

Cork Institute of Technology  
Bachelor of Science in Applied Biosciences - Stage 1  
(SBIOS\_7\_Y1)  
Summer 2008  
**Biology (Old Syllabus)**  
(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: Prof. G. Walsh  
Ms. M. Lane  
Dr. J. O Mahony  
Ms. E. Flannery

**Section A**

**Q1. (Compulsory)**

- (a) In the light microscope, what magnification is used to see bacterial cells, and which lens would you look through to achieve this magnification?
- (b) Explain how you would test for the presence of starch in the laboratory.
- (c) Explain how you would test for the presence of protein in the laboratory.
- (d) What is meant by the isoelectric point of protein?
- (e) Name the enzymes responsible for the following reactions:  
$$\text{NH}_2\text{CONH}_2 + \text{H}_2\text{O} \rightarrow \text{CO}_2 + 2 \text{NH}_3$$
$$2\text{H}_2\text{O}_2 \rightarrow 2 \text{H}_2\text{O} + \text{O}_2$$
- (f) What is meant by osmosis?
- (g) What is the essential difference between a simple stain and a negative stain?
- (h) Explain how heat-sensitive liquids might be sterilized.
- (i) What does a viable plate count measure?
- (j) What is the purpose of fixing in bacterial staining procedures?

(20 marks)

## Section B – Answer two questions

- Q2. (a) Describe the structure of proteins. (10 marks)  
(b) Write an account of the functions of proteins. (10 marks)
- Q3. Write a descriptive account of each of the following:  
(a) Endoplasmic reticulum  
(b) Ribosomes  
(c) Golgi apparatus  
(d) Cytoplasmic membrane  
(e) Cytoskeleton (20 marks)
- Q4. Write an account of the cell cycle as it occurs in healthy cells. Describe each phase of the cycle and how the cycle is controlled. (20 marks)

## Section C – Answer two questions

- Q5. Discuss the importance of enzymes in biological systems. In your answer describe the general structure of an enzyme and outline the factors that influence enzyme activity. (20 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)