Chittagong Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 3rd Year 1st Semester Final Examination, 2013
Subject: Food Bio-Technology (Theory)
Course Code: FBT – 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 scripts for each section. Split answer is not allowed.)

SECTION: A

1. How is food biotechnology used? Are foods produced through biotechnology safe to eat? 5

2. a) With a figure show how the reaction rate constant is related to temperature. 4
   b) The following moisture adsorption data were obtained for freeze-dried beef. From this data find out the monolayer moisture content and energy constant. 6

a_w	% moisture content (db)
0.04	4.1
0.1	7.7
0.15	9.3
0.2	10.6
0.3	12.1
0.4	13.7

   Is there any influence of temperature on sorption isotherm? If yes, why?

3. a) Define enzyme. Discuss the main theoretical modes that try to explain the formation of the enzyme substrate complex. 5
   b) Explain Mass balance equation in single vessel with recycling for steady state cultivation. 5

4. a) What is genetic code? Why is it important? 2
   b) Explain the BET theory. 3
   c) With a sketch describe the process of translation occurred during protein synthesis. 5

5. a) What are the advantages and disadvantages of using continuous culture? 4
   b) Name the factors influencing the growth of microorganism? Briefly describe the effect of temperature and pH on the growth of microorganism. 6

SECTION: B

6. Give an overview of bubble aeration-single bubble and swarm of bubbles. 5

7. a) Mention the cardinal rules for designing fermenter. 4
   b) Describe a stirred tank reactor with a schematic presentation. 6

8. a) Discuss the mechanical agitation in terms of power number versus Reynolds number. 4
   b) Data recorded (at 27°C) in steady state operation at a sewage treatment plant are as follows: 6
   Flow rate of sewage, F = 310000 m^3/day
   Flow rate of excess sludge, Fex = 6800 m^3/day
   Working volume of aeration unit, V = 67500 m^3
   Recycle ratio, W = 0.197
   Concentration of the marker microbe in effluent from separator, Xe = 56/ml
   Concentration of specific species of microbe (marker) in aeration basin, X = 21000/ml
   Assuming complete missing in the aeration unit and that no growth of the sludge occurs in the separator, estimate the value of specific growth rate, μ of the sludge.

9. a) Prove that, $No_2' = (2D/d)\,\bar{a}n\bar{c}$ 3

b) Write down the common methods of mutations. 3

c) In the presence of the enzyme phospho-glucomutase, glucose-1-phosphate is converted to glucose-6-phosphate. Starting with 0.020 M glucose-1-phosphate at 25°C, it is observed that the concentration of this compound decreases to 0.001 M while the concentration of glucose-6-phosphate increases to 0.019 M. Assuming, R = 1.987 cal/mole degree, determine the standard change in free energy of the reaction. 4

10. a) Discuss the advantages of continuous sterilization of media. 3

b) Describe about Diffuser aerator. 3

c) Which important factors are considered for determining microbial death rate during media sterilization? 4

Chittagong Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 3rd Year 1st Semester Final Examination, 2013
Subject: Basic Electrical and Electronic Engineering (Theory)
Course Code: EEE– 301 (T)

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

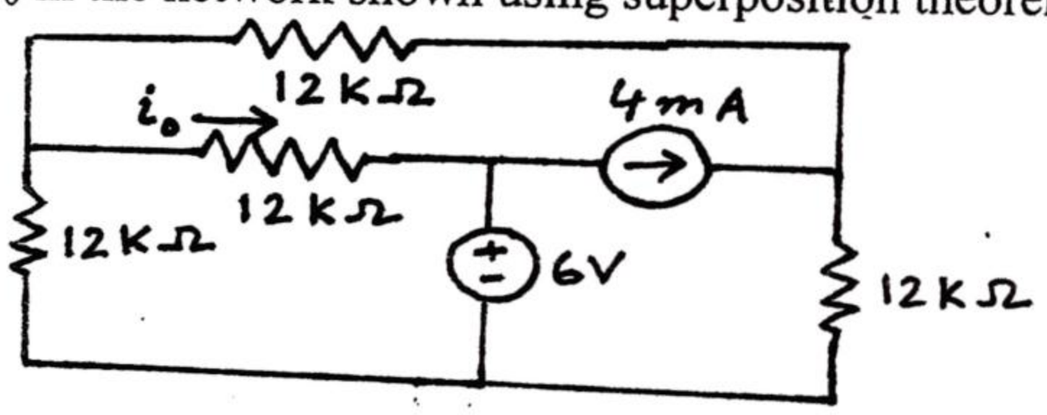
(Figures in the right margin indicate full marks. Answer **Four (4)** questions from each section where question no. **1** and **6** are compulsory. Use separate answer scripts for each section. Split answer is not allowed.)

