

Chattogram Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 3rd year 2nd Semester Final Examination, 2019
Course Title: Technology of Sugar and Sugar Products (Theory)
Course Code: STH-302 (T)

Full Marks: 70

Time: 3 hours

[Figures in the right margin indicate Full Marks. Answer any 4 (Four) questions from each section. **Question 1(one) and 6 (six) are compulsory.** Use separate answer script for each section. **Split answer is strongly discouraged.**]

SECTION-A

1. a) Differentiate between glucose and fructose. 3
 b) How are colloidal particles removed from sugar juice? 2

2. a) Enlist the unit operations in sugar manufacturing process. 3
 b) Discuss in details about the sulphitation process for clarification of cane juice. 7

3. a) Write down the principle of multiple effect evaporators. 4
 b) Why is multiple effect evaporators used instead of single effect evaporator? 3
 c) How can you utilize sugarcane bagasse? 3

4. a) Discuss about the water quality parameters those are considered for sugar industries waste water. 5
 b) What do you mean by corrosion? Explain the conditions of caustic embattlement and prevention of this problem. 5

5. a) Why is lime used in defecation process? Write the reactions involved in defecation process. 2+3=5
 b) Define curing process. Discuss the ways of curing for separation of crystals. 5

SECTION-B

6. a) Define the following terms: 3
 i) Molasses, ii) Distillation, iii) Calandria
 b) How are losses of sucrose occurred in sugar factory? 2

7. a) What do you mean by saturated, unsaturated and supersaturated solutions? 3
 b) Why is increase in sucrose concentration mandatory for sugar crystallization? 3
 c) Discuss about the milling operation in sugarcane industry. 4

8. a) What do you mean by reducing sugar? 2
 b) How may inversion of sucrose occur in sugarcane factories? 3
 c) Why is vacuum filter used instead of filter press or gravity filters? Enlist the advantages of this type. 4
 d) Write down the composition of sugarcane. 1

9. a) Sketch a triple effect feed forward and feed backward evaporators. 6
 b) 2000 kg/hr of a slurry containing 20% suspended solids and the rest water is treated according to the scheme in figure. Calculate: 4
 i) the rates of overflow and underflow
 ii) the rates of filtrate and filtercake

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graph LR
    Feed --> Thickener
    Thickener -- overflow --> Overflow
    Thickener -- underflow --> Filter
    Filter -- filtrate --> Filtrate
    Filter -- filtercake --> Filtercake
    
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10. a) Write the differences between white and brown sugar. 3
 b) Write a short note on 6
 Rectified spirit, power alcohol
 c) Identify the only distillery industry located in Bangladesh. 1

Chittagong Veterinary and Animal Sciences University

Faculty of Food Science and Technology

BFST 3rd Year 2nd Semester Final Examination 2019

Course Title: Dairy Product Technology (Theory)

Course Code: DPT-302(T)

Full Marks: 70

Time: 3 hours

(Figures in the right margin indicate full marks. Answer any three (3) questions from each section of which question number 1 and 5 are compulsory. Use separate answer script for each section. Split answer is strongly discouraged.)

SECTION-A

1. a) What is difference between Dairy Technology and Dairy Science? Briefly classify the common Dairy products. 3
- b) What do you mean by overrun in Ice-cream? Indicate the factors affecting bitter taste of Ice-cream. 2+2=4
- c) Describe the Ice-cream manufacturing process with flow diagram. 4
- 2 a) Define Cheese with classification. 2
- b) Sketch a flow diagram of Cheddar cheese production process from whole milk. 3
- c) State the biochemical changes during cheese ripening. 3
- d) Discuss the common defects and prevention measures of Cheese. 4
3. a) Define Powder milk with its composition. 2
- b) Discuss the manufacturing process of whole milk powder by spray-drying technique. 4
- c) Compare the physical and sensory characteristics of drum and spray-drying Powder milk. 3
- d) Are SMP and Whey powder are same? 3
4. a) What is difference between Butter and Ghee? 2
- b) What are the various methods of manufacture of Butter and Ghee? Describe which are suitable for commercial Butter operations. 4
- c) State the sensory evaluation score card for Ghee. 3
- d) How can you proceed for analysis of adulterated Ghee? 3

