

**Chittagong Veterinary and Animal Sciences University**  
**Faculty of Food Science and Technology**  
**BFST 3<sup>rd</sup> year 1<sup>st</sup> Semester Final Examination 2017**  
**Subject: Technology of Fruits and Vegetable Products (Theory)**  
**Course Code: FVP-301**

**Full Marks: 70**

**Time: 3 hours**

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

**Section-A**

1. Proper harvesting and storage can reduce the significant loss of fruits and vegetables - explain this statement. 5
2. a) How do you differentiate between fruits and vegetables morphologically? Give a brief account of physiological development of fruits and vegetables. 3+3=6  
b) Define fermented and non-fermented fruits beverage. Show the flow chart for fruit juice preparation. 2+2=4
3. a) Describe the pigments and colour precursors found in fruits and vegetables. 5  
b) Illustrate the structural and chemical components of plant cells with diagrammatic figure of a parenchyma cell. 5
4. a) Define cell turgor. Describe the factors which affect the range of textures encountered in fresh and cooked fruits/vegetables. 1+4=5  
b) Define controlled atmosphere (CA) and modified atmosphere (MA). Enumerate in brief the factors influencing the adoption of CA/MA storage for fruits and vegetables. 2+3=5
5. a) Discuss the antimicrobial properties of salt and acid. 5  
b) You could observe some defects in processed jelly, Please indicate them with possible remedies. 5

**Section-B**

6. Define dehydro-freezing and rehydration ratio with example. Compare between natural and artificial dehydration. 2+3=5
7. a) Differentiate in tabular form among Nectar, Cordial, Squash, Crush, RTS and Syrup in respect to T.S.S, acidity, preservatives and necessity of dilution. 4  
b) Define Cordial. Discuss the necessary steps required in clarification of lime juice cordial. Find out the necessary methods applied in juice extraction from fresh fruits. 1+3+2=6
8. a) Distinguish among the following items: 3 x 2=6  
i) Jam, jelly and marmalades,  
ii) Chutney, sauces and ketchup,  
iii) Preserve, candy and crystalized fruits and vegetables.  
b) Define pickles. Mention the problems which are encountered in pickle manufacturing. 1+3=4
9. a) Give a flow chart for commercial canning of fruits or vegetables. Write down the following defects of canning: 1+3x2=7  
i) T.A. soilage,  
ii) Sulfide stinker,  
iii) Hydrogen swells.  
b) Indicate the precaution needs to process chutney. 3
10. a) Give the standard definition of vinegar. Describe the alcoholic fermentation and acetification methods for manufacture of vinegar. 1+5=6  
b) Give recommended conditions for dehydration of carrot, banana, and green pea. 4



**Chittagong Veterinary and Animal Sciences University**  
**Faculty of Food Science and Technology**  
**BFST 3<sup>rd</sup> Year 1<sup>st</sup> Semester Final Examination, 2017**  
**Subject: Computer Application in Food Technology**  
**Course Code: CFT- 301 (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 answer is discouraged.)

**Section-A**

1. a) What are the components of a C program? 2  
b) Write down the allowed forms of the main function. 2  
c) Write a program to calculate the average of a set of N numbers. 3
  
2. a) Write a program to show the use of type casting. Show the output also. 3  
b) Why do we need to use comments in programs? - Explain. 2  
c) Find the errors and correct them: 2  

```
main();  
{  
INT a, b  
D = a/b.  
print( " %d", &D);  
}
```
  
3. a) What do you mean by an array? Give the classification of array. Show some 1+1+1=3 applications where the concept of array can be used. 3  
b) Write a program using array to evaluate the following 4  
$$T = \sum_{k=1}^7 X^2_k$$
  
4. a) Write a program that prints all the odd numbers ranges 1-50. 2  
b) What will be the output of the following code segments: 2.5  

```
int i = 60;  
for (i= -1; i < 50 , i++)  
{  
if ( i % 5 == 0)  
continue;  
printf( "% d\ n", i);  
}
```

  
c) Write about puts and gets function with example. 2.5
  
5. a) Identify errors in each of the following statements and correct them. Explain your answer. 3
  - i) int num [ ] = {0, 0, 0, 0};
  - ii) float item [3] [2] = {0, 1, 2, 3, 4, 5};
  - iii) int num [3] = {3, 4, 5, 6}
  - iv) int m[2,4] = {(0, 0, 0, 0) (1, 1, 1, 1)};  
b) Write a program to copy one string into another and count the number of characters copied. 4
  
