Miscellaneous Exercise Question Bank

ONLY ONE OPTION CORRECT TYPE

1. Catenation tendency in group 14 is :

(A) C >> Si > Ge ≃ Pb due to bond energies of C – H > Si – H > Ge – H > Sn – H

(B) C >> Si > Ge ≃ Sn > Pb due to bond energies of C – C > Si – C > Ge – C > Sn – C

(C) C ≃ Si ≃ Ge ≃ Sn ≃ Pb due to bond energies of C – H > Si – H > Ge – H > Sn – H

(D) C >> Si > Ge ≃ Sn > Pb due to bond energies of C – C > Si – Si > Ge – Ge > Sn – Sn

2. $Si \xrightarrow[\text{Conc, }\Delta]{HNO_3/HF} (A) \xrightarrow{HF} (B)$, $(A) \xrightarrow{H_2O} (B) + (C)$

Select the correct option :

(A) (A) is SiF_4 **(B)** (B) is H_2SiF_6 **(C)** (C) is H_4SiO_4 **(D)** All of these

3. Aluminium vessels should not be washed with materials containing washing soda because :

(A) Washing soda is expensive

(B) Washing soda is easily decomposed

(C) Washing soda reacts with aluminium to form soluble aluminate

(D) Washing soda reacts with aluminium to form insoluble aluminium oxide

4. $B_2H_6 + NH_3 \rightarrow$ Addition compound (X) $\xrightarrow{450\,K} Y + Z(g)$

In the above sequence Y and Z are respectively :

(A) borazine, N_2 **(B)** boron, H_2

(C) boron nitride, H_2 **(D)** borazine and hydrogen

5. Aqueous ammonia is used as a precipitating reagent for Al^{3+} ion as $Al(OH)_3$ rather than aqueous NaOH, because :

(A) NH_4^+ is a weak base **(B)** NaOH is a very strong base

(C) NaOH forms soluble $[Al(OH)_4]^-$ ions **(D)** NaOH forms $[Al(OH)_2]^+$ ions

6. $H_3BO_3(s) + \text{aq. NaOH} \xrightarrow{\Delta} (X)$; $H_3BO_3(s) + \text{molten NaOH} \xrightarrow{\Delta} (Y)$.

Compound (X) & (Y) are respectively :

(A) Na_3BO_3, Na_3B **(B)** Na_3BO_3, $NaBO_2$

(C) $Na[B(OH)_4]$, Na_3BO_3 **(D)** Na_3BO_3, $Na[B(OH)_4]$

7. BF_3 on hydrolysis form :

(A) H_3BO_3 **(B)** HBF_4 **(C)** both (A) & (B) **(D)** None of these

8. Which of the following reaction is incorrect ?

(A) $BF_3(g) + F^-(aq) \longrightarrow BF_4^-$ **(B)** $BF_3(g) + 2H_2O \longrightarrow [BF_3OH]^- + H_3O^+$

(C) $BCl_3(g) + 3EtOH(\ell) \longrightarrow B(OEt)_3(\ell) + 3HCl$

(D) $BCl_3(g) + 2C_5H_5N(\ell) \longrightarrow Cl_3B(C_5H_5N)_2(s)$

9. Which of the following reactions lead to chemical inertness :

(A) Lead with conc. H_2SO_4 **(B)** Lead with conc. HCl

(C) Aluminium with conc. HNO_3 **(D)** All of above reactions

10. Which of the following statements regarding ortho boric acid (H_3BO_3) is false ?

(A) It acts as a weak monobasic acid **(B)** It is soluble in hot water

(C) It has a planar structure **(D)** It acts as a tribasic acid

11. Which of the following is a correct match :

I. Potash alum – $K_2SO_4 \cdot Al_2(SO_4)_3 \cdot 24H_2O$

II. Chrome alum – $K_2SO_4 \cdot Cr_2(SO_4)_3 \cdot 24H_2O$

III. Potash alum $K_2SO_4 \cdot Fe_2(SO_4)_3 \cdot 24H_2O$

IV. Ammonium alum – $(NH_4)_2SO_4 \cdot Al_2(SO_4)_3 \cdot 24H_2O$

(A) I, II, III & IV **(B)** I, II & III **(C)** I, II & IV **(D)** Only II & IV

12. TlI_3 is an ionic compound which furnishes any of the following ions :

(A) Tl^+ & I_3^- **(B)** Tl^{3+} & I_3^- **(C)** Tl^{3+} & I^- **(D)** Tl^+ & I^-

