

M.Sc.(Chem.) Semester - 1 (CBCS) Examination
Oct/Nov. -2019 - [OLD COURSE]
INORGANIC 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 Answer the following (Any Seven) (14)
- a. Define nanomaterials
 - b. Discuss S-S coupling
 - c. What do you mean by Recoil less Emission?
 - d. Discuss the MB spectrum of $K_3[Fe(CN)_6]$
 - e. Write history of Nano Materials
 - f. Give the use of KIO_3 in Inorganic analysis
 - g. What is Anti-ferromagnetism?
 - h. Write note on Intensity of magnetisation
 - i. Discuss approximation suggested by Born-Oppenheimer.
 - j. Find out the ground state spectral term of the following
(i) d^4 (ii) d^6
- Q.2 Answer the following (Any Two) (14)
- a. Give general discussion and use of Potassium Bromate in inorganic analysis
 - b. Discuss magnetic moment for multiple width large compare to KT
 - c. Discuss the MB spectrum of $Na_2[Fe(CN)_5NO]$
- Q.3 Answer the following. (14)
- a. Write note on Gouy's method for determination of magnetic susceptibility (05)
 - b. Write note on properties and types of Nano Material (05)
 - c. Discuss use of EDTA in inorganic analysis (04)
- OR
- Q.3 Answer the following. (14)
- a. Give the stereo chemical application of Magnetic properties of Lanthanide series. (07)
 - b. Evaluate coefficient of wave function of sp hybrid orbital and show that bond angle between two hybrid orbitals is 180° (07)
- Q.4 Answer the following: (14)
- Answer any two questions from the following (each of 5 marks):
- a. Write note on integrals introduced by Huckel.
 - b. Discuss the synthesis of nanomaterials.
 - c. Discuss the MB spectrum of $Fe(CO)_5$ and $Fe_2(CO)_9$
- Answer any one question from the following (4 marks):
- a. Discuss Hybridization with useful example
 - b. Discuss the application of nanomaterials
- Q.5 Answer any two from the following: (14)
- a. Derive Secular Determinant for H_2^+
 - b. Derivation of Van Vleck formula for Susceptibility
 - c. Discuss Huckel π -electro theory and its applications to Ethylene
 - d. Discuss different types of magnetic bodies