SECTION: A

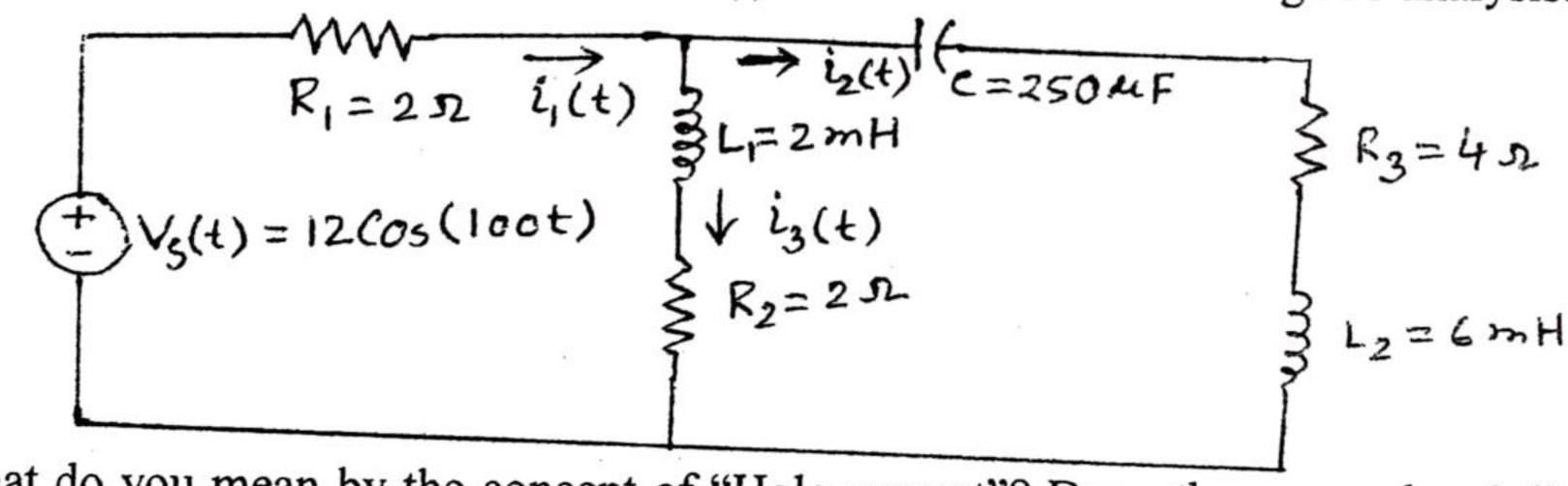
1. a) What do you mean by 'current source' and 'voltage source'? Draw the circuit diagrams for practical current source and voltage source. 03
   b) How can you differentiate unilateral elements from bilateral elements in an electrical network? 01

2. a) Draw the Hysteresis curve with proper notification. 02
   b) What do you mean by the term "Co-ordination number" of an atom in crystalline solids? Calculate co-ordination number of a given atom in crystal for its 03
      (i) Simple cubic structure.
      (ii) Body centered cubic structure
      (iii) Face centered cubic structure
   c) Distinguish between crystalline and Amorphous solids. 03

3. a) State and proof maximum power transfer theorem. 05
   b) Find i_0 in the network shown using superposition theorem. 03



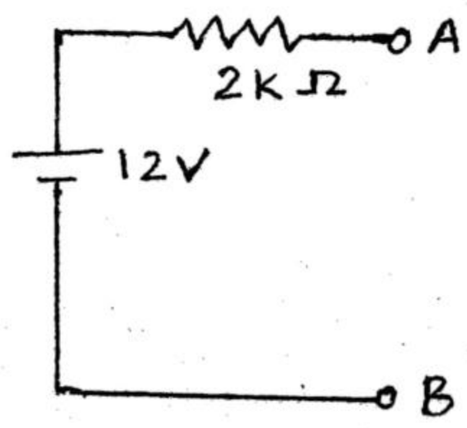
4. a) Establish a relationship between R.M.S current and Peak current for an AC generator. 03
   b) Determine the currents $i_1(t)$, $i_2(t)$ and $i_3(t)$ in the circuit below using AC analysis. 05



