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



Ph.D. (Second Semester-Summer) Examinations, April – 2026
23SPPECY2017 - Advanced Analytical Chemistry and
Chromatographic Techniques
(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. | Explain the terms Mean, Median and Standard Deviation with example | 7 |
| b. | Explain the Accuracy and precision with an example. | 7 |
| 2. | What is the principle behind solvent extraction? Explain different types of solvent extraction methods. | 14 |
| 3.. | What is the primary principle behind column and paper chromatography? Explain the difference between mobile and stationary phases in column chromatography. | 14 |
| 4. | Explain TEM method for characterization of nano materials? | 14 |
| 5. | Discuss addition and condensation polymerization mechanism with examples. | 14 |
| 6.a. | Explain number average and weight average molecular weights. | 7 |
| b. | Define nano materials? Explain top–down and bottom–up approach for nanomaterial preparation. | 7 |
| 7. | What are the different types of HPLCs? Mention its components and working. | 14 |
| 8. | How are ion exchange resins regenerated? Mention their advantages of using ion exchange for separation with some applications of chromatography. | 14 |

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