SECTION-B

5. a) What is a difference among Curd, Dahi and Yoghurt? 2
- b) Briefly describe manufacturing steps of Dahi. 3
- c) Illustrate biochemical changes during fermentation. 3
- d) How can you proceed for analysis of Dahi? 3
6. a) What do you mean by indigenous dairy products? 2
- b) Illustrate manufacturing steps of milk vita Rossomalai. 3
- c) Briefly describe the health benefits of Rossomalai. 3
- d) Give a schematic diagram for Sandesh preparation 4
7. a) Briefly explain types of packing material used for dairy products. 3
- b) Briefly describe recommended storage times and temperatures for dairy products. 3
- c) What are the nutritional compositions of Sweetened Condensed milk? 3
- d) Briefly describe the Sweetened Condensed milk manufacture. 3
8. Write following short notes (any four) on : 3×4=12
- a) Starter culture of Yoghurt.
- b) Evaporated milk.
- c) Functional dairy foods.
- d) Mini dairy plant.
- e) Quality control lab for dairy products.

Chattogram Veterinary and Animal Sciences University
Faculty of Food Science and Technology
B. FST 3rd year 2nd Semester Final Examination, 2019
Subject: Tea, Coffee, Cocoa and Spices Technology (Theory)
Course Code: TCS-302 (T)

Full Marks: 35

Time: 2 hours

(Figures in the right margin indicate full marks. Answer any **four** questions from each section where question no. **1 and 6** are compulsory. Use separate answer script for each section. Split answer is not allowed.)

Section-A

1. Write down the chemical composition of tea, coffee and cocoa. 03
2. a) Discuss about the quality standard of spices. 02
b) Write down the main active plant constituents of herbs. 03
3. a) How can you assess the quality of green tea leaf? 03
b) Enlist the biochemical components of tea with their functions. 02
4. a) Sketch the processing steps for chocolate manufacturing. 03
b) Write down the short note on "Fat bloom". 02
5. a) What are the common factors should consider during fermentation of tea leaf? 03
b) Enlist the beneficial effects of tea fermentation. 02

Section-B

6. Write down the significance of physical and chemical withering. 02
7. a) Illustrate the biochemical changes occurred in tea leaf during withering. 03
b) What are the effects of withering on tea quality? 02
8. a) Briefly describe the manufacturing process of instant coffee. 03
b) State the general functions of spices. 02
9. a) Demonstrate the flow sheet of coffee processing. 03
b) Discuss about the health benefits of drinking coffee. 02
10. a) Give an outline of chemical changes in tea leaf during fermentation. 03
b) Suppose you have 1500 kg of green tea leaf. Before withering the moisture content was 80% and after withering moisture content was 70%. Now find the withering percentage. 02

Full Marks: 70

Time: 3 hours

(Figures in the right margin indicate full marks. Answer **THREE** questions from each section where Question No. **1 and 5** are mandatory. Use separate answer script for each section. **Split answer is strongly discouraged.**)

Section- A

1. (a) Define statistics. Write down its functions and limitations. Being a student of Food Science, discuss the importance of studying statistics. 6
- (b) Suppose you are provided a data set of monthly income (in taka) of 30 workers selected randomly from a fish processing plant. 2
 - (i) Does the data set belong to population or sample?
 - (ii) What is the name of the variable being measured over here?
 - (iii) Is the variable discrete, continuous or qualitative?
 - (v) What is the experimental unit here?
 - (iv) If you determine the average income of the given data, would the value represent parameter or statistic?
- (c) Identify each of the following variables and their scale of measurements: 3
 - (i) Variety of fishes;
 - (ii) Diastolic blood pressure of the employees of a food industry.
 - (iii) Sugar contents (g/100gm) in blackberry pulp;
2. (a) Define frequency and frequency distribution. Describe the important steps in constructing a frequency distribution from raw data. 5
- (b) The following frequency distribution shows the length of hilsha fish caught on a certain day at a certain point of the Padma. 3

