

Chattogram Veterinary and Animal Sciences University
MS in Food Processing and Engineering Final Examination
January-June Semester 2024

Course Title: Food Irradiation

Course Code: FID-501

Total Marks: 40 Time: 2 hours

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

1. a. Can specific wavelengths of radiant energy be tailored to target particular bacterial strains more effectively? **5**
b. How does ionizing radiation interact with microbial cells to cause DNA damage and disruption of cellular functions? **5**
2. a. How does radiation treatment affect the nutritional content of food, particularly in terms of vitamins, minerals, and macronutrients? **5**
b. What are the regulatory guidelines and safety standards in place to ensure that irradiated food products are safe for consumption? **5**
3. a. How do the properties of microwaves influence their interaction with food molecules during heating? **5**
b. Briefly describe the industrial application of microwave heating. **5**
4. a. What are the basic principles of UV-light technology? Illustrate the mechanisms of UV-light generation. **5**
b. State the basic principle of photochemistry. **5**
5. **Write short note on the followings:** **2.5×4=10**
 - i. Limitations and future of microwave heating
 - ii. Ionizing radiations and sources
 - iii. Irradiation as cold sterilization
 - iv. Radurization, Radicidation and Radappertization

Chattogram Veterinary and Animal Sciences University
MS in Food Processing and Engineering Final Examination
January-June Semester 2024
Course Title: Food Additives, Contaminants and Toxicology
Course Code: FCT-501

Time: 2 hours

Total Marks: 40

[Answer any four (4) questions. Figure in the right margin indicate full marks.]

1.
 - a) Define toxin and toxicology. State the dose response relationship on toxicology. **5**
 - b) Briefly describe the aquatic bio-toxins related to marine source. Enlist some marine, plant and mycotoxins found in foods along with respective sources. **5**
2.
 - a) Briefly describe the properties and uses of some sweeteners and sugar polyols widely used in baking industry. **5**
 - b) Classify synergists and antagonists. Write down the mode of action of antioxidants and their role in processed food products. **5**
3.
 - a) What are genetically modified (GM) organisms and GM foods? Briefly describe the risk of GM food, food supplements and persistent organic pollutant. **5**
 - b) Illustrate the extraction methods of dyes present in food and food products. Briefly describe the formation, sources and health implications of toxicant formed during food processing. **5**
4.
 - a) State QuEChERS method? Illustrate the methods that are evolved in the analysis of heavy metal and pesticide residue in food matrices. **5**
 - b) Define INS and E-numbers. Enlist some permitted synthetic color used in food with permitted doses. **5**
5. Write short note on the followings: **2.5 × 4 = 10**
 - i) Food additives as toxicants
 - ii) Agricultural and Industrial contaminants in food
 - iii) Chelating agents and their mode of action
 - iv) Acrylamide in food products.

Chattogram Veterinary and Animal Sciences University
MS in Food Processing and Engineering Final Examination
January-June Semester 2024
Course Title: Advanced Food and Industrial Microbiology
Course Code: AFM-501
Total Marks: 40 Time: 2 hours

Answer any five (05) questions. Figures in the right margin indicate full marks. Split answers are strongly discouraged.

1. a) Define food microbiology. Briefly describe the significance of microorganisms in food application. **1+3=4**
b) What do you understand by bacterial growth curve? Enumerate the factors influencing the growth and survival of microorganisms in food. **2+2=4**
2. a) Write down the differences between food borne infections and intoxication. Enlist some mycotoxigenic moulds along with their toxins and health implications. **2+2=4**
b) Explain the disease etiology of food borne pathogens. Describe the intervention strategy for foodborne illness. **2+2=4**
3. a) Define bioprocessing. Briefly describe the outline of upstream and downstream processing. **1+3=4**
b) Why do we need to preserve viable cultures of microorganisms? Describe the basics of preservation of viable bacterial cultures. **1+3=4**
4. a) Write down the basic mechanism of food spoilage. Enumerate the factors affecting the spoilage of food products. **2+2=4**
b) Briefly describe the causes of spoilage in canned foods. **04**
5. a) Define hurdle technology. Describe the applications of hurdle technology in controlling microbial growth. **1+3=4**
b) Why food preservation is important? Analyze the role of natural antimicrobial compounds in food preservation. **2+2=4**
6. **Write short note on the followings:** **4×2=8**
 - a) Baker's yeast
 - b) Batch fermentation
 - c) Production of diacetyl
 - d) Food application of algae

