

Paper Id: **231519**

Roll No. 

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**(SEM VIII) THEORY EXAMINATION 2022-23  
ADVANCED INSTRUMENTATION TECHNIQUES**

**Time: 3 Hours**

**Total Marks: 75**

**Note:** Attempt all Sections. If require any missing data; then choose suitably.

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**SECTION A**

**1. Attempt all questions in brief. 2 x 10 = 20**

- (a) Differentiate  $^1\text{H-NMR}$  and  $^{13}\text{C-NMR}$ .
- (b) What is chemical ionization technique?
- (c) What is Thermogram? <https://pharmacyindia.co.in/>
- (d) What do you mean by Miller Indices?
- (e) Define Accuracy and Precision as per ICH guidelines.
- (f) How will you calibrate electronic balance?
- (g) What is n/p ratio? Mention its significance in radioactivity.
- (h) Enlist the radioisotopes used in Radioimmunoassay.
- (i) What do you understand by Scanning densitometry in HPTLC?
- (j) What is MS-MS technique? <https://pharmacyindia.co.in/>

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**SECTION B**

**2. Attempt any two parts of the following: 10 x 2 = 20**

- (a) Discuss the instrumentation of NMR. Explain relaxation processes.
- (b) Describe the principle, instrumentation and applications of DSC.
- (c) Explain liquid-liquid extraction principle. Discuss the applications of LC-MS/MS.

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**SECTION C**

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**3. Attempt any five parts of the following: 7 x 5 = 35**

- (a) Discuss spin-spin coupling with example. Write the significance of 'J' value.
- (b) Describe the fragmentation pathway in mass spectrometry.
- (c) Write the principle and application of Thermogravimetric Analysis.
- (d) Explain X-Ray crystallography principle and its role in structure elucidation.
- (e) Discuss the calibration of HPLC with its parameters as per ICH guidelines.
- (f) Discuss the procedure of Radioimmunoassay with its applications. <https://pharmacyindia.co.in/>
- (g) Explain time of flight mass spectrometer. What is Quasi-equilibrium theory.

