

Chattogram Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 2nd Year 2nd Semester Final Examination 2023
Course Title: Baking and Confectionery Technology (Theory)
Course Code: BCT-202 (T)

Full Marks: 70

Time: 3 Hours

(Figures in the right margin indicate full marks. Answer **Four (4)** questions from each section, where question no. **1** and **6** are compulsory. Use separate answer script for each section. Split answers are strongly discouraged.)

SECTION-A

- | | | |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 1. | Why is rice flour a popular choice for gluten-free baked products? What role does hydroxypropyl methylcellulose play in rice-flour based baking? | 2+3=5 |
| 2. | a. What are the effects of caramelization and Maillard reaction on baked products? | 4 |
| | b. Why should an oven not be overcrowded during baking? | 2 |
| | c. Compare dry heating and wet heating techniques. | 4 |
| 3. | a. What are the essential ingredients in baking, and what are their functions? | 4 |
| | b. Discuss the primary tests performed to assess the baking quality of flour. | 4 |
| | c. What are single-acting and double-acting baking powders? | 2 |
| 4. | a. Compare yeast fermentation and chemical leavening agents. | 3 |
| | b. Explain the chemical reactions involved in using baking soda and baking powder. | 3 |
| | c. Discuss common defects in bread and their causes. | 4 |
| 5. | Write brief notes on:
i) Slip point and neutralizing value ii) Role of gluten in baked products iii) Difference between hard and soft flour of wheat iv) Self-rising flour | 10 |

SECTION-B

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|-----|----------------------------------------------------------------------------------|-------|
| 6. | What is Falling Number test? How is it used to measure alpha-amylase activity? | 2+3=5 |
| 7. | a. Draw a flow chart of the bread-making process and explain each stage briefly. | 6 |
| | b. What is the role of fermentation in bread-making? | 2 |
| | c. What causes cakes to crack during baking and how can this be prevented? | 2 |
| 8. | a. Compare the flour requirements for bread, cakes, and biscuits. | 4 |
| | b. What is an extensograph and how is it used to analyze dough properties? | 4 |
| | c. Discuss factors affecting the crumb structure of bread. | 2 |
| 9. | a. Differentiate between baker's confectionery and sugar confectionery. | 3 |
| | b. Explain the process of chocolate production from cocoa beans. | 4 |
| | c. Compare the properties of dark, milk, and white chocolate. | 3 |
| 10. | a. Describe the manufacturing process of pasta with a flow chart. | 4 |
| | b. What are the properties of durum wheat and its role in pasta production? | 3 |
| | c. Compare the classifications of noodles based on processing methods. | 3 |

BFST 2nd year 2nd Semester Final Examination, 2023
Course Title: Food Plants Design, Layout & Management (Theory)
Course Code: PDL-202 (T)

Full Marks: 70

Time: 3 Hours

Figures in the right margin indicate full marks. Answer **four (4)** questions from each section where question no. **1** and **6** are compulsory. Split answers are strongly discouraged.

SECTION-A

1. "Computer aided design (CAD) has turned into an essential tool for solving engineering challenges in various food industries"-justify the statement. 5
2. a) What do you understand by plant layout? Briefly explain the steps involved in designing an ideal food plant. 1+2
b) How does food processing plant design differ from non-food processing plants? Briefly state the features of a good plant layout. 2+2
c) How does the hardware architecture of a PLC system ensure its reliability and flexibility in controlling industrial process? 3
3. a) Enlist the key elements required for building design. Briefly describe the factors influencing design and construction of a food plant. 2+2
b) What type of flooring materials are used in food processing plant? Shortly explain the legal aspects required for designing a food plant. 1+2
c) How can automation and smart material handling systems enhance efficiency in modern food plants? 3
4. a) Write down the principles of hygienic design of food processing machinery. 3
b) Define foundation. How could you differentiate between the shallow foundation and deep foundation? 1+3
c) Briefly explain the basic steps involved in designing of a food processing machinery. 3
5. a) What do you understand by personnel management and system management of a food plant? Briefly describe the characteristics of an ideal organization. 2+3
b) Write down the differences between company and organization. Illustrate the organizational framework of a baking industry. 2+3

