Chittagong Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 3rd year 1st Semester Final Examination, 2015
Subject: Technology of Fruits and Vegetables Products (Theory)
Course Code: FVP-301

Full Marks: 70 **Time: 3 hours**

(Figures in the right margin indicate full marks. Answer **4** questions from each section. 1 & 6 Questions are compulsory. Use separate answer script for each section. Split answer is not allowed.)

Section-A

1. a) What are the optimum storage temperature for fresh fruits and vegetables? 2
   b) Mention the phases of respiration. Classify fruits based on their respiration pattern. 3

2. a) What are the typical percentage compositions of edible portion of potatoes? Mention the structural unit of edible portion of most fruits and vegetables. Draw a diagrammatic figure of a parenchyma cell. 5
   b) Enlist some carotenoids which are found in different coloured fruits and vegetables. Why do peas, beans, spinach and green vegetables lose their bright green colours on heating? 5

3. a) How quality of fruits and vegetables is graded? Point out the tips of drying of fruits and vegetables. How foods can be preserved with oil and spice? 6
   b) What are the factors that affect the rate of drying of horticulture produce? Which criteria are considered for the selection of a particular drying method? 4

4. a) Describe the general harvesting practices of fruits processing. 4
   b) Why fruit beverages are far superior to many synthetic and aerated drinks? State the function of ethylene during ripening of mango. What changes are observed in fruits and vegetables on the eve of ripening? 6

5. a) What is meant by maturity indices? State the maturity indices of avocado and apple. Give an over view about the different methods of determination of harvest maturity indices. 5
   b) Show the time course changes in the fruits growth and respiration and ethylene evolution rates of fruits which are based on respiration pattern by graphical representation. 5

Section-B

6. a) Why freezing is superior to any other preservation practices? Why blanching treatment is applied prior to freezing and canning? 3
   b) Classify vegetables with examples. 2

7. a) What do you mean by reconstitution and rehydration of dehydrated products? If the drained weight of 15 gram of dried/dehydrated sample containing 4 % moisture after rehydration is 80 gram and the fresh sample before drying contained 90 % moisture. Calculate the rehydration ratio, rehydration co-efficient and percentage of water in the rehydrated material. 6
   b) Write down the principle of dehydro-freezing and freeze drying. What changes may appear in the frozen products during storage? 4

8. a) Define clarification. Briefly illustrate the different methods of clarification that are used during processing and preservation of unfermented fruit beverages. 5
   b) Why grapes are considered for the preparation of wine and which types of apples are selected for making of cider? 5

9. a) Differentiate among nectar, cordial and squash. Draw a flow chart and describe the process for making cordial. 5
   b) "During fermentation whether aerobic, anaerobic or partial aerobic environment is maintained "- justify the statement. Calculate the required amount of ingredients to prepare 1 kg pineapple squash when pulp acidity is 0.37 % and TSS is 14 %. 5

10. a) "Neither immature or green fruits nor overripe fruits, only firm mature fruits are taken into account for making good quality jelly"-justify your answer. What are the factors that influence the precipitation of pectin? 5
    b) What is RTS(Ready-to-serve) beverages? Give an outline scheme of vinegar production. 5

Chittagong Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 2nd year 1st Semester Final Examination, 2015
Subject: Food Bio-Technology (Theory)
Course Code: FBT-201

Full Marks: 70 **Time: 3 hours**

(Figures in the right margin indicate full marks. Answer **4** questions from each section. 1 & 6 Questions are compulsory. Use separate answer script for each section. Split answer is not allowed.)

Section-A

1. a) Define Food Biotechnology. What are the scopes of food biotechnology? 3
   b) Categorize foods which are produced through modern biotechnology. 2

2. a) What are the concepts of generation time? Why some bacteria cannot grow in presence of oxygen? 5
   b) What do you mean by "Central Dogma"? How does DNA replicate? 5

3. a) How recombinant DNA is produced? Briefly illustrate the tools of genetic engineering. 6
   b) How DNA, RNA and Proteins are separated and purified from the cell lysates. 4

4. a) How sticky ends are converted to blunt ends? Write down the characteristics of an ideal cloning vector. Draw a schematic structure of the plasmid cloning vector P^{UC18}. 5
   b) Give a detailed account of biological methods of gene transfer which are usually observed in bacteria .What's the molecular mechanism undergoing Agrobacterium mediated transformation? 5

