

M.Sc. (Physics) (CBCS Pattern) Semester-IV
PSCPHYT16.1 - Foundation Course F2.1 - Paper-XVI - Spectroscopic Applications

P. Pages : 2

Time : Three Hours



GUG/W/24/11419

Max. Marks : 80

Either:

1. a) Explain the radiation sources and detectors in UV spectrometer. 8
- b) Describe in brief double beam UV spectrometer experimental set up. 8

OR

- e) What is the difference between Raman spectroscopy and infrared spectroscopy. 8
- f) Explain organic and inorganic functional group identification through IR spectroscopy. 8

Either:

2. a) Explain the theory of Nuclear Magnetic Resonance (NMR). 8
- b) Explain in brief spin-spin coupling between two nuclei. 8

OR

- e) Discuss the electronic spectroscopy. 8
- f) What is Zeeman Effect. Derive an expression for energy associated with Zeeman shift. 8

Either:

3. a) Explain how electron paramagnetic resonance spectroscopy is successful in the study of inorganic compounds. 8
- b) Explain anomalous Zeeman splitting in ions with appropriate diagram. 8

OR

- e) Describe Mossbauer spectroscopy. Give experimental details of the Mossbauer Spectroscopy. 8
- f) Write a note on magnetic hyperfine and quadrupole interaction. 8

Either:

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

OR

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