SECTION-B

6. Enlist the utilities required for food processing plant. How can ^{electricity} supply and generation be managed efficiently? 5
7. a) Suppose, you have agri-food processing plant, how will you implement the waste hierarchy concept concerning the waste generated from the plant? 3
b) Briefly describe the impurities present in waste water. 3
c) How could you remove suspended matters for wastewater? – briefly explain with mechanism. 4
8. a) What do you understand by ozone treatment? Briefly state the mode action of ozone treatment to disinfect waste water. 2+3
b) Define anaerobic digestion of food waste. Briefly explain the working principle of trickling filters. 2+3
9. a) How does ergonomic factors play role in designing food machineries? Why is it important for workers safety and efficiency? 3+2
b) How could you differentiate cleaning, sanitizing and disinfecting? Briefly describe the cleaning-in-place (CIP) cycle in food processing. 2+3
10. Write short notes on any four (04) of the followings: 4×2.5
 - a) Commissary food service system
 - b) 3-D food printing
 - c) Working principle of PLC
 - d) Chemistry of detergents
 - e) Process or functional layout

BFST 2nd year 2nd Semester Final Examination, 2023
Course Title: Nutritional Evaluation of Processed Food (Theory)
Course Code: NFP-202(T)

Full Marks: 70

Time: 3 Hours

(Figures in the right margin indicate full marks. Answer **four (4)** questions from each section, where question no **1** and **6** are compulsory. Use separate answer script for each section. Split answers are strongly discouraged.)

SECTION-A

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|----|----|-------------------------------------------------------------------------------------------------------------------|--------------------|
| 1. | a) | Classify processed food. Why is nutritional evaluation important for the processed foods? | 3+2 |
| 2. | a) | List the names of polyphenols involved in the browning of different foods. | 3 |
| | b) | Categorize the browning reaction. Sketch the mechanism that takes place behind every browning of food. | 6+1 1+6 |
| 3. | a) | "Food is a key outcome of agricultural activities" – Justify the statement. | 2 |
| | b) | What do you mean by harvesting? Illustrate the factors affecting harvesting and storing of food commodities. | 1+4 |
| | c) | Recommend harvest and post-harvest procedures for maximum retention of nutrients in crops. | 3 |
| 4. | a) | Define portion control. How does cooking increase availability of nutrients and antioxidant value in foods? | 1+2 |
| | b) | What are the types of nutrient loss in home preparation of foods? | 1.5 |
| | c) | Compile the effects of cooking on micronutrients of foods. | 4 |
| | d) | Interpret the guidelines to minimize the cooking loss of nutrients. | 1.5 |
| 5. | a) | Combine the major activities of packaging. | 2 |
| | b) | Design a modern food packaging system to retain nutritional quality and freshness of fresh fruits and vegetables. | 3 |
| | c) | Explain your opinions regarding proper packaging of bakery, dairy, dehydrated and frozen foods. | 5 |

SECTION-B

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|-----|----|----------------------------------------------------------------------------------------------------------------------------------------|-------|
| 6. | a) | Summarize the benefits of fermentation during food processing. | 5 |
| 7 | a) | What do you mean by secondary processing of food? Briefly outline the effects of secondary processing on nutritional quality of wheat. | 1+3 |
| | b) | "Browning in food industry shows both advantageous and detrimental outcomes"- Clarify your opinion about this. | 4 |
| | c) | What are the solutions should apply to get rid of detrimental browning effects on food? | 2 |
| 8. | a) | Define curing. Write down the basic principle of food processing for preservation. | 1+3 |
| | b) | Figure out the mechanism of the following phenomena : | 3 X 2 |
| | | i. Microwave heating of food | |
| | | ii. Irradiation of food | |
| | | iii. Pulsed electric field for food preservation. | |
| 9. | a) | Enlist the names of worldwide fortified foods. | 4 |
| | b) | Draw the flow chart of fortification method. | 4 |
| | c) | Differentiate between food fortification and food enrichment methods. | 2 |
| 10. | a) | What are the food additives? Sketch the mode of action of food additives to preserve foods. | 1+2 |
| | b) | Briefly describe the benefits and limitations of processed foods. | 7 |