5. a) What are some examples of plant tissue that can be used to regenerate adventitious shoots? Which part of the plant is best suited for making virus free plants and why? 4
   b) Why is micro propagation based on the principle of totipotency? Briefly describe the steps that are involved in micro propagation. What is the major advantage of producing plants by micro propagation? 6

Section-B

6. a) State the principle of tissue culture. What is meant by Organogenesis? 3
   b) "Contributions from plant tissue culture have been significant in the improvement of quality of plants "- Justify the statements. 2

7. a) Differentiate among explant, germplasm and propagules. Which culture technique is most widely utilized for haploid production? Discuss it briefly. 6
   b) Give an account on somatic hybridization, somaclonal variation, electroporation and electrofusion. Give the advantages and limitations of GM food. 4

8. a) Elaborate the mechanism of different types of bioreactors which are based on the mode of operation. 5
   b) Write on about SSF and SMF. Give the practical problems associated with continuous cultivation. 5

9. a) What are the components of a fermentation process? Elucidate the different stages of bioprocess. 4
   b) What are the natural sources of citric acid? Illustrate the biosynthesis of citric acid and its recovery and purification with industrial application. 6

10. a) Develop the Michalis-Manten eqution and reciprocal line Weaver-Burke equation with figure. 5
    b) Categorize different classes of enzymes with example? Enlist the different types of enzymes which are used on carbohydrate compounds and their industrial application. 5

Chittagong Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 3rd year 1st Semester Final Examination, 2015
Subject: Computer Application in Food Technology(Theory)
Course Code: CFT-301

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) Distinguish between the following statements: 2
   i) x = y ii) x = = y
   b) Write down the differences between the functions getch() and getche(). 2
   c) The following is a segment of a program 3

```
x =1;
y =1;
if(n>0)
x = x+1;
y = y-1;
printf ("%d %d", x, y);
```

What will be the values of x & y if n assumes a value of i) 1 and ii) 0

2. a) Consider the following program, find errors if any, rewriting the program: 5

```
# include <math.h>
main()
{
int a, b, c, d, x, y;
scanf ("%d %d %d", &a, &b, &c, &d);
x=a+b;
y=c-d;
if(y= =0);
printf (" The result is infinity");
else
printf ("Answer = ", x/y);
}
```

   b) "How conditional operator works"-Explain with an example. 2

3. a) Write a program that will reverse a given number. 5

Sample input	Sample output
1234	4321

   b) Assume that the value of the Strings S_1 and S_2 are: 2
   S_1= "Computer" and S_2="Programming"
   Now what will be the output of the following string operations:
   i) strcat (S_1, S_2) ii) strlen(S_2)

4. a) What do you mean by backslash character constant? What is the meaning of the following backslash character constant? 4
   i) '\b' ii) '\f ' iii) '\n ' iv) '\0'
   b) What is the output of the following segment? 3

```
int k=1;
for (int i =1; i<= 3; i++)
{
 for (int j=1; j<= 3; j++)
  {
  if (j>1)
    {
     k=i*j;
    printf ("%d\n" , k);
     }
  }
```

5. a) Explain how if else statement works with a flow chart. 3
b) Write a program to print the following output using for loops. 3

```
1
2  2
3  3  3
4  4  4  4
5  5  5  5  5
```

c) What is the problem of the following statement? 1
int x[5]={1,2,3,4,5,6};

6. a) Assuming that x=2, y=1 and z=0 initially, what will be their values after executing the following code segments? 5

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) How while statement differs with do statement? 2

Section-B

7. a) What is an array? Give some examples where array can be used. How we can declare a two dimensional array? 3
b) Briefly describe about the fundamental data types in C. 4

8. a) What do you mean by function definition, function call and function declaration? 5
b) Change the following for loop to while loop: 2

```
for(n=1; n<=10; n++)
{
printf ("%d", n);
}
```

9. a) Write a C program which calculates factorial number using user defined function. 5
b) What are the functions of # include directive? 2

10. a) What is token? Give examples of six different types of token. 4
b) Define the following test function: 3
i) isalpha (c) ii) isupper (c) iii) isprint (c)

