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	: 2024-2025
Date	: 12th July 2025
Time	: 9.30 a.m. – 12.30 p.m.
Duration	: 3 hours

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 on 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 an exam offense **will lead to punishment.**

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(1) (A) Describe three steps involved in the commercial canning process and the importance of each step.

(15 Marks)

(B) Explain the concept of D-value and its importance in designing thermal processes.

(15 Marks)

(C) What is meant by the term cold spot? (10 Marks)

(D) How do you prevent the following sensory changes during blanching?

    (i) Loss of green colour due to leaching of chlorophyll

    (ii) Browning of cut apples and potatoes

    (iii) Texture of potatoes

                                         (15 Marks)

(E) Explain the principle of microwave cooking. Describe how microwaves cook food.

                                         (15Marks)

(F) **(i)** Define the term "Sterilization".   **(10 Marks)**

    (ii) Give **four (4)** Factors affecting in-container sterilization   **(10 Marks)**

    (iii) Why is it not possible to obtain 100% sterile food?   **(10 Marks)**

(2) (A) **(i)** Briefly explain how dehydration preserves the food materials.   **(10 marks)**

    (ii) Name **three (3)** drying methods involved in dehydration.   **(06 marks)**

    (iii) Write down **three (3)** properties of food that affect the rate of dehydration.

                                         (06 marks)

(B) **(i)** Name **two (2)** types of thin film evaporators.   **(08 marks)**

    (ii) Write down **four (4)** advantages and **two (2)** disadvantages of freeze drying.

                                         (18 marks)

    (iii) Briefly explain the chemistry behind freeze concentration.   **(10 marks)**

    (iv) Write down **two (2)** applications of freeze concentration.   **(10 marks)**

(C) **(i)** Write down the desirable effects of fermentation for each of the following food materials.

                                         (18 marks)

          a. Yoghurt

          b. Cassava

          c. Alcohol

(ii)   Write down **two (2)** advantages of using technical enzymes in food fermentation.

(08 marks)

(iii) Name **three (3)** organic acids produced by microbial fermentation that are widely used as food additives.

(06 marks)

(3) (A) (i)   Milk is a colloidal system, although it appears as a white liquid. Justify the statement.

(10 marks)

(ii)   Briefly explain the following terms.   (12 marks)

    a. Casien micelle

    b. Whey proteins

(iii) Name **three (3)** quality tests to test the acidity that have been carried out at the factory.

(12 marks)

(iv)   Write down **four (4)** disadvantages of the homogenization of milk.   (16 marks)

(B) (i)   Mention the key functions of spices in food preparation. Give an example of a spice for each.

(12 marks)

(ii)   What are essential oils? Give 3 modern methods used in the extraction of essential oils.

(10 marks)

(iii) What is meant by spice spent? Give some potential applications of it.

(09 marks)

(iv)   Differentiate between primary, secondary and derived spice products.

(09 marks)

(v)   What is 'total quality control'? Give the key areas to be monitored in total quality control.

(10 marks)

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(4) (A) (i) Briefly explain why cereals are widely used as food worldwide.

(ii) Wheat is the most widely consumed cereal grain in most countries. Identify the enzyme(s) and product (s) involved in the leavening process of wheat dough.

a. hydrolysis of starch in wheat flour to Glucose

b. formation of carbon dioxide from glucose

(iii) Briefly explain the basic features found in mills used to produce wheat flour after primary processing.

(51 marks).

(B) (i) Label the parts A to D of a mature broad bean seed given below.
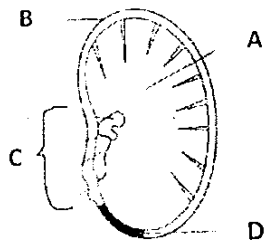
(ii) Briefly explain why a combination of cereal protein and legume protein (e.g., rice and beans) is required to serve as an ideal source of dietary proteins for human beings.

(22 arks)

(C) Consider that you are going to be an entrepreneur in pasta manufacturing. You plan to develop a new pasta for the market with a unique shape.

(i) What are the main ingredients you will use in pasta manufacturing?

(ii) Briefly explain the processes involved in the manufacture of pasta.

(Hint: no exact temperatures or timing is necessary)

(27 marks)

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