

Cork Institute of Technology

Bachelor of Science in Cell & Molecular Biology – Award

(NFQ Level 7)

Autumn 2006

Biotechnology

(Time: 3 Hours)

Answer **five** questions in total.

Examiners: Dr. Tom Beresford
Ms. Sheila Kenny
Ms. Margaret Lane

Answer **two** questions from Section A,
and **three** questions from Section B.

Use separate answer books for each Section.

Section A - Answer any two questions

- Q1. Define pressure and viscosity and state the units for each. (5 marks)
Outline how pressure is measured in fluids. (7 marks)
Write a note on pumps and the mechanism of action of any two types. (8 marks)
- Q2. Write a note on the growth of *E. Coli* and give reasons for the extensive use of *E. Coli* in biotechnology. (8 marks)
What feature do Lactic Acid bacteria have in common? List the five species used in industrial fermentations. (6 marks)
List the industrial applications of *Saccharomyces Cervisiae*. (6 marks)
- Q3. Write notes on five of the following
- a) Direct vat set starter cultures
 - b) Harvesting of starter cultures
 - c) Freeze drying of starter cultures
 - d) The refrigeration cycle
 - e) Reverse osmosis
 - f) C.I.P. (cleaning in place)
- (20 marks)

Section B - Answer 3 Questions

- Q4. Write brief notes on each of the following:
- (a) Properties of a useful Industrial Microorganism. (4 Marks)
 - (b) Main features of a typical aerobic fermenter. (4 Marks)
 - (c) The term “Scale Up” as used in fermentation process. (4 Marks)
 - (d) Primary and secondary metabolites. (4 Marks)
 - (e) Fed batch Process. (4 Marks)
- Q5.(a) List and discuss the commercial applications of Enzymes. (6 Marks)
- (b) Discuss the Genetic /Biochemical factors that influence the microbial production of enzymes. (8 Marks)
 - (c) Write a brief note on the recovery and purification of enzymes in a commercial process. (6 Marks)
- Q6. Write an account of the properties, structure and production of Penicillin antibiotics. (20 Marks)
- Q7. Discuss the role of Recombinant DNA technology in Biotechnology.
(Mention the tools and procedures used to obtain pieces of DNA and successfully clone them into host cells)
(20 Marks)