

B.Sc. Semester - 5 (Remedial) (CBCS) Examination**March/April-2022 (NEW 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.

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- Que-1 (A) **Answer the following question.** (04)
1. Give Normalization of wave function of the particle in a one dimensional box.
- Que-1 (B) **Answer any two questions out of three.** (10)
1. Discuss structure of $\text{Fe}(\text{CO})_5$.
2. Derive the normalized wave function for a particle moving in three dimensional box.
3. Discuss metal nitrosyls containing NO^+ as a ligand.
- Que-2 (A) **Answer the following question.** (04)
1. Write note on role of micro nutrients in plant growth.
- Que-2 (B) **Answer any two questions out of three.** (10)
1. Discuss different types of cement (any ten).
2. Explain Stengel process with process flow diagram for production of ammonium nitrate.
3. Discuss setting and hardening of Portland cement.
- Que-3 (A) **Answer the following question.** (04)
1. Prove that $[\text{NiCl}_4]^{-2}$ is tetrahedral while $[\text{Ni}(\text{CN})_4]^{-2}$ is square planar.
- Que-3 (B) **Answer any two questions out of three.** (10)
1. Explain raw materials used for manufacturing of glass. (Any ten).
2. Discuss manufacturing of cotton seed oil by solvent extraction method.
3. Explain splitting of d-orbitals in octahedral field with CFSE.
- Que-4 (A) **Answer the following question.** (04)
1. Write note on 18 electron rule.
- Que-4 (B) **Answer any two questions out of three.** (10)
1. Draw the structure and write number of bridged and terminal CO group in $\text{Ru}_3(\text{CO})_{12}$ & $\text{Ir}_4(\text{CO})_{12}$.
2. Discuss factors affecting the crystal field splitting energy.
3. Discuss manufacturing of triple super phosphate with flow diagram.
- Que-5 (A) **Answer the following question.** (04)
1. Differentiate: High spin and Low spin octahedral complexes.
- Que-5 (B) **Answer any two questions out of three.** (10)
1. Write note on Degeneracy.
2. Discuss manufacturing of Portland cement with reactions.
3. Discuss different types of glass. (Any ten).