BFST 2nd Year 2nd Semester Final Examination 2023
Course Title: Cereal and Legume Technology (Theory)
Course Code: CLT-202(T)

Full Marks: 70

Time: 3 Hours

(Figures in the right margin indicate full marks. Answer **Four (4)** questions from each section, where question No. 1 and 6 are compulsory. Use separate answer script for each section. Split answers are strongly discouraged.)

SECTION-A

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|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 1. | a) Describe the anatomical structure of rice kernel with a neat sketch and indicate the implications of distribution of nutrients in rice kernel. | 5 |
| 2. | a) Define gelatinization temperature. How does amylose content affect the palatability characteristics of rice? | 1+4=5 |
| | b) Illustrate the principle of parboiling process of rice. | 2 |
| | c) Write down the reaction process of gluten formation during dough formation. | 3 |
| 3. | a) Name the various equipment involved in rice milling process. Describe in brief the modern rice milling procedures. | 2+4=6 |
| | b) Illustrate the coating method of rice enrichment. | 4 |
| 4. | a) Enumerate the purpose of tempering of wheat before milling. | 3 |
| | b) "Time and temperature are the crucial factor in parboiling process"- discuss the statement. | 3 |
| | c) Describe the various bleaching agents which are usually used for the treatment of wheat flour. | 4 |
| 5. | a) Briefly describe the industrial utilization of maize. | 2 |
| | b) Why is soymilk considered a healthy alternative to cow's milk? | 4 |
| | c) Paddy with an initial moisture content of 11.8% (d.b.) is to be soaked at 70°C under isothermal condition. The initial moisture gain Δx_i for the paddy at 70°C is 4.6% and k_m is 2.189×10^{-3} . Calculate the time required to attain a moisture content of 42% (d.b.). What would be the moisture content of the paddy if it is soaked isothermally at 75°C for 3h? | 4 |

SECTION-B

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|-----|------------------------------------------------------------------------------------------------------------------------|----------|
| 6. | a) Summarize the specific characteristics of barley for malting and brewing. | 3 |
| | b) How does extraction rate affects the efficiency of a flour milling system? | 2 |
| 7. | a) Enumerate the various properties of parboiled rice and indicate the advantages and disadvantages of parboiled rice. | 6 |
| | b) Write down the causes and mechanism of cracking of rice during drying of paddy. | 4 |
| 8. | a) Describe the principle and objective of rice enrichment. | 2 |
| | b) Summarize the main uses of different pulses in Bangladesh. | 4 |
| | c) List out the utilization of rice husk. | 4 |
| 9. | a) Briefly describe the malting operation of beer production. | 5 |
| | b) Describe the chemical changes that occur during grain storage. | 5 |
| 10. | Shortly describe the following terms (any four): | 2.5x4=10 |
| | i) Breakfast cereal | |
| | ii) Rice polishing equipment | |
| | iii) Function of Brabender Extensograph | |
| | iv) Fundamental principles of grain storage | |
| | v) Manufacturing process of corn flakes. | |

(Figures in the right margin indicate full marks. Answer **Four (4)** questions from each section, where question No. 1 and 6 are compulsory. Use separate answer script for each section. Split answers are strongly discouraged.)

