

Exam. Code : 103202

Subject Code : 1256

B.A./B.Sc. 2nd Semester

CHEMISTRY

(Inorganic Chemistry—II)

Time Allowed—2 Hours] [Maximum Marks—35

Note :— There are *eight* questions of equal marks.
Candidates are required to attempt any *four* questions.

1. (a) Why Boron and Silicon show similar properties ? Explain.
(b) Why PbBr_4 and PbI_4 do not exist ?
(c) Discuss hydride formation of p-block elements and compare the acidic strength of these hydrides.
2. (a) What are electron deficient compounds ? How do you account for the structure of diborane in terms of three-centre electron pair bond ?
(b) Explain the structure and geometry of SO_2 and SO_3 molecules on the basis of hybridization concept.
3. (a) Compare the similarities of alkali metals with alkaline earth metals with regard to the following properties :
 - (i) Reducing behavior
 - (ii) Ionic radii
 - (iii) Melting and boiling points.

- (b) Alkali metals are good reducing agents. Explain.
- (c) How do alkali metals react with water ?
- (d) Why LiCl is covalent and NaCl is ionic in nature ?
4. (a) Explain HSAB principle. Discuss its applications in detail.
- (b) What are Lewis acids ? Arrange the following in the order of decreasing base strength :
 BCl_3 , BI_3 , BF_3 .
- (c) Define base according to LUX-Flood concept.
5. (a) Write down one method for the preparation of tetrasulfurtetranitride and draw its structure.
- (b) Write a short note on fluorocarbon.
- (c) Discuss basic properties of halogens.
6. (a) Draw the structures of following silicates :
 (i) SiO_4^{2-}
 (ii) $\text{Si}_2\text{O}_7^{6-}$
 (iii) $(\text{SiO}_3^{2-})_n$
 (iv) $(\text{Si}_4\text{O}_{11}^{6-})_n$
- (b) What are phosphazenes ? Discuss the nature of bonding in triphosphazenes.
7. (a) Compare the following properties of first transition metal series with second and third transition series :
 (i) Oxidation state
 (ii) Geometry of complexes.

- (b) Assign the reasons for the following :
- (i) The melting point of d-block elements in a series reach a maximum upto the middle and thereafter show a decrease.
- (ii) Transition elements in zero or low oxidation states only form complexes with weak ligands (like CO, NO etc.).
- (iii) Transition elements show variable oxidation states.
8. (a) How is the magnetic behavior of third row transition elements differ from the elements of first and second row transition series ? Explain with suitable examples.
- (b) Why transition elements have a great tendency to form complexes ? Explain.