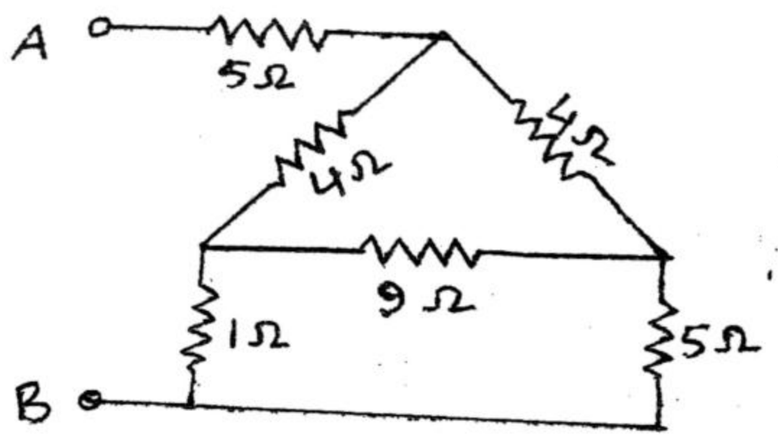
5. a) What do you mean by the concept of "Hole current"? Draw the energy band diagram for n-type and p-type semiconductors. 03
   b) Describe in brief I-V characteristics curve of p-n junction with figures. 04
   c) How does a p-n junction diode work as a rectifier? 01

SECTION: B

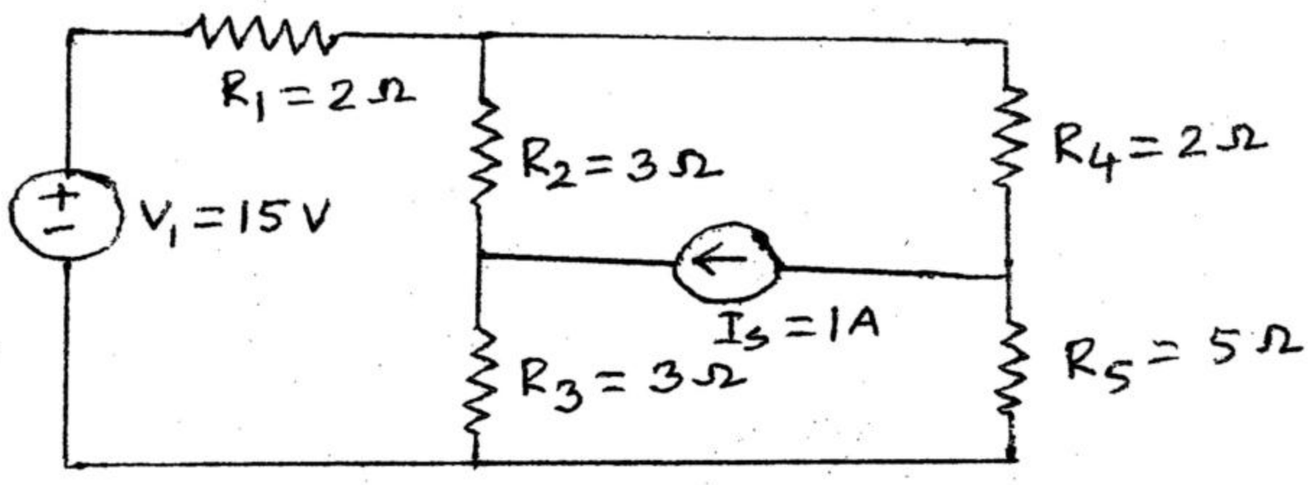
6. a) Convert the constant voltage source into equivalent current source. 01



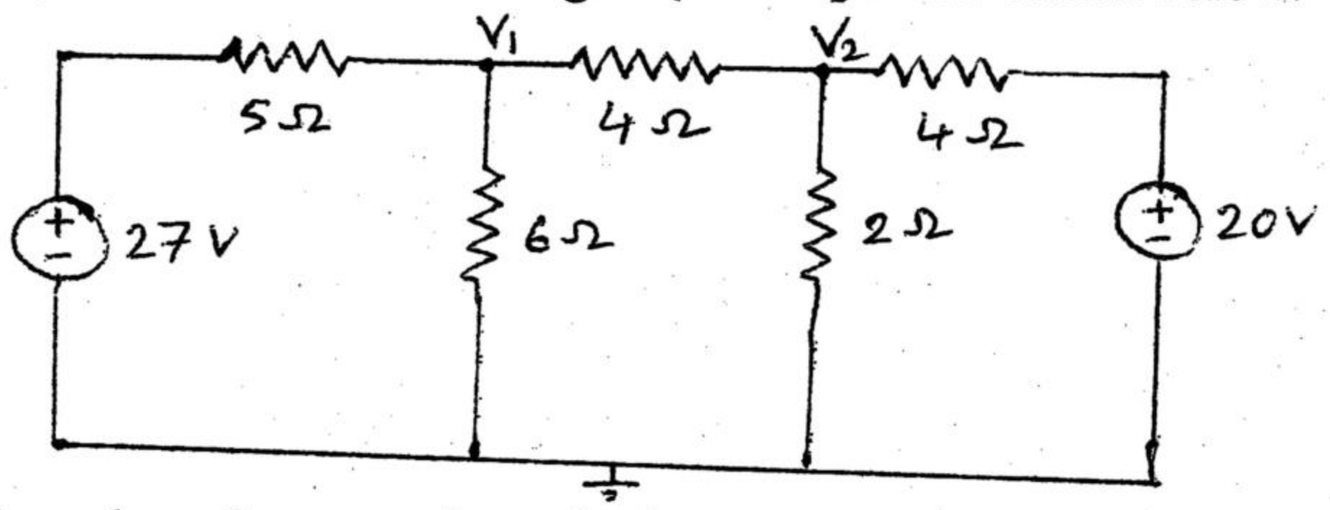
b) For the circuit shown, find R equivalent using Y-Δ or Δ-Y transformation technique. 02



