

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

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- Q.1(A) Answer the following question. (04)
(1) Give arrangement of d^1 to d^{10} electrons in t_{2g} and e_g octahedral high spin complex with CFSE.
- Q.1(B) Answer the following questions. (Any two) (10)
(1) Discuss factors affecting on the crystal field splitting energy.
(2) CFSE value of $[\text{Co}(\text{CN})_6]^{-3}$ is -26520 cm^{-1} and d orbital splitting energy is 34800 cm^{-1} . Find out pairing energy (P).
(3) Discuss splitting of d-orbital in tetrahedral field.
- Q.2(A) Answer the following question. (04)
(1) Explain classification of metal carbonyls.
- Q.2(B) Answer the following questions. (Any two) (10)
(1) Discuss the nature of M-CO bond in metal carbonyls.
(2) Discuss structure of $\text{Mn}_2(\text{CO})_{10}$.
(3) Explain the importance of IR spectra in study of metal carbonyls.
- Q.3(A) Answer the following question. (04)
(1) Find out the degeneracy of a particle moving in a cubic box length at the energy level $E = 9h^2/8ma^2$.
- Q.3(B) Answer the following questions. (Any two) (10)
(1) Discuss different types of glass (any ten).
(2) Explain raw materials used for manufacture of glass.
(3) Derive the normalized wave function for a particle moving in one dimensional box.
- Q.4(A) Answer the following question. (04)
(1) Write note on RCC.
- Q.4(B) Answer the following questions. (Any two) (10)
(1) Discuss ISI specification of cement.
(2) Explain manufacturing of Portland cement.
(3) Explain properties of cement.
- Q.5(A) Answer the following question. (04)
(1) Explain classification of fertilizers.
- Q.5(B) Answer the following questions. (Any two) (10)
(1) Describe manufacture of normal super phosphate by Den process.
(2) Explain Sindri method for the production of Urea.
(3) Discuss Prilling method for the production of ammonium nitrate with process flow diagram.
