

B.Sc. Semester - 5 (Remedial) (CBCS) Examination
Feb/Mar. -2021 (OLD COURSE)
INORGANIC AND INDUSTRIAL CHEMISTRY(CORE)

Time: 1:30 Hours

Marks: 42

Instructions:

1. Figures to the right indicate marks.
2. There are five questions in the question paper.
3. Answer any three of the following questions.

- Q.1(A) Answer the following question. (04)
 1. Discuss splitting of d- orbitals in tetrahedral ligand field.
- Q.1(B) Answer any two questions out of three (10)
 1. Discuss the factors affecting splitting energy Δ .
 2. (i) What is a Spectrochemical Series?
 (ii) Why Splitting energy Δ_t is less than Δ_o ?
 3. Discuss splitting of d-orbital in octahedral field with CFSE.
- Q.2(A) Answer the following question (04)
 1. Discuss the classification of metal carbonyls.
- Q.2(B) Answer any two questions out of three (10)
 1. Explain the structure of $\text{Fe}(\text{Co})_5$ with its preparation and properties.
 2. Define metal nitrosyl and explain bonding in metal nitrosyls.
 3. Discuss about the usefulness of IR spectroscopy in the study of metal carbonyls.
- Q.3(A) Answer the following question (04)
 1. List the types of glass with their uses.
- Q.3(B) Answer any two question out of three (10)
 1. (i) Give chemical properties of glass.
 (ii) What is zero point energy? Give its equation for cubic box and rectangular box systems.
 2. Derive energy equation for a particle moving in one dimensional box and explain the terms involved in it.
 3. Derive energy of 1S orbital in a.u. where $\Psi = \frac{1}{\sqrt{\pi}}$
- Q.4(A) Answer the following question (04)
 1. What is cement? Discuss properties of cement.
- Q.4(B) Answer any two questions out of three (10)
 1. Discuss manufacturing process of cement
 2. (i) Write a short note on, "setting and hardening of Portland cement".
 (ii) Give comparison between Dry process and Wet process of miring in cement manufacturing.
 3. Give condition of ISI for specification of ordinary Portland cement.
- Q.5(A) Answer the following question (04)
 1. Write a short note: plant nutrients and its role
- Q.5(B) Answer any two questions out of three (10)
 1. Define the fertilizer. Give its all types of classification.
 2. List the names of nitrogenous Fertilizers and discuss any one manufacturing process of urea with its action as Fertilizer.
 3. List the names of phosphate Fertilizers. Discuss manufacturing process of dimmonium phosphate and the role of phosphate Fertilizers.