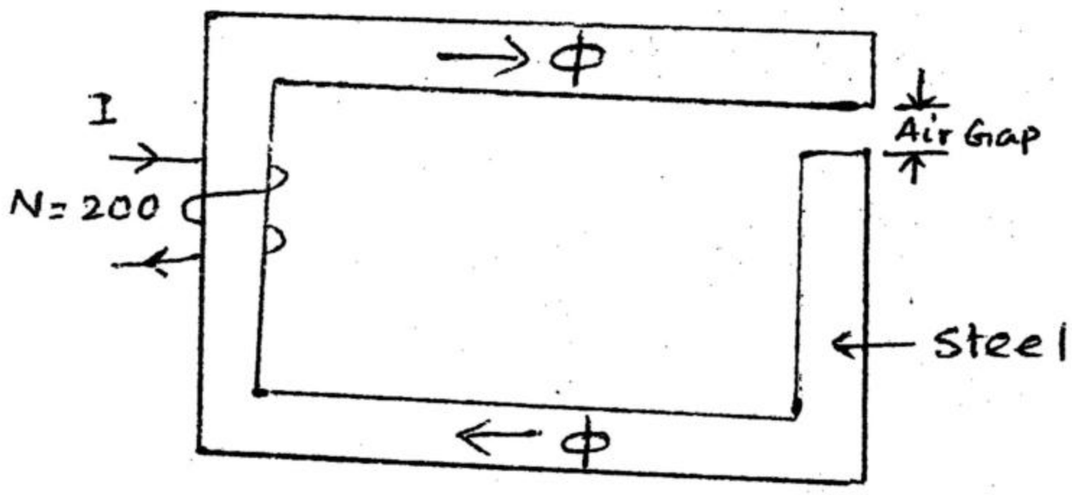
7. a) Obtain the mesh currents of the circuit below using mesh analysis: 04



b) Obtain the unknown node voltage V_1 and V_2 of the circuit below: 04

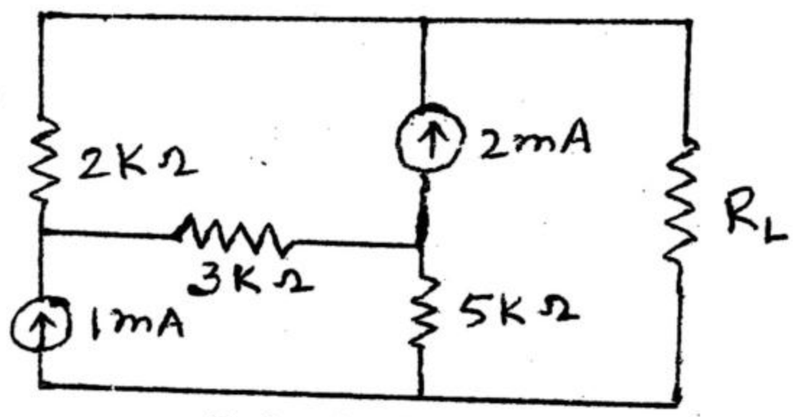


8. a) Find the value of current, I required to establish a magnetic flux $\phi=0.75\times10^{-4}$wb in the series magnetic circuit as shown below. The relative permeability for the steel is $\mu_r=1424$. The area throughout is 1.5×10^{-6} m^2, length of the steel section and of the air gap is 0.1m and 0.002m, respectively. 04