Chattogram Veterinary and Animal Sciences University
Department of Food Processing and Engineering
MS in Food Processing and Engineering Final Examination
January –June Semester Final Examination, 2024
Subject Code & Title: NST-501, Novel Separation Techniques
Total Marks = 40 Time = 2 hours
(Figures in the right margin indicate full marks. Answer any **Four** questions,
Split answer is not allowed)

1. a) Define Separation and Novel Separation Techniques. Classify different types of filtrations according to retentate and pore size. Briefly describe the principle and mechanism of filtration. 5
b) Enumerate the principle of membrane separation. With figure shortly describe common modules/configurations of membrane. 5
2. a) Define Zone refining and shortly describe the techniques of zone refining, also differentiate between zone melting and zone refining. 5
b) Explain the principles following terms (any two): 2.5x2=5
 - i) Ion-exchange chromatography,
 - ii) Electrophoresis,
 - iii) electrodialysis.
3. a) Illustrate the principle and mechanism of following thermal separation process (Any four): i) Distillation, ii) Rectification, iii) Desorption, iv) Crystallization, and v) Evaporation. 2.5x4=10
4. a) Explain the principle and mechanism of adsorption separation process. Show the comparison between Physical Adsorption and Chemical Adsorption. 5
b) Describe the factors which influence the adsorption separation process. Enumerate in brief the principle of affinity chromatography. 5
5. a) Write down the principles of following terms (any Three): 6
 - i) Adductive crystallization,
 - ii) Supercritical fluid extraction,
 - iii) Prevaporation techniques,
 - iv) Permeation techniques.
b) Name different types of separation techniques and say which method is best for separation and why? 4

Chattogram Veterinary and Animal Sciences University

MS in Food Processing and Engineering Final Examination

January-June Semester 2024

Course Title: Advanced Dairy Engineering

Course Code: ADE-501

Total Marks: 40 Time: 2 hours

Answer any five (05) questions. Figures in the right margin indicate full marks. Split answers are strongly discouraged.

1. a) What do you understand by dairy engineering? Briefly describe the scopes of dairy engineering 1+3=4
b) Enlist the engineering properties of milk and dairy products along with their functionality in dairy processing. 04
2. a) Classify dairy plants based on end product and plant capacity. Briefly describe the role of GMP and HACCP in the maintenance of hygiene in dairy plants. 2+2=4
b) Briefly enumerate the factors to be considered prior to planning a dairy plant. 04
3. a) Enlist the commonly used materials in dairy plant along with their properties. Describe the factors to be considered while designing of sanitary pipelines. 2+2=4
b) Briefly describe the types and application of pumps used in dairy plant. 04
4. a) Define sterilized milk. Describe the preventive strategy of accumulation of unwanted materials in a sterilizer. 1+3=4
b) Briefly describe the working principle, instrumentation and application of spray dryer in dairy plants. 04
5. a) Define food packaging. Briefly enumerate the functionality of different packaging materials used in dairy plants. 1+3=4
b) Briefly describe the working principle and application of microwave processing in dairy plants. 04
6. a) What do you understand by lactoperoxidase system. Briefly describe the role of lactic acid bacteria (LAB) in fermented dairy products. 1+3=4
b) Briefly enumerate the enzymes important for dairy industry along with their food applications. 04

Chattogram Veterinary and Animal Sciences University
Department of Food Processing and Engineering
MS in Food Processing and Engineering Final Examination
January –June Semester Final Examination, 2024
Subject Code & Title: FMD-501, Food Machinery Design

Total Marks = 40

Time = 2 hours

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

1. a) Give a brief outline of the steps of engineering design process with figure for food industries. What do you mean by engineering properties of food materials? 5
 b) Enumerate the basic requirement and content of vessel design. 5
 Explain the cause of corrosion in pressure vessel with remedies.
2. a) Shortly mention the design consideration and procedure of piping. 5
 Completely design a food storage tank.
 b) Classify the Heat Exchangers. Differentiate between direct contact 5
 and indirect contact heat exchanger.
3. a) Describe the theoretical & Practical design configuration of an 5
 ideal dryer. Shortly describe the Air Blast freezer.
 b) Briefly mention the design consideration and utilization of 5
 material handling equipment. Explain the following parts of a
 machine: i) Bearing and ii) Shaft.
4. a) Write short notes on Positive displacement pump and Food grade 4
 gasket material.
 b) Illustrate in brief the seed processing steps. Show in tabular form 6
 the names of different separator equipment's used in seed handling
 operation with their specific property and uses.
5. a) List the factors affecting in size reduction of material. 5
 b) Enumerate in brief the types of Evaporators and their design 5
 configuration factors.