6. a) Write the output of the following program: 3

```
main () {  
int n = 5;  
if ( n < 7 )  
printf ( " n less than 7 \ n");  
if (n < 20)  
printf ( " n less than 20 \ n");}
```



**Chittagong Veterinary and Animal Sciences University**  
**Faculty of Food Science and Technology**  
**BFST 3<sup>rd</sup> year 1<sup>st</sup> Semester Final Examination 2017**  
**Subject: Food Biotechnology (Theory)**  
**Course Code: FBT-301**

**Full Marks: 70**

**Time: 3 hours**

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

**Section-A**

1. a) What is biotechnology? Write in brief the different areas of interest. 1+2=3  
b) Discuss the achievements of food biotechnology. 2
2. a) What's the molecular mechanism undergoing Agrobacterium mediated transformation? 4  
b) Write short notes on :i) strain development strategy, 2 x 3=6  
ii) Solid –substrate fermentation,  
iii) Prebiotic and probiotic.
3. a) "Aerobic, anaerobic, partially aerobic or anaerobic environment are maintained for the growth of microorganisms in the fermenter"- explain it briefly. 5  
b) "Contributions from plant tissue culture have been significant in the improvement of quality of plants"- Justify the statement 5
4. a) Define enzyme. Write the properties of enzyme. 1+4=5  
b) How does enzymes those are actively associated with DNA synthesis keep a vital role in DNA replication? 5
5. a) Differentiate between the free energy and activation energy. Also differentiate between fermenter and bioreactor. 2+2=4  
b) Elaborate the mechanism of different types of bioreactors which are based on the mode of operation. Briefly discuss the factors influence the fermentation process. 3+3=6

**Section-B**

6. Which culture techniques is most widely used for the generation of virus free plants and why? 5
7. a) Develop the Michalis-Manten equation. 5  
b) What do you mean by crown gall disease in plants? Briefly describe the functions of virulence region, auxin, cytokinin and opine production region of Ti plasmid. 2+3=5
8. a) What is the first step of gene expression? Briefly describe the phases of "Central Dogma"? 2+3=5  
b) How nucleic acids are separated and purified from the cell lysates? 5
9. a) Illustrate the production of baker's yeast from the molasses and its recovery and purification with industrial application. 5  
b) Write down the characteristics of an ideal cloning vector. Draw a schematic structure of the most widely used cloning vector in genetic engineering techniques. 2+3=5
10. a) What do you understand by strain improvement of microorganism? 1  
b) Write short notes on the following terms in relation to food biotechnology: 3 x 3 =9  
i) Mutation,  
ii) Protoplast fusion and  
iii) Recombinant DNA technology/ Genetic Engineering techniques.



- b) Rewrite the following program using for loop and find the output. 3
- ```
main(){
int n=3; int i=1;
while(i<=5){
printf(" % x % d= % d\ n", n, i, n*i );
i++;}}
```
- c) Find out the error from the following segment: 1
- ```
do{
printf (" input a number\ n");
number = getnum (); }
while(number > 0)
```

### Section-B

7. a) Write a program to find the area and perimeter of a circle. 3
- b) What will be the output of the following segments? 2
- ```
main (){
int n = 0;
while (n < 10){
n = n+1;
if (n % 2 == 0){
break; }
printf (" % d \ n", n);}}
```
- c) What is library function and user defined function? Give example. 2
8. a) In which ways one dimensional arrays can be initialized? Explain with example. 3
- b) Write a program to read number of values in an array and display it in reverse order. 4
9. a) Differentiate between function definition and function calling 2
- b) Write a program to print individual character of string in reverse order. As the word CVASU should be written as USAVC. 4
- c) What will be the output of the following statement? 1
- ```
print( " % d", strcmp ("push", "pull"));
```
10. a) Find the output of the following code: 3
- ```
int main ()
{
int a = 4, b= 5;
print_values (a, b);
}
print_value ( int b , int a)
{printf(" %d % d", a , b);
{
int a = 0;
int b =1;
printf("%d % d", a , b);
}
return 0;
}
```
- b) What do you mean by searching and sorting? 2
- c) Write the uses of advantages of using function. 2
11. a) Write a program that will generate the following output 2
- ```
+
+ +
+ + +
+ + + +
```
- b) Differentiate between switch statement and if statement. 2
- c) Draw the flowchart of if...else control and switch statement. 3
12. a) In a class total number of boys is 10. Write a program to count the number boys whose weight is less than 50 kg, height is greater than 170 cm. Weight and height will be taken from keyboard. 5
- b) What is <stdio.h>? Explain its function. 2



