

Exam Date & Time: 13-Jul-2022 (10:00 AM - 01:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

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

ADVANCED INSTRUMENTAL ANALYSIS [PCH-MPA201T-S1]

Marks: 75

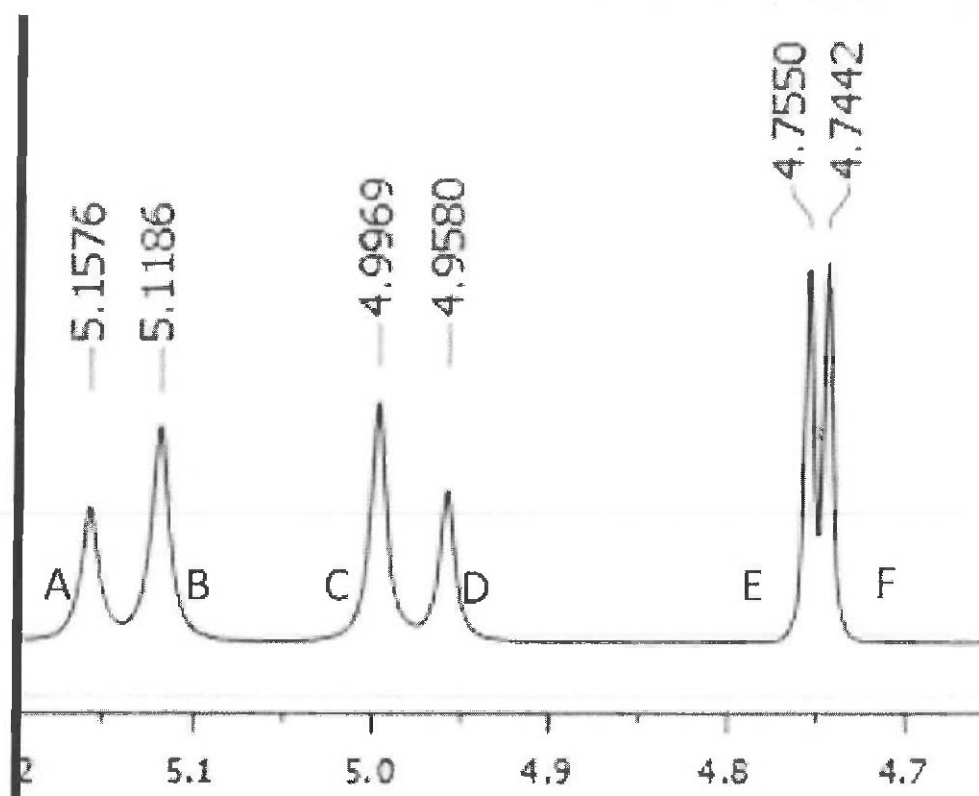
Duration: 180 mins.

SECTION - A

Answer all the questions.

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

- 1) With a neat labelled flow chart explain the principle and instrumentation of LC-NMR. (6 M) (10)
Write a note on chiral stationary phase. (4 M)
- 2) Explain the principle and methodology of 2D NMR spectroscopy along with spectral details.- 6M
Calculate the coupling constants between 2 M
a) A-B b) C-D & c) E-F taken at 300 Hz frequency from the below spectra



(10)

What is meant by shielding and deshielding? Give examples. (2 M)

- 3) What is HETCOR? Name the different techniques under it. Explain about any two methods under HETCOR with general features, spectra and application of the technique. (6 M) (10)
Enumerate the differences between COSY and INADEQUATE techniques. What do mean by equivalent and nonequivalent hydrogens? Give examples. (2 + 2 = 4 M)

- 4) How do you differentiate the following from IR spectra? (5 M)
1. phenol and ethyl alcohol
2. acetic acid and acetaldehyde (10)
Explain the principle and applications of near-IR. (5 M)
- 5) Discuss with suitable example fragmentation pattern of amines in electron impact ionisation. (5 M) (10)
Explain metastable ion peak and M+2 ion peaks mass spectra. (5 M)

SECTION - B

Answer all the questions.

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

- 6) What is the principle of ion-exclusion chromatography? Write a note on resin phase and its application. (5)
- 7) Discuss the stationary phase and applications of Nano liquid chromatography and ultra-performance liquid chromatography. (5)
- 8) Write a note on GC-MS. (5)
- 9) Explain the Woodward Fieser rules for Conjugated Dienes. (5)
- 10) How do you differentiate primary, secondary, and tertiary alcohol from electron impact ionization mass spectrum? (5)

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