# THE AMERICAN COLLEGE, MADURAI

(An Autonomous Institution Affiliated to Madurai Kamaraj University)
Re-accredited (2nd Cycle) by NAAC with Grade "A", CGPA – 3.46 on a 4-point scale

## Backlog Arrear Examination, March 2021

**PHS 3663 Atomic Physics & Molecular Spectroscopy**

**Time: 3 hrs** **Max. Marks: 75**

**PART – A** **Answer <u>any five</u> of the following questions.** **5 x 15 = 75**

1. Describe the vector atom model. Explain various quantum numbers associated with it.
2. Derive Bragg's law for X-ray diffraction in crystals. Describe the X-ray spectrometer method of determining the wavelength of X-rays.
3. Discuss rotational spectrum of a non-rigid rotator.
4. Describe the instrumentation and working of a Microwave spectrometer.
5. List out the important features of the Vibrational Spectrum of a diatomic molecule.
6. Explain the Classical and Quantum theories of Raman Scattering.
7. Explain the rotational fine structure of vibrational Raman spectrum in a diatomic molecule.

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