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**Gandhi Institute of Engineering and Technology University, Odisha, Gunupur
(GIET UNIVERSITY)**



Ph.D. (First Semester-Summer) Examinations, December – 2025
23SPPECY1021 - 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.. Explain the salient feature of fragmentation of organic compounds, and Mc Lafferty rearrangements		14
2. Explain the working principle and instrumentation of NMR Spectroscopy with analytical applications, advantages and disadvantages.		14
3.a. Describe the working principle of Atomic Emission Spectroscopy (AES) and explain its instrumentation. Include its		7
b. Explain the analytical applications as well as the major advantages and limitations of the AES technique.		7
4. Explain working, principle and instrumental part of scanning electron microscope		14
5. Provide a detailed explanation of the working principle and instrumentation of Thermogravimetric Analysis (TGA). Discuss its major analytical applications, as well as the key advantages and limitations of the technique.		14
6.a. What is crystallization temperature?		7
b. What are the factors affecting TGA curve?		7
7. Draw and explain Jablonski diagram in detail.		14
8.a. Explain the effect of solvent on electronic transitions?		7
b. Explain Beer-Lambert Law		7

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