Class Interval (Length in cm)	No. of fishes caught	Class In (Length in cm)	No. of fishes caught
25-30	39	45-50	15
30-35	45	50-55	8
35-40	52	55-60	6
40-45	75	-	-

Point out the following issues with the help of the above frequency table:

- (i) the frequency density of the last class interval;
- (ii) mid value of the modal class;
- (iii) upper limit of the median class;
- (iv) width of the 5th class interval;
- (v) percentages of fishes having length below 45 cm;
- (vi) relative frequency of the class 40-45.
- (c) Draw histogram and hence locate mode of the length distribution of fishes. 4
3. (a) Define central tendency. What are its objectives? Mention the desirable characteristics of a good measure. 4
- (b) The arithmetic mean and geometric mean of weights of two big *Jackfruits* are 6.5 kg and 6 kg respectively. Find the weight of two fruits and hence obtain their harmonic mean. 4
- (c) What do you mean by shift if origin and change of scale. Show that arithmetic mean depends both on shift of origin and change of scale. 4
4. (a) Define measures of dispersion. Distinguish between (i) Absolute measures and relative measures (ii) Skewness and kurtosis. 4
- (b) In two factories A and B engaged in the same industry, the average weekly wages and standard deviation are as follows: 5

	Mean weekly wage(Tk)	S.D. of Wages (Tk.)	No. of wage earners
A	460	50	100
B	490	40	80

- i) Find coefficient of variation of two factories separately and comment which factory you consider the more consistent.
- ii) Calculate (a) the average weekly wage and (b) the standard deviation of all the workers in two factories taken together.
- (c) Define moment? Write the relationships between raw moments and corrected moments. 3

Section- B

5. (a) Which one of the following measures of central tendency is appropriate for open-ended class interval? 11
 (i) Arithmetic mean (ii) Median (iii) Geometric mean (iv) None of these
- (b) The point of intersection of the 'less than' and 'greater than' ogive curve is called ----
- (c) If mean is larger than the median then the frequency curve is called -----
- (d) A negatively skewed distribution has mean 10, then the 50th percentile of the distribution is - (i) less than 10 (ii) equal to 10 (iii) greater than 10 (iv) none of these
- (e) The correlation coefficient between the marks obtained by the students in two courses is 0.6. If 5 and 10 marks are given extra to each student in each course, then the new correlation coefficient will be - (i) 0.3 (ii) 0.6 (iii) less than 0.6 (iv) none of these.
- (f) If $\beta_2 > 3$, the distribution is said to be ----
- (g) There are ---- types of scale of measurement.
- (h) The correlation coefficient (i) can take any value between -1 and +1 (ii) is always less than -1 (iii) is always greater than 1 (iv) can't be zero
- (i) When the correlation coefficient is zero, the two regression lines are and when $r_{xy} = \pm 1$, then the regression lines are
- (j) In tossing 3 fair coins at a time the probability of getting one tail is (i) 3/8, (ii) 1/8, (iii) 1/2 (iv) None of these
- (k) Mean and variance are equal for (i) Binomial distribution (ii) Poisson Distribution, (iii) Bernoulli distribution (iv) Normal distribution

6. (a) What do you mean by bivariate data? Distinguish between correlation and regression. 4
- (b) You are given the following information on age (x, years) and blood pressure (y, mm Hg) of 10 fishermen in a certain area of Bangladesh:

$$\sum_{i=1}^{10} x_i = 429 \quad \sum_{i=1}^{10} x_i^2 = 19277 \quad \sum_{i=1}^{10} y_i = 1265 \quad \sum_{i=1}^{10} x_i y_i = 54915$$

