

Chittagong Veterinary and Animal Sciences University
MS in Food Processing and Engineering Final Examination
January- June Semester, 2017
Course Title: Food Machinery Design
Course Code: FMD- 501
Full mark: 40, Time: 2 hours

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

1. a. Give a brief outline of Input and Output Devices of Programmable logic Controller system. 4
- b. Define vessel and how it could be classify? Show the different parts of vessels. 6
 How corrosion can be controlled by electropolishing and passivation?
2. a. Write down the important consideration of piping design process. Mention the different types of valves which are generally used in piping system. 5
- b. Differentiate between direct contact and indirect contact heat exchanger. Illustrate the general design considerations of Heat Exchanger. 5
3. a. Enumerate in brief the seed processing steps. Show in Tabular form the names of different separator equipments used in seed handling with their specific property and uses. 5
- b. List the factors affecting in size reduction of material. Enumerate in brief the types of Evaporator and their design consideration factors. 5
4. a. Explain the theoretical design consideration of a dryer. Name the main parts of a dryer. Mention different novel drying techniques. 5
- b. Describe with figure the main parts of Gear. Explain the working principle of positive displacement pump with figure. 5
5. a. Define Transducer. Explain different types of Transducer and basic requirements of a transducer. 5
- b. Write short notes on following terms: i) Process Characteristics, ii) Symbology, iii) DC motors. 5

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Course Title: Novel Separation Techniques
Course Code: NST- 501
Full mark: 40, Time: 2 hours

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

1. a. Show in tabular form the stages of filtration mechanism. Classify filtration according to the retentate and pore size. 4
b. Explain the principle of following separation techniques: 6
 - i) Affinity chromatography,
 - ii) Immuno chromatography,
 - iii) Zeolite adsorption.

2. a. Differentiate between physisorption and Chemisorption. Briefly describe the factors influencing adsorption. 6
b. Define thermal separation. Differentiate the major thermal separation process between i) adsorption & absorption, 4
ii) adsorption & desorption.

3. a. Explain in brief the following topics : i) Properties of supercritical fluid, 5
ii) Advantages of vapour permeation process,
iii) Pervaporation Process.
b. Enumerate in brief the techniques of zone refining and electro dialysis. 5

4. a. Write down the principle of Dielectrophoresis with application. 6
b. Discuss the merits and demerits of different membrane reactors. 4

5. a. Give a brief outline in recent advances in separation techniques. 4
b. Write down the following terms (any three) : 6
 - i) Cross-flow electro-filtration,
 - ii) Operating equation for filtration process,
 - iii) Reverse Osmosis,
 - iv) Ultra filtration.

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Course Code: ADE- 501

Course Title: Advanced Dairy Engineering

Full mark: 40

Time: 2 hours

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

1. a. Briefly describe the Engineering properties of milk. Classify pump and various positive displacement pumps. 6
b. Differentiate between AC motor and DC motor. Shortly describe the lighting in dairy plant. 4
2. Describe the following topics :i) Method of cream separation, 10
ii) Advantage of clarifiers,
iii) Effect of homogenization.
3. a. Enumerate in brief the various method of cooling of milk. 4
b. Mention the factors effecting plant operating efficiency. Explain the basic design consideration for drainage system of food plant. 6
4. a. Describe the following topics: i) Spray dryer, 5
ii) Aseptic processing,
iii) Super critical fluid extraction.
b. Define effluents. .Shortly describe different effluent treatment 5
5. a. Describe the different milk testing and microbiological equipments which are generally used in food industry. Briefly describe the source of dairy waste water. 5
b. Define butter and butter churn. Enumerate in brief the process flow chart of Ghee. 5

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Course Title: Food Additives Contaminants and Toxicology
Course Code: FCT-501
Total Marks: 40 Time: 2 hours

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

1. a. Classify sensitivities. What is the mechanism of immediate hypersensitivity? 5
b. State substances associated with non-immunological food sensitivities with type of reaction and specific illness. 5

2. a. Briefly describe the reactions that are associated with food borne substances other than proteins or enzymes. 5
b. What are genetically modified (GM) organisms and GM foods? Why are GM foods produced? 5

3. a. "Antitoxicants alter toxicant biotransformation and suppress the initiation phase of carcinogenesis" – Explain it briefly. 5
b. Briefly describe the aquatic biotoxins related to seafood and fresh water. Enlist some mycotoxin and bacterial toxins found in foods with related food sources. 5

4. a. What are the functions of FDA, USDA, EPA, AOAC, IFT and BSTI? 5
b. Illustrate the methods that are evolved in the analysis of chemical toxicants and contaminants in foods. 5

5. **Write short note on the followings:** 2.5×4
 - i. Food allergy and Food intolerance
 - ii. Codex Alimentarius Commission
 - iii. Dietary estrogens and antiestrogens
 - iv. Risk assessment and Risk characterization

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MS in Food Processing and Engineering Final Examination
January-June Semester 2017
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. What is the irradiation process? Does irradiation make food radioactive? 5
b. How does irradiation destroy microorganisms? Why irradiation process is called cold sterilization? 5
2. a. What do you mean by dose and dosimetry? How much radiation is used to irradiate food? How does irradiation affect in organoleptic characteristics of food? 5
b. What are the criteria for irradiator design? Briefly describe the x-ray and E-beam irradiators with schematic diagram. 5
3. 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
4. a. Mention the Principles of microwave heating. Briefly describe the applications of microwave heating in food industry. 5
b. Write down the potential downside of eating microwave heated food. "UV in food preservation and deterioration"-Justify your answer. 5
5. **Write short note on the followings:** 2.5×4
 - i. Sources of UV light
 - ii. Ionization and Excitation
 - iii. Regulations of irradiated foods
 - iv. Radurization, Radicidation and Radappertization

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MS in Food Processing and Engineering Final Examination
January-June Semester 2017
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. State the concept of generation time, primary and secondary metabolite of a bacterium. Give some examples of it mentioning the name of bacteria and its use in industrial microbiology. 5
b. Briefly describe the mechanism of different types of fermentors based on the mode of operation. 5

2. a. Describe the economic parameters of a successful fermentation process. 5
b. Give an overview of the commercial production of Baker's Yeast. 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
 - i. Strain Development Strategy
 - ii. Fermentation Media
 - iii. Solid-Substrate Fermentations
 - iv. Pre-biotic and Probiotic