13. Which of the following is not formed as product in the reaction ?

$$Na_2B_4O_7 + 2NH_4Cl \xrightarrow{\text{Red hot}}$$

(A) BN **(B)** B_2O_3 **(C)** NaCl **(D)** $B_3N_3H_6$

14. A mixture of ethyl alcohol and boric acid burns with green edged flame. The green edged flame contains :

(A) Triethyl borate **(B)** ethyl boride **(C)** Acetaldehyde **(D)** diborane

15. Which of the following does not form alums :

(A) K^+ **(B)** Ga^{3+} **(C)** Cr^{3+} **(D)** Li^+

16. Ionisation energy 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

17. Which of the following statements is correct ?

(A) $T\ell(NO_3)_3$ act as an oxidising agent

(B) CO_2 is a gas while SiO_2 is solid

(C) PbO_2 is stronger oxidising agent than SnO_2

(D) All are correct

18. $2Al + N_2 \rightarrow X \xrightarrow{H_2O} Y + Z \uparrow$

Correct statement regarding Y

(A) Y is soluble in H_2O

(B) Y is insoluble in H_2O

(C) Y is only basic and does not show acidic behaviour

(D) M.W. of 'Y' is 17

19. Select the incorrect statement :

(A) Silicon does not form an allotrope like graphite because it do not has tendency to form multiple bond.

(B) Catenation tendency is greater in C than in Si.

(C) CO is stable in nature but SiO is not

(D) None of these

20. Which of the following statement about Si is correct ?

(A) Si predominantly forms covalent compounds with oxidation number $+4$.

(B) Ionisation enthalpy of Si is more than that of carbon.

(C) Electron affinity of Si is less than that of carbon.

(D) Si can't show coordination number more than 4.

21. Which of the following is not a property of silicones ?

(A) They are combustible

(B) They are water-repellant

(C) They are polymeric liquids or solids

(D) Their viscosity does not change significantly with rise in temperature

22. The dehydration of malonic acid $CH_2(COOH)_2$ with P_4O_{10} gives :

(A) carbon monoxide **(B)** carbon suboxide

(C) carbon dioxide **(D)** all three

23. Correct statement among the following is :

(A) CNC bond angle in NMe_3 is greater than SiNSi bond angle in $N(SiMe_3)_3$.

(B) Methyl isocyanate $(CH_3 - N = C = O)$ is bent with respect to nitrogen but silyl isocyanate $(SiH_3 - N = C = O)$ is linear with respect to the same.

(C) In trisilyl amine $[(SiH_3)_3N]$ all $N - Si$ bond lengths are longer than the expected $N - Si$ bond length.

(D) All the above statements are correct.

24. Water transported through lead pipes becomes poisonous due to the formation of :

(A) PbO **(B)** PbO_2 **(C)** $Pb(OH)_2$ **(D)** Pb_3O_4

25. When steam is passed over red hot coke, the outgoing gas contains :

(A) Producer gas **(B)** Water gas **(C)** Coal gas **(D)** None of the above

26. In BF_3, the $B - F$ bond length is 1.30Å, when BF_3 is allowed to be treated with Me_3N, it forms an adduct, $Me_3N \rightarrow BF_3$, The bond length of $B - F$ in the adduct is :

(A) Greater than 1.30 Å **(B)** Smaller than 1.30 Å

(C) Equal to 1.30 Å **(D)** None of these

27. When Al is added to KOH solution :

(A) No action takes place **(B)** Oxygen is evolved

(C) Water is produced **(D)** Hydrogen is evolved

ONE OR MORE THAN ONE OPTION CORRECT TYPE

28. Select the correct statement(s).

(A) The graphite is diamagnetic and diamond is paramagnetic in nature.

