Chattogram Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 3rd year 1st Semester Final Examination, 2023
Course Title: Clinical Nutrition (Theory)
Course Code: CLN-301 (T)

Full Marks: 35 **Time: 2 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.		Define protein-energy malnutrition (PEM). Propose a community-based intervention to reduce the incidence of PEM in rural area.	03
2.	a)	What is IDA? Which nutrients are linked with it?	02
	b)	Point out the clinical features of nutritional anemia.	01
	c)	What measures would you take, as a public health expert to reduce the risk of nutritional anemia?	02
3.	a)	Define food allergy. Enlist common food allergens.	02
	b)	How can you detect food allergies? Discuss the role of an elimination diet in managing food allergies.	03
4.	a)	Explain how vitamin A deficiency impacts vision?	02
	b)	Write in detail action for the treatment of diarrhea.	03
5.	a)	Describe the complications of untreated obesity. Propose a school-based program to promote healthy eating and physical activity among children.	1+2=03
	b)	Construct an integrated approach to address both infection and malnutrition in low-income communities.	02

SECTION-B

6.		What do you mean by clinical nutritionist and what responsibilities come with this term?	02
7.	a)	Mention the dietary sources and RDA of the following micronutrients for pregnant women- i)Folic acid ii) Vitamin B_2 iii) Vitamin D	03
	b)	What is beta-carotene? List some sources of beta-carotene.	02
8.	a)	Discuss about the effects of malnutrition on possible defence mechanism in human body.	03
	b)	What are the effects of infection on nutritional status?	02
9.	a)	Define gout. Explain the risk factor of gout.	03
	b)	Describe the lifestyle changes and dietary modification of gout patients.	02
10.	a)	Explain the clinical features of vitamin A deficiency disorder (VADD).	02
	b)	Illustrate the clinical signs of scurvy. Discuss a historical account of scurvy among sailors and the measures taken to prevent it.	03

Chattogram Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 3rd year 1st Semester Final Examination, 2023
Course Title: Market Milk Processing Technology (Theory)
Course Code: MMP-301(T)

Full Marks: 35 **Time: 2 Hours**

(Figures in the right margin indicate full marks. Answer **Three (3)** questions from each section, where question no. **1** is compulsory. Use separate answer script for each section. Split answers are strongly discouraged.)

SECTION-A

1. a) What do you mean by standardization and homogenization of milk? 2
b) How many kg each of 32% cream and 2.9% milk will be required to make 220000 liters of a mixture with 1.029 specific gravity, testing BSTI recommended fat % for market milk? 3

2. a) What are the methods of payment and collection of raw milk? Which method of payment and collection of raw milk is more expected to you and why? 3
b) Give a scenario of milk production and percapita consumption of different countries in the globe. 3

3. a) Who is the "Father of White Revolution'' in Bangladesh and why is he called so? 2
b) Discuss the factors affecting the quality of milk. 4

4. a) What are the various sources of contamination of milk. 2
b) What is pasteurization of milk ? State the merits and demerits of different types pasteurization. 4

SECTION-B

5. a) Show the manufacturing procedure of market milk by a flow diagram. 3
b) Mention the flavour defects in milk, theire causes and prevention. 3

6. a) Why is chilling important for processing raw milk in tropical countries like Bangladesh. 2
b) Discuses the routine activities in milk chilling plant. 4

7. a) State the role of microorganisms in the milk deterioration of quality in milk. 2
b) What is CIP. What are the factors that affect the success of CIP system? 4

8. Write short notes on (any three) 2×3=6
a) Physical properties of milk
b) Platform tests
c) Reconstituted milk
d) Market milk

Chattogram Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 3rd year 1st Semester Final Examination, 2023
Course Title: Oil and Fat Technology (Theory)
Course Code: OFT-301(T)

Full Marks: 35 **Time: 2 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.		Draw the following structures: -	03
	i.	Triglyceride	
	ii.	Omega-6 fatty acid	
	iii.	Triunsaturated fatty acid	
	iv.	Lipid peroxide radical	
	v.	Oleic acid	
	vi.	Trans fatty acid.	
2.	a)	Why degumming is done at the beginning of refining process?	01
	b)	Describe the degumming process of palm oil.	04
3.	a)	Differentiate between essential oil and fatty oil.	01
	b)	Draw the flow chart of essential oil extraction process.	02
	c)	Why trans fatty acids are harmful for human body?	02
4.	a)	Define iodine value and saponification value.	01
	b)	Explain the working principles of iodine value and saponification value determination test.	04
5.	a)	What is peroxidation of oil?	01
	b)	Briefly explain the stages of peroxidation process of oil.	02
	c)	Differentiate vegetable fat and animal oil.	02

