M.Pharm Even Semester Examination, May, 2025

PHARMACEUTICAL SCIENCES

(2nd Semester)

Course No: MPC-201T

(Advanced Spectral Analysis)

FM: 75

Time: 3 Hours

The figures in the right margin indicate full marks for the question

I. Objective type (Answer the following in brief) 2x10=20

1. Explain is nitrogen rule?
2. What is the importance of metastable ions or peaks?
3. Calculate the value of absorption maximum ($ë_{max}$) for 2,3-dimethylene bicyclo[2.2.1]heptane using Woodward-Fieser rule.
4. Define the terms ADC2 and AMD in respect of HPTLC.
5. What do you mean by FID? Why is Fourier Transform program applied to FID?
6. Why is an eight-inch steel plate placed at the top of GC?
8. What are the non-flame atomizers used in GC-AAS?
9. What do you mean by super critical fluid?

10. What are the interfaces used for LC-FTIR?

II. Long answers (Answer two out of three questions) 10x2=20

1. (a) Describe benzylic cleavage with an example of n-propyl benzene. 5

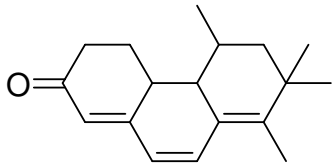
   (b) Write a note on McLafferty rearrangement. 5

2. Write in brief about basic principle, instrumentation and limitation of GC-MS 10

3. Write the basic principle, instrumentation and application of DTA. 3+5+2

III. Short answers (Answer seven out of nine questions) 5x7=35

1. Calculate the value of absorption maximum (λ_{max}) for the following compound:



2. Describe the construction and working of ATR-IR.

3. (a) How will you note the progress of the conversion of p-nitrobenzoic acid to p-nitrobenzamide in Infrared spectroscopy?

   (b) Calculate the value of absorption maximum (λ_{max}) for 3,4-diethylacetophenone using Woodward-Fieser rule. 2.5+2.5

4. What are problems arising in combining HPLC and MS?

5. Write the basic principle of 2D NMR. What are the stages of 2D NMR.

6. Define critical temperature and critical pressure. Write few important properties of supercritical fluid. 2+3

7. Discuss about principle and application of Raman Spectroscopy. 3+2

8. Define COSY and NOESY with examples. 2.5x2

9. Write in brief about cell window material of LC-FTIR.

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