

(6 pages)

Reg. No. :

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M.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2010.

First Semester

Chemistry

Paper I — INORGANIC CHEMISTRY – I

(For those who joined in July 2008 and afterwards)

Time : Three hours

Maximum : 75 marks

PART A — ($10 \times 1 = 10$ marks)

Answer ALL questions.

1. Predict the molecular geometry including expected distortions for BrF_3 and SF_4 .
2. Define apicophilicity with a suitable example.
3. How many Cs^+ ions and how many Cl^- ions are in the CsCl unit cell?

4. How is F-centre formed? Explain the effect of F centre on properties of solids.
5. Explain Hall effect.
6. Among diamond and graphite which would conduct electricity? Why?
7. Explain the structure of metasilicates (pyroxenes).
8. What is heterocatenation? Illustrate with an example.
9. Give a method of separation of plutonium from fission products.
10. What are shift reagents? Give an example.

PART B — ($5 \times 5 = 25$ marks)

Answer ALL questions choosing either (a) or (b).

11. (a) Explain Walsh diagrams of BeH_2 molecule.

Or

- (b) Discuss the isomerism in five-coordinate complexes with suitable example.

18. (a) Discuss how non-stoichiometric defects affect the physical properties of solids.

Or

- (b) Discuss how band theory explains conduction in metals.

19. (a) Discuss the different types of structures found in silicates.

Or

- (b) Discuss the structural features of isopoly anion $[\text{Mo}_7\text{O}_{24}]^{6-}$ and octachlorodirhenate(III) ion, $\text{Re}_2\text{Cl}_8^{2-}$.

20. (a) (i) What is characteristic about the coordination number of lanthanide ions? Explain with suitable example.
(ii) Discuss the use of ion-exchange methods for the separation of lanthanide ions.

Or

- (b) (i) Sketch the variation of the magnetic susceptibility with atomic number for the lanthanide ions. Comment on the graph.
(ii) Discuss the electronic spectra of actinides.
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