SECTION-B

6.		Discuss the prospects of oil industry in Bangladesh.	02
7.	a)	Define cooking oil and salad oil.	01
	b)	Draw a flow chart of olive oil production process.	02
	c)	How do you prevent the rancidity of cooking oil?	02
8.	a)	Define hydrogenation of oil.	01
	b)	List the positive and negative effects of hydrogenation.	02
	c)	Elaborate the chemistry of hydrogenation of cooking oil.	02
9.	a)	Differentiate between drying oil and non-drying oil.	01
	b)	Briefly explain the minor elements of crude oil.	04
10.		Write short notes on: -	03+02
		i. Deacidification and deodorization of crude oil	
		ii. Fractionation and interesterification of oil.	

Chattogram Veterinary and Animal Sciences University

Faculty of Food Science and Technology

BFST 3rd year 1st Semester Final Examination, 2023

Course Title: Technology of Fruits and Vegetables Products (Theory)

Course Code: FVP-301 (T)

Full Marks: 70 **Time: 3 Hours**

(Answer four (4) questions from each section where 1 and 6 are compulsory. Figures in the right margin indicate full marks. Split answers are strongly discouraged.)

SECTION-A

1.	a)	Can you explain how fruits and vegetables are fundamentally different?	3.0
	b)	How can you prevent cross-contamination in vegetables processing industry?	2.0
2.	a)	In what ways do the internal structure of apples and grapes reflects their status as true or false fruits?	4.0
	b)	Briefly describe the pigments and color precursors found in fruits and vegetables.	6.0
3	a)	Define post-harvest technology. How do pre-harvest and post-harvest conditions impact the quality of horticultural crops?	6.0
	b)	How can a diagrammatic representation visually illustrate the relative changes in important characteristics during the growth and maturation of fruits?	4.0
4.	a)	How do ethylene inhibitors contribute to extending the post-harvest life of fruits and vegetables?	4.0
	b)	Classify fruits on the basis of respiration pattern. Briefly describe the different methods of pre-cooling of fruits and vegetables.	6.0
5.	a)	What is the major biochemical transformations involved in fruit ripening?	4.0
	b)	Describe the physical and chemical methods of judging maturing in horticultural produce.	4.0
	c)	Interpret drying kinetics of fruits and vegetables.	2.0

SECTION-B

6.		Give short notes on the followings: i. Blanching ii. Spoilage of dried products iii. Sharp freezing vs. quick freezing iv. Cryogenic freezing v. Sublimation	5.0
7.	a)	Give a brief description on any two of the followings: i) Causes of spoilage of fruits and vegetables ii) Classification of foods by ease of spoilage iii) Fining agents for clarification	4.0
	b)	Why freezing is superior to any other preservation practices? Briefly describe the general post-harvest practices of fruits.	6.0
8	a)	Why blanching treatment is applied prior to freezing and canning? Briefly describe the steps involved in canning of fruits and vegetables.	5.0
	b)	What do you mean by synthetic and energy drink? Mention the technological flow sheet for manufacturing process of wine.	5.0
9.	a)	What do you mean by grain strength, fruit vinegar and artificial vinegar? Describe the steps involved in vinegar production from malt by *Saccaromyces cerevisiae* fermentation.	6.0
	b)	Breifly describe the terms: reconstitution test, reconstitution ration, rehydration coefficient, and percent (%) of water in rehydrated material	4.0
10.	a)	Which ingredients are essential for the quality of jelly? Give a manufacturing flow sheet of squash.	5.0
	b)	What are the differences between pickle and chutney? Briefly describe the spoilage of canned foods.	5.0

Chattogram Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 3rd year 1st Semester Final Examination, 2023
Course Title: Fish Processing Technology (Theory)
Course Code: FPT- 301 (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 the knowledge on fish processing technology is essential for a food scientist graduate?"- with respect to the technological problems on fish processing in the context of Bangladesh. 5

