

Cork Institute of Technology

Bachelor of Science (Honours) in Applied Biosciences – Award

Summer 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
Dr. T. Beresford

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

Section A

- Q1.** Write an essay on the sources of oxidative stress and the antioxidant defence systems of the body. What role does diet play in the antioxidant defence capability of the body?

(25 marks)

- Q2.** Discuss the role of the Ser-His-Asp catalytic triad in serine proteases. What evidence is there to support both divergent and convergent evolution within this group of proteins?

(25 marks)

Section B

- Q3.** Describe the molecular mechanisms of drug-receptor interaction, using diagrams and specific examples to illustrate your answer.

(25 marks)

- Q4.** 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)

Section C

- Q5.** Discuss the role of electrolytes in maintaining ionic balances in the body and outline their biochemical significance in relation to kidney function. (25 marks)
- Q6.** Describe in detail the mechanistic role played by insulin in regulating the cellular uptake of glucose during carbohydrate absorption. (25 marks)

Section D

- Q7.** Discuss some of the main recent developments in the area of clinical diagnostics, particularly with regard to detecting myocardial infarctions. (25 marks)
- Q8.** Discuss the importance of recombinant protein engineering over the last 20 years and highlight some of the main subsequent therapeutic applications. (25 marks)