Statement.

Statement - I : $SnCl_4$ is a covalent liquid, while $SnCl_2$ is ionic in nature

Statement - II : Sn^{+4} is much more polarising than Sn^{+2}

A. Statement - I is true, Statement - II is true, Statement - II is a correct explanation of Statement - I

B. Statement - I is true, Statement - II is true, Statement - II is not a correct explanation of Statement - I.

C. Statement - I is true, Statement - II is false

D. Statement - I is false, Statement - II is true.

Answer: A

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122. This question has Statement I and Statement II. Of the four choices given after the Statement, choose the one that best

describes the two Statement.

Statement - I: Pb^{+4} is oxidising, while Ge^{+2} is reducing in nature

Statement - II : Because of innert pair effect S^2 pair become non-ionising as we move down the group.

A. Statement - I is true, Statement - II is true, Statement - II is a correct explanation of Statement - I

B. Statement - I is true, Statement - II is true, Statement - II is not a correct

explanation of Statement - I.

C. Statement - I is true, Statement - II is false

D. Statement - I is false, Statement - II is true.

Answer: A

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123. This question has Statement I and Statement II. Of the four choices given after the Statement, choose the one that best describes the two Statement.

Statement - I : BF_3 is the strongest lewis acid among boron trihalides

Statement - II : $p\pi - p\pi$ back bonding taken place among empty p orbital of B & filled p orbital of halogen.

A. Statement - I is true, Statement - II is true, Statement - II is a correct

explanation of Statement - I

B. Statement - I is true, Statement - II is true, Statement - II is not a correct explanation of Statement - I.

C. Statement - I is true, Statement - II is false

D. Statement - I is false, Statement - II is true.

Answer: D

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124. This question has Statement I and Statement II. Of the four choices given after the Statement, choose the one that best describes the two Statement.

Statement - I : Silicones are organo silicon polymers containing Si-O-Si linkage.

Statement -II : Silicones are hydrophilic in nature

A. Statement - I is true, Statement - II is true, Statement - II is a correct

explanation of Statement - I

B. Statement - I is true, Statement - II is true, Statement - II is not a correct explanation of Statement - I.

C. Statement - I is true, Statement - II is false

D. Statement - I is false, Statement - II is true.

Answer: C

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125. This question has Statement I and Statement II. Of the four choices given after the Statement, choose the one that best describes the two Statement.

Statement - I : Be_2C on hydrolysis produces CH_4 just like Al_4C_3

Statement - II : Both of them contain C_2^{2-} unit

A. Statement - I is true, Statement - II is true, Statement - II is a correct explanation of Statement - I

B. Statement - I is true, Statement - II is true, Statement - II is not a correct explanation of Statement - I.

C. Statement - I is true, Statement - II is false

D. Statement - I is false, Statement - II is true.

Answer: C

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126. Carbon combines with more electropositive elements when heated to high temperature to form carbides. Carbides are of mainly three types

(i) Salt type carbides : They contain C_2^{2-} or C^{4-} unit

(ii) Covalent carbides : Mainly these are carbides of non-metals such as silicon & boron.

(iii) Interstitial carbides : They are formed by transitional elements & consist of metallic lattices with carbon atom in the interstitial

positions. e.g. WC, VC

Carborundum is

A. SiO_2

B. SiC

C. Be_2C

D. pyrosilicates

Answer: B

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127. Carbon combines with more electropositive elements when heated to high temperature to form carbides. Carbides are of mainly three types

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positions. e.g. WC, VC

Be_2C on hydrolysis produces :

A. CH_4

B. C_2H_2

C. C_4H_4

D. None of these

Answer: A

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128. Match Column-I with Column- II

	Column-I		Column-II
(A)	Colemanite	(P)	$B_3N_3H_6$
(B)	Bauxite	(Q)	$Ca_2B_6O_{11}.5H_2O$
(C)	Borax	(R)	$Al_2O_3.2H_2O$
(D)	Inorganic Benzene	(S)	$Na_2B_4O_7.10H_2O$

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129. Cyclic silicate $Si_3O_9^{x-}$, where x is

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130. In pyrosilicates how many oxygen atoms are shared per tetrahedral units

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131. In B_2H_6 how many hydrogen can be replaced by CH_3 groups.

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132. Why is SiH_4 more reactive than CH_4 ?

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133. $SnCl_2$ gives white precipitate with $HgCl_2$ which turns grey later on, but $SnCl_2$ does not. Why ?

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134. A piece of Sn foil is added to $SnCl_2$ solution for preserving it. Explain.

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135. An aqueous solution of a substance gives a white precipitate on treatment with dilute HCl, which dissolves on heating. On passing H_2S in hot acidic solution a black precipitate is formed. Identify the substance.

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136. $AlCl_3$ fumes in moist air because of :

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137. The stability of +1 oxidation state among Al, Ga, In and TI increases in the sequence

A. $Ga < In < Al < TI$

B. $Al < Ga < In < TI$

C. $TI < In < Ga < Al$

D. $In < TI < Ga < Al$

Answer:

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138. Pyrosilicate ion is

A. SiO_2^{2-}

B. SiO_4^{2-}

C. SiO_4^{6-}

D. SiO_7^{6-}

Answer: D

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139. Name of the alloy of aluminium which is used in aeroplane is

A. duralumin

B. bell metal

C. γ-alloy (gamma alloy)

D. aluminium bronze

Answer: A

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140. Aluminium oxide is not reduced by chemical reactions since

A. reducing agent contaminate

B. the process pollute the environment

C. aluminium oxide is highly stable

D. aluminium oxide is reactive

Answer: C

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141. Which of the following structure is similar to graphite ?