2. a) What do you mean by rigor-mortis? Explain the biochemical changes in fish during rigor-mortis. 4
   b) Identify the influencing factors, effects and remedies of rigor-mortis in fish. 6

3. a) Give some possible measures to improve the existing marketing system in Bangladesh. 5
   b) Summarize the novel techniques to control the beetles and mites in dried fish. 2
   c) "Ice can be a source of contamination to raw fish/shrimp"- justify the statement. 3

4. a) Define Honey Combing. Illustrate the Struvite formation and sulphite blackening problems which are usually occur in the canned fishery products. 1+3=4
   b) How Irradiation process is used to preserve the fish? 3
   c) What are the standard requirements for an ideal fish processing plant. 3

5. a) Differentiate between white and dark muscle. 2
   b) Give a brief outline for the improvement of traditional sun-drying fish preservation methods in Bangladesh. 3
   c) What is food safety? Write in brief about CCP in fish processing? 5

SECTION-B

6. Describe the features which lead to the deterioration in the quality of fish during marketing. 5

7. a) Briefly describe the skeletal, cardiac, and smooth muscle of fish with their functional significance. 4
   b) Shortly describe the enzymatic changes in post-mortem condition in fish. 3
   c) Define traceability. Why traceability is crucial for fish and shell fish processing? 3

8. a) Discuss the two basic methods of collecting and concentrating the from sun in fish during drying process. 3
   b) Distinguish between radiation sterilization and radiation pasteurization. 3
   c) Shortly describe the principle of the fish curing process with their preserving action. 4

9. a) Briefly describe the factors that affect the freezing time of fish. 4
   b) Define Biofactors / Health factors. Give a brief description of the roles of different bio-factors found in fish. 1+5=6

10. a) Discuss the following process terms: radiation, radurization, radicidation and radappertisation. 4
    b) List out and briefly describe the fish processing techniques of the world. 6

Chattogram Veterinary and Animal Sciences University
Faculty of Food Science & Technology
BFST 3rd year 1st Semester Final Examination, 2023
Course Title: Computer Application in Food Technology (Theory)
Course Code: CFT-301(T)

Full Marks: 70 **Time: 3 Hours**

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

SECTION-A

1. a) What is the purpose of the preprocessor derivative # include? 2

   b) Define variables and constants in C. Provide an example for each. 3

   c) Evaluate the following C expressions and determine the output: 2
      i) int a = 5, b = 2; printf ("%d", a > b && a = =5);
      ii) int x = 10; printf (("%d", x++ + ++x);

2. a) What do you mean by operator precedence and associativity in expression evaluation? 2

   b) Write a C program to calculate the roots of the quadratic equation: $ax^2+bx+c = 0$ 5

3. a) Define keyword and identifier with examples. Explain the rules for constructing variables in C language. 3

   b) The following is a segment of a program: 4

```
x=100;
y=200;
if(x+y>z)
x=x+10;
y=y-10;
printf("%d %d",x,y);
```

   What will be the values of x and y if Z assumes a value of (*i*) 100 (*ii*) 500.

4. a) What is data type in C? Write down the name and describe the four fundamental data types in C with its qualifiers. 3

   b) Write a C program that will check whether a given character is alphabet or digit or any other special character. 4

5. a) Explain the how the decision making statement else if ladder in C works with appropriate example. 3

   b) Determine the value of each of the following logical expressions if i = 5, j = 10, k = 20, x = 30 and y = 40 4
      i) 2 * ((i+j)/(k*i/j)%(i/2))
      ii) (i*j+3)%(k*j-3) % (x-y)
      iii) (x > y) || ! (i <5.5)&& (j >=20.5)
      iv) (float)((int) 750.55 /10 % (int) 15.5)

6. a) Assuming that x = 1, y = 2 and z = 0 initially, what will be their values after executing the following code segments? 3

(*i*) switch(x)
{
case 2:
x=1;
y=x+1;
break;
case 1:
x=0;
break;
default:
x=1;
y=0;
}
	(*ii*)) switch(y)
	{
	case 0:
	x=0;
	y=0;
	break;
	case 1:
	x=2;
	z=2;
	break;
	default:
	x=1;
	y=2;
	}

b) What is an array? How a single dimensional and two dimensional arrays are declared and initialized? 4

SECTION-B

7. a) Identify true or false statements 4

i) In C, Int and int conveying the same meaning.

ii) Only one function may be named main()

iii) Character constants are coded using double quotes.

