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M-6323

M.Sc. (IInd Semester) Examination, 2020

CHEMISTRY

(Physical Chemistry)

Time Allowed : Three Hours

Maximum Marks : 70

Note : Attempt all the five questions. One question from each unit is compulsory. Marks are indicated against the questions.

Unit - I

Q. 1. What is microwave spectroscopy. Discuss the rotation spectra of di- and poly- atomic molecules. **14**

Or

Explain the following :

(i) Nuclear Spin Effect **7**

(ii) Stark Effect **7**

Unit - II

Q. 2. Discuss the vibrational Raman spectra. Describe the role of Raman and IR spectroscopy in structure elucidation with suitable examples. **14**

Or

Explain the following :

(i) Molecular photoelectron spectroscopy **7**

(ii) Vibrational coarse structure. **7**

Unit - III

Q. 3. Discuss the principles of NMR. What do you mean by chemical shift and spin-spin coupling ? **14**

Or

Describe the following :

(i) Applications of ESR **7**

(ii) Mossbaur Spectroscopy **7**

Unit - IV

Q. 4. Discuss various techniques for detection and measurement of radiations. **14**

Or

Explain the following :

(i) Interaction of radiation with matter **7**

(ii) Decay kinetics **7**

Unit - V

Q. 5. Discuss the Indian nuclear energy programme in detail. **14**

Or

Explain the following :

(i) Neutron activation analysis **7**

(ii) Radiometric titration **7**