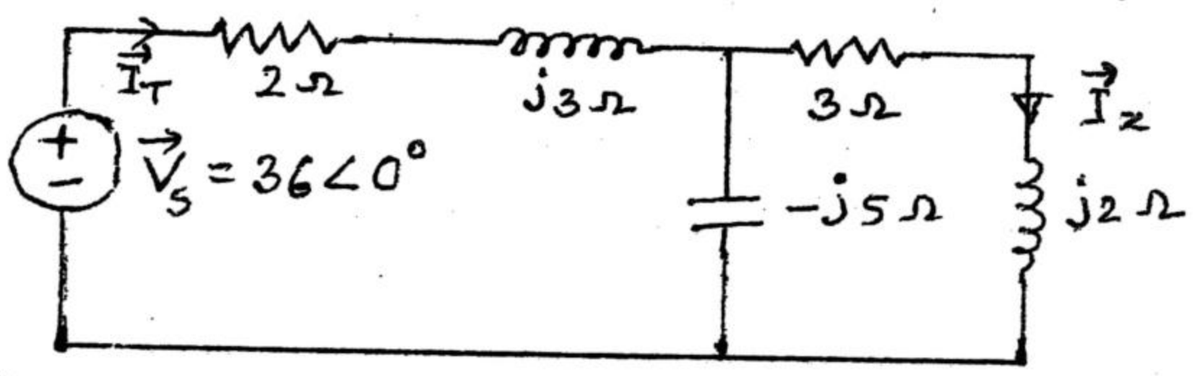


b) State superposition theorem and justify this theorem using any network. 04

9. a) Find the value of R_L for maximum power transfer and the maximum power that can be transferred in the network shown. 04



b) Find the current $\mathbf{I_x}$ in the j 2 Ω impedance and hence verify reciprocity theorem. 04



10. a) Draw the common emitter configuration of both pnp and npn transistor with symbol and proper identification of current. 03

b) Derive the e.m.f equation of transformer. Give a structural concept of step-up and step-down transformer on the basis of this equation. 03

c) Explain the workings of n-channel JFET. 02

Chittagong Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 3rd Year 1st Semester Final Examination, 2013
Subject: Clinical Nutrition (Theory)
Course Code: CLN – 301(T)

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

(Figures in the right margin indicate full marks. Answer **Five (5)** questions from each section where question no. **1** and **7** are compulsory. Use separate answer scripts for each section. Split answer is not allowed.

SECTION: A

1. Briefly state the nutritional management of a 2 years child suffering from kwashiorkor. 3

2. A 25 years old lady resides in a rural area of Dinajpur district, has noticed a diffuse swelling over her throat that moves up and down with swallowing. She gets no vocal problems. The consulting physician assured her about this smooth, diffuse, soft swelling that, it is not a tumour and advised her to consult with a dietitian.
   a) Name the clinical condition the lady is suffering from. 1
   b) Which nutrient is deficient in this case and mention its Recommended Dietary Allowance (RDA). 1
   c) Write down the management for this patient. 4

3. a) Differentiate between diarrhoea and dysentery. 2
   b) Which nutrients are usually lost during diarrhoea? 2
   c) What is the treatment plan for a baby at home who is 7 years old, suffering from acute diarrhoea with signs of dehydration? 2

4. Discuss the effects of malnutrition and infection on nutritional status of a child. 6

5. Give definition, etiology, clinical signs, symptoms and brief management of : 3X2
   a) Scurvy
   b) Beriberi

6. a) Define Food Allergy. 2
   b) Classify allergy with clinical signs and symptoms 4

SECTION: B

7. a) What are the most common nutritional disorders prevalent in Bangladesh? 1
   b) Illustrate the graphical conceptual framework of malnutrition in Bangladesh. 3

8. a) What is VADD? 1
   b) Write down the grading or classification of vitamin A deficiency. 3
   c) How will you diagnose VADD in an individual? 2

9. a) What is Malnutrition? 1
   b) Tabulate the differences between Marasmus and Kwashiorkor. 3
   c) What are the micronutrients usually lost in PEM? 2

10. a) Write down the RDA of the following micronutrients of a non-pregnant adult woman. 3
    a) Vitamin B_1 b) Niacin c) Iodine d) Vitamin B_2 e) Ca f) Na
    b) How can you examine an anemic patient? 3

11. a) Mention the dietary source of vitamin A, Iron, Ca and vitamin D of a person. 4
    b) How active form of vitamin D is formed in our body? 2

12. Write down short notes on the following topics (Any two) : 3X2
    a) IDA
    b) Dietary management of a gout patient
    c) Function of vitamin A in vision cycle.

Chittagong Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 3rd Year 1st Semester Final Examination, 2013
Subject: Communicative English
Course Code: ENG-301

Full Marks: 35 **Time: 2 hours**

(Figures in the right margin indicate full marks. Answer **ALL** the questions from both sections. Use separate answer script for each section.)

