16.(A) Due to non-availability of d-orbitals, boron in unable to expand its octet. Therefore, the maximum covalency of boron cannot exceed 4.

17.(C) Silicon exist as covalent crystal.

18.(A)

Silica gel	-	Drying agent
Silicon	-	Transistor
Silicone	-	Sealant
Silicate	-	Ion-exchanger

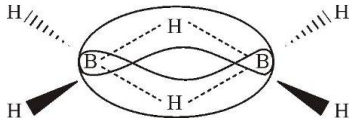
19.(B) In graphite, only three valence electrons are involved in bonding and one electron remain free giving electrical conductivity. In diamond, all the four valence electrons are covalently bonded hence, insulator.

Diamond is better thermal conductor than graphite. Electrical conductivity is due to availability of free electrons, thermal conduction is due to transfer of thermal vibration energy from one atom to another atom. A compact and precisely aligned crystals like diamond thus facilitate better movement of heat.

20.(B) Structure of B_2H_6

$2 \to 3$ centred $2e^-$ bonds (banana bonds)

$4 \to 2$ centred $2e^-$ bonds (with terminal H)



21.(C) Al usually exists in $+3$ state whereas thallium exists in $+1$ and $+3$ states due to inert pair effect.

22.(B) CCl_4 can not get hydrolysed due to absence of vacant *d* orbitals.

23.(B) The tendency of catenation decreases from top to bottom in carbon family.

24.(B) Strength of $p\pi - p\pi$ bond decreases from top to bottom in carbon family.

25.(D) Due to inert pair effect

26.(B) Silicones are polymers with hydrophobic character, are biocompatible, are resistant to oxidation and used as grease.

27.(D) Fact

28.(C) C_{60} contains 12 Pentagons of 20 hexagons

29.(B) Consider the following reactions:

$$B_2H_6 + \frac{3}{2}O_2 \xrightarrow{\text{Oxidation}} B_2O_3 + 3H_2\uparrow$$

$$B_2H_6 + 6H_2O \xrightarrow{\text{Hydrolysis}} 2H_3BO_3 + 6H_2\uparrow$$

30.(D) $C-C$ bond length will be maximum in diamond due to sp^3 Hybrid state of the carbon atoms.

31.(A) 12 five membered rings in C_{60} and 4 number trigons (triangles) in P_4 (white) phosphorous.

32.(A) Boron trioxide (B_2O_3) is acidic

Al_2O_3 and Ga_2O_3 amphoteric

In_2O_3 and Tl_2O_3 are basic

33.(B) Kieselghur is an amorphous form of slica.

34.(A) $\underset{(A)}{B_3N_3H_3Cl_3} + LiBH_4 \longrightarrow B_3N_3H_6 + LiCl + BCl_3$

$\underset{(A)}{B_3N_3H_3Cl_3} + 3\underset{(C)}{MeMgBr} \longrightarrow B_3N_3H_3(CH_3)_3 + 3MgBrCl$