SECTION-A

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|----|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 1. | a. | Compare among slaughtering, stunning and bleeding. Categories ritual slaughtering method with their essentials. | 1+2 |
| | b. | Summarize the steps of carcass dressing for different meat animal species. Explain briefly the carcass dressing of pig. | 1+4 |
| 2. | a. | What are the different steps that has to be passed for conversion of muscle in to meat? Explain briefly. | 4 |
| | b. | State briefly about the artificial methods of meat tenderization with specific mechanisms. | 5 |
| 3. | a. | “Meat protein is better than plant protein”- Justify the statement. | 4 |
| | b. | Animal derived meat contains both the saturated and unsaturated fatty acids as well as some other essential components. What types of meat usually preferred by the health conscious consumers based on fatty acids? How fatty acid composition and other components influence on the health and storage quality of meat? | 2+3 |
| 4. | a. | Define meat grading. Why is it important for meat industry? Explain quality grade and yield grade of meat. | 1+1+2 |
| | b. | Briefly describe the entire process of animal receiving to packaging of carcass. How quality and safety issues of meat can be ensured through the process following cleaning and sanitation steps? | 2+3 |
| 5. | a. | Write down the prospects and problems of meat industry in Bangladesh. | 4 |
| | b. | Describe the methods of meat preservation. Differentiate refrigeration and freezing. Demonstrate smoking method and its mechanism to protect the meat from spoilage. | 1+1+3 |

SECTION-B

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|-----|----|---------------------------------------------------------------------------------------------------------------------------------------|-----|
| 6. | a. | Write down the meat consumption habits in different region of the world. Mention the national and global annual meat production. | 2+1 |
| | b. | “Ante-mortem and post-mortem inspection are the essential part for quality meat production” - Explain briefly. | 5 |
| 7. | a. | Write in detail about the meat water, protein, lipid, carbohydrate and mineral contents. | 4 |
| | b. | Differentiate between red meat and white meat. Discuss about marbling. | 3+2 |
| 8. | a. | Write in detail about the single layer and multi-layer film for packaging of meat and meat products. | 4 |
| | b. | Give examples of different slaughter house by-products with their proper uses. | 5 |
| 9. | a. | Classify different non-meat ingredients with their functions and dose levels. | 4 |
| | b. | Infer physical and chemical differentiation of meat from different animal species. | 5 |
| 10. | a. | Distinguish between conventional and organic meat. What are the conditions for production of organic meat and food products? Explain. | 2+2 |
| | b. | Name with purpose of various functional food products. Mention different types of packaging materials. | 2+3 |

Chattogram Veterinary and Animal Sciences University
Faculty of Food Science & Technology
BFST 2nd year 2nd Semester Final Examination, 2023
Course Title: Food Microbiology (Theory)
Course Code: FMB 202(T)

Full Marks: 70

Time: 3 Hours

(Figures in the right margin indicate full marks. Answer five (5) questions from each section.
 Use separate answer script for each section. Split answers are strongly discouraged.)

SECTION-A

1. a) Write the factors of food that influence microbial activity with explanation. 2
 b) Name the causal agents of the following conditions: 0.5×10= 5
 i) Pink mold rot ii) Brewer's yeast iii) Bread mild iv) The stale fishy odor of fish v) French dry sherry vi) Alternaria rot vii) Fishiness flavor of milk viii) T.A spoilage of canned food ix) Green rot of egg x) Caramel flavor of milk.
2. a) Mention the list of yeast which are related to food industry. 2
 b) Point out the bacterial list in the following group: Lactic acid, Thermotolerant, Proteolytic, Lipolytic, Saccharolytic, and Halophilic. 5
3. a) Describe metabiotic and symbiotic relationship of microorganisms in food. 3
 b) Write down the principle and methods of food preservation. 4
4. a) Write the different methods of drying for food preservation with example. 2
 b) What are the treatments given to food prior to drying? 3
 c) Enlist the chemicals found in wood smoke which helps in food preservation. 2
5. a) Make a list of national and international food control agencies. 3
 b) Briefly describe the different spoilage of egg. 4
6. a) Define food borne disease outbreak. 2
 b) Mention the member of team in the outbreak investigation with their role. 2
 c) How will you investigate food borne disease outbreak? 3

