

Cork Institute of Technology

Higher Certificate in Science in Applied Biology – Stage 1

(National Certificate in Science in Applied Biology – Stage 1)

(NFQ – Level 6)

Autumn 2005

Biology

(Time: 3 Hours)

Answer FIVE questions in total.

Question 1 in section A is compulsory. Answer TWO questions from section B and TWO questions from section C. Use separate answer books for each section.

Examiners: Dr. T. Beresford
Ms. M. Lane
Dr. S. Kenny
Ms. E. Flannery
Dr. A. Coffey

Section A

Q1. (compulsory)

- (a) How is the magnifying power of the microscope calculated?
- (b) Explain how you would test for the presence of starch in the laboratory?
- (c) Describe a simple experiment to test for the presence of lipids?
- (d) What method is used to estimate the level of vitamin C in potatoes and apples?
- (e) Briefly explain how a spectrophotometer works?
- (f) What is meant by osmosis?
- (h) What is the essential difference between a simple stain and a negative stain?
- (i) Explain how heat-sensitive liquids might be sterilized?
- (j) What does a viable plate count measure?
- (k) What is meant by a decimal dilution series?

(20 marks)

Section B

(Answer two questions)

- Q2. (a) List and briefly explain the functions of proteins. (10 marks)
- (b) Explain the structure of proteins. (10 marks)
- Q3. (a) Write an account of the methods used to study cells. (microscopy, cell fractionation and differential centrifugation.) (10 marks)
- (b) Write an account of the cytoskeleton in eukaryotic cells. (10 marks)
- Q4. (a) Write an account of mitosis as it occurs during the cell cycle. (12 marks)
- (b) Describe the characteristics of cancer cells. (8 marks)

Section C

(Answer two questions)

- Q5. Give a general account of the influence of:
- (a) temperature on enzyme activity (10 marks)
- (b) pH on enzyme activity. (10 marks)
- Q6. Describe how the energy stored in Glucose is used to phosphorylate ADP during cellular respiration. (20 marks)
- Q7. Discuss in detail FOUR different ways that microbes are useful for man and TWO different ways that microbes are harmful. (20 marks)