**Chittagong Veterinary and Animal Sciences University**  
**Faculty of Food Science and Technology**  
**BFST 3<sup>rd</sup> year 1<sup>st</sup> Semester Final Examination, 2017**  
**Subject: Clinical Nutrition**  
**Course Code: CLN-301**

**Full Marks: 35**

**Time: 2 hours**

(Figures in the right margin indicate full marks. Answer **Three (3)** questions from each section where Question **five (5)** is compulsory. Use separate answer script for each section. Split answer is discouraged.)

**Section-A**

1. a) Briefly describe complications and management of obesity. 4  
b) What are the causes of diarrhea? 2
2. a) Define malnutrition. What are the causes of malnutrition? 1+2  
b) Why vitamin A is important in visual cycle? 3
3. a) Rahima, a sixteen years girl, suddenly observe swelling and fissuring to her lips. 1+2  
What types of nutrient deficiency occur in her body? How can you treat this deficiency?  
b) Mention the functions of following micronutrients- 3  
i) Ca    ii) Fe    iii) Vitamin-D
4. a) Briefly discuss the nutritional management of marasmus patient. 3  
b) How thyroid hormone synthesis in human body? 3

**Section-B**

5. a) Define low birth weight. List the nutritional disorders in Bangladesh. 1+2  
b) Enlist dietary sources and RDA of following micronutrients for adult person in Bangladesh 2  
i) Vitamin B<sub>3</sub>    ii) Vitamin B<sub>6</sub>    iii) Vitamin E    iv) Sodium
6. a) What is nutritional anemia? State the clinical features of nutritional anemia. 1+2  
b) How can you assess the nutritional status of a child? 3
7. a) How vitamin-D activate in human body? 3  
b) A person frequently pass 300 gm stool. Describe following statement 3  
i) Identify the clinical manifestations 2  
ii) State the diagnosis and treatment 1
8. a) Define infection. Distinguish between diarrhea and dehydration. 1+2  
b) Explain - "Malnutrition and infection is a vicious cycle." 3



**Chittagong Veterinary and Animal Sciences University**  
**Faculty of Food Science and Technology**  
**BFST 3rd year 1st Semester Final Examination 2017**  
**Subject: Market Milk Processing Technology (Theory)**  
**Course Code: MMP-301**

**Full Marks: 35**

**Time: 2 hours**

Figures in the right margin indicate full marks. Answer any **two (2)** questions from each section where questions no 1 is compulsory. Use separate answer scripts for each section. Split answer is discouraged.

**SECTION-A**

1. a) List the differences between Milk and Market Milk. 02  
b) Show the flow-diagram for the processing of market milk mentioning salient points in each steps of manufacturing. 03  
c) List the common defects of market milk mentioning their respective causes. 03
2. a) What should be the results of microbial growth in milk? 03  
b) Mention the bacterial factors in milk held for 18 (eighteen) hours from 0 degree Celsius to 25 degree Celsius. 02  
c) Give a comparison among the common methods of buying raw milk in Bangladesh. 04
3. Write short notes on any 3 (three) of the followings: 03X3= 09  
a) Pricing of milk according to the cost of production;  
b) Flavoured milk;  
c) Milk stone and its composition;  
d) Bulk cooler; and  
e) Milk-borne diseases with respective symptoms and control measures.

**SECTION-B**

4. a) List the required machineries and chemicals to establish a milk chilling plant with a capacity of 5000 liters per day. 03  
b) What precautions will you take during receiving milk in a chilling industry? 04  
c) Mention different types of milk chilling with disadvantages. 02
5. a) What do you mean by Standardization of milk? Mention the methods of standardization. 02  
b) How many parts by weight of 35.0% cream and 2.7% milk must be mixed to make milk testing 3.5% fat? 04  
c) Mention the grades of milk on the basis of bacterial population. 03
6. Write short notes on any 3 (three) of the followings: 03X3= 09  
a) Acidity of milk;  
b) Advantages and disadvantages of UHT milk;  
c) Economic importance of HTST method of milk pasteurization;  
d) Comparison among the milk of cow, goat, buffalo and human according to their gross composition; and  
e) Physical properties of milk.



