

**CORK INSTITUTE OF TECHNOLOGY
INSTITIÚID TEICNEOLAÍOCHTA CHORCAÍ**

Semester 1 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
NHSC_7_Y3

External Examiner(s): Dr D. Faller, Dr A. Gallagher
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: Winter 2011

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

- Q.1 (a) Write a note on food irradiation to include sources, functions and effects on foods and microorganisms.
(10 marks)
- (b) Describe in detail the principles and applications of two of the following unit operations in the food or healthcare industry:
(i) Evaporation
(ii) Ultrafiltration
(iii) Ion Exchange
(10 marks)
- (c) 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
(10 marks)
- Q.2 (a) Write a note on the following drying methods used in the food industry.
(i) Spray Drying
(ii) Freeze Drying
(10 marks)
- (b) In the production of extruded products write a note on the following:
(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.
(10 marks)
- (c) Discuss the functions of the ingredients used in the production of carbonated drinks.
(10 marks)
- Q.3 (a) Write a note on the processing of whey in the Dairy Industry to include products produced.
(10 marks)
- (b) Write a brief note on two categories of healthcare products that you are familiar with.
(8 marks)
- (c) Discuss in detail the main freezing methods available in the commercial processing of foods. Discuss how the rate of freezing affects food quality.
(12 marks)

Section B

- Q.4 Describe the design and operation of a mechanical refrigeration circuit. Comment briefly on the function of each component of the system.
(20 marks)
- Q.5 Describe the design and operation of a boiler for steam generation. Comment briefly on the function of each component of the system.
(20 marks)
- Q.6 Discuss the principles which should be taken into account when designing the internal layout of a manufacturing plant for a food, drink or healthcare product of your choice.
(20 marks)