

**CORK INSTITUTE OF TECHNOLOGY
INSTITIÚID TEICNEOLAÍOCHTA CHORCAÍ**

Autumn Examinations 2011/12

Module Title: Bioprocessing

Module Code: BIOL7004

School: Science & Informatics

Programme Title: BSc in Food and Health Science
BSc (Hons) in Nutrition and Health Science

Programme Code: SFSTE_7_Y3
SNHSC_7_Y3

External Examiner(s): Dr Alison Gallagher, Dr Don Faller
Internal Examiner(s): Ms A. Murphy, Mr E. Fitzgerald

Instructions: Answer four questions in total. Answer two questions from Section A and two questions from Section B.
Use separate answer books for each section.

Note: Questions in Section A have 30 marks each.
Questions in Section B have 20 marks each.

Duration: 2 hours

Sitting: Autumn 2012

Requirements for this examination:

Note to Candidates: Please check the Programme Title and the Module Title to ensure that you have received the correct examination paper.
If in doubt please contact an Invigilator.

Section A

(Answer two questions from Section A)

- Q1 (a) Describe in detail the principles and applications of the following unit operations in food or healthcare industries:
- (i) Reverse Osmosis
 - (ii) Ultrafiltration
 - (iii) Ion Exchange
- (15 marks)
- (b) Write a short note on the following in relation to the thermal processing of foods:
- (i) Pasteurisation
 - (ii) Commercially Sterile
 - (iii) Hot Pack/Hot Fill
- (9 marks)
- (c) Describe the factors that affect the rate of heat transfer during evaporation
- (6 marks)
- Q2 (a) Discuss the freezing methods available for commercial use in food and healthcare industries.
- (10 marks)
- (b) Write a note on the production of extruded products under the following headings.
- (i) Main methods of producing extruding foods including types of equipment used
 - (ii) Examples of products produced by each type of equipment
 - (iii) Factors affecting the quality of extruded products.
- (12 marks)
- (c) Discuss the importance of disinfectant control and use in food and healthcare industries
- (8 marks)
- Q3 (a) Write a detailed note on the production of the following dried milk powders:
- (i) Instant whole milk powder
 - (ii) Whey protein concentrate
 - (iii) Casein
- (15 marks)
- (b) Describe briefly the production of carbonated non alcoholic beverages.
- (9 marks)
- (c) Write a brief note on one category of healthcare products that you are familiar with.
- (6 marks)

Section B

(Answer two questions from Section B)

- Q4 Describe the design and operation of a mechanical refrigeration circuit. Describe, with the aid of diagrams, the function of each component of the system.
(20 marks)
- Q5 Discuss the principles which should be taken into account when designing the site and external layout of a manufacturing plant for a food, drink or healthcare product of your choice. Take account of security, contamination, product flow and efficiency in your answer.
(20 marks)