- (i) Find regression coefficient of y on x and comment. 3
- (ii) Obtain correlation co-efficient, 'r' for $\sum_{i=1}^{10} y_i^2 = 1,60,675$ and use all information given above and comment. 3
- iii) Find the value of co-efficient of determination by using the value of r found in (ii) and interpret the value. 2

7. (a) Define with example random experiment, impossible event, complementary event and probability of an event. 4
- (b) A sample survey students of food science department of CVASU was undertaken to investigate which fruits like. In a survey of 100 students, the following results were obtained: 3

60 like Mango (A)	40 like Apple (B)	70 like Orange (C)
32 like A and B	45 like A and C	38 like B and C
30 like A, B and C		

Draw a Venn diagram and count the sample points. If a student is selected at random from the sample, find the probability that he likes at least two fruits.

- (c) A bakery has the following probability function of daily demand for birth day cake: 5

No. of cake demanded :x	0	1	2	3	4	5
Probability, P(x)	0.1	k	0.2	2k	0.3	0.1

Obtain: (i) the value of k; (ii) $P[1 < X < 4]$; (iii) Mean of daily demand of birth day cake. (iv) Standard deviation of X.

8. (a) What is test statistic? Mention some test statistics that are commonly used in fishery analysis. 2
- (b) Define hypothesis testing. State the important steps involved in conducting a hypothesis testing. 4
- (c) Define contingency table and one tail test. 6

A tobacco company claims that there is no relationship between smoking and lungs ailments. To investigate the claim a random sample of 300 males of 40-50 are given medical test. The observed sample results are shown below:

	Found Lung ailment	No lung ailment	Total
Smokers	75	105	180
Non- smokers	25	95	120
Total	100	200	300

On the basis of the information, can it be concluded that smoking and lung ailments are independent? Use $\alpha=0.05$.

(Apply $\chi^2_{0.05,1} = 3.84$, $\chi^2_{0.05,2} = 5.99$, $\chi^2_{0.05,3} = 7.81$)

Chattogram Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 3rd Year 2nd Semester Final Examination 2019
Course Title: Food Safety and Hygiene (Theory)
Course Code: FSH-302 (T)

Full Marks:70

Time: 3 hours

(Figures in the right margin indicate full marks. **Answer any Four (4) questions** from each section of which question number **1 & 6 are compulsory**. Use separate answer script for each section. **Split answer is strongly discouraged.**)

SECTION-A

- | | | |
|----|---|---------|
| 1. | a) What is food safety? | 2 |
| | b) Discuss about different types of food contaminants. | 3 |
| 2. | a) List the components of "Hand Washing Facility" in food industry and also discuss importance of washing hands. | 1+2=3 |
| | b) Mention the practices those should be adopted to ensure safe storage of foods. | 4 |
| | c) Enumerate on "High Risk Foods". | 3 |
| 3. | a) What is HACCP? Why do food industries use HACCP? List down benefit associated with HACCP. | 1+2+2=5 |
| | b) Differentiate between control point (CP) and critical control point (CCP). | 3 |
| | c) State seven principles of HACCP. | 2 |
| 4. | a) What are the punishments those can be imposed by Health and Safety Executive? Recall standards expected from the employee. | 2+2=4 |
| | b) Define hazard. Describe common hazards of a working environment. | 1+2=3 |
| | c) Illustrate objectives of safety policy. | 3 |
| 5. | a) Define the term "Risk Assessment". Why is it important?. | 1+2=3 |
| | b) Write down its goal and how do you conduct risk assessment? | 2+3=5 |
| | c) What are the stages of food safety management system? | 2 |

