

Question Paper

Exam Date & Time: 11-May-2023 (02:00 PM - 05:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

Manipal Academy of Higher Education, Manipal MPharm Theory End-Semester Examinations.

Advanced Instrumental Analysis [PCH-MPA201T -S2]

Marks: 75

Duration: 180 mins.

SECTION - A

Answer all the questions.

Answer the following (10 marks x 5 = 50 marks)

- 1) 1A. Why C=O vibrational frequency shifts from its normal value? How do you differentiate the following from IR spectra? (10)
Benzoic acid and Benzaldehyde;
Phenol and ethyl alcohol. 5 M
1B. Explain the principle and applications of ATR-IR. 5 M
- 2) 2. Discuss with suitable example, the fragmentation pattern of carbonyl compounds in electron impact ionisation. 10 M (10)
- 3) 3. Discuss the different types of ionic peaks produced in electron impact ionisation. 10 M (10)
- 4) 4A. List out the various 2D NMR techniques. Explain any one in detail. (1M+4M) (10)
4B. Define Shielding, Deshielding, equivalent and non-equivalent protons. Write a note on NOE and its Significance in NMR. (2M+ 3M)
- 5) 5A. List out the similarities and differences between Proton NMR and ¹³C NMR. (2.5M x 2) (10)
5B. Explain the principle involved in 1D NMR spectroscopy for ¹H and ¹³C. With help of a neat diagram, explain the instrumentation of a NMR spectrometer. (2 M+3 M)

SECTION - B

Answer all the questions.

Answer the following (5 marks x 5 = 25 marks)

- 6) 6. Explain the Woodward Fieser rules for Conjugated Dienes. (5)
- 7) 7. Explain the principle and instrumentation of GC-MS. (5)
- 8) 8. Write a note on supercritical chromatography. (5)
- 9) 9. Illustrate the different steps involved in HPTLC. (5)
- 10) Write a note on HPLC solvents and their characteristic features. (5)

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