SECTION: A

1. Use the right form of verbs in the following sentences: 5
   a) If I had read the book, I (tell) you about it last night.
   b) Jeff looked as though he (see) a ghost.
   c) Ten days (be) a long time for doing such a work.
   d) I will have finished my work before (go) to bed.
   e) It's not long since I (pass) my childhood.

2. Complete the following sentences: 5
   a) As a result of his laziness ----------
   b) ----------, he would have been able to pass the exam.
   c) The student was punished ----------
   d) Since the weather was very hot ----------
   e) He asked me whether ----------

3. Change the voice of the following sentences: 5
   a) Someone built this building about one hundred years ago.
   b) We are going to watch a movie tonight.
   c) The students' questions are always answered by the course teacher.
   d) They use video for teaching the students.
   e) Let not the weak be insulted.

4. Turn the following into indirect speech: 3
   "What kind of stories did Aesop tell?" asked the little girl.
   "Fables", replied the mother. "Do you know what fables are?"
   "No", replied the girl.
   "Well", continued the mother "fables are stories with a message or a moral."

SECTION: B

5. Write a paragraph on any one of the following: 7
   i) Genetically Modified Food
   ii) Food Habit

6. Suppose you are concerned about the life style of today's young generation. Now, write a letter to the editor of the Daily Star stating this concern. 5

7. Join the following sentences as directed: 5
   a) Jack bought a nice clock. He wanted to gift it on his friend's birthday. (in order to)
   b) He was a hard-worker. He succeeded for that reason. (since)
   c) It was raining cats and dogs. All the students attended the class even after that. (though)
   d) The government should make more flyovers. If the government does not do so, there would be more traffic jam. (either ------- or)
   e) Tamim made a century. He got the man of the match award. (present participle)

Chittagong Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 3rd Year 1st Semester Final Examination, 2013
Subject: Oil and Fat Technology (Theory)
Course Code: OFT – 301 (T)

Full Marks: 55 **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 scripts for each section. Split answer is not allowed.)

SECTION: A

1. Write down the structural formula and chemical name of: 3
   i) Linolic acid
   ii) Palmitic acid
   iii) Oleic acid

2. a) What is fatty acid? Discuss the classification of fatty acid with examples. 3
   b) Discuss in brief the production of oil and fat from seed. 5

3. a) Define acid value. How can you measure acid value of oil? 4
   b) What are Polenske, Kirschner, Acetyle and Thiocyanogen value of oil and fat? 4

4. a) Discuss in details acid refining and EDTA degumming of oil and fat. 4
   b) How can you remove colouring and odouring substances from oil and fat? 4

5. a) What is Margarine? Write down the uses of Margarine. 3
   b) Discuss the role and minimum desirable intake of oil and fat. 5

SECTION: B

6. a) What is triglyceride? Discuss the formation process of triglyceride. 3
   b) What is essential oil? 1

7. a) Discuss the production process of palm oil with a neat flow diagram. 6
   b) Define butter. Write down the composition of butter. 2

8. a) What is hydrogenation of oil? Discuss in details the hydrogenation process of oil. 5
   b) Write a note on components affecting the stability of oils. 3

9. a) Discuss in details the alkali refining process of oil with flow diagram. 6
   b) What are flash and fire point of oil? Write down their significance. 2

10. a) What is peroxide value (PV)? How can you measure the PV of oil? 4
    b) What is winterization? Draw the flow diagram of winterization. 4

Chittagong Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 3rd Year 1st Semester Final Examination, 2013
Subject: Waste Management and Environmental Science (Theory)
Course Code: WME – 301 (T)

Full Marks: 55 **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 scripts for each section. Split answer is not allowed.)

SECTION: A

1. a) What is fly ash? 1
   b) Give an account of Air Quality Standards of primary air pollutants. 2

2. a) Describe a typical sanitary landfill mentioning all its components. 6
   b) Where do we use encapsulation? 2

3. a) How do you propose to control hydrocarbon and particulate emission? 4
   b) Why are two catalytic reactions necessary to control all major automotive exhaust pollutants? 4

4. a) What is aerobic treatment process? Discuss the distinguishing features of activated sludge process. 4
   b) Give an outline of the modes of solid waste disposal. 3
   c) What is BOD? 1

5. Write short notes on: 8
   i) Chernobyl disaster
   ii) CO monitor
   iii) PAN
   iv) London Smog

SECTION: B

6. a) Give a list of typical toxic wastes. 2
   b) How can we utilize the pineapple and mango wastes? 2

7. a) Describe the byproducts from plantation crops and how can you utilize them? 6
   b) What are the byproducts from fish processing industries? 2