iv) The expression !(x<=y) is same as the expression x>y.

b) You have a value of 42532. Can you use int data type to store this value? 1

c) Explain how null characters help in string manipulation? 2

8. a) Write a program to check whether the entered number is ZERO, POSITIVE or NEGATIVE number. 5

b) Differentiate between syntax errors and run-time error. 2

9. a) What is the difference between 'a' and "a" in C language? 2

b) What do you mean by backslash character constant? What is the meaning of the following backslash character constant? 1+4 = 5

(*i*) '\b' (*ii*) '\f' (*iii*) '\t' (*iv*) '\0'

10. a) What are the differences between getchar() and scanf()? 2

b) Which of the following initialization statements are incorrect and why; rewrite the incorrect statement correctly? 5

(*i*) char string 1 [5] = "CVASU" ;
(*ii*) char string 3 [ ] = "CFT-301" ;
(*iii*) float marks [15] = 0 ;
(*iv*) int x [2, 3] = {(0, 0, 0), (0, 0, 0)} ;
(*v*) int y [ ] [ ] = {0, 0, 0} ;

11. a) Compare do and while statements in terms of their functions. 3

b) Write a C program to find all the integer numbers greater than 100 and less than 800 that are divisible by 7. 4

12. a) How do you open and close a file in C? Provide examples. 3

b) Write a C program to read from a text file and count the number of lines in it. 4

Chattogram Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 3rd year 1st Semester Final Examination, 2023
Course Title: Waste Management and Environmental Science (Theory)
Course Code: WME-301 (T)

Full Marks: 35 **Time: 2 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.	a)	What are the primary pollutants?	01
	b)	List out the sources of SO_X.	01
2.	a)	Describe the byproducts from plantation crops and how can you utilize them?	03
	b)	What are the byproducts from fish processing industry?	02
3.	a)	Define BOD.	01
	b)	Draw a picture mentioning activated sludge process.	02
	c)	Show how organic waste matter undergoes breakdown.	01
	d)	Compare the advantages of aerobic and anaerobic processes.	01
4.	a)	Illustrate how PAN is formed in a smog producing chain reaction from reactive hydrocarbon.	03
	b)	How can internal combustion engines be modified to make auto exhausts free from pollutants?	02
5.	a)	Differentiate between waste and sludge.	01
	b)	Discuss several processes of waste minimization.	04

SECTION-B

6.	a)	Give an outline of the modes of solid waste disposal.	02
	b)	Make a chart for annual solid waste production.	01
7.	a)	What is fly ash?	01
	b)	How do you propose to control particulate emission?	03
	c)	List the sources of particulate matter.	01
8.	a)	Describe a typical sanitary landfill mentioning all its components.	03
	b)	How do you propose to control NO_X and SO_X.	02
9.	a)	Why anaerobic waste treatment is preferred to other processes?	02
	b)	Explain the breaking down process of organic waste matter.	03
10.		Write short notes on: -	2+2+1=5
	i.	Rotary Kiln incineration	
	ii.	Acid rain	
	iii.	Ozone hole.	

Chattogram Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 3rd year 1st Semester Final Examination, 2023
Course Title: Fish and Sea Food Technology (Theory)
Course Code: FSF-301 (T)

Full Marks: 70 **Time: 3 Hours**

(Answer four (4) questions from each section where 1 and 6 are compulsory. Figures in the right margin indicate full marks. Split answers are strongly discouraged.)

SECTION-A

1.		What are molluscs and crustaceans? Classify molluscs and crustaceans with proper examples.	2+3
2.	a)	How do the terms pelagic, demersal, diadromous, gastropods, aquatic reptiles, and mammals describe different types of aquatic life? State the importance and major roles of fish lipids in the human body.	3+2=5
	b)	Compare beneficial fats with harmful fats. Why do scientists and researchers prioritize marine lipids in their studies?	2+2=4
	c)	Differentiate between finfish and shellfish.	1
3	a)	What mechanisms allow seaweed to help prevent cancer and how can seaweed help in ensuring proper thyroid function?	3+3=6
	b)	What adverse effects might arise from frequent seafood consumption? What are the benefits of using equipment to locate and detect fish?	2+2=4
4.	a)	What are the main factors affecting the quality of fish on-board? Briefly describe the good handling practices on board fishing vessels.	3+3=6
	b)	Can you describe the four phases of fish quality decline when kept on ice?	4
5.	a)	Define the term post mortem changes. What are the six sequential stages of post-mortem changes that occur after death?	1+5=6
	b)	Enumerate the stages of rigor mortis. What biochemical mechanisms lead to the onset of rigor mortis in fish?	1+3=4

