Reg. No. \_\_\_\_\_\_\_\_\_\_\_\_\_



**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **14PH2012** | **Duration :** | **3hrs** |
| **Sub. Name :** | **SPECTROSCOPY** | **Max. Marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Define Spectroscopy. | CO1 | 3 |
| b. | Describe the different regions of electromagnetic spectra and the type of spectroscopy associated with it. | CO1 | 17 |
| **(OR)** | | | | |
| 2. | a. | Define magnetic moment. | CO1 | 3 |
| b. | Classify fine structure and hyperfine structure of hydrogen atom. | CO1 | 17 |
|  |  |  |  |  |
| 3. | a. | Define XPS. | CO1 | 3 |
| b. | With a neat sketch explain the basic principle and working of XPS. | CO1 | 17 |
| **(OR)** | | | | |
| 4. | a. | Define signal to noise ratio and resolving power. | CO1 | 3 |
| b. | Explain the principle and working of UV-Visible Spectroscopic instrument. | CO1 | 17 |
|  |  |  |  |  |
| 5. | a. | Give example for linear and non-linear molecule. | CO1 | 3 |
| b. | Explore the different types of vibrations in H2O and CO2 molecules. | CO1 | 17 |
| **(OR)** | | | | |
| 6. | a. | Give some examples of diatomic molecules. | CO1 | 3 |
| b. | Comment on vibrating diatomic molecule as a simple harmonic oscillator with energy level diagrams. | CO1 | 17 |
|  |  |  |  |  |
| 7. | a. | Define principle of mutual exclusion. | CO1 | 3 |
| b. | Discuss the basic working principle, applications and the instrumentation part of FTIR. | CO1 | 17 |
| **(OR)** | | | | |
| 8. | a. | Classify Rayleigh and Raman Scattering. | CO1 | 3 |
| b. | Write in detail about classical theory of Raman effect. | CO1 | 17 |
|  | | **Compulsory**: |  |  |
| 9. |  | Give a detailed note on Resonance Raman Spectroscopy and its applications. | CO1 | 20 |