Date Planned : __ / __ / __	Daily Tutorial Sheet-3	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	JEE Advanced Archive	Exact Duration :_____

31. Name 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

32. Starting from $SiCl_4$, prepare the following in steps not exceeding the number given in parenthesis (give reactions only) **(2005)**

(i) Silicon (1 step)

(ii) Linear silicon containing methyl group only (2 steps)

(iii) Na_2SiO_3 (3 steps)

33. Match the following : **(2006)**

Column-I		Column-II	
(A)	$Bi^{3+} \longrightarrow (BiO)^+$	**(p)**	Heat
(B)	$[AlO_2]^- \longrightarrow Al(OH)_3$	**(q)**	Hydrolysis
(C)	$SiO_4^{4-} \longrightarrow Si_2O_7^{6-}$	**(r)**	Acidification
(D)	$(B_4O_7^{2-}) \longrightarrow [B(OH)_3]$	**(s)**	Dilution by water

34. $B(OH)_3 + NaOH \rightleftharpoons NaBO_2 + Na[B(OH)_4] + H_2O$

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

35. **Statement-I :** Boron always forms covalent bond. **(2007)**

Statement-II : The small size of B^{3+} favours formation of covalent bond.

(A) Statement-I is True, Statement-II is True and Statement-II is a correct explanation for Statement-I

(B) Statement-I is True, Statement-II is True and Statement-II is NOT a correct explanation for Statement-I

(C) Statement-I is True, Statement-II is False

(D) Statement-I is False, Statement-II is True

36. **Statement-I :** In water, orthoboric acid behaves as a weak monobasic acid. **(2007)**

Statement-II : In water, orthoboric acid acts as a proton donor.

(A) Statement-I is True, Statement-II is True and Statement-II is a correct explanation for Statement-I

(B) Statement-I is True, Statement-II is True and Statement-II is NOT a correct explanation for Statement-I

(C) Statement-I is True, Statement-II is False

(D) Statement-I is False, Statement-II is True

37. H_3BO_3 is : **(2007)**

(A) monobasic and weak Lewis acid **(B)** monobasic and weak Bronsted acid

(C) monobasic and strong Lewis acid **(D)** tribasic and weak Bronsted acid

38. **Statement-I** : Pb^{4+} compound are stronger oxidizing agent than Sn^{2+} compounds. **(2008)**

Statement-II : The higher oxidation states for the group 14 elements are more stable for the heavier members of the group due to 'inert pair effect".

(A) Statement-I is True, Statement-II is True and Statement-II is a correct explanation for Statement-I

(B) Statement-I is True, Statement-II is True and Statement-II is NOT a correct explanation for Statement-I

(C) Statement-I is True, Statement-II is False

(D) Statement-I is False, Statement-II is True

***39.** In the reaction, $2X + B_2H_6 \longrightarrow [BH_2(X)_2]^+ [BH_4]^-$. The amine(s) X is/are : **(2009)**

(A) NH_3 **(B)** CH_3NH_2 **(C)** $(CH_3)_2NH$ **(D)** $(CH_3)_3N$

40. The value of n in the molecular formula $Be_nAl_2Si_6O_{18}$ is : **(2010)**

***41.** With respect to graphite and diamond, which of the statement (s) given below is/are correct. **(2012)**

(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

***42.** The correct statement(s) for orthoboric acid is/are : **(2014)**

(A) It behaves as a weak acid in water due to self ionization

(B) Acidity of its aqueous solution increases upon addition of ethylene glycol

(C) It has a three-dimensional structure due to hydrogen bonding

(D) It is a weak electrolyte in water

43. Three moles of B_2H_6 are completely reacted with methanol. The number of moles of boron containing products formed is _____. **(2015)**

44 Under hydrolytic conditions, the compounds used for preparation of linear polymer and for chain termination, respectively, are : **(2015)**

(A) CH_3SiCl_3 and $Si(CH_3)_4$ **(B)** $(CH_3)_2SiCl_2$ and $(CH_3)_3SiCl$

(C) $(CH_3)_2SiCl_2$ and CH_3SiCl_3 **(D)** $SiCl_4$ and $(CH_3)_3SiCl$

45. The increasing order of atomic radii of the following Group 13 elements is : **(2016)**

(A) Al < Ga < In < Tl **(B)** Ga < Al < In < Tl

(C) Al < In < Ga < Tl **(D)** Al < Ga < Tl < In

46. The crystalline form of borax has : **(2016)**

(A) tetranuclear $[B_4O_5(OH_4)]^{2-}$ unit **(B)** all boron atoms in the same plane

(C) equal number of sp^2 and sp^3 hybridized boron atoms

(D) one terminal hydroxide per boron atom

47. Among the following, the correct statement(s) is/(are) : **(2017)**

(A) $Al(CH_3)_3$ has the three – centre two-electron bonds in its dimeric structure

(B) BH_3 has the three-centre two-electron bonds in its dimeric structure

(C) $AlCl_3$ has the three-centre two-electron bonds in its dimeric structure

(D) The Lewis acidity of BCl_3 is greater than that of $AlCl_3$

48. A tin chloride Q undergoes the following reactions (not balanced)

$$Q + Cl^- \longrightarrow X$$

$$Q + Me_3N \longrightarrow Y$$

$$Q + CuCl_2 \longrightarrow Z + CuCl$$

X is a monoanion having pyramidal geometry. Both Y and Z are neutral compounds. Choose the correct options(s) : **(2019)**

(A) The central atom in Z has one lone pair of electrons

(B) The oxidation state of the central atom in Z is $+2$

(C) The central atom in X is sp^3 hybridized

(D) There is a coordinate bond Y