

Cork Institute of Technology

Bachelor of Science (Honours) in BioSciences - Award

(NFQ Level 8)

Autumn 2006

Bioanalytical Science

(Time: 3 Hours)

Answer one question from each of Section A, B, C and D. Each question carries equal marks.

Use separate answer books for each section and mark the question attempted

Examiners: Ms. A. Ward
Dr. H. Tarrant
Prof. R. Fitzgerald

Section A

- Q1.** Give an account of the principles of enzyme assay design, illustrating your answer with practical examples. (25 marks)
- Q2.** Describe the methodologies currently employed in protein/enzyme engineering. Use at least one detailed case study to illustrate your answer. (25 marks)

Section B

- Q3.** Discuss the use of *in vivo* and *in vitro* bioassay systems in the investigation of environmental estrogens. (25 marks)
- Q4.** Give an account of the design and application of biosensors in the measurement of biologically important molecules. Comment on how this technology may develop in the future. (25 marks)

Section C

- Q5. Give an overview of heterogeneous and homogeneous enzyme immunoassay systems. In your answer describe in detail using diagrams specific examples of each classification. (25 marks)
- Q6. Write an essay on the principle and application of the Immuno-magnetic separation (IMS) technique. (25 marks)

Section D

- Q7. Give an account of the design and optimisation of a Polyacrylamide Gel Electrophoresis (PAGE) system for macromolecular separation. (25 marks)
- Q8. (a) Outline the important validation parameters required for method validation of an analytical technique. (15 marks)
- (b) Write a brief account of the principles of standardisation as they apply to immunoassays. (10 marks)