

# 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)

Summer 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.

All questions carry equal marks.

Examiners: Dr Tom Beresford

Ms M. Lane

Ms Elaine Flannery

Dr A. Coffey

Dr S. Kenny

## Section A

Q1. (Compulsory)

- (a) In the light the microscope, what magnification is used to see bacterial cells, and which lenses would you look through to achieve this magnification?
- (b) Explain how you would test for the presence of protein in the laboratory.
- (c) What is meant by the isoelectric point of a protein?
- (d) Explain why apple tissue turns brown when exposed to oxygen.
- (e) What is a standard graph?
- (f) What conversions do the following enzymes catalyse? Urease, Amylase, Catalase and Rennin.
- (g) In thin layer chromatography, what is meant by the R<sub>f</sub> value?
- (h) In microscopy, explain what is a wet mount?
- (i) What is the purpose of 'fixing' in bacterial staining procedures?
- (j) Describe three effective methods of sterilization?

(20 marks)

## Section B - Answer two questions

- Q2. (a) Explain each of the following terms and give an example for each one.
- (i) Hexose
  - (ii) Pentose
  - (iii) Sugar isomer
  - (iv) Phospholipid
  - (v) Saturated Fat
  - (vi) Unsaturated Fat
  - (vii) Steroid
  - (viii) Triglyceride
- (8marks)
- (b) Write a detailed account of the structure of nucleic acids. (12 marks)
- Q3. (a) Describe with the aid of a diagram the structure of a typical eucaryotic cell. (6 marks)
- (b) Explain how a protein is synthesised and then transported within a eucaryotic cell. In your answer describe the important organelles involved (nucleus, ribosome, endoplasmic-reticulum, transport vesicles and golgi apparatus). (14 marks)
- Q4. Write an account of the cell cycle as it occurs in healthy cells. Describe each phase of the cycle. (20 marks)

## Section C – Answer two questions

- Q5. The active site of an enzyme brings about a change to the molecular structure of a substrate. Describe two examples of how this is accomplished. (20 marks)
- Q6. Using glucose as a substrate, explain the difference between the ATP yield from aerobic respiration and the ATP yield from fermentation. (20 marks)

- Q7. Draw a labelled diagram of a typical bacterial cell and discuss in detail FOUR important components. (20 marks)