SECTION-B

- | | | |
|-----|--|-----------|
| 6. | What is "Temperature Danger Zone"? Discuss about the factors those influence bacterial growth. | 5 |
| 7. | a) Mention common food pests in food environment and evidence of food infestation. | 1.5+1.5=3 |
| | b) How do you control food infestation? | 4 |
| | c) How many ways a chemical can do harm to humans? | 3 |
| 8. | a) Discuss briefly different food preservation techniques. | 4 |
| | b) Briefly discuss establishment of CCP/, Importance of CCP monitoring requirement and Implementation of corrective action as a step in HACCP. | 6 |
| 9. | a) What are the importance of reporting of accidents? How is it done? | 1.5+1.5=3 |
| | b) Explain the term "RIDDOR". | 3 |
| | c) Write down the features of protective work wear. | 2 |
| | d) Define the following term:
Hygiene, Risk, Safety, Corrective Action | 2 |
| 10. | Write a short note on the following:
i) Food Poisoning, ii) Different Hazards in Food Environment, iii) PPE, iv) Data Coding | 2.5X4=10 |

Chattogram Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 3rd year 2nd Semester Final Examination- 2019
Subject: Applied Dietetics (Theory)
Course Code: APD-302

Full Marks: 35

Time: 2 hours

(Figures in the right margin indicate full marks. Answer any 3 questions from each section where 1 and 5 are compulsory. Use separate answer script for each section. **Split answer is strongly discouraged.**)

Section-A

1. a) What is food pyramid? List out the guidelines for maintain good health. 1+1=2
b) Define recommended dietary intake (RDI). What factors affect the RDI? 1+1=2
2. a) Define therapeutic diet. How diet and nutrition are related to disease? 1+2=3
b) Enumerate the factors influencing meal planning. 4
3. a) Write down the classification of diabetes mellitus (DM) with symptoms. 2+1=3
b) Briefly outline the complications of DM and how a diabetic patient can overcome that? 3+1=4
4. a) "Life of person depends upon the liver"- explain it. 3
b) Describe the dietary management for liver cirrhosis. 4

Section-B

5. a) Define serving size and portion size. 1
b) Explain serving size with example. 2
6. a) Enlist the different types of hospital diets with example. 5
b) A pregnant woman was prescribed supplemental iron tablets by her physician but she decided not to take them. Explain her about the importance of iron during pregnancy period. 2
7. a) Sketch out the kidney functioning tests. 2
b) Summarize the dietary management for acute and chronic glomerulonephritis. 5
8. a) Diets can be modified in terms of quality and quantity- justifies it. 2
b) A low calorie diet accompanied by physical exercise is effective in causing weight loss- explain briefly. 5

Chattogram Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 3rd Year 2nd Semester Final Examination 2019
Course Title: Food Packaging (Theory)
Course Code: FPK-302 (T)

Full Marks:70

Time: 3 hours

(Figures in the right margin indicate full marks. **Answer any Four (4) questions** from each section of which question number **1 & 6 are compulsory**. Use separate answer script for each section. **Split answer is strongly discouraged.**)

SECTION-A

1. Define food packaging. Write down the chronological history of metal packaging. 5

2. a) What are the functions and importance of food packaging? 5
b) What are the environments of food packaging? Write down different types of food packaging. 2+3=5

3. a) Define flexible packaging. What are the advantages of flexible packaging materials? 4
b) Write down the properties and uses of following which are used as flexible materials: 6
 i) Polyethelene, ii) Polypropylene, iii) Aluminium foil

4. a) Classify paper as a packaging material. 3
b) Why are alcoholic beverages stored in glass bottle instead of plastic? 3
c) Evaluate plastic as packaging material. 4

5. a) What are primary, secondary and tertiary containers for food packaging? 5
b) Write down the packaging technique of the following food items: 5
 i) Fresh Meat, ii) Respiring Fruits and Vegetables

SECTION-B

6. Write a short note on "Thermoforming Process". 5

7. a) What do you mean by active packaging? Describe O₂ scavengers and CO₂ scavengers with examples. 5
b) What are the advantages and disadvantages of modified atmosphere packaging? 5

8. a) What is plastication? 2
b) Describe extrusion process for plastic processing. 4
c) Discuss about the compression and transfer molding. 4

