

# Cork Institute of Technology

## Bachelor of Science (Honours) in BioSciences - Award

(NFQ Level 8)

Autumn 2007

### **Biochemistry**

(Time: 3 Hours)

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

Examiners: Dr. H. Tarrant  
Dr. J. O'Mahony  
Dr. T. Beresford

Use separate answer books for each section and mark the questions attempted.

### Section A

- Q1.** Write an essay on oxidative stress and the antioxidant defence systems of the body. In your answer briefly consider the role of diet in the antioxidant defence capability of the body. (25 marks)
- Q2.** Give an account of the testing process for a new candidate drug, considering both preclinical safety testing and subsequent clinical studies in humans. (25 marks)

### Section B

- Q3.** Discuss the strengths and limitations of receptor binding studies, cell proliferation assays and reporter gene-based assays with reference to the detection and quantification of environmental estrogens. (25 marks)
- Q4.** "Toxicology is the study of adverse effects of chemical and physical agents on living systems". Discuss this statement using examples of common environmental toxins to illustrate your answer. (25 marks)

## Section C

- Q5.** In the last 20 years improvements in pharmaceutical drug design and development have greatly benefited mankind. Discuss your views on this statement with relevant examples and indicate where you feel the future of drug development rests.  
(25 marks)
- Q6.** Discuss the three basic pharmacokinetic processes of absorption, distribution and clearance. In your answer, include definitions of the parameters used to quantify these processes and describe the significance of such parameters in the clinical environment.  
(25 marks)

## Section D

- Q7.** Discuss the two major routes of metabolic elimination of drugs in the body and the specific enzymes that catalyze those biotransformation reactions. Use relevant example(s) to support your answer.  
(25 marks)
- Q8.** Describe the molecular mechanisms of drug-receptor interaction, using diagrams and specific examples to illustrate your answer.  
(25 marks)