BIYANI GIRLS COLLEGE

Model Paper - 2015

M.Sc. (Previous) Chemistry

Fourth Paper (Spectroscopy)

Time – Three Hours ***Marks - 75***

Unit – I

Q.1 Defines of Isotopic substitution on the transition frequencies and relative intensities of spectral lines according to rotational (microwave) spectroscopy.

Q.2 Explain the following –
(a)Rigid Rotor (b) Stark Effect

Unit – II

Q.3 (a) Defines the vibration-rotational spectra of a Diatomic molecule.
(b)P-Q-R branches

Q4 Explain the following-
(A) Simple Harmonic Oscillator (Vibration Motion)
(b) Zero point energy

Unit-III

Q.5 Define the energies of atomic orbital and vector representation of momenta in atomic spectroscopy.

Q.6 Explain the following-
(a) Koopmans Theorem
(b)Chemical shifts in ESCA

Unit IV

Q.7 Write short notes on-
(a) Spin densities and Mc Connell Relationship
(b) Anisotropic Hyperfine Interaction

Q.8 (a) Define the zero field splitting And Kramer's degeneracy according to ESR.
(b) Spin Hamilton

Unit-V

Q.9 Write short notes on-
(a) Bragg method
(b) Laue method

Q.10 Explain the following-
(a) Absolute configuration of molecules
(b) Miller Indices

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Unit – I

Q.1 Explain the classification of Rotor's?

Q.2 Define the Nuclear and Electron spin interaction according to rotational (microwave) Spectroscopy?

Unit – II

Q.3 Write short note on –
(a) Overtones and hot bands
(b) Force constant and Bond strength

Q4 Define the an harmonic oscillator (Anharmonicity)?

Unit-III

Q.**5** Define the calculation of energy and vector addition / coupling?

Q.6 Define the atomic and molecular photoelectrons spectra?

Unit IV

Q.7 Explain the Spin Hamilton and hyper fine interaction?

Q.8 Define the Zero field splitting and Cremers degeneracy?

Unit-V

Q.9 Explain the Bragg equation and X – Ray's analysis method?

Q.10 Write short note on –
(i) Laue method
(ii) Bragg method