11. a) Write a C program which would print the alphabet set a to z and A to Z 6
b) What are the differences between prefix and postfix operation? 1

12. a) Assuming that the variable String contains the value "First solve the problem. Then write the code." Determine the output of the following program segments: 4

```
i) printf ("% s", String);
ii) printf ("% 30.11 s", String);
iii) printf ("% s", String[0]);
iv) for (i=0; string[i]!= '\0'; i++)
        printf ("% c", String[i]);
```

b) What are the differences between getchar and scanf ? 3

Chittagong Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 3rd year 1st Semester Final Examination, 2015
Subject: Waste Management and Environmental Science (Theory)
Course Code: WME-301

Full Marks: 55 **Time: 3 hours**

(Figures in the right margin indicate full marks. Answer **4** questions from each section. 1 & 6 Questions are compulsory. Use separate answer script for each section. Split answer is not allowed.)

Section-A

1. a) What is DO? 1
   b) Distinguish between BOD and COD. 2

2. a) What is acid rain and how does it occur? 3
   b) What are the ecological effects of acid rain? 3
   c) What necessary measures should be taken to minimize the acid rain? 2

3. a) Write the merits and demerits of activated sludge process. 3
   b) Why anaerobic waste water treatment is preferred to other process? 2
   c) Draw a schematic view of a lagooning process. 3

4. a) Briefly describe the storage and disposal of high level nuclear reactor wastes. 5
   b) Briefly describe the materials recovery facility. 3

5. a) Illustrate how PAN is formed in smog-producing chain reaction. 4
   b) How do you propose to control NO_X and SO_X emission? 4

Section-B

6. a) What are the by-products from poultry industry? 2
   b) How can you utilize the jack-fruit and grapes wastes? 2

7. a) How are solid wastes classified? 2
   b) Briefly describe the encapsulation technique for toxic chemical disposal. 2
   c) Briefly describe the various methods of solid waste treatment and disposal. 4

8. a) What is incineration? Describe short note on rotary kiln incineration. 4
   b) What do you mean by waste minimization? Write the processes of waste minimization. 4

9. a) CO_2 and N_2 both are green-house gases or not-explain. 2
   b) "Now-a-days global warming is a vital issue in the world"-Why and how the global warming affects the climate change? 3
   c) Write a note on the smog formation in air. 3

10. a) What are primary air pollutants? Describe the main sources of CO and NO_X emission. 4
    b) Why are two catalytic reactions necessary to control all major automotive exhaust pollutants? 4

Chittagong Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 3rd year 1st Semester Final Examination, 2015
Subject: Oil and Fat Technology (Theory)
Course Code: OFT-301

Full Marks: 55 **Time: 3 hours**

(Figures in the right margin indicate full marks. Answer **4** questions from each section. 1 & 6 Questions are compulsory. Use separate answer script for each section. Split answer is not allowed.)

Section-A

1. Write down the chemical formulae of stearic acid, palmitic acid and oleic acid. 3

2. a) What do you mean by drying, semi-drying and non-drying oils? 3
   b) What is iodine value? How do you measure iodine value of oil? 5

3. a) What do you mean by hydrogenation of oils? 2
   b) Write down the favorable conditions for the hydrogenation process. 3
   c) Briefly discuss the preparation of raw materials for hydrogenation of oils. 3

4. a) Describe the role of fats and oils in human growth development. 3
   b) What is smoke point? Describe the effects of heating of fat or oil. 5

5. a) Briefly discuss about the margarine and butter with their health effects. 6
   b) Write down the structural formulae of EPA and DHA. 2

Section-B

6. Distinguish between oils and fats. 4

7. a) With a neat flow-diagram describe neutralization process as refining of fat or oil. 6
   b) Discuss about bleaching by silica gel. 2

8. a) What is interesterified fat? Write down the chemistry of interesterification. 5
   b) Discuss about health effect of interesterified fat. 3

9. a) What are the difference between animal, vegetable and mineral oils? 2
   b) With a neat flow-diagram write down the manufacture of Soya bean oil by solvent extraction method. 6

10. Write short note on: (Any two) 8
    a) Winterization
    b) Acid degumming
    c) Deodorization

Chittagong Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 3rd year 1st Semester Final Examination, 2015
Subject: Market Milk Processing Technology(Theory)
Course Code: MMP-301

Full Marks: 55 **Time: 3 hours**

(Figures in the right margin indicate full marks. Answer **three (3)** questions from each section where question no. **1** & **5** are compulsory. Use separate answer script for each section. Split answer is discouraged.