8. a) What is incineration? Describe short note on rotary kiln incinerator. 4
   b) Describe the waste produced from nuclear power plant. 3
   c) Give some advantages of reuse. 1

9. a) What are primary air pollutants? Discuss their sources and relative contribution to air pollution. 4
   b) What are anaerobic treatment processes? Show the breaking down process of organic waste matter. 3
   c) What is ocean dumping? 1

10. a) Give an account of industrial waste water treatment. 5
    b) Sketch a flow diagram for primary and secondary treatment of municipal waste water. 3

Chittagong Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 3rd Year 1st Semester Final Examination, 2013
Subject: Technology of Fruits and Vegetables Products (Theory)
Course Code: FVP – 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 scripts for each section. Split answer is not allowed.)

SECTION: A

1. a) Write down the principles of fruits and vegetables preservation. 3
   b) Why fruit beverages are far superior to many synthetic and aerated drinks? 2

2. a) Enlist some carotenoids found in fruits and vegetables. 2
   b) Why do peas, beans, spinach and green vegetables lose their bright green colours on heating? 3
   c) Discuss the structural and chemical components of plant cell. 5

3. a) What are the factors that affect fruits and vegetables quality? 5
   b) Classify fruits and vegetables according to ethylene production rate. 3
   c) Point out the tips of drying of fruits and vegetables. 2

4. a) How foods can be preserved with oil and spice? 2
   b) Define fermentation. Describe in brief the different types of fermentation related to food preservation. 5
   c) What is T.A. spoilage? Discuss the canning of mango? 3

5. a) Describe the general harvesting procedures of fruits. 5
   b) What are the factors that affect the rate of drying of horticulture produce? 2
   c) What are the criteria for selection of a particular drying method? 3

SECTION: B

6. a) Write down the advantages of dehydration over sun drying. 3
   b) Why freezing is superior to any other preservation practices? 2

7. a) What is rehydration ratio? Calculate the rehydration co-efficient, if the drained weight of 10 g of dried sample containing 5 % moisture after rehydration is 70 g and the fresh sample before drying contained 90% moisture. 5
   b) Define dehydro-freezing. Draw the flow diagram for freezing of beans. 2
   c) What changes will occur during freezing of fruits and vegetables? 3

8. a) What is RTS? Mention the manufacturing process of cordial by flow diagram. 2
   b) Classify wine. Give the manufacturing flow diagram of red wine. 5
   c) Calculate the required amount of ingredients to prepare 1 kg pineapple squash, when pulp acidity is 0.37% and TSS is 14%. 3

9. a) Calculate the required amount of ingredients to prepare 1 kg of mango jam when the TSS of used pulp is 14%. 5
   b) Differentiate among jam, jelly and marmalade. 2
   c) Write down the principle of vinegar production. 3

10. a) What are the factors that influence the precipitation of pectin? 3
    b) What do you mean by inversion of sugar? How the end point of boiling is judged in the preparation of jelly. 3
    c) Give a manufacturing flow diagram of tomato ketchup. 4

Chittagong Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 3rd Year 1st Semester Final Examination, 2013
Subject: Fish and Sea-Food Technology (Theory)
Course Code: FSF – 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 scripts for each section. Split answer is not allowed.

SECTION: A

1. Differentiate between: 5
   i. Chilling and Freezing
   ii. Dark muscle and white muscle
   iii. Fish and Sea-Food

2. a) What do you mean by sous vide cooking? Write down the basic steps of sous vide cooking process. 5
   b) What is Marine Biology? 2
   c) What types of crash caused by marine invasive species on adjacent area? 3

3. a) Give an overview about the forms of feed used in aquaculture. 4
   b) Briefly discuss the principles of plate and air blast freezer. 6

4. a) A spherical food product is being frozen in an air blast wind tunnel. The initial product temperature is 10°C and cold air -15°C. The product has a 9 cm dia with density of 1000kg/m^3, the initial freezing temperature -3.25°C and the latent heat fusion is 250kj/kg. Compute the freezing time. 6
   b) Indicate the inputs and outputs during the canning of tuna fish with a flow diagram. 4

5. a) What are the types of marinade? Prepare cooked marinade with CCP. 5
   b) Describe about marine toxin poisoning. 5

SECTION: B

6. Give brief descriptions on any two of the following: 5
   i. Health benefits of eating sea-food
   ii. Smoking of fish
   iii. Action of acetic acid and salt in fish marinade

