

Exam. Code : 103202

Subject Code : 1254

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

CHEMISTRY (INORGANIC CHEMISTRY—A)

Time Allowed—3 Hours]

[Maximum Marks—35

Note :- Attempt **five** questions selecting at least **one** question from each Section (A-D). The fifth question may be attempted from any Section.

SECTION—A

- I. (a) What is meant by Diagonal Relationship ? Explain giving example of two diagonally related elements. 3
- (b) Explain inert pair effect taking suitable examples of elements from group 14 of periodic table. 2
- (c) The solution of $B(OH)_3$ in water acts as a weak acid. Explain. 2
- II. (a) What is Inorganic Benzene ? Draw and explain its structure. 3
- (b) Give reason why tetrahalides of carbon cannot be hydrolysed by water under normal conditions, but tetrahalides of silicon are easily hydrolysed. 2.5
- (c) Which characteristics of nitrogen make it different from rest of the elements of group 15 ? 1.5

SECTION—B

- III. (a) Why do alkali metals give paramagnetic and blue solutions in liquid ammonia? 3
- (b) Why does beryllium differ so much from the rest of the alkaline earth metals? Discuss the main points of difference. 4
- IV. (a) What do you understand by Lewis definition of acids and bases? Give examples and discuss limitations of this concept? 5
- (b) What is an acid and base according to Lowry-Bronsted concept. 2

SECTION—C

- V. (a) What do you mean by 'carbides'? How salt like carbides are further classified according to the hydrocarbon they produce on hydrolysis? 3
- (b) Draw the structures of basic units of Orthosilicates and Pyrosilicates. 3
- (c) What is the formula of basic unit of Silicones? 1
- VI. (a) Explain the structure and hybridisation of interhalogen IF_7 . 3
- (b) What are fluorocarbons? Mention two industrially important fluorocarbons. 2
- (c) Explain briefly the nature of bonding in triphosphazenes. 2

SECTION—D

- VII. (a) Give the outer electronic configuration of V^{4+} and Mn^{4+} ions. 2
- (b) Why Sc^{3+} ions are white in colour ? 1
- (c) How elements of 3d series are different in properties from their analogues of 4d and 5d series ? Discuss in terms of ionic radius, oxidation states and magnetic behaviour. 4
- VIII.(a) Why are Second Ionisation Energies of Cr and Cu exceptionally high ? 2
- (b) How do the transition metals act as catalysts ? Give example of any two such catalysts. 3
- (c) What is Paramagnetism ? Calculate in Bohr Magneton the expected magnetic moment for Co^{2+} ion. 2