**Chittagong Veterinary and Animal Sciences University**  
**Faculty of Food Science and Technology**  
**BFST 3<sup>rd</sup> year 1<sup>st</sup> Semester Final Examination, 2017**  
**Subject: Oil and Fat Technology (Theory)**  
**Course Code: OFT-301**

**Full Marks: 35**

**Time: 2 hours**

(Figures in the right margin indicate full marks. Answers any three (3) questions from each section where question no 1 and 5 are compulsory. Split answer is strongly discouraged.)

**Section-A**

1. a) Justify your answer- "In excess polyunsaturated fatty acids are harmful for human body." 05
2. a) Define Acid Value. 01  
b) Write down the procedure of Acid Value determination. 03  
c) Explain the principle of the determination of Peroxide Value. 02
3. a) List down positive and negative effects of Hydrogenation. 1.5  
b) Draw a flow diagram of Palm Oil refining process. 2.5  
c) Write down the procedure of Enzymatic Degumming process. 02
4. a) Define rancidity of oil. 01  
b) Discuss different types of rancidity in edible oil. 03  
c) What are meant by the term Saturated, Unsaturated and Essential Fatty Acids? 02

**Section-B**

5. a) "Food is more than nutrients."-Explain this statement. 02  
b) Write down the chemistry of Interesterification process. 02  
c) Discuss the working principle of Iodine Value determination test. 02
6. a) What is sensitizer? How they cause Lipid oxidation? 01+01=02  
b) Design a flow chart for Essential Oil extraction process. 02  
c) Differentiate between Vegetable Fat and Animal Oil. 02
7. a) Briefly explain major and minor components of edible oil. 2.5+2.5=05  
b) Compare between drying and nondrying oils. 01
8. Write down opinions on 2x3=06
  - a) Mayonnaise and Margarine
  - b) Lard and Tallow
  - c) Fractionation and Deodorization of edible oil



**Chittagong Veterinary and Animal Sciences University**  
**Faculty of Food Science and Technology**  
**BFST 3<sup>rd</sup> year 1<sup>st</sup> Semester Final Examination, 2017**  
**Subject: Waste Management and Environmental Science(Theory)**  
**Course Code: WME-301**

**Full Marks:35**

**Time: 2 hours**

(Figures in the right margin indicate full marks. Answers any three (3) questions from each section where question no 1 and 5 are compulsory. Split answer is strongly discouraged.)

**Section-A**

- |    |  |          |
|----|--|----------|
| 1. | a) What is waste?  | 01       |
|    | b) What are the impacts of waste if not managed wisely?                                | 02       |
| 2. | a) What is acid rain and how does it occur?  | 01+02=03 |
|    | b) What are the ecological effects of acid rain?                                       | 02       |
|    | c) What necessary measures should be taken to minimize the acid rain?                  | 02       |
| 3. | a) Write down the differences between aerobic and anaerobic treatment process.         | 02       |
|    | b) Sketch a flow diagram for primary and secondary treatment of municipal waste water. | 03       |
|    | c) Write down the merits and demerits of activated sludge process.                     | 02       |
| 4. | a) Briefly discuss the Bhopal disaster and later consequences in India.                | 02+02=04 |
|    | b) Discuss the Photochemical Smog formation in air.                                    | 03       |

**Section-B**

- |    |  |           |
|----|--|-----------|
| 5. | a) What are the byproducts from poultry industry?  | 02        |
|    | b) How can you utilize the Jackfruit and Grapes wastes?                                  | 02        |
| 6. | a) Describe the byproducts from plantation crops and how can you utilize them?           | 2.5+2.5=5 |
|    | b) Write a short note on Rotary Kiln Incineration.                                       | 02        |
| 7. | a) How do you plan to control hydrocarbon and particulate emission?                      | 02+02=04  |
|    | b) Give an outline of the modes of solid waste disposal.                                 | 02        |
|    | c) Give some advantages of reuse.  | 01        |
| 8. | a) What do you mean by waste minimization? Write down the process of waste minimization. | 1.5+2.5=4 |
|    | b) Briefly describe the waste produced from Nuclear Power Plant.                         | 03        |



**Chittagong Veterinary and Animal Sciences University**  
**Faculty of Food Science and Technology**  
**BFST 3<sup>rd</sup> year 1<sup>st</sup> Semester Final Examination 2017**  
**Subject: Fish and Sea Food Technology (Theory)**  
**Course Code: FSF-301**

**Full Marks: 70**

**Time: 3 hours**

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

**Section-A**

1. Define marine biology. Interpret the basic concepts of Aquaculture, Mariculture, IMTA and ISSCAAP? 1+4=5
  
2. a) Define fish handling. What are the principles (role) of good fish handling? 1+1=2  
b) Which factors you should consider for fishing? 2  
c) Write in details: i) Aseptic method of food preservation, 3 x 2=6  
ii) UHT Sterilization,  
iii) Dehydrofreezing.
  
