

B.Sc. Semester - 5 (CBCS) Examination

July-2025 (Old Course)

INORGANIC AND INDUSTRIAL CHEMISTRY (CORE)

Time: 2:30 Hours

Marks: 70

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate marks.

- Que.1(A) Answer the following question. (04)**
1) Discuss four applications of Crystal field theory.
- Que.1(B) Answer the following questions. (Any two) (10)**
1) Give the difference between High spin and Low spin complexes.
2) Discuss the factors affecting Crystal field splitting energy.
3) Explain hybridization, structure and magnetic momentum of two ML₄ type complex.
- Que.2(A) Answer the following question. (04)**
1) Write a note on IR spectroscopy of metal nitrosyls.
- Que.2(B) Answer the following questions. (Any two) (10)**
1) Define 18-electron Rule and Effective Atomic Number with two examples each.
2) Explain the structure of Dimanganese decacarbonyl.
3) Describe preparation and properties of sodium nitroprusside and brown-ring complex.
- Que.3(A) Answer the following question. (04)**
1) Write a note on Momentum operator.
- Que.3(B) Answer the following questions. (Any two) (10)**
1) Derive energy equation of a particle in one dimensional box and define zero-point energy.
2) Explain any ten raw materials used in the manufacture of glass.
3) Describe any five types of glass in detail.
- Que.4(A) Answer the following question. (04)**
1) Discuss the raw materials used in the manufacture of Portland cement and write the function of ingredients of cement.
- Que.4(B) Answer the following questions. (Any two) (10)**
1) Write a note on setting and hardening of Portland cement along with all the chemical reactions involved.
2) Explain any ten properties of cement in detail.
3) What is RCC? Write its advantages and uses. Explain decay and curing of concrete briefly
- Que.5(A) Answer the following question. (04)**
1) Write nutrient function of Nitrogen, Phosphorous, Potassium and Calcium in plant growth.
- Que.5(B) Answer the following questions. (Any two) (10)**
1) Discuss the manufacture of mono and diammonium phosphate with diagram.
2) Explain production of Urea from ammonium carbide with diagram.
3) Describe any three potassium fertilizers in detail.
