



NBV-003-010402 Seat No. _____

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

April / May - 2017

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.

1 Answer the following : (any seven) 14

- a. Discuss NMR of Phosphorous - 31.
- b. How many ESR signals do you expect H_2 radical.
- c. Give the basic idea of NMR.
- d. Discuss Isomer shift.
- e. What is Doppler effect in MB spectroscopy.
- f. What are Isotropic and Anisotropic 'g' value.
- g. Give the principle of Photoelectron Spectroscopy.
- h. Name the nuclei other than proton which can be studied by NMR.
- i. Discuss the role of Recoil Energy in Mossbauer Spectroscopy.
- j. Give the limitations of ESR spectroscopy.

- 2** Answer the following : (any two) **14**
- Discuss the ESR spectrum of H-Atom (one electron influenced by one proton)
 - Discuss Photo electric effect in Photoelectron Spectroscopy
 - Discuss 'g' value and factor affecting it in ESR.
- 3** Answer the following : (any two) **14**
- Discuss Kramer's Degeneracy in ESR.
 - Discuss the ESR spectrum of N_2^{\cdot} (one electron delocalized over two equivalent nitrogen, $I=1$).
 - Write note on NMR shift reagent
- 4** Answer the following : **14**
- Explain Mossbauer spectroscopy in detail
 - Discuss MB spectrum of $FeCl_3$ and $FeSO_4$.
- 5** Answer the following : (any two) **14**
- Discuss the NMR study of Ferrocene compounds
 - Predict the MB spectrum of $Na_2 [Fe(CN)_5NO]$
 - Explain ESR techniques and discuss the work of different part in detail (Instrumentation)
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