Chattogram Veterinary and Animal Sciences University

MS in Food Processing and Engineering Final Examination

July- December Semester 2023

Course Title: Fermentation and Food Biotechnology

Course Code: FFB-502

Total Marks: 40 Time: 2 hours

Answer any four (4) questions. Figures in the right margin indicate full marks.

1. **a.** Can you discuss the role of biotechnology in the development of functional foods and how these foods are categorized? **5.0**

   b. How does aerobic fermentation differ from anaerobic fermentation and what are some examples of organisms that engage in each type of fermentation? **5.0**

2. **a.** How do sensory qualities contribute to the overall eating experience and why are they important in evaluating food? **5.0**

   b. What are the key advantages of using submerged fermentation in the production of various bio-products? **5.0**

3. **a**. Can you explain the key microorganisms or processes involved in the production of single-cell protein? **5.0**

   b. What are the key steps involved in the industrial production of baker's yeast and how do they contribute to ensuring a high-quality product for baking purposes? **5.0**

4. **a.** Illustrate the separation and purification process of nucleic acids. **5.0**

   b. Describe the process of DNA replication, highlighting the key enzymes and molecular components involved in ensuring accurate and efficient copying of genetic material. **5.0**

5. **a.** What is the role of Agrobacterium in mediated transformation and how does it facilitate the transfer of genetic material into plant cells? **5.0**

   b. How does biotechnology contribute to enhancing the nutritional quality of food products? **5.0**

Chattogram Veterinary and Animal Sciences University

MS in Food Processing and Engineering Final Examination

July- December Semester 2023

Course Title: Risk Assessment and International Food Legislations

Course Code: RFL-502

Total Marks: 40 Time: 2 hours

Answer any four (4) questions. Figures in the right margin indicate full marks.

1. **a.** Identify and explain the key components typically found in a risk assessment chart. Briefly describe the different types of risk assessment. **5.0**

   b. How does the risk assessment process prioritize risks for mitigation or management? **5.0**

2. **a.** Why are food regulations important in food production and how do they contribute to ensuring the safety and quality of food products? **5.0**

   b. How many fundamental requirements of BRC? **5.0**

3. **a**. What are the key steps and considerations in implementing Good Manufacturing Practices in the food industry? **5.0**

   b. In the context of HACCP, what are the key roles and responsibilities of a Food Safety Team and how do they contribute to the development and implementation of a successful HACCP plan? **5.0**

4. **a.** How does the Deming Cycle promote a culture of continuous improvement in an organization? **5.0**

   b. How is UNICEF actively contributing to food system transformation on a global scale? **5.0**

5. **a.** Write short notes on: (Any two) **5.0**

   i. Food adulteration

   ii. Halal certification

   iii. Misbranding of foods

   b. Can you outline the key activities conducted by CAC in ensuring the success and efficiency of its operations? **5.0**

Chattogram Veterinary and Animal Sciences University
Department of Food Processing and Engineering
MS in Food Processing and Engineering Final Examination
July-December Semester Final Examination, 2023

Subject Title: Advanced Unit Operations in Process and Food Engineering

Subject Code: AUP-502

Total Marks = 40 Time = 2 hours

(Figures in the right margin indicate full marks. Answer any **Four** questions, the Split answer is not allowed)

1. a) State the law of conservation of mass and energy. Give an overview of an Engineering Process in unit operation. 5
   b) Briefly describe the following Pasteurization processes (any two): 2.5x2=5
      i) High temperature-short-time (HTST) pasteurization,
      ii) Low-Temperature Long Time (LTLT) pasteurization,
      iii) Ultra-High Temperature (UHT) Pasteurization.

2. a) Define the pump and list the components of a pumping system. Explain the operating principle of a centrifugal pump with an advantage. 5
   b) Enumerate in brief the concept of sterility. Discuss the concept of D-value and the concept of Z-value. 5

3. a) Mention the objectives of size reduction and equipment for size reduction. 4
   b) Enumerate in brief the following process: 2x3=6
      i) Types of the different evaporation processes,
      ii) Types of commercial evaporative crystallizers.

4. a) Define the following terms: i) Slurry, ii) Filtrate, iii) Filter Medium, iv) Filter cake, and v) Filter. Shortly describes the vacuum filtration process. 5
   b) Describe the applications of Refractometry in tabular form. 5

5. Write down the following terms (any four): 2.5x4=10
      i) Principle of Refractometry,
      ii) Principle of Flame photometry,
      iii) Principle of Mass Spectroscopy,
      iv) Various methods of sampling,
      v) Principle of atomic absorption spectroscopy.