SECTION-A

1.	a)	What is milk and market milk?	2
	b)	Write down the gross composition of cow and buffalo milk.	2
	c)	What are the common types of adulteration in milk?	2
	d)	How will you identify if milk is adulterated with formalin and soda?	4
2.	a)	What do you mean by "Pasteurization"?	2
	b)	Briefly describe the HTST method of milk pasteurization.	5
	c)	Does *Mycobacterium paratuberculosis* survive in commercial HTST pasteurization?	2
3.	a)	Why cow's milk is yellowish white and buffalo milk white?	2
	b)	Write down the factors affecting the quality and quantity of milk production.	7
4.	a)	Define dairy starter culture with classification.	2
	b)	Write down the major roles of starter culture during fermentation of milk.	2
	c)	Give a flow chart for the preparation of starter culture.	2
	d)	State the microbial standards of some grade A dairy products.	2
	e)	What is lactic acid bacteria?	1

SECTION-B

5.		Write down briefly of different steps on:	
	a)	Hygienic milk production	3
	b)	Hygienic milk collection.	3
	c)	Hygienic milk transportation.	3
6	a)	Define standardization of milk.	1
	b)	If a creamery has 160kg cream of 40% butter fat(BF) and wishes to standardize it to 32% BF containing cream, how much skim milk must be added (ignore the fat% of skim milk)?	3
	c)	Diagrammatically and briefly explain the automatic milk standardization process.	3
	d)	Briefly describe the effect of homogenization in milk and milk products.	2
7.	a)	What are the major factors considered for milk pricing?	2
	b)	Briefly discuss about the present milk marketing systems in Bangladesh.	7
8.		Write short notes (any three) on	3×3= 9
		a) Cooling of milk b) Recombined milk d) Flavored milk	
10.		d) Milk-borne illness e) Functional dairy food	

Chittagong Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 3rd year 1st Semester Final Examination, 2015
Subject: Fish Processing Technology (Theory)
Course Code: FPT-301

Full Marks: 70 **Time: 3 hours**

(Figures in the right margin indicate full marks. Answer **4** questions from each section. 1 & 6 Questions are compulsory. Use separate answer script for each section. Split answer is not allowed.)

Section-A

1. Enumerate the role of Protein and lipid in fish quality and processability. 5

2. a) Systematically illustrate the freezing curve for fish. What is the significance of "Thermal Arrest Period" in fish freezing? 5
   b) Write down the importance of chemical composition of fish and fishery products to a fish processor. 5

3. a) Systematically illustrate the principal changes in fish after death. 3
   b) What is gapping? How can this be mitigated in frozen fillets? 3
   c) Give a brief outline of the characteristic pattern of fish deterioration during stored in chilled condition. 4

4. a) Differentiate between drying & dehydration of fish. 3
   b) What are the advantages of dried fish? 3
   c) Mention the importance of traditional drying in the coastal area of Bangladesh. 4

5. a) Define Canning. Briefly discuss the various steps of sardine fish canning. 7
   b) Write down the present status of transportation of iced fish in Bangladesh. 3

Section-B

6. a) Which preservative method is the best method for fish preservation? –Justify your answer in the context of Bangladesh. 5

7. a) How to calculate refrigeration requirements for freezing fish? Calculate the refrigeration requirement to freeze 5 tons Hilsa fish. Where initial temperature of fish is 25^0C and storage temperature -40^0C. 7
   b) What do you mean by thawing? Describe shortly the methods of thawing. 3

8. a) Explain the term "glazing and driploss". 3
   b) Categorize salted fish according to the quantity of salt used. 3
   c) What types of spoilage occurred in salted fish and how to prevent them? 4

9. a) Point out the effects of rigor-mortis on the quality of frozen fish and fish fillets. 6
   b) What are the preservative actions of smoke? 4

10. Write short notes on: (any Four) **(2.5x4=10)**
    i) Risk Assessment,
    ii) Food born illness outbreak,
    iii) Freeze burn,
    iv) Acute toxicity,
    v) Chemical migration.