SECTION-B

- 7 a) Enlist some milk and meat borne disease. 2
 b) Describe different color and flavor changes of milk due to spoilage. 5
8. a) Classify food borne illness with example. 2
 b) Differentiate food infection from food intoxication. 3
 c) Explain staphylococcal food intoxication. 2
9. a) Categorize common wines with their composition 3
 b) What is germicidal ice? What are the evidences that confirm fish spoilage? 1+3=4
10. a) Define thermostabilization. Enlist five probiotic bacteria. 2
 b) Write down ten microbial spoilages of fruits and vegetables with their causal agents. 5
11. a) Make a list of food borne bacterial, viral and parasitic disease with their etiology. 3.5
 b) Briefly describe some microbial enzymes with their source and use. 3.5
12. a) What do you mean by TDT and TDP? 2
 b) Define HACCP. Briefly Describe the principles that are involved in operating HACCP program. 1+4 = 5

Chattogram Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 2nd year 2nd Semester Final Examination, 2023
Course Title: Food Chemistry (Theory)
Course Code: FCM-202 (T)

Full Marks: 70

Time: 3 Hours

Figures in the right margin indicate full marks. Answer **four (4)** questions from each section where question no. 1 and 6 are compulsory. Split answers are strongly discouraged.

SECTION-A

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|----|-----------------------------------------------------------------------------------------------------------------|---|
| 1. | Discuss the role of food chemistry in addressing global food security. | 5 |
| 2. | a) Define functional properties. | 1 |
| | b) Analyze the nutritional changes of protein during cooking. | 4 |
| | c) "Edman's reagent is better than Sanger's reagent"- Justify. | 5 |
| 3. | a) What are the potential impacts of storing bread in a humid environment on starch retrogradation and texture? | 2 |
| | b) Illustrate the chemical reactions of monosaccharide. | 4 |
| | c) Briefly explain the chemical methods of carbohydrate analysis. | 4 |
| 4. | a) Why lipid is called concentrated energy source? | 2 |
| | b) Analyse the peroxidation process of vegetable oil. | 3 |
| | c) Summarize the basic techniques of SFC altering process. | 5 |
| 5. | a) List the major classes of lipids found in foods and briefly describe each. | 3 |
| | b) What are trans fats and how are they formed during food processing? | 3 |
| | c) What is the role of dietary fat in the absorption of fat-soluble vitamins? | 4 |

SECTION-B

- | | | |
|-----|----------------------------------------------------------------------------------------|---|
| 6. | Draw the following structures- | 5 |
| | i) Amylopectin | |
| | ii) Hyaluronic Acid | |
| | iii) Methionine | |
| | iv) Trans fatty acid | |
| | v) Triglyceride | |
| 7. | a) Define a_w . | 1 |
| | b) Elaborate the importance of a_w in food processing and preservation. | 4 |
| | c) Draw a pictorial diagram of drinking water treatment plant. | 5 |
| 8. | a) Define heavy metal with example. | 1 |
| | b) How does your body absorb heavy metals? | 3 |
| | c) Explain common toxic mechanisms and sites of actions of heavy metals. | 6 |
| 9. | a) What are food pigments and how do they affect the appearance of food? | 3 |
| | b) Describe different types of pigments found in food. | 3 |
| | c) List different types of food flavor with respective chemical compounds. | 4 |
| 10. | a) Define caramelization. | 1 |
| | b) How does water interact with volatile compounds in food to affect aroma and flavor? | 3 |
| | c) Discuss the roles of fiber and starch in food processing? | 4 |
| | d) Compare and contrast the chemical structure of amylose and amylopectin. | 2 |