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DHH-003-010402 Seat No. _____

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

May / June – 2015

Inorganic Chemistry

C (I) - 402 : Inorganic Spectroscopy

Faculty Code : 003

Subject Code : 010402

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

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

Q.1 Answer the following (Any Seven) [14]

a. What is hyperfine splitting in ESR

b. What is Zero field splitting

c. Give the basic idea of NMR

d. Define Nuclear Quadruple Resonance

e. What is recoil Energy in MB spectroscopy

f. What are Isotropic and Anisotropic 'g' value

g. Give the basic principle of Photoelectron Spectroscopy

h. Give the name of nuclei other than proton which can be studied by NMR

i. Define Mossbauer Spectroscopy

j. Discuss the limitations of ESR spectroscopy

Q.2 Answer the following (Any Two) [14]

a. Discuss the ESR spectrum of H_2 radical (one electron influenced by two equivalent protons)

b. Discuss Photo electric effect in Photoelectron Spectroscopy

c. Predict the MB spectrum of $K_4[Fe(CN)_6]$

Q.3 Answer the following (Any Two) [14]

a. Discuss the factures affecting 'g' value in ESR

b. Write short note on Quadrupole splitting in MB spectroscopy

c. Write note on NMR shift reagent

Q.4 Answer the following [14]

a. Discuss NMR of ^{19}F and ^{11}B

b. Explain, Why $FeCl_3$ will give singlet and not doublet in MB spectrum

Q.5 Answer the following [14]

Discuss the NQR spectra of Quadrupolar nucleus having I=3/2 and determine energy of each energy level

Or

Q.5 Answer the following (Any Two) [14]

a. Discuss the NMR study of Following Inorganic nuclei ^{13}P and Be compound
b. Write note on photoelectron spectroscopy