9. a) List the raw materials of paper. 2
b) Mention the reasons of using fillers, sizing agents and coloring agents during paper making. 3
c) Describe the production process of a Tin plate. 5

10. Write a short note on the following: 2.5X4=10
 i) Biodegradable plastic, ii) Food Spoilage Bacteria, iii) Package Testing, iv) Containers

Chattogram Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 3rd year 2nd Semester Final Examination, 2019
Course Title: Fermentation and Beverage Technology (Theory)
Course Code: FBT-302 (T)

Full Marks: 70

Time: 3 hours

[Figures in the right margin indicate Full Marks. Answer any **4 (Four) questions** from each section. **Question 1(one) and 6 (six) are compulsory.** Use separate answer script for each section. **Split answer is strongly discouraged.**]

SECTION-A

1. Define fermentation process with its benefits. Illustrate the schematic diagram of a typical fermentation process. 5
2. a) Write down the brief discussion on LAB. 5
b) Describe the upstream and downstream process. 5
3. a) Discuss about batch culture fermentation process. 5
b) What do you understand by primary and secondary metabolites of fermentation process? 5
4. a) Identify the types of fermenter. Discuss in brief the main components of an ideal fermenter with their purposes. 7
b) Discuss the differences between white and red wine. 3
5. a) Enlist the common raw materials of beer. Why is malted barley used in beer processing? 2+3=5
b) Illustrate the overview of malting and brewing of beer. 5

SECTION-B

6. Write a short note on the following: 2.5+2.5=5
 - i) Probiotic
 - ii) Prebiotic
7. a) What do you understand by the term "Spice of Beer"? Write the role of this spice in beer processing. 2+3=5
b) Demonstrate the overview of sake production. 5
8. a) Define asepsis. How can you achieve and maintain aseptic condition? 2+3=5
b) Briefly describe about submerged fermentation. 5
9. a) Define inoculum development. How can you prepare bacterial inoculum? 2+3=5
b) What do you mean by starter culture? Enlist the phenomena of starter culture. 2+3=5
10. a) Give an outline of white wine and red wine manufacturing process. 5
b) Define cheese. Draw out the reactions of lipid and protein to develop cheese flavor. 2+3=5

Chattogram Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 3rd year 2nd Semester Final Examination 2019
Subject: Food Trade and Laws (Theory)
Course Code: FTL-302

Full Marks: 35

Time: 2 hours

(Figures in the right margin indicate full marks. Answer any 4 questions from each section where 1 and 6 are compulsory. Use separate answer script for each section. **Split answer is strongly discouraged.**)

Section-A

- | | | |
|----|--|---|
| 1. | a) Define food trade. | 1 |
| | b) Classify food trade along with some examples. | 2 |
| 2. | a) Differentiate between domestic and international trade. | 2 |
| | b) Summarize the components of trade development strategy. | 3 |
| 3. | a) List out the major food control organizations in Bangladesh. | 1 |
| | b) Briefly explain the functions of BSTI. | 4 |
| 4. | a) State the principles and values of Bangladesh Food Safety Authority (BFSA). | 2 |
| | b) Give some recommendations of food control infrastructure development. | 3 |
| 5. | a) List out some international trade organizations. | 1 |
| | b) Demonstrate some barriers of international trade. | 4 |

Section-B

- | | | | |
|----|---|--|-------|
| 6. | a) Define globalization. Which factors accelerated the globalization? | | 1+1=2 |
| 7. | a) Identify the main functions of the World Trade Organization (WTO). | | 2 |
| | b) Illustrate the principles of WTO for trading system. | | 3 |
| 8. | Briefly describe the laws and regulations of food additives used in Bangladesh. | | 5 |
| 9. | a) What are the key principles of ISO in standard development? | | 2 |
| | b) List out some popular ISO standard for food safety. | | 1 |
| | c) Summarize the food adulteration ways in Bangladesh according to FDA. | | 2 |
| 10 | How BSTI prepared standard for food commodities? Explain with flow diagram. | | 5 |