

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: M.PHARM.
BRANCH: PHARMACY

SEMESTER: II
SESSION: SP2025

SUBJECT: MPC201T ADVANCED SPECTRAL ANALYSIS

TIME: 3.00 Hours

FULL MARK: 75

INSTRUCTIONS:

1. The missing data, if any, may be assumed suitably.
2. Before attempting the question paper, be sure that you have got the correct question paper.
3. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
5. Answer any five questions.

- 1a. Enumerate the principle of Raman spectroscopy in lights of Rayleigh, Stokes and anti-Stokes scattering. [7]
- 1b. Describe the instrumentation of the Raman spectroscope and mention the applications of the technique. [8]
- 2a. Classify various types of ELISA techniques. Explain direct and indirect ELISA techniques (with a schematic diagram) along with their advantages and disadvantages. [7]
- 2b. Describe the principle, procedure and applications of Radioimmunoassay in brief. [8]
- 3a. Discuss the principle, instrumentation and applications of TGA. [7]
- 3b. Discuss the Woodward-Fischer rule with respect to α,β -Unsaturated carbonyl compounds with suitable examples. [8]
- 4a. Explain and differentiate the ^1H NMR for n-propanol and iso-propanol. [7]
- 4b. Explain two-dimensional NMR techniques with suitable examples. [8]
- 5a. Discuss the instrumentation and working principle of Flash Chromatography. [7]
- 5b. Explain the various types of interfaces present in LC-MS. [8]
- 6a. Write the significance of fingerprint region in IR spectroscopy. Discuss Attenuated Total Reflectance (ATR) spectroscopy. [7]
- 6b. Answer the following questions [8]
- a) Distinguish between maleic acid & fumaric acid by IR Spectroscopy.
 - b) Distinguish between 4-(Aminomethyl) benzoic acid and 4-(aminophenyl) acetic acid by IR Spectroscopy.
- 7a. Explain the important features of hydrocarbons with suitable examples with respect to MS. [7]
- 7b. Discuss with examples and their significance in MS fragmentation [8]
- a) McLafferty rearrangement
 - b) Homolytic cleavage

:::::25/04/2025:::::E