SECTION-B

6.		Give short notes on the followings: I. Biotoxins II. Hydro cooling and icing III. Air blast freezing IV. Groups of shellfish toxin and V. Spoilage due to oxidation	5.0
7.	a)	How do intrinsic and extrinsic factors contribute to the spoilage of fish? Describe the spoilage of fish due to endogenous enzymes and microbial activity.	2+2=4
	b)	Categorize pathogenic bacteria associated with fish and fishery products. What are the physical and chemical approaches to control Salmonella in fish and fishery products?	2+4=6
8	a)	What is the working principle of solar dryer? Write down the signs of spoilage in salted fish.	2+3=5
	b)	What types of pesticides are commonly used in the preservation of traditional dried fish? How fish is smoked?	2+3=5
9.	a)	Classify fermented fish products. Briefly describe the preparation of cooked marinades.	2+3=5
	b)	Write down the functions of cryoprotectants in surimi. How surimi is prepared from dark muscle fish?	2+3=5
10.	a)	How many groups of algae are cultivated for food? Enlist the seaweed based products.	3
	b)	What steps are involved in the production of agar from raw seaweed?	3
	c)	How do antioxidants work in food preservation? Suppose you are a chief chemist in a fish processing company. Your company is facing fish spoilage with fat-rich sardine fish. Which additive will you use to oreserve sardine fish and why?	4

Chattogram Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 3rd year 1st Semester Final Examination, 2023
Course Title: Food Biotechnology (Theory)
Course Code: FBT-301 (T)

Full Marks: 70 **Time: 3 Hours**

(Answer **four (4)** questions from each section where **1** and **6** are compulsory. Figures in the right margin indicate full marks. Split answers are strongly discouraged.)

SECTION-A

1. Write down the prospects and challenges of GM crops into sustainable food production system in Bangladesh. 5.0

2. a) What do you understand by food biotechnology? Enumerate the importance of microorganisms used in biotechnological approaches. 1+2=3
   b) Briefly describe the areas and scopes of biotechnology in food science. 3.0
   c) Write down the tools and techniques that are used in plant biotechnology. 4.0

3 a) Define upstream and downstream bioprocessing. Briefly describe the outline of bioprocessing operations with schematic representation. 1+1=2
   b) Enumerate the factors to be considered for microbial strain selection. Briefly describe the strategies for improving the productivity of a microorganism 2+3=5
   c) Compare the advantages and disadvantages of using industrial strains versus wild type strains in bioprocessing. 3.0

4. a) Illustrate the central dogma of molecular biology. 2.0
   b) What do you understand by gene expression and gene regulation? Briefly describe the phases of transcription and translation process. 2+2=4
   c) Briefly describe the important DNA modifying enzymes and their applications in molecular biology. 4.0

5. a) How do you isolate a plasmid DNA from bacteria? Which techniques can be used to purify nucleic acids from a cell lysate? 2+3=5
   b) How PCR works step by step? Write down the applications of PCR in food analysis. 2+3=5

SECTION-B

6. 'Bioinformatics tools and omics technologies play crucial role in food research'- Justify the statement. 5.0

7. a) Write down the working principle of gel electrophoresis. Enumerate the key differences among different blotting techniques. 2+3=5
   b) Why does DNA have a negative charge? Briefly describe the process of genetic engineering in recombinant DNA technology. 1+4=5

8 a) What is the microbiology of food fermentation? Write down the major types of fermentation related to food production. 2+3=5
   b) Give an outline of enzyme production. Briefly describe the application of enzymes in different food industry. 2+3=5

9. a) Which culture technique is mostly used for the generation of virus free plants and why? Briefly describe the procedure of protoplast fusion. 2+3=5
   b) Enumerate the risks and concern of GM crops. Write down the molecular testing methods that are used for the identification of GM crops. 2+3=5

10. Write down short notes on the following: 5×2=10
   i) DNA finger printing
   ii) Ultrasound mediated gene transfer
   iii) Fermented foods
   iv) Meat alternatives
   v) Application of plant biotechnology in foods