

**Chattogram Veterinary and Animal Sciences University**  
**MS in Food Processing and Engineering Final Examination**  
**January-June Semester 2021**  
**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. Why is food irradiated? Does irradiation make food radioactive? 5  
b. How does irradiation affect shelf life of foods? Does irradiation destroy all bacteria or cause chemical changes in food? How does irradiation destroy bacteria? 5
2. a. How much radiation is used in food processing? How does irradiation affect the taste of food? 5  
b. What equipment is employed to irradiate food? Write down the criteria for irradiator design. Briefly describe the grain irradiator with schematic diagram. 5
3. a. Do the free radicals produced during irradiation affect the safety of food? Do irradiated foods require special packaging? 5  
b. How does irradiation affect the taste of food? How can irradiated foods be identified in the market? 5
4. a. What do you mean by electromagnetic radiation spectrum? 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. Ionization and Excitation
  - ii. Radiation chemistry of food components
  - iii. Regulations of irradiated foods
  - iv. Radurization, Radicidation and Radappertization

Chattogram Veterinary and Animal Sciences University  
MS in Food Processing and Engineering  
January-June Semester Final Examination, 2021  
**Subject Code & Title: FCT 501, Food Additives, Contaminants and Toxicology**  
Total marks: 40      Time: 2 hours

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

1. a. What do you mean by emulsifying agent? 2
- b. Classify emulsifiers with description. 3
- c. Briefly explain the reasons of instability of an emulsion. 5
2. a. What are the side effects of using synthetic colorants? 2
- b. Which criteria need to fulfill for a chemical preservative to use in food products? 2
- c. Describe the lipid oxidation mechanisms by autooxidation and thermal oxidation process? 6
3. a. Give a flow chart of the influencing parameters of encapsulation efficiency during flavor encapsulation by spray drying. 2
- b. Explain coacervation and molecular inclusion process to encapsulate flavor compounds. 6
- c. Mention the advantages and disadvantages of spray drying process. 2
4. a. Summarize the release mechanisms of active compounds by diffusion, fragmentation, degradation and swelling. 6
- b. What is encapsulation? Draw a schematic illustration of different processes of encapsulation. 4
5. a. Write short notes on- 1.5×4=6
  - i. Dose-response curve
  - ii. Margin of safety
  - iii. Therapeutic index
  - iv. Acceptable daily intake
- b. How Maillard reaction create toxic compounds? 4

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, 2021  
**Subject Code & Title: FMD-501, Food Machinery Design**

Total Marks = 40

Time = ~~60 min~~ 2 hour

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

1. a) Give a brief outline of engineering properties of food materials. 5  
How a food engineer implement machinery design for food Industries?
- b) Write down the basic requirement and content of vessel design. 5  
Explain the main components of a pressure vessel with schematic diagram.
2. a) Mention the different design considerations which are used in piping system. Completely design a food storage tank. 5
- b) Differentiate between direct contact and indirect contact heat exchanger. Illustrate the design configurations of a Heat exchanger. 5
3. a) Enumerate in brief the types of Evaporator and their design configuration factors. List the factors affecting in size reduction of material. 5
- b) Illustrate in brief the seed processing steps. Show in tabular form the names of different separator equipment's used in seed handling operation with their specific property and uses. 5
4. a) Describe the theoretical & Practical design configuration of an ideal dryer. Mention different novel drying methods. 6
- b) Explain the following parts of a machine: 4  
i) Bearing, ii) Shaft, iii) Gear, iv) Chain drive.
5. a) Write down the different types of nozzles used in the food processing industry. Mention the different types of valves which are generally used in piping system. 5
- b) Write down the primary factors involved in conveyor equipment selection. How corrosion can be controlled by electropolishing and passivation? 5

Chittagong Veterinary and Animal Sciences University  
MS in Food Processing and Engineering  
January-June Semester 2021 Final Exam  
**Course Title: Advanced Technology of plant Food Products**  
**Course code: ATPP- 501**

Total Marks: 40

Time: 2 hour

**Answer any four (04) questions. Figures in the right margin indicate full marks.**

1. a. Give an overview of the post-harvest handling and storage of cereal grains. 05  
b. Briefly describe the mechanism of *Dhal* milling and processing of pulses. 05
2. a. Analyze the characteristics of freshly roasted coffee powder. 04  
b. Explain the roasting and brewing of coffee. 06
3. a. Assess the importance of conching and tempering in chocolate manufacturing? 06  
b. Give an overview about the health benefits of cocoa butter. 04
4. a. Illustrate the methods of extraction of polyphenolic constituents. 05  
b. Analyze the antioxidative action of tea polyphenols. 05
5. a. Briefly describe the essential oils and oleoresins extraction procedure and their utilization. 05  
b. Describe pre-harvest and post-harvest problems in fruits and vegetables processing. 05

**Chattogram Veterinary and Animal Sciences University**  
**MS in Food Processing and Engineering Final Examination**  
**January-June Semester 2021**  
**Course Title: Advanced Food and Industrial Microbiology**  
**Course Code: AFM-501**  
**Total Marks: 40      Time: 2 hours**

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

1. a. What are N-nitrosamines and how are they formed in fermented meat products other than nitrites/nitrates? 5  
b. What causes discoloration of meat products? How is nitrosylmyoglobin formed in fermented sausage? 5
  
2. a. What is *Monascus* pigment? How are they produced naturally? Briefly describe the uses of *Monascus* pigments in food industries. 5  
b. What are the meat-inherent mechanisms of zinc protoporphyrin IX (ZnPP) formation? How is lactic acid bacteria contributed to form ZnPP in fermented meat products? 5
  
3. a. Illustrate biosynthesis of lactic acid and its recovery and purification with industrial application. 5  
b. Enlist different enzymes which are used on carbohydrate compounds and their industrial applications. 5
  
4. a. What are the different classes of biosafety cabinet? Mention the salient features of BSC II and BSC III. 5  
b. Describe upstream and downstream processing for the commercial production of citric acid. 5
  
5. **Write short note on the followings:** **2.5×4=10**
  - i. Strain Development Strategy
  - ii. Solid State Fermentation
  - iii. Substrate Fermentation
  - iv. Red Fermented Rice

Chittagong Veterinary and Animal Sciences University  
MS in Food Processing and Engineering  
January-June Semester 2021 Final Exam  
Course Title: Advanced Dairy Engineering  
Course code: ADE- 501

Total Marks: 40

Time: 2 hour

**Answer any four (04) questions. Figures in the right margin indicate full marks.**

1. a. Define Dairy Engineering. Briefly describe the engineering properties of milk and milk products. 1+5=6
- b. Give an overview about the maintenance of dairy plant? 04
2. a. Discuss the application of milk separators, pasteurizer and milk homogenizer. 06
- b. Explain the types of dairy detergents and sanitizers. 04
3. a. Define fermented dairy products. Discuss the processing techniques of fermented dairy products? 05
- b. Explain aseptic processing techniques of milk and milk products? 05
4. a. Give an overview about the physico-chemical properties of milk and milk products. 05
- b. Assess the prospect of the applications of enzymes in dairy industry. 05
5. a. Give an overview about the present trends in cleaning and sanitization in dairy plants? 05
- b. Briefly describe the types of dairy waste from different sections? 05