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Reg. No. : .....

Name : .....

Second Semester M.Sc. Degree Examination, September 2022

Chemistry / Analytical Chemistry / Polymer Chemistry

CH/CL/PC 221- INORGANIC CHEMISTRY -II

(2020 Admission Onwards)

Time : 3 Hours Max. Marks : 75

SECTION – A

Answer **any two** sub-questions among (a), (b), or (c) from each question.
Each sub-question carries **2** marks

1. (a) What is d-d transition? What is its impact?
   (b) What is difference between Orgel diagram and Tanabe Sugano diagram?
   (c) What is meant by spin state cross over?
2. (a) Discuss the reciprocal lattice concept.
   (b) What are different types of voids formed in close packed structures?
   (c) What is the reason for Schottky defect?
3. (a) Describe the band theory of solids.
   (b) Differentiate between the properties of intrinsic and extrinsic semiconductors.
   (c) What is photovoltaic effect? What are its uses?
4. (a) What is Styx number? What is its significance?
   (b) Discuss the synthesis and applications of phosphorus sesquisulfide.
   (c) What are carboranes? Where do you find applications for carboranes?

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5. (a) Discuss the uses of lanthanide complexes as reagents.

(b) Discuss the splitting of 'f' orbital in cubic ligand field.

(c) What are the main components obtained from the beaches of Kerala? Discuss.

(10 × 2 = 20 Marks)

SECTION – B

Answer either (a) or (b) of each question. Each question carries **5** marks

6. (a) Describe the Gouy's method for the determination of magnetic moment.

(b) Briefly explain the temperature dependence of magnetism of metal complexes.

7. (a) Describe the rotating crystal X-ray diffraction method. Discuss its applications.

(b) Discuss the colour centres in alkali halide crystals.

8. (a) Briefly explain the effect of temperature on conductivity of solids.

(b) What is meant by doping? How is carried out? What are its advantages?

9. (a) What are phosphazines? Discuss the various types of phosphazines.

(b) Discuss the topological approach to boron hydride structure?

10. (a) Discuss the separation techniques used in the extraction of lanthanides

(b) Compare the properties of lanthanides and actinides.

(5 × 5 = 25 Marks)

SECTION – C

Answer **any three** questions. Each question carries **10** marks.

11. Explain the magnetic properties of coordination compounds.

12. Explain the crystal structures of Zinc blend and Wurtizite.

13. What is piezoelectricity? How is it differing from pyroelectricity? Discuss the applications of piezoeolectric and pyroelectrics.

14. Explain the structure, bonding and reactions of diborane.

15. Explain the occurrence, extraction and general properties of actinides.

(3 × 10 = 30 Marks)