A. BN

B. B

C. B_4C

D. B_2H_6

Answer: A

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142. Which of these is not a monomer for a high molecular mass silicone polymer ?

A. $MeSiCl_3$

B. Me_2SiCl_2

C. Me_3SiCl

D. $PhSiCl_3$

Answer: C

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143. The basic structural unit of silicates is

A. SiO^-

B. SiO_4^{4-}

C. SiO_3^{2-}

D. SiO_4^{2-}

Answer: B

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144. Assertion PbI_4 is a stable compound

Reason iodide stabilizes higher oxidation state.

A. If both Assertion and Reason are true and reason ic correct explanation of Assertion

B. If both Assertion and Reason are true but reason is not correct explanation of Assertion

C. If Assertion is true but Reason is false

D. If both Assertion and Reason are false

Answer: D

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145. Water gas is produced by

A. passing steam over red hot coke

B. passing steam and air over red hot coke

C. burning coke in excess of air

D. burning coke in limited supply of air

Answer: A

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146. Philosopher's wool on heating with BaO at $1100^\circ C$ produce

A. $Ba + ZnCl_2$

B. $BaCdO_2$

C. $BaZnO_2$

D. $BaO_2 + Zn$

Answer: C

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147. The composition of duralumin is

A. $Al94\ \%$, $Mg6\ \%$

B. $Cu56\ \%$, $Zn24\ \%$, $Ni20\ \%$

C. $Cu95\ \%$, $Al5\ \%$

D. $Al95\ \%$, $Cu4\ \%$, $Mn0.5\ \%$, $Mg0.5\ \%$

Answer: D

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148. The molecular formula of cryolite is

A. Na_2FAlF_6

B. Na_3AlF_6

C. Na_3AlF_5

D. Na_2AlF_3

Answer: B

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149. Sindoor is represented by

A. $Pb(NO_3)_2$

B. $PbCO_3Pb(OH)_2$

C. $Pb(OH)_{24}PbCO_3$

D. Pb_3O_4

Answer: D

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150. Correct formula of aluminium nitride is

A. Al_2N_2

B. AlN_3

C. AlN_2

D. AlN

Answer: D

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151. From the Ellingham graphs on carbon, which of the following statement is false ?

A. CO reduces Fe_2O_3 to Fe at less than 983 K

B. CO is less stable than CO_2 at more than 983 K

C. CO reduces Fe_2O_3 to Fe in the reduction zone of blast furnace

D. CO_2 is more stable than CO at less than

983 K

Answer: B

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152. Solder is an alloy lead with

A. Cu

B. Fe

C. Sn

D. Zn

Answer: C

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153. CO_2 goes to air, causes green house effect and gets dissolved in water. What will be effect on soil fertility and pH of the water ?

A. Increase

B. Decrease

C. Remain same

D. None of these

Answer: B

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154. Duralumin is an alloy of

A. Al+Mg

B. Cu+Al

C. Al+Cu+Ni

D. Mg+Al+Mn+Cu

Answer: D

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155. Ammonal used in bombs is a mixture of

A. $Al + KNO_3$

B. $Al + Al_2O_3 + B_2O_3$

C. $Al + Al(NO_3)_3$

D. $Al_2O_3 + C$

Answer: C

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156. Ge (II) compounds are powerful reducing agents whereas Pb (IV) compounds are strong oxidants. It can be because to

A. Pb is more electropositive than Ge

B. ionisation potential of lead is less than that of Ge

C. Ionic radii of Pb^{2+} and Pb^{4+} are larger than those of Ge^{2+} and Ge^{4+}

D. more pronounced inert pair effect in lead than Ge.

Answer: D

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157. Graphite is a soft solid lubricant extremely difficult to melt. The reason for this anomalous behaviour is that graphite

A. is an allotropic form of carbon

B. is a non crystalline substance

C. has carbon atoms arranged in large plates of rings of strongly bonded carbon atoms with weak interplate bonds.

D. has molecule of variable molecular masses like polymers.

Answer: C

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

A. BF_6^{3-}

B. BH_4^-

C. $B(OH)_4^-$

D. BO_2^-

Answer: A

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

A. Three dimensional

B. Linear chain silicate

C. Sheet silicate

D. Pyrosilicate

Answer: D

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160. With respect to graphite and diamond, which of the statement(s) given below is (are) correct ?

A. Graphite is harder than diamond

B. Graphite has higher electrical conductivity than diamond

C. Graphite has higher thermal conductivity than diamond

D. Graphite has higher C-C bond order than diamond

Answer:

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161. Extraction of metal from the ore cassiterite invoices

A. carbon reduction of an oxide ore

B. self-reduction of a sulphide ore

C. removal of copper impurity

D. removal of iron impurity

Answer:

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