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Total No. of printed pages = 1

Monsoon, 2023

M. Pharm (Pharmacognosy) Semester Examinations  
MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

Course Code: MPG101T

Full Marks – 75

Time – 03 hours

*The figure in the margin indicates full marks for the questions.*

**A. Answer all: (50 words)**

**(10×2=20)**

1. Define gradient elution.
2. Mention the benefit of purging.
3. With example state the difference between emission and absorption spectroscopy.
4. Define plate theory of chromatography.
5. Explain isocratic elution.
6. Write and explain the Van Deemter equation.
7. Enlist some limitations of flame photometry.
8. Define coupling and coupling constant?
9. Define molecular ion peak.
10. Mention two detectors used in IR spectroscopy.

**B. Answer any seven: (100 words)**

**(7×5=35)**

1. Write a note on the vibrations of IR Spectroscopy.
2. Explain electronic transitions of UV spectrophotometry.
3. With a neat diagram write the working of Photomultiplier Tube.
4. Explain the working of Barrier Layer Cell.
5. With figure explain the Jablonskis' theory for fluorescence and phosphorescence.
6. Write a note on TGA.
7. Write a short note on HPTLC.
8. Write a note on different ionization techniques used in mass spectrometry.
9. Derive the Bragg's equation.

**C. Answer any two: (200 words)**

**(2×10=20)**

1. Define Chromophore and Auxochrome with suitable examples. Explain the different electronic transitions of UV Visible spectroscopy. With diagram explain the working of a double beam UV-Visible spectrophotometer. **(2+4+4)**
2. Explain the principle of NMR. With proper diagram explain the instrumentation NMR instrument. **(3+7)**
3. Write the principle of HPLC. With diagram explain the different parts and working of an HPLC instrument. **(3+7)**