

Cork Institute of Technology

Higher Certificate in Science in Applied Biology—Stage 1

(NFQ – Level 6)

Autumn 2006

Biology

(Time: 3 Hours)

Instructions

Answer Five questions in total

.Question 1 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: Prof R Fitzgerald

Dr.Jim O Mahony

Ms M Lane.

Dr.A Coffey

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_f 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. Write a descriptive account of the structure and function of (a) Proteins and (b) Nucleic Acids (20 Marks)
- Q3 Write an explanatory note on each of the following :
(a) Endoplasmic Reticulum
(b) Golgi Apparatus
(c) Ribosomes
(d) Cytoplasmic Membrane
(e) Cytoskeleton (20 Marks)
- Q4 (a). Write an account of the events that make up a normal cell cycle.
(b) Explain how the cell cycle is controlled and the consequences of uncontrolled cell growth. (20 marks)

Section C

(Answer two questions)

- Q5. Using the following headings, write a detailed account of **enzymes**:
(a) Structure (7 marks)
(b) mode of action (7 marks)
(c) Inhibition (6 marks)
- Q6. Describe the cellular mechanisms employed by eukaryotes to obtain energy from a carbohydrate substrate. (20 marks)
- Q7. Discuss the role of each of the following in relation to disease.
(i) Bacterial infections (10 marks)
(ii) Diet (10 marks)