3. a) Justify " Water and fat are interchangeable". 3  
b) Compare between terrestrial and marine animals. 3  
c) Analyze the fat content of fish muscle. Why omega-3 fatty acids are good for you? 2+2=4
  
4. a) Describe the medicinal uses of sea weeds. 3  
b) Name some value added sea food that are exporting from Bangladesh. 2  
c) Briefly describe the cause and effect of rigor mortis in fish. How can you avoid the undesirable effects of rigor mortis? 3+2=5
  
5. a) Describe the freezing process of shrimp in Bangladeshi processing industry. 5  
b) What do you mean by cryogenic freezing? 1  
c) Give an overview about the use of fish location and detection equipment. 4

**Section-B**

6. Give an overview about the aquatic biotoxins in seafood's and fresh water. 5
  
7. a) Differentiate among brining, pickle curing and kench curing. 3  
b) Describe the procedure for the smoking of sea fish. Enumerate the compounds identified in wood smoke. 4+3=7
  
8. a) What vital information must be mentioned on seafood packet as label? 2  
b) Compare IQF shrimp prepared by different freezing process. 3  
c) Illustrate typical fish freezing curve. Describe the factors affecting freezing time. 3+2=5
  
9. a) Analyze the importance of sun drying of fish in Bangladesh. Assess the traditional storage of dried fish. 3+3=6  
b) Discuss the control of beetles and mites in dried fish. 4
  
10. a) Classify marinades. Illustrate the preparation of cold marinades and state its shelf life. 2+3=5  
b) Categorize the fermented products of fish with proper example. How will you prepare products in which the original fish are reduced to the form of a paste? 2+3=5



Chittagong Veterinary and Animal Sciences University

Faculty of Food Science and Technology

BFST 3<sup>rd</sup> year 1<sup>st</sup> Semester Final Examination 2017

Subject: Fish Processing Technology (Theory)

Course Code: FPT-301

Full Marks: 70

Time: 3 hours

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

**Section-A**

1. What is meant by shell fish? Evaluate the present status of production, processing and marketing systems of shrimp in Bangladesh. 1+4=5
2. a) Compare between low and high temperature techniques of fish preservation in a tabular form. 5  
b) Appraise the role of protein and fat in fish quality and processability. 5
3. a) What types of postmortem changes are taken place in fish? Briefly describe the autolytic changes in fish. 3+2=5  
b) Define bio-factor. Assess the bio-factor of fish. Mention the importance of compositional study of fish. 1+2+2=5
4. a) In which ways may fish products be spoiled? What are the factors influencing the kind and rate of spoilage? Discuss the evidence of spoilage. 1+3+3=7  
b) Define freshness of fish. Show the process of grading of fishes. 1+2=3
5. a) What do you mean by salting? What are the insights of salting in preserving fish? 2+3=5  
b) Systematically illustrate the freezing curve for fish. What is the significance of "Thermal arrest period" in fish freezing? 2+3=5

**Section-B**

6. Outline the advantages of quick freezing? Distinguish different quick freezing techniques for fishery products. 2+3=5
7. a) Mention the criteria of good cans, possible hazards related to cans and how a processed fish can be tested. 5  
b) What do you mean by fermented fish products? Describe the procedure for the preparation of belachan. 1+4=5
8. a) Give an over view about the application of pesticides in traditional dried fish? What are the characteristics of dried fish prepared from fresh or rotten raw materials? 2+3=5  
b) Discuss the advantages and disadvantages of vacuum packing? Enumerate the advantages of *sous vide* cooking over conventional cooking? 2+3=5
9. a) Explain the mechanism of smoking in fish preservation. 4  
b) Briefly describe the medicinal byproducts of fish and their utilization. 6
10. a) Evaluate the general composition and nutritive value of fish. 4  
b) What is rigor mortis? What are the causes and effects of rigor mortis in fish? Give some examples of onset duration of rigor mortis in various fish species. 1+3+2=6