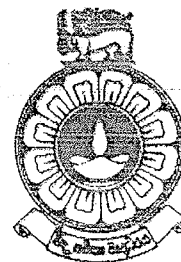


The Open University of Sri Lanka

Faculty of Natural Sciences

Diploma in Food Science



Department	: Chemistry
Level	: 3
Name of the Examination	: Final Examination
Course Title and Code	: Food Preservation and Processing (CYD3614)
Academic Year	: 2022-2023
Date	: 06 th January 2023
Time	: 9.30 a.m. – 12.30 p.m.
Duration	: 3 hr

General Instructions

1. Read all instructions carefully before answering the questions.
2. This question paper consists of (04) essay questions in (4) pages.
3. Answer all (04) questions.
4. Use a blue or black pen not a pencil. Use the given book to write down answers for (4) essay questions.
5. Answer for each question should commence from a new page.
6. Draw fully labelled diagrams where necessary.
7. Clearly state your index number in your answer script.
8. Involvement in any activity that is considered as an exam offense will lead to punishment.

01. A) (i) State two most important processing objectives of thermal processing used in the food industry. (06 Marks)
- (ii) Explain **two (02) processing methods** and give **one (01) example for the technique** which can be used in one of the above processing objectives you mention above question 01. A) (i). (10 Marks)
- (iii) State **three (03)** classes of Food borne microorganisms according to optimum temperature required for growth. (06 Marks)
- (iv) Explain the mode of heat transfer occurred in following processed foods during the thermal processing conditions applied.
- (a) Fruit juice
- (b) Tomato juice (08 Marks)
- B) (i) Define the term sterilization used in the food industry. (06 Marks)
- (ii) Indicate the beneficial and non-beneficial effects of sterilization of food. (08 Marks)
- (iii) Explain **two (02)** commonly used methods in sterilization. (06 Marks)
- (iv) Give **three (03)** examples of food products processed with Ultra Heat Treatment (UHT). (10 Marks)
- C) (i) Define the term extrusion. (10 Marks)
- (ii) Indicate the steps used in preparing the breakfast cereals as extruded products. (10 Marks)
- (iii) 'Usually added volatile artificial flavouring substance is not retained in the extruded product'. Explain this statement. (10 Marks)
- (iv) Explain the basic parts in an extruder with an aid of a diagram of a single screw extruder. (10 Marks)
02. A) Spray dryer is used to produce milk powder from liquid milk.
- (i) Write down **three (03)** advantages of spray dryer. (06 marks)
- (ii) Name **four (04)** applications of evaporation in food industry. (08 marks)
- (iii) In industry evaporation is carried out using an evaporator. Write down **three (03)** factors that depend on the type of evaporator used in the industry. (09 marks)
- (iv) "Evaporation is good for the salt industry, but not very suitable for the tomato puree industry". Justify the statement. (10 marks)

B) Membrane concentration is the second most commonly used method for concentration or separating constituents in a solution.

(i) What is the principle behind the membrane concentration? Using a suitable diagram briefly explain your answer. (14 marks)

(ii) Write down the **most suitable** method of concentration for the following applications.

(a) water treatment to remove bacteria greater than $0.003 \mu\text{m}$

(b) water treatment to remove bacteria greater than $0.003 \mu\text{m}$

(c) Separation of concentrate Whey protein during cheese manufacturing process

(09 marks)

(iii) Write down **three (03)** factors affecting membrane concentration.

(09 marks)

C) (i) "The products formed in fermentation were found to extend the shelf life". Justify the statement by giving **two (02)** examples. (20 marks)

(ii) Name **three (03)** disadvantages of fermentation of food.

(09 marks)

(iii) Name **three (03)** enzymes that are used in fermentation.

(06 marks)

03. A) (i) Briefly explain the reason for the colour of cow's milk is slightly yellow colour whereas buffalo milk is white in colour. (10 marks)

(ii) What is meant by lactose intolerance? (08 marks)

(08 marks)

(iii) Name **four (04)** major enzymes in cow's milk. (08 marks)

(08 marks)

(iv) Write down **two (02)** methods that could be used to detect whether milk is adulterated with water. (08 marks)

(08 marks)

(v) Write down the conditions for the pasteurization of milk under LTLT and HTST treatments. (06 marks)

(06 marks)

(vi) Write down the **five (05)** major steps involved in manufacturing ice cream. (10 marks)

(10 marks)

B) (i) Give **two (02)** reasons why dried spices are advantageous over fresh spices. (10 marks)

(10 marks)

(ii) What is the difference between spice oils and oleoresins. (10 marks)

(10 marks)

(iii) What is meant by 'value addition' in relation to spices? (10 marks)

(10 marks)

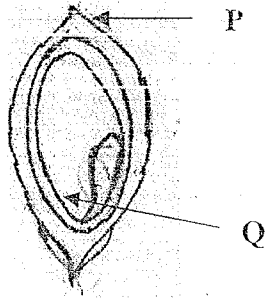
(iv) What is solar drying? Why is it more beneficial than sun drying? (10 marks)

(10 marks)

(v) Explain what is meant by 'total quality control'. (10 marks)

(10 marks)

04. A) (i) Rice is the main cereal grown in Sri Lanka. Explain why rice is categorized as a cereal. (05 marks)
- (ii) Identify the following parts (P and Q) of the structure of a rice grain. Briefly explain the use of P and Q. (20 marks)



- (iii) Briefly explain two (02) steps involved in the primary processing of rice. (10 marks)

B) (i) Legumes refer to the edible seeds of leguminous plants belonging to the *leguminosae* family. Name the two (02) groups of legumes used as food. (05 marks)

- (ii) Name five (05) nutrient components found in Legumes. (10 marks)

(iii)

(a) Name any two (02) groups in which Wheat flour is classified according to the Source of wheat grain. (05 marks)

(b) Briefly explain why Ready-to-eat breakfast cereals are so popular as a breakfast item. (05 marks)

(c) Briefly explain how flaked cereals (e.g. corn flakes) are produced. (15 marks)

C) (i) Consider that you are going to be an entrepreneur in bread manufacturing. What are the main ingredients you will use in bread manufacturing? (10 marks)

(ii) Briefly explain the biochemical changes involved in the manufacture of bread. (15 marks)
