



JBD-003-1101001 Seat No. _____

M. Sc. (Sem. I) (CBCS) Examination

December - 2019

C - 101 : Inorganic Chemistry

Faculty Code : 003

Subject Code : 1101001

Time : Hours]

[Total Marks : 70

- Instructions :** (1) All Questions are compulsory.
(2) All Questions carry equal Marks.

1 Answer the following : (Any **Seven**) **14**

- (a) Define Huckel π -electron theory.
- (b) Discuss J-J coupling.
- (c) Write short note on Sol-Gel synthesis.
- (d) What do you mean by Hybridization ? Explain.
- (e) Explain spin-orbit interaction.
- (f) Give the limitation of Valence Bond Theory.
- (g) Write a note on Quantum dots.
- (h) Define Isomer shift.
- (i) Draw the structure of $\text{Fe}_3(\text{CO})_{12}$ and predict the MB spectrum of it.
- (j) Who nanotechnology is useful ? Explain.

2 Answer the following : (Any **Two**) **14**

- (a) Explain the importance of EDTA in analysis.
- (b) Explain delocalization energy in conjugated system with suitable example.
- (c) Discuss the Mossbauer spectrum of $\text{K}_3[\text{Fe}(\text{CN})_6]$

- 3 Answer the following : 14
- (a) Derive Van Vleck formula for magnetic Susceptibility.
 - (b) Explain Huckel pi-electron theory and its application to Butadiene.

OR

- 3 Answer the following : 14
- (a) Discuss the stereo chemical applications and magnetic properties of Lanthanide and Actinide series.
 - (b) Evaluate the Magnetic Moment for Multiple width small compare to kT .

- 4 Answer the following : 14
- (a) Evaluate the coefficient of wave function for sp^2 hybrid orbitals and show that the bond angle is of 120°
 - (b) Compare the Mossbauer spectrum of the following
 - (1) $FeCl_3$
 - (2) $FeSO_4$

- 5 Answer the following : (Any Two) 14
- (a) Discuss different methods for determination of magnetic susceptibility.
 - (b) Discuss the use of the following reagents in Inorganic analysis
 - (1) Ceric Sulphate
 - (2) Pottassium Iodate
 - (c) How Nano catalyst property can be tailored ?
 - (d) Write note on spin multiplicity and find out the spectral term of the following
 - (1) Mn^{++}
 - (2) Cr^{+++}