

Cork Institute of Technology

Bachelor of Science (Honours) in Applied Biosciences – Award

December 2006

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
Prof. R. J. Fitzgerald

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

Section A

- Q1.** “It is generally accepted that the degenerative diseases associated with ageing involve free radical mediated processes.” Discuss this statement, including an explanation of the body’s array of antioxidant defence mechanisms and the role that diet plays in these systems.

(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.** Ethanol may be considered our most ubiquitous drug and it features in far more cases of poisoning or adverse effects than more notorious drugs such as heroin or cocaine. Write an essay on the pharmacological and toxic effects of ethanol in man.

(25 marks)

Section C

- Q5.** “Improvements in pharmaceutical drug design and development can be solely attributed to advances in biochemistry.” Discuss your views on this statement with relevant examples and indicate where you feel the future of drug development rests. (25 marks)
- Q6.** Write an essay on drug biotransformation reactions using relevant example(s) to support your discussion. (25 marks)

Section D

- Q7.** 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)
- Q8.** Describe the molecular mechanisms of drug-receptor interaction, using diagrams and specific examples to illustrate your answer. (25 marks)