(B) Graphite acts as a metallic conductor along the layers of carbon atoms.

(C) Graphite is less denser than diamond

(D) C_{60} is called as Buckminster fullerene

29. Boron can be obtained by :

(A) reduction of B_2O_3 by C

(B) reduction of BCl_3 with H_2 at 1270 K

(C) thermal decomposition of boron halides at 1173 K

(D) electrolytic reduction of KBF_4 in KF at 1073 K

30. Which of the following can produce silicon.

(A) Reduction of SiO_2 by carbon **(B)** Reduction of SiO_2 by silicon carbide

(C) Thermal decomposition of SiH_4 **(D)** Thermal decomposition of SiC

31. Which statement(s) is/are correct ?

(A) Al acts as a reducing agent

(B) Al does not react with steam even at higher temperature

(C) Al forms a number of alloys with other metals

(D) Al is ionic in all its compounds

32. Which of the following statements are true ?

(A) Red lead (Pb_3O_4) is diamagnetic and contains both Pb^{2+} and Pb^{4+} ions

(B) Both PbO and PbO_2 are amphoteric in nature.

(C) Stannate and plumbate ions are oxidising agents

(D) Concentrated Nitric acid oxidises red lead into lead dioxide

33. Diborane undergoes unsymmetrical cleavage reactions with :

(A) dimethylamine **(B)** ammonia at low temperature

(C) pyridine **(D)** carbon dioxide

34. Select correct statements :

(A) B_2H_6 is stronger Lewis acid than BF_3 **(B)** BF_3 is weaker Lewis acid than BCl_3

(C) B_2H_6 is not a Lewis acid

(D) B_2H_6 is used for reduction of organic compounds

35. Borax bead test is given by :

(A) An aluminium salt **(B)** A cobalt salt **(C)** A copper (II) salt **(D)** A nickel salt

36. Carbon monoxide is prepared by :

(A) heating formic acid with conc. H_2SO_4

(B) heating potassium ferrocyanide with conc H_2SO_4

(C) heating malonic acid with P_4O_{10}

(D) hydrolysis of Mg_2C_3

37. The following are some statements about graphite :

I. C – C bond length is 1.42 Å

II. Distance between two successive layers is 3.35 Å

III. Bond angle is 60°

The correct statements is/are :

(A) All are correct **(B)** Only I and II **(C)** Only II **(D)** Only III

38. Which of the following are correct :

(A) B_2H_6 is non polar

(B) B_2H_6 undergoes symmetrical cleavage with PF_3, CO and $(C_2H_5)_3N$

(C) B_2H_6 undergoes unsymmetrical cleavage with NH_3, CH_3NH_2, $(CH_3)_2NH$

(D) $BeH_2(s)$, Ga_2Me_6, Al_2Me_6 have two type of bonds (2C – 2e bond as well as 3C – 2e bond)

39. A complex cross-linked polymer (silicone) is formed by :

(A) hydrolysis of $(CH_3)_3SiCl$

(B) hydrolysis of a mixture of $(CH_3)_3SiCl$ and $(CH_3)_2SiCl_2$

(C) hydrolysis of CH_3SiCl_3

(D) hydrolysis of $SiCl_4$

40. Which of the following statements are correct ?

(A) Graphite is a good conductor of electricity because free electrons are spread out in the structure and the adjacent layers are held by weak Vander Waals forces.

(B) In C-60, there are 12 pentagonal and 20 hexagonal faces

(C) Graphite is thermodynamically more stable than diamond

(D) In diamond each carbon undergoes sp^3 hybridisation and is three dimensional

41. The one which can't be prepared by hydrolysis of metal carbide ?

(A) C_4H_4 **(B)** CH_4 **(C)** C_2H_2 **(D)** C_3H_4

42. Select the correct statement about the compound $NO[BF_4]$.

(A) It has 5σ and 2π bonds

(B) Nitrogen-oxygen bond length is higher than nitric oxide

(C) "B-F" bond energy in this compound is more than in BF_3

(D) It is a diamagnetic substance

COMPREHENSION TYPE

Paragraph for Q. 43 to 45

Compound (A) on reaction with iodine in the solvent diglyme gives a hydride (B) and hydrogen gas. The product (B) is instantly hydrolysed by water or aqueous alkali forming compound (C) and liberating hydrogen gas. The compound (C) in aqueous solution behaves as a weak mono basic acid. But in presence of certain organic polyhydroxy compound behaves as a strong monobasic acid. The hydride (B) in air catches fire spontaneously forming oxide which gives coloured beads with transition metal compounds.

