Chittagong Veterinary and Animal Sciences University
MS in Food Processing and Engineering
January-June Semester Final Examination, 2019
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.	Define food additives. Classify food additives according to the purpose of use.	**2.0**
	b.	Write down the properties and functionalities of some selected food additives.	**4.0**
	c.	Point out the purpose, acceptable limit and toxicity level of 2 major antioxidants and sweeteners.	**4.0**
2.	a.	What is microencapsulation? Which characteristics should be available to be an ideal wall material?	**2.0**
	b.	Why flavor encapsulation is necessary? Describe the properties of some suitable wall materials (any 4) to encapsulate flavor compounds.	**3.0**
	c.	Briefly describe any one type of chemical process to encapsulate active compounds.	**5.0**
3.	a.	Which steps are necessary for encapsulation during spray drying technique? Highlight the advantages and disadvantages of spray drying.	**3.0**
	b.	Explain the mechanisms of controlled release of encapsulated flavors.	**6.0**
	c.	What is selective diffusion theory?	**1.0**
4.	a.	Define food toxicology. Describe dose response curve.	**3.0**
	b.	Suppose the TD_{50} and ED_{50} of additive X and additive Y are 150 and 3 mg/kg body weight, respectively. The values of ED_{99}, TD_{1X} and TD_{1Y} are 12, 0.01 and 20 mg/kg body weight, respectively. Compare the safety issue between additive X and Y based on TI and MS.	**2.0**
	c.	Classify toxic hazardous materials. How biological factors influence toxicity?	**5.0**
5.	a.	What is the major source of polycyclic aromatic hydrocarbons (PAHs)? Briefly explain the mode of toxic action of benzo[a]pyrene (BP).	**4.0**
	b.	Classify colorants. Differentiate natural colorant and synthetic colorant.	**2.0**
	c.	Mention the maximum permitted level of commonly used color in food products. Describe health aspects of using food colorants.	**4.0**

Chittagong Veterinary and Animal Sciences University
MS in Food Processing and Engineering
January-June Semester 2019 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 inspection and inspection schedule of dairy plant?	04
2.	**a.** Discuss the application of milk separators, clarifiers and milk homogenizer.	06
	b. Explain the types of conveyors used in dairy industry.	04
3.	**a.** Define fermented dairy products. Discuss the processing techniques of fermented dairy products?	05
	b. Explain ohmic and microwave heating 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

Chittagong Veterinary and Animal Sciences University

MS in Food Processing and Engineering (Final Examination)

January-June Semester 2019

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.** Define the principle of food irradiation. Illustrate what do you think the about the advantages of food irradiation over other preservation methods. **5.0**

   b. Outline the characteristics of ionization irradiation sources. Clarify the effect of dose limits of ionization radiation to reduce the microorganism and pathogens from foods. **5.0**

2. **a.** What is the basic principle of UV-light technology? Clarify the factors that influences the UV-light radiations. **5.0**

   b. Explain briefly about the applications of UV-light in food processing. **5.0**

3. **a.** Define the principle of microwave heating. Describe shortly about the advantages of microwave heating. **5.0**

   b."Careful choice of packaging materials is necessary for radiation stability"- Justify your answer. **5.0**

4. **a.** Investigate the effects of irradiation on nutritional changes of foods. **5.0**

   b. How canionizing radiations be applied in combination with other methods of food preservation for better performance? **5.0**

5. **a.** What is the rationale for utilizing radiation in treatment of wastewater and sewage waste? Categories the factors that affect the responses of microorganisms to irradiation used in wastewater, sewage and food processing wastes treatment. **6.0**

   b. Identify the prospects of food irradiation in Bangladesh. **4.0**

Chattogram Veterinary and Animal Sciences University (CVASU)
Department of Food Processing and Engineering

MS in Food Processing and Engineering Final Examination

January-June Semester, 2019

Course Title: Food Machinery Design

Course Code: FMD-501

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. Write down the engineering properties of food. How a food engineer implement machinery design for food industries?	2+4=6
	b. Design of food machinery is a rather complex subject which not only needs all the knowledge necessary for common machinery design but also calls upon food science, engineering, and technology. Justify?	4
2	a. How do you compare the programmable logic controller (PLC) with computers? Briefly describe the architecture of PLC.	1+4=5
	b. Explain the methods and equipment used for size reduction of food materials.	5
3	a. Write down the basic requirement and content of vessel design. Explain the main components of a pressure vessel with a schematic diagram.	2+3=5
	b. Write down the primary factors involved in conveyor equipment selection. Describe a bucket elevator with a schematic diagram.	2+3=5
4	a. Briefly explain the working principles of different pump used in the food processing industry.	4
	b. Describe different types of nozzles and gear used in the food processing industry.	6
5	a. Write short notes on any of the following three (3):	3×2=6
	i. Freeze dryer ii. Tubular heat exchanger iii. Air blast freezer iv. Agitated thin-film evaporator	
	b. Write down the principles of automatic process control. How instrument evaluation is done?	1+3=4

Chittagong Veterinary and Animal Sciences University
MS in Food Processing and Engineering
January-June Semester 2019 Final Exam
Course Title: Advanced Technology of plant Food Products
Course code: TPP- 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.** Asses 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 (CVASU)
Department of Food Processing and Engineering

MS in Food Processing and Engineering Final Examination

January-June Semester, 2019

Course Title: Advanced Food and Industrial Microbiology

Course Code: AFM-501

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

1	a. Categorize foods according to modern biotechnology with proper example. How strains improvement has been accomplished in fermentation industries?	2+3=5
	b. Briefly explain bioprocessing operations with the appropriate schematic diagram.	5
2	a. Illustrate the production of citric acid from the molasses and its recovery and purification with industrial application.	5
	c. What are hops? Which compound of hops makes bitterness in beer? Why is malt used in beer?	1+2+2=5
3	a. What is bioinformatics? Suppose you are assigned to clone an egg lysozyme into E. coli. What basic steps are used to produce a genetically engineered E. coli to produce prokaryotic and eukaryotic enzymes?	1+4=5
	b. Briefly describe the process of purification and separation of nucleic acids.	5
4	a. Explain enzyme kinetics with the derivation of Michalis-Menten equation.	5
	b. Write down the principle, procedure, and application of western blotting technique.	5
5	a. Write down the characteristic features of the major classes gene transfer methods.	5
	b. What are genetically modified (GM) organisms and GM foods? Are GM foods safe? What are the main issues of concern for human health?	1+2+2=5