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**GIET UNIVERSITY, GUNUPUR – 765022**

Ph.D. (First Semester) Examinations, January – 2024

23SPPECY1011 - Instrumental Methods of Chemical Analysis
(Chemistry)

Time: 3 hrs

Maximum: 70 Marks

The figures in the right-hand margin indicate marks.**Answer ANY FIVE Questions****(14 x 5 = 70 Marks)**

	Marks
1.a. Explain about the characteristic vibrational frequencies of functional groups in I.R. Spectroscopy.	7
b. Derive the expression of energy level in vibrational rotational transition.	7
2.a. Explain the analytical applications, advantages and disadvantages of NMR Spectroscopy .	14
3.a. Explain the principles, rules and applications of ^{13}C -NMR.	14
4.a. Explain the analytical applications, advantages and disadvantages of Atomic absorption Spectroscopy.	14
5.a. Mention the advantages and disadvantages of AES.	7
b. Write the difference between AAS and AES.	7
6.a. Explain the instrumentation of X- Ray diffraction, X – Absorption methods .	14
7.a. Derive Bragg's law.	14
8.a. Explain the working principle of polarography and instrumentation of cyclic voltammetry with analytical applications.	14

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