43. Which of the following statement is correct for the product (C) ?

(A) It is an odd electron molecule

(B) In water it acts as proton donor

(C) In solid state it have hydrogen bonding

(D) It is a useful primary standard for titrating against acids

***44.** Aqueous solution of product (C) can be titrated against sodium hydroxide using phenolphthalein indicator only in presence of :

(A) cis-1,2 diol **(B)** trans-1,2 diol **(C)** salicylic acid **(D)** propane-1, 3-diol

45. Which of the following statement is correct for hydride (B) ?

(A) One mole of it react with two moles of HCl

(B) It reacts with excess of ammonia at low temperature to form an ionic compound

(C) One mole of its reacts with one mole of trimethylamine

(D) It reacts with methyl alcohol to form a trimethyl compound liberating oxygen gas

Paragraph for Q. 46 to 48

The small size and high charge of Al^{3+} ion gives it a high charge density which is responsible for its tendency to show (a) covalency in its compounds in the gaseous state (b) high hydration energy which stabilizes its compounds in solution, (c) high lattice energy of its compounds in the solid state. Thus aluminium can form both covalent and ionic bond.

Like halides of boron, halides of aluminium do not show back bonding because of increase in size of aluminium. Actually aluminium atoms complete their octets by forming dimers. Thus chloride and bromide of aluminium exists as dimers, both in the vapour state and in polar-solvents like benzene with corresponding boron halides exists as monomer. In boron trihalides the extent of back bonding decreases with increase in size of halogens and thus Lewis acid character increases. All BX_3 are hydrolysed by water but BF_3 shows a different behaviour.

46. The dimeric structure of aluminium chloride disappears when :

(A) it dissolves in water **(B)** it reacts with donor molecules like R_3N

(C) it dissolves in benzene **(D)** (A) & (B) both

47. Which of the following statements are correct ?

(A) All boron trihalides are hydrolysed to boric acid

(B) Anhydrous aluminium chloride is an ionic compound

(C) Aluminium halides make up the electron deficiency by bridging with halides or alkyl groups

(D) None of these

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

(A) it is an ionic compound **(B)** it is not easily hydrolysed

(C) it sublimes at 100°C under vaccum **(D)** it is a strong Lewis base

Paragraph for Q. 49 to 53

"A" is a white crystalline solid. Its aqueous solution is alkaline in nature. It is used in water softening. On heating it swells up to form a puffy mass, B. Strong heating of B gives C. Heating of C with nickel oxide gives a brown bead, D.

Answer the following :

49. The number of moles of water of crystallization present per mole of the compound. A is :

(A) 10 **(B)** 5 **(C)** 7 **(D)** 9

50. The aqueous solution of A is alkaline due to :

(A) The presence of Ca^{2+} ions **(B)** The presence of H_3BO_3

(C) Hydrolysis of $B_4O_7^{2-}$ **(D)** Hydrolysis of CO_3^{2-}

51. When the solution of A is added to hard water, Ca^{2+} are eliminated as :

(A) $CaCO_3$ **(B)** $Ca(BO_6)_2$ **(C)** CaB_4O_7 **(D)** $Ca_2B_6O_{11}$

52. Composition of the substance, B is :

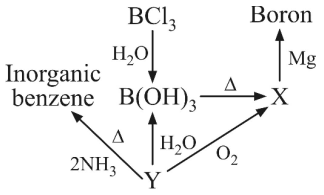
(A) $Na_2B_4O_7$ **(B)** B_2O_3 **(C)** H_3BO_3 **(D)** HBO_2

