

Cork Institute of Technology

Bachelor of Science (Honours) in BioSciences - Award

(NFQ Level 8)

Autumn 2006

Biochemistry

(Time: 3 Hours)

Answer one question from each of Sections A, B, C and D. Each question carries equal marks. Use separate answer books for each Section and mark the questions attempted.

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

Section A

- Q1.** "Oxygen; a double-edged sword". Discuss this statement considering the two main routes of Reactive Oxygen Species (ROS) production in the body: deliberate and accidental, and the body's defence mechanisms against oxidative damage. (25 marks)
- Q2.** Prions are considered established as a group of pathogens along with other well-known infectious agents, including bacteria, viruses, fungi and parasites. Discuss in detail the mechanism by which prions are proposed to cause neurodegenerative diseases. (25 marks)

Section B

- Q3.** 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)
- Q4.** "One of the most important issues in environmental toxicology concerns the potential risk to humans and wildlife derived from exposure to both natural and synthetic chemicals that may interfere with reproduction and development." Discuss this statement. (25 marks)

Section C

- Q5. Outline the main biochemical processes involved in digesting, absorbing and storing food nutrients.
- Q6. Describe in detail the mechanistic role played by insulin in regulating the cellular uptake of glucose during carbohydrate absorption.

Section D

- Q7. Using suitable examples discuss how enzymes and bio-markers have impacted upon clinical diagnostics in the modern laboratory.
- Q8. Describe using suitable examples, the role of engineered proteins for clinical therapeutic applications.