

PSCPHYT16.1 - Foundation Course-II - Paper-XVI - Spectroscopic Applications

P. Pages : 2

Time : Three Hours



GUG/S/25/11419

Max. Marks : 80

Either:

1. a) What is the function to each of the following components of spectroscopic instrument. **8**
- i) Radiation source
 - ii) Sample holder
 - iii) Radiation detector
- b) Explain double beam experiment. **8**

OR

- e) How Raman spectroscopy is useful in structure determination of simple molecules. **8**
- f) Explain the applications of Infrared spectroscopy to inorganic complexes. **8**

Either:

2. a) Discuss the theory of Nuclear Magnetic Resonance (NMR). **8**
- b) Explain spin-spin and spin-lattice relaxations. **8**

OR

- e) Discuss Electronic spectroscopy in detail. **8**
- f) Explain electronic spectra of organic molecules with suitable examples on structure elucidation. **8**

Either:

3. a) Discuss normal and anomalous Zeeman Effect. **8**
- b) Explain how electron paramagnetic resonance spectroscopy is successful in the study of Inorganic compounds. **8**

OR

- e) Discuss Mossbauer spectroscopy. Give experimental details of the Mossbauer Spectroscopy. **8**
- f) Explain recoilless emission and absorption of gamma rays. **8**

Either:

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| 4. | a) | Explain the basic principle and theory of mass spectroscopy. | 8 |
| | b) | What are the ionization techniques used in mass spectroscopy? | 8 |

OR

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|-----------|----|---|----------|
| | e) | Discuss ESI-MS and MALDI-MS techniques. | 8 |
| | f) | Describe the experimental arrangement of high-resolution mass spectrometry. | 8 |
| 5. | | Attempt all the followings. | |
| | a) | Explain vibrational spectra of a diatomic molecule. | 4 |
| | b) | Write short notes on chemical shift. | 4 |
| | c) | Explain the determination and deviation of g-value. | 4 |
| | d) | Discuss soft ionization methods. | 4 |