53. The components of glassy bead. C and brown bead D respectively are :

(A) $NaBO_2$ and NiO **(B)** B_2O_3 and $Ni(BO_2)_2$

(C) $NaBO_2$ and NiB_4O_7 **(D)** B_2O_3 and $NaBO_2$

Paragraph for Q. 54 to 55



54. The compound Y is :

(A) BCl_3 **(B)** BF_3 **(C)** B_2H_6 **(D)** B_2O_3

55. The compound X is :

(A) B_2H_6 **(B)** $[B(OH)_4]^-$ **(C)** B_2O_3 **(D)** $H_2B_4O_7$

Paragraph for Q. 56 to 58

The silicons are organosilicon polymers containing $Si-O-Si$ linkage. They are usually prepared by hydrolysis of alkylchlorosilanes, the silanols formed as intermediates on hydrolysis condense by intermolecular elimination of water with the formation of $Si-O-Si$ linkage

56.

$$-O-Si(CH_3)_2-O-\underset{\displaystyle O}{\underset{|}{Si}}(CH_3)-O-Si(CH_3)_2-O-$$
$$-O-Si(CH_3)_2-O-\underset{\displaystyle O}{\underset{|}{Si}}(CH_3)-O-Si(CH_3)_2-O-$$

The above silicon can be obtained by hydrolysis of which of the following ?

(A) $(CH_3)_3SiCl$ **(B)** $CH_3SiCl_3+(CH_3)_3SiCl$

(C) $(CH_3)_2SiCl_2$ **(D)** $CH_3SiCl_3+(CH_3)_2SiCl_2$

57. Which of the following is not the property of silicone ?

(A) They are thermally stable **(B)** They are having high volatility

(C) They are having water repellent property **(D)** They are electric insulators

58. To get the silicone of $R_3Si-(OSiR_2)_n-SiR_3$; having four $Si-O-Si$ linkages, the unit taken is :

(A) 3 unit of R_3SiCl and 2 unit R_2SiCl_2 **(B)** 3 unit of R_2SiCl_2 and 2 unit R_3SiCl

(C) 2 unit of R_2SiCl_2 and 2 unit R_3SiCl **(D)** 4 unit of R_2SiCl_2 and 2 unit R_3SiCl

Paragraph for Q. 59 to 61

$$\text{Borax} \xrightarrow{H_2SO_4} P \xrightarrow[\text{heating}]{\text{strong}} Q \xrightarrow{Mg/Heat} R \xrightarrow[\Delta]{Cl_2} S \xrightarrow[\text{Ether}]{LiAlH_4} X \xrightarrow[120°C]{NH_3} Y \xrightarrow{200°C} Z$$

(All products from P to Z are related to Boron. The by products are not included)

59. The compound X is :

(A) B_2H_6 **(B)** H_3BO_3 **(C)** B_2O_3 **(D)** Moisson Boron

60. The ionic structure $\left[BH_2(NH_3)_2\right]^+[BH_4]^-$ corresponds to :

(A) Z **(B)** Y **(C)** X **(D)** S

61. The following is called inorganic benzene :

(A) P **(B)** X **(C)** Y **(D)** Z

Paragraph for Q. 62 to 64

Diborane (B_2H_6) on heating with NH_3 at 450 K produces a compound called Borazole (or) Borazine. It is called inorganic benzene (or) triborane triamine. It is a colourless liquid. It has cyclic structure.

62. Number of sp^2-sp^2 overlaps in Borazine :

(A) 4 **(B)** 3 **(C)** 6 **(D)** 8

63. B_2H_6 on reaction with CO forms :

(A) $[BH_3 \cdot CO]$ **(B)** $BC + CO_2$ **(C)** $BC + H_2O$ **(D)** $B + CO_2 + H_2O$

64. $B_2H_6 + HCl \xrightarrow{\text{Anhydrous } AlCl_3} X + H_2\uparrow$ 'X' is :

(A) $B_2H_4Cl_2$ **(B)** $B_2H_4Cl_4$ **(C)** B_2H_5Cl **(D)** $B_2Cl_6 + H_2$

ASSERTION & REASON TYPE

The following questions consist of two statements one labelled ASSERTION (A) and the another labelled REASON (R). Select the correct answers to these questions from the codes given below :

