

1128

**B.E. (Biotechnology) Seventh Semester
BIO-714/704: Bio Analytical Techniques**

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit. Suitable assumptions should be made wherever necessary.

x-x-x

I. Attempt the following:-

- a) Discuss the possible causes for the deviation from Beer-Lambert's law.
- b) Contrast two-types of imaging modes in AFM.
- c) Enlist main parts of a mass-spectrometer,
- d) Give reasons for using TMS as a reference in NMR.
- e) Differentiate Hyperchromic and Hypochromic shift.
- f) Give full form of MALDI-TOF.
- g) Define autoradiography.
- h) Explain diamagnetic shielding.
- i) Compare the important features of colorimeter and spectrophotometer.
- j) Discuss the significance of a radiotracer. (10x1)

UNIT - I

- II. a) Explain the term "degenerate" and elaborate the distribution of population densities of NMR.
b) Discuss the following in contrast to Pulsed FT-NMR spectrometer i) pulse ii) FID signal iii) advantages over the CW measurements. (4,6)
- III. Explain the Atomic absorption spectrometry w.r.t. excitation source and sample aspiration for measurement. (10)
- IV. a) What is the principle of Spectrophotometry? Elaborate the main features of a double beam spectrophotometer.
b) The molar absorptivity of a particular solute is 2.1×10^4 . Calculate the transmittance through a cuvette with a 5.00 cm path length for a 2.00×10^{-6} m solution. (6,4)

P.T.O.

(2)

UNIT - II

- V. a) Draw and label the basic components of a mass-spectrometer.
b) Explain the principle of double focussing and TOF in mass-spectrometer. (5,5)
- VI. Give a detailed account on comparison of x-ray Vis a Vis other diffraction methods. (10)
- VII. a) What are the various measurement tools for radioisotopes?
b) Define radioactivity. Also discuss the use of various tracers for biochemical investigators. (5,5)

x-x-x