

#/2/23

Total No. of printed pages = 2

MPL 101 T

Roll No. of candidate

--	--	--	--	--	--	--	--	--	--	--

2023

M.Pharm. 1<sup>st</sup> Semester End-Term Examination

Pharmacology

MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

Full Marks – 75

Time – Three hours

The figures in the margin indicate full marks for the questions.

1. Answer *all* : (10 × 2 = 20)
  - (a) Explain the wave properties of Electromagnetic radiation and how it interacts with the matter?
  - (b) Why UV spectroscopy is called electronic spectroscopy? Explain suitably.
  - (c) Write a note on Chromophore and Auxochrome.
  - (d) Differentiate absorption and emission spectroscopy with suitable example?
  - (e) What are quantum number and their role in NMR?
  - (f) Enlist the application of flame photometry.
  - (g) List out the applications of Atomic Absorption Spectroscopy.
  - (h) Write the principle involved in potentiometry.
  - (i) Define plate theory of chromatography.
  - (j) Write a note on Differential Thermal Analysis (DTA).
  
2. Answer any *seven* questions only : (7 × 5 = 35)
  - (a) Write a note on Instrumental Deviations from Beer's Law.
  - (b) Explain the principle involved in fluorescence spectroscopy.
  - (c) Write a note on the modes of molecular vibrations.

[Turn over

- (d) Write a note on:
- (i) Chemical shift and
  - (ii) Spin-Spin coupling.
- (e) Explain the sample handling techniques used in IR spectra.
- (f) Write a note on  $^{13}\text{C}$ -NMR.
- (g) Describe the principle and any two types of ionization methods of mass spectroscopy.
- (h) Discuss the principle and applications of X-ray diffraction method.
- (i) Explain the mechanism of ion exchange in ion exchange chromatography.
- (j) Discuss the principle and factors affecting separation of paper electrophoresis.

3. Answer any *two* questions only: (2 × 10 = 20)

- (a) Explain in details about the construction and working of double beam UV-Visible spectroscopy and give its application.
- (b) Explain the principle and instrumentation of Nuclear magnetic spectroscopy.
- (c) Explain the principle, instrumentation and applications of the HPLC.