(A) Both Assertion and Reason are true and Reason is correct explanation of Assertion

(B) Both Assertion and Reason are true and Reason is not correct explanation of Assertion

(C) Assertion is true but Reason is false

(D) Assertion is false but Reason is true

65. **Assertion :** Al shows passivity with conc. HNO_3

Reason : Al forms a protective layer of Al_2O_3 with conc. HNO_3

66. **Assertion :** Al liberates H_2 gas with both NaOH and HCl

Reason : Al is amphoteric metal

67. **Assertion :** Alums are acidic in nature
Reason : Due to cationic Hydrolysis

68. **Assertion :** Among IIIA group elements boron has highest melting point
Reason : Boron exists as a giant covalent polymer

69. **Assertion :** Thallium compounds are stable in $+1$ oxidation state
Assertion : The $6s^2$ electrons in Tl show reluctanace in participation in bond formation

70. **Assertion :** BF_3 undergoes partial hydrolysis.
Reason : Due to strong back bonding in BF_3 only two fluoride groups gets hydrolysed by H_2O.

71. **Assertion :** Diborane has two types of hydrogens
Reason : By methylation only four hydrogen atoms of diborane are substituted forming $Me_4B_2H_2$

72. **Assertion :** Borazole is inorganic benzene
Reason : Benzene and Borazole are isoelectronic and show structural similarity

73. **Assertion :** When diborane is heated with NH_3 at 200°C, borazole is obtained
Reason : Borazole is known as inorganic benzene

74. **Assertion :** Boron always forms covalent bond
Reason : The small size and high charge on boron favours formation of covalent bond

75. **Assertion :** Among the trihalides of Boron with different halogen atoms, the Lewis acid character follows the order $-BF_3 < BCl_3 < BBr_3$
Reason : $p\pi - p\pi$ back bonding is maximum in the case of fluorine due to its small size and more interelectronic repulsions.

76. **Assertion :** BCl_3 can be hydrolysed to form H_3BO_3.
Reason : Boron having vacant 2p-orbital can accept a lone pair from H_2O molecule

77. **Assertion :** Boric acid is a tribasic acid
Reason : Boric acid contains three hydroxyl groups

78. **Assertion :** C_3O_2 has linear structure
Reason : Each carbon atom in C_3O_2 is sp-hybridized

79. **Assertion :** $SiCl_4$ reacts with water but CCl_4 does not react with water
Reason : $SiCl_4$ is ionic but CCl_4 is covalent

80. **Assertion :** CO_2 is a gas, while SiO_2 is solid
Reason : Carbon has no vaccant 'd' orbitals but silicon has

81. **Assertion :** The central carbon atom in $F_2C = C = CF_2$ and both carbon atoms in both $F_2B - C \equiv C - BF_3$ are sp-hybridized.
Reason : Both molecules are planar.

82. **Assertion :** Carbonate and silicates are isostrucutral
Reason : Carbon and silicon have same number of valence electrons

83. **Assertion :** Bond dissociation energy of $B-F$ bond in BF_3 molecule is lower than $C-F$ bond in CF_4 molecule.

Reason : Atomic size of B-atom is larger than that of C-atom.

84. **Assertion :** Diamond is extremely hard and non volatile substance

Reason : In diamond strong C-C bonding is present throughout the crystal

85. **Assertion :** The value of x of $(Si_4O_{12})^{x-}$ is 8

Reason : In $[Si_4O_{12}]^{x-}$ every SiO_4 tetrahedra unit having 2 oxygen shared and 2 oxygen unshared.

