



Shree H N Shukla Group of Colleges Rajkot  
(Affiliated to Saurashtra University)  
Behind marketing yard, near lalpari lake,  
Between amargadh-bhichri Rajkot.



**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  $\pi$ -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  $\text{K}_3[\text{Fe}(\text{CN})_6]$



Shree H N Shukla Group of Colleges Rajkot  
(Affiliated to Saurashtra University)  
Behind marketing yard, near lalpari lake,  
Between amargadh-bhichri Rajkot.

Ph: (0281) 2708070, 9099063150

- 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  $120^\circ$
  - (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)  $Cr^{+++}$