Chittagong Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 3rd year 1st Semester Final Examination, 2015
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 **four (4)** questions from each section. Use separate answer script for each section. Question no 1 & 6 are compulsory,Split answer is discouraged.)

Section-A

1. a) What are the basic concepts of aquaculture, Mari-culture, IMTA and ISSCAAP? 3
   b) What are the terms diadromous, gastropods and aquatic mammals meant for? 2

2. a) What type and content of proteins and lipids do we get in fish muscle that are obtained from sea and are they good for us and why? 6
   b) State the minor components of sea food. Compare between terrestrial and marine animals. 4

3. a) Which fish is lowest in fat? Is it true that prawns are bad for your cholesterol levels and why? 4
   b) "Shark and Sword fish that are particularly high in mercury levels"- What should i worry about? How does sea weed keep a vital role for the prevention of enlargement of thyroid gland? 6

4. a) What changes occur in different stages of rigor mortis of fish? What are the roles of rigor mortis in fish preservation? 5
   b) Briefly describe the procurement and shipboard operations of sea fish. 5

5. a) Illustrate the factors that affect the quality of frozen sea fish during cold storage. 4
   b) How does spoilage occur in fish and how it can be prevented? 6

Section-B

6. a) Give a brief description on any two of the following: i) Shell fish, ii) Fishing vessel sanitation, iii) Dark muscle and White muscle. 3
   b) Write down the factors to be considered to set up a sea food processing industry. 2

7. a) Give an overview about the heat inactivation characteristics of important bacteria of food poisoning that are encountered during sea food processing. 6
   b) Classify pathogenic bacteria that are associated with fish and fishery products. Write down the steps of smoking. 4

8. a) Differentiate among brining, pickle curing and kench curing. Briefly narrate the improved process of fish drying .How can we cheek beetles and mites in dried fish during storage. 5
   b) How spoilage in salted and dried fish can be prevented? 5

9. a) Classify marinades. Illustrate the preparation of cooked marinades and state its shelf life. 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? 5

10. a) Enumerate a list of commercially important sea weeds used in food industry and highlight some additives with E-number and functions. 3
    b) Briefly describe the processing and preservation of crabs. 4
    c) Discuss about the types of packaging material for frozen fish. 3

Chittagong Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 3rd year 1st Semester Final Examination, 2015
Subject: Clinical Nutrition (Theory)
Course Code: CLN-301

Full Marks: 55 **Time: 3 hours**

(Figures in the right margin indicate full marks. Answer **Three (3)** questions from each section where Question 1 (**one**) and 5 (**five**) are compulsory. Use separate answer script for each section. Split answer is not allowed.)

Section-A

1. a) Describe the dietary management of Protein Energy Malnutrition (PEM). 5
   b) Discuss the approaches for prevention of protein energy malnutrition. 2

2. a) State the causes of diarrhea. 2
   b) How can you assess dehydration? What measures can be taken to prevent diarrhea? 3
   c) A two years old child suffering from diarrhea for last two days and become moderately dehydrated. Her weight is 12 kg. How will you manage it? Write the composition of ORS. 5

3. a) Discuss the epidemiological determinants of obesity. 2
   b) How can you assess obesity? Give a comparison between metabolic and regulatory obesity? 5
   c) Mention the nutritional health problems in Bangladesh. 3

4. a) A patient came to you with swelling, erythema, extreme pain and tenderness of the 1st meta tarophalangeal joint. What is your probable diagnosis? How can you manage the case? 5
   b) What are the sources of uric acid in our body? 2
   c) Describe the metabolic defects of gouty patients. What types of foods can increase the risk of gout? 3

Section-B

5. a) List the vitamin deficiency diseases. 5
   b) Enumerate the sources of vit B_1, vit B_6, vit B_{12} and Iron. 3

6. a) Give a schema of vitamin A metabolism. 3
   b) Write the classification of Xeropthalmia. How the disorder can be prevented? 7

7. a) What is infection? How infection can be transmitted? 2
   b) What types of foods can be used to defend our body against microbes? 3
   c) How can you diagnose anemia? Describe the dietary management of anemia. 5

8. a) What are the common causes and symptoms of mineral deficiency? 2
   b) Name the important minerals and discuss their importance. 5
   c) Name most common foods which causes allergy. How can you treat a case of food allergy? 3