MATRIX MATCHING TYPE

86. **Match the List-1 and List-II**

	List-1		**List-2**
(1)	Al_2O_3	**(P)**	Dimer
(2)	$AlCl_3$	**(Q)**	Non-metal
(3)	B	**(R)**	Acidic
(4)	B_2O_3	**(S)**	Amphoteric

The correct match is :

	1	**2**	**3**	**4**		**1**	**2**	**3**	**4**
(A)	S	R	Q	P	**(B)**	P	S	R	Q
(C)	Q	R	S	P	**(D)**	S	P	Q	R

87. **Match the List-1 and List-II**

	List-1		**List-2**
(1)	Boron Nitride	**(P)**	Inorganic Benzene
(2)	Borazole	**(Q)**	Inorganic graphite
(3)	Ruby	**(R)**	Graphite
(4)	Black lead	**(S)**	Aluminium oxide

The correct match is :

	1	**2**	**3**	**4**		**1**	**2**	**3**	**4**
(A)	S	R	Q	P	**(B)**	P	S	R	Q
(C)	Q	R	S	P	**(D)**	Q	P	S	R

88. Match List (Fuels) with List II (Composition) and select the correct answer using the codes given below the lists :

	List-I (Fuels)		**List-II (Composition)**
1.	Water gas	**i.**	A mixture of CO and N_2
2.	Producer gas	**ii.**	Methane
3.	Coal gas	**iii.**	A mixture of CO and H_2
4.	Natural gas	**iv.**	A mixture of CO, H_2, CH_4 and CO_2

	1	2	3	4		1	2	3	4
(A)	iii	i	iv	ii	**(B)**	iii	i	ii	iv
(C)	i	iii	iv	ii	**(D)**	iii	ii	iv	i

89. Match the following :

	Column I		**Column-II**
(A)	B_2H_6	**(p)**	tetrahedral hybridisation
(B)	Al_2Cl_6	**(q)**	trigonal hybridisation
(C)	$BeCl_2$ (solid)	**(r)**	Empty orbital(s) of central atom participate in hybridization
(D)	$N(SiH_3)_3$	**(s)**	$p\pi - d\pi$ bonds

90. Match the following :

	Column I		**Column-II**
(A)	$Al_2(C_2)_3 + H_2O \longrightarrow$	**(p)**	One of the products contains both σ and π -bond
(B)	$CH_2(COOH)_2 + P_4O_{10} \longrightarrow$	**(q)**	Hydrolysis
(C)	$CH_3SiCl_3 + H_2O \longrightarrow$	**(r)**	Dehydration
(D)	$SnCl_2 \cdot 2H_2O \xrightarrow[\text{standing}]{\text{on}}$	**(s)**	Complex crosslinked polymer

INTEGER TYPE

91. In borax the number of boron atoms which are sp^2 hybridised is :

92. Which of the following are Lewis acid B_2H_6, BCl_3, CO_2, CF_4, Al_2Cl_6, AlF_3, $SiCl_4$

93. Consider the structure of Al_2Me_6 compound and find the total number of atoms that are sp^3 hybridised.

94. How many of the following compounds cleave diborane symmetrically ?
CH_3NH_2, $(CH_3)_2NH$, $(CH_3)_3N$, CO, $(CH_3)_2O$, NH_3

95. How many of the following order of bond energies are correct ?

(i)	C – C > Si – Si	**(ii)**	C – O > Si – O	**(iii)**	C – F > Si – F
(iv)	C – H > Si – H	**(v)**	Si – Cl > C – Cl	**(vi)**	Si – Si > Ge – Ge

96. Which of the following oxides are amphoteric in nature.
PbO, PbO_2, SnO, SnO_2, Al_2O_3, BeO, Ga_2O_3, B_2O_3.

97. Find the number of hydroxyl group in borax.

98. How many compounds are acidic.
B_2O_3, Tl_2O_3, $Al(OH)_3$, $Ga(OH)_3$, Al_2O_3, Ga_2O_3, $Sr(OH)_2$, Cr_2O_3, CO, SiO_2

99. Number of compounds producing gas on hydrolysis (with H_2O) is _____
Al_4C_3, BaC_2, Mg_2C_3, SiC, B_2H_6, Fe_3C

100. SiF_4 on hydrolysis gives X and Y. $SiCl_4$ on hydrolysis gives X and Z. Covalency of central atom in Y is C_1 and that of halogen in Z is C_2. Then $C_1 + C_2$ is :