7. a) Narrate 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

8. Prepare a hazard analysis worksheet for catching and freezing of raw prawn. 10

9. a) How will you prepare the liquid fermented fish product? 4
   b) An IQF tunnel is being used for tuna fish. The product conveyor is 5 ft wide and 20 ft long. The air used as a freezing medium is at -30°F and moves through the product bed at a velocity which produces a surface heat transfer coefficient of 50 Btu/hrft^2°F. If the tuna fish enter the tunnel at 40°F and are frozen to 0°F and the freezing time needed 1.54 min, compute the capacity of freezer in tons where L is 150 Btu/lbm. 6

10. a) How do you design and construct a fish and sea-food processing plant? 5
    b) Define additive. Highlight some additives with E-number and functions. 3
    c) Write down the types of fish muscle lipids. 2

Chittagong Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 3rd Year 1st Semester Final Examination, 2013
Subject: Fish Processing Technology (Theory)
Course Code: FPT-301

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 answer is not allowed)

SECTION: A

1. a) Write down the factors that affect the composition of fish. 3
   b) Calculate the calorific value (Kcal) of the flesh of 270g silver carp. Assume the quantity of fish flesh is half of its total weight and also assume standard amount of water, protein and fat. 2

2. a) Write down the advantages of salt curing over other preservation methods. 2
   b) Give a brief outline of the fish salting methods. 4
   c) Describe the factors that affect salting process and quality of the products. 4

3. a) Enumerate nine main fishery classes. 3
   b) Distinguish between fresh and stale fish. 2
   c) Mention the quality changes in fish occurred during different stages of handling, transportation, processing and storage. 5

4. a) Define smoking of fish. 2
   b) Describe preservative action of smoking on fish? 3
   c) Write in brief the common unit operation in canning of carp fish. 5

5. Write short notes on: 10
   i) Post mortem changes in fish muscle
   ii) Fish freezing
   iii) Principle of canning
   iv) Principle of curing

SECTION: B

6. In the context of Bangladesh, discuss the scope of fish processing. 5

7. a) What are the causes of rigor mortis in fish? 2
   b) Compare between drying and curing of fish. 3
   c) Systematically illustrate the characteristics pattern of fish deterioration during storing in ice. 5

8. a) Describe in brief the marketing channels of fish. 4
   b) Enumerate the quality changes of fish in the supply chain of fish. 3
   c) Discuss the problems and ways to improve existing marketing system of fish in Bangladesh. 3

9. a) Mention the changes in fish associated with freezing and cold storage. 5
   b) Describe the packaging requirement for frozen fish. 2
   c) How much energy have to be removed for freezing of 5000 kg fish from the temperature 25°C to -18°C? 3

10. a) Indicate the factors that influence drying rate of fish. 3
    b) Write down the advantages and disadvantages of sun drying. 4
    c) What actions to be taken for the improvement of traditional sun-drying process? 3

Chittagong Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 3rd Year 1st Semester Final Examination, 2013
Subject: Market Milk Processing Technology (Theory)
Course Code: MMP– 301 (T)

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

(Figures in the right margin indicate full marks. Answer **THREE (3)** questions from each section where question No.**5** is compulsory. Use separate answer scripts for each section. Split answer is not allowed.)

SECTION: A

1.	a)	What do you mean by Market Milk? State analytical composition of milk.	2
	b)	State food value of milk and milk products in human nutrition.	3
	c)	What are the major factors affecting the quality of fresh milk? Briefly discuss.	3
	d)	Classify forms of milk.	1
2.	a)	How can you proceed for milk Grading? Briefly discuss.	3
	b)	Briefly describe the HTST milk pasteurization.	4
	c)	Do you support the traditional methods of cooking milk for drinking? Justify your answer.	2
3.	a)	Enlist the important lactic acid bacteria in milk and milk products.	2
	b)	What are the various sources of contamination in milk? Briefly discuss.	5
	c)	Classify the milk-borne diseases.	2
4.	a)	What are the tests that are done by individual dairy processing plant?	2
	b)	Briefly describe the fluid milk processing steps.	6
	c)	What is the shelf-life of pasteurized milk as per pasteurized milk ordinance?	1

SECTION: B

5.	a)	Make a plan for the establishment of pilot dairy processing plant.	5
	b)	Sketch the mini dairy processing plant.	5
6.	a)	Define functional dairy food.	2
	b)	State the significant bioactive functions associated with dairy products and their components.	4
	c)	Briefly describe the LP system for milk preservation.	3
7.	a)	Briefly describe the milk chilling plant.	5
	b)	Give an overview of range of dairy products from milk.	4
8.		Write short notes (any three) :	3 x 3 = 9.0
		a) Automatic standardization process of milk.	
		b) Homogenization of milk.	
		c) Starter culture	
		d) Microbial standards for some Grade A dairy products.	