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**GANDHI INSTITUTE OF ENGINEERING AND TECHNOLOGY UNIVERSITY, ODISHA, GUNUPUR
(GIET UNIVERSITY)**



Ph.D. (Second Semester-Summer) Examinations, May - 2025
23SPPECY2013 -Analytical Methods in Material Characterization
(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**

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| 1.a. Write the differences between colorimeter and spectrophotometer. | 5 |
| b. Derive the expression for Beer- Lamberts law and its limitations. | 9 |
| 2. Explain the BIS standards of potable water quality and water quality index and its calculation. | 14 |
| 3.a. Define colloids and distinguish them from solutions and suspensions. | 7 |
| b. Explain two chemical and biological methods of preparation of metal oxides. | 7 |
| 4.a. Write the principle, instrumentation and application of DSC. | 14 |
| 5.a. What are the main physical parameters that define water quality, and how are they measured? | 14 |
| 6.a. How BET equation is useful in the application of colloids and nanomaterials | 7 |
| b. Write notes on stabilizing agents. | 7 |
| 7. Derive the Langmuir adsorption isotherm curve and write its applications in different directions. | 14 |
| 8.a. Explain the concept of chromophores and auxochrome. | 7 |
| b. Write notes on Grating Monochromators. | 7 |

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