

Exam. Code : 103202

Subject Code : 1324

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

CHEMISTRY (Inorganic Chemistry-II)

Time Allowed—3 Hours]

[Maximum Marks—35

PART-A

Note :- All the questions are compulsory. Each question carries 1 mark. The maximum length of answer can be **one-third** of a page.

1. Draw the structure of nitrogen pentaoxide molecule.
2. What are fullerenes ?
3. Except for beryllium, dipositive ions of alkaline earth metals are formed readily. Explain why.
4. What are Lewis acids ? Arrange the following in the order of decreasing base strength : BCl_3 , BI_3 , BF_3 .
5. Comment on the statement "All Arrhenius acids are also Bronsted acids but all Arrhenius bases are not Bronsted bases".
6. Zinc, cadmium and mercury are not included in d-block elements. Why ?
7. Cu^{2+} ions are coloured and paramagnetic while Zn^{2+} ions are colourless and diamagnetic. Explain.
8. Mercury is a liquid metal. Explain.

PART-B

Note :- Attempt any **two** questions from each Section. Each question carries **4.5** marks. The maximum length of answer can be up to **5** pages.

SECTION-I

9. Discuss in detail the reason as to why the first member of each group and the elements of the second short period differ from rest of the elements in their respective group.
10. Explain the following :
- (a) Radius of chloride ion is larger than that of chlorine atom.
 - (b) First ionization energy of nitrogen is more than that of oxygen.
 - (c) Electron affinity of chlorine is more than that of fluorine.
11. Discuss the structure of borazine. Explain why it is more reactive than benzene.

SECTION-II

12. Compare the similarities of alkali metals with alkaline earth metals with regard to following properties :
- (a) Reducing behaviour
 - (b) Ionic radii
 - (c) Melting and boiling points.

13. Based on the tetrahedral structure of SiO_4^{2-} , describe the structure of various types of silicates.
14. What are silicones ? Write down their most common method of preparation and brief account of applications in industry.

SECTION-III

15. How does the magnetic behaviour of third row transition elements differ from the elements of first and second row transition series ? Explain with suitable example.
16. Why do transition elements have a great tendency to form complexes ? Explain.
17. Compare the following properties of first transition metal series with second and third transition series :
 - (a) Oxidation state
 - (b) Geometry of complexes
 - (c) Metal-metal bonding.