

CORK INSTITUTE OF TECHNOLOGY
INSTITIÚID TEICNEOLAÍOCHTA CHORCAÍ

Semester 2 Examinations 2008/09

Module Title: Bioanalytical Science 4

Module Code: BIOT6002

School: Science

Programme Title: Bachelor of Science in Applied Biosciences – Stage 2

Programme Code: SBIOS_7_Y2

External Examiner(s): Prof. Gary Walsh

Internal Examiner(s): Ms. Anne Ward

Instructions: Answer FOUR questions only. Each question carries equal marks.

Duration: 2 hours

Sitting: Summer 2009

Requirements for this examination:

Note to Candidates: Please check the Programme Title and the Module Title to ensure that you have received the correct examination paper.
If in doubt please contact an Invigilator.

- Q1. (a) Define each of the following:
- (i) Monoclonal antibody (3 marks)
 - (ii) Polyclonal antibody (3 marks)
 - (iii) Primary & secondary immune response (3 marks)
- (b) Describe briefly the principle of **TWO** of the following immunoprecipitation techniques:
- (i) Immunoelectrophoresis
 - (ii) Immunodiffusion (Ouchterlony assay)
 - (iii) Single Radial Immunodiffusion (SRID)
 - (iv) Rocket immunoelectrophoresis (16 marks)
- Q2. (a) Draw a simple diagram of the structure of IgG (10 marks)
- (b) Outline, using a diagram, the principle of a non-competitive sandwich ELISA (15 marks)
- Q3. (a) Write a brief note on the use of control charts in internal quality control assessment (13 marks)
- (b) Outline the four main performance characteristics required to achieve a reliable assay. (12 marks)
- Q4. Write short notes on **TWO** of the following:
- (i) Internal Quality Control
 - (ii) Potential sources of error in a bioanalytical assay
 - (iii) External Quality Assessment
 - (iv) Recovery experiments to assess method accuracy (25 marks)
- Q5. (a) Describe the principle of ONE of the following electrophoretic techniques:
- (i) SDS-Polyacrylamide Gel Electrophoresis
 - (ii) Isoelectric focusing (10 marks)
- (b) Outline the main methods of identification and quantitation of proteins post electrophoresis (15 marks)

- Q6. (a) Describe, with the aid of a simple diagram, the principle of gel filtration chromatography. (15 marks)
- (b) Illustrate and describe the principle of immunoaffinity chromatography (10 marks)