

NATIONAL UNIVERSITY OF IRELAND, GALWAY
Ollscoil na hÉireann, Gaillimh

Spring Examinations, 2000

BIOCHEMISTRY (BI305)
Advanced Techniques for Biologists
(Physical Aspects of Biochemistry)

Extern Examiner: Professor N.C. Price

Time allowed: Three Hours

Please attempt **five** of the following. All questions carry equal marks.
Please use separate answer books for each Section.

Section A

1. Describe how X-rays are used to determine the 3-D structure of macromolecules.
2. Discuss the uses of confocal microscopy in cell biology, paying particular attention to its advantages and shortcomings compared to other imaging techniques.

Section B

3. Describe DNA sequencing by the Sanger chain termination method.
4. Write an essay on the determination of the three dimensional structure of proteins using Nuclear Magnetic Resonance (NMR).
5. Write notes on two of the following:-
 - (a) UV and Visible Absorption Spectroscopy;
 - (b) Fluorescence Spectroscopy;
 - (c) Circular Dichroism.

P.T.O.

6. Describe (a) the basic components in a mass spectrometer, and (b) outline the importance of matrix assisted laser desorption ionisation (MALDI) and electrospray ionization (ESI) in the analysis of biomolecules.
7. "Electrophoresis is a versatile separation and analytical tool in proteomics and genomics". Discuss with reference to matrix options, system selection, separation conditions and staining techniques.
8. Discuss the applications of radioisotopes in biochemical research.