Chattogram Veterinary and Animal Sciences University (CVASU)
Department of Food Processing and Engineering
MS in Food Processing and Engineering Final Examination
July-December Semester, 2023
Course Title: Advanced Technology of Animal products
Course Code: ATA-502

Full Marks: 40 Time: 2 hours

Answer any four (4) questions. Figures in the right margin indicate full marks. Split answer is not allowed.

1	a. What are the major post mortem changes occurring in muscle of meat animals? Explain.	6
	b. Illustrate the ATP production process in muscle.	4
2	a. Briefly describe the technological quality of meat for processing.	4
	b. Draw a flow chart of beef slaughtering, dressing process and points where various physical or chemical decontamination interventions can be applied.	3
	c. Explain the principles of color development in fermented sausages.?	3
3	a. Illustrate the diagram of major operations in bacon processing.	3
	b. Write down the principle of cheese making? Describe the manufacturing process of cheddar cheese?	1+3=4
	c. How you evaluate the internal and external quality of eggs.	3
4	a. "Paralytic Shellfish Poisoning - Harmful Algal Blooms" Justify the statement.	2
	b. Describe the quality and quality changes of fish in different novel preservation methods.	8
5	a. Describe the quality changes in fish during different stages of handling, transportation, preservation and processing.	4
	b. What is fish protein concentrate (FPC)? Is FPC the same as fish flour? - justify your answer? Write down the manufacturing process of FPC?	1+2+3=6

Chattogram Veterinary and Animal Sciences University

Department of Food Processing and Engineering

MS in Food Processing and Engineering Final Examination

July-December Semester Final Examination, 2023

Subject Code & Title: NFT-502, Novel Food Processing Techniques

Total Marks = 40 Time = 2 hours

(Figures in the right margin indicate full marks. Answer any **Four** questions, the Split answer is not allowed)

1. a) Define organic food and organic farming. Briefly describe the minimum requirements of organic farming to fulfill its objectives. 5

   b) Enumerate the encapsulation techniques with a flow diagram. How does edible coating preserve foods? 5

2. a) Describe the materials used in edible coating or film formulations with their functionality. Illustrate the release mechanism of flavor from encapsulated powder. 5

   b) Describe the principles of the High-Pressure Processing (HPP) food preservation method. List out the key benefits of HPP methods. 5

3. a) Briefly describe the five major techniques that are usually used in surface preparation and coating techniques. 5

   b) Illustrate the mechanism of action of Pulse Electric Field (PEF) processing with a diagram. Mention some applications of PEF processing. 5

4. a) Define hybrid drying Technology. Write down the working mechanism and benefits of Microwave Vacuum Drying. 6

   b) Define Osmotic Dehydration. Enumerate in brief the factors affecting mass transfer during Osmotic Dehydration. 4

5. a) "Ultrasound as a Processing Aid"- discuss the statement. Explain the role of applying Osmotic Dehydration for preserving the nutritive value of food. 5

   b) Define Osmotic Membrane Distillation (OMD). How Radio Frequency Electric Field chamber can be configured for food processing? 5

Chattogram Veterinary and Animal Sciences University (CVASU)
Department of Food Processing and Engineering
MS in Food Processing and Engineering Final Examination
July-December Semester, 2023
Course Title: By- product Utilization and Waste Treatment in Food Industry
Course Code: BUW-502

Full Marks: 40 Time: 2 hours

Answer any four (4) questions. Figures in the right margin indicate full marks. Split answer is not allowed.

1	a. Differentiate the term: waste, co-product and byproduct.	3
	b. Briefly explain the key reasons to minimize waste.	3
	c. Write down the good housekeeping recommendations for fruits and vegetable processing industries to reduce waste.	4
2	a. Draw a schematic flow chart of waste water treatment plant for food industry.	6
	b. How you implement the waste hierarchy concept in relation to food processing co-products and wastes.	4
3	a. Describe different dewatering methods for solid food processing waste.	4
	b. Explain environmental benefit of the recovery of by-products from the food and food-processing industries.	6
4	a. Differentiate between a hazard and a risk? Write down the importance of microbiological risk management in the stabilization of co-products. Describe Strategies for microbiological risk management?	1+2+3=6
	b. Describe the three main categories of co-products that utilize all, or almost all, seafood processing wastes?	4
5	Briefly describe the following (any 5) secondary treatment methods of waste water. a. Activated sludge process b. Aerated lagoon c. Trickling filters d. Rotating biological contactors e. Pond stabilization f. Anaerobic digestion g. Biological nutrient removal	5×2=10