

Chittagong Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 4th Year 1st Semester Final Examination, 2013
Subject: Epidemiology and Public Health (Theory)
Course Code: EPH- 401

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 discouraged.)

Section-A

1. a) State the definition of epidemiology. List basic principles of Epidemiology. 3
 b) An outbreak of gastroenteritis has occurred among 205 attendees of a corporate picnic; 99 persons ate salad, 30 of whom developed gastroenteritis. Calculate the risk of illness. 2
2. a) Define survey, surveillance and monitoring. 3
 b) List different types of surveillance system. 3
 c) Describe briefly the purposes and steps of surveillance. 4
3. a) What is causal interference? 1
 b) Explain the considerations commonly used to assess the causal nature of observed associations. 4
 c) What do you mean by necessary and sufficient cause? 2
 d) Describe the factors that play important role in the causation of diseases. 3
4. a) Define screening. What are the types of screening? 3
 b) Describe how you can measure the quality of a screening test? 7
5. a) What is validity? How can you check validity against data? 4
 b) What is informed consent? What are the acts declared by the World Medical Association about informed consent? 3
 c) Seven cases of hepatitis A occurred among 70 children attending a child care center. Each infected child came from a different family. The total number of persons in the 7 affected families was 32. One incubation period later, 5 family members of the 7 infected children also developed hepatitis A. Calculate the attack rate among family contacts of those cases. 3

Section-B

6. a) Define the terms: target population, study population, sampling frame. 3
 b) Describe the steps in systematic random sampling. 2
7. a) What are the epidemiological measurements of disease frequency? Describe the factors that influence the prevalence of a disease. 2
 b) Define relative risk and odds ratio? 3
 c) In a small pilot study, 12 persons with rectum cancer and 12 with no apparent disease were conducted and asked whether they had long exposure of consuming smoke foods. Each person with cancer was matched by age, race, and weight to a person without the disease. The results are shown below. Calculate odds ratio for matched and unmatched pair. 5

Pair number	Person with rectum cancer	Person without rectum cancer
1	Exposed	Non exposed
2	Non exposed	Non exposed
3	Exposed	Exposed
4	Exposed	Exposed
5	Exposed	Non exposed
6	Non exposed	Non exposed
7	Exposed	Non exposed
8	Exposed	Non exposed
9	Non exposed	Exposed
10	Non exposed	Exposed
11	Exposed	Non exposed
12	Exposed	Non exposed

8. a) Define the terms Endemic, Epidemic and Pandemic. 3
b) What do you mean by food borne diseases? How will you investigate the outbreak of a food borne disease? 7
- 9) a) Draw a schematic figure of case control study design and describe it briefly with the help of an example of food borne illness. 4
b) Differentiate experimental study design from that of observational. 2
c) Explain randomized controlled trial with example. 4
- 10 a) Classify errors in epidemiology. 2
b) Define selection bias and confounding bias with an example. 3
c) Some investigators enrolled 2100 women in a study to determine the incidence rate of heart disease. After one year, none had a new diagnosed heart disease, but 100 had been lost to follow up. After 2 years one had a new diagnosed and another 99 had been lost to follow up. After three years another 7 had new diagnosed and 793 had been lost to follow up. After 4 years 8 had new diagnosed and 392 more had been lost to follow up. Calculate the incident rate of heart disease among this cohort. 5

Chittagong Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 4th Year 1st Semester Final Examination, 2013
Subject: Refrigeration, Air Conditioning and Food Processing
Course Code: RAP-401

Full Marks: 70

Time: 3 Hours

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

Section: A

1. Write down the application of refrigeration and air conditioning in food processing. 5
2. a) What do you understand by unit of refrigeration? Draw a simple diagram of vapour compression refrigeration system and explain operating principles of the system. 6
b) Show the effect of sub-cooling and super heating in a refrigeration plant. 4
3. a) Enumerate in brief the source of trouble in a refrigeration unit and give suggestions of their remedies. 5
b) Draw a skeleton psychrometric chart and explain the following processes: i) cooling and humidification and ii) heating and dehumidification. 5
4. a) Develop an expression for overall heat transfer co-efficient for steady state combined heat transfer through a composite pipe. 5
b) A cold room has one of the walls 7.5 m × 3.5 m made of bricks 15 cm thick, insulated externally by cork slabbing 10 cm thick, cork is protected externally by 3 cm wood. Estimate the infiltration of heat through the wall in 24 hours, if the interior of the cold room is maintained at a temperature ^{of 25°C and outside temp at} 30°C. Thermal conductivity of cork, wood and bricks are 0.045, 0.175 and 0.93 w/m°K, respectively. What will be the interface temperatures? 5
5. a) What do you mean by heating load/cooling load? List all the parameters you must consider for calculating heating load. 7
b) Define air conditioning and give its classification. 3

Section: B

6. "Ozone depletion and global warming potential" - Explain about it. 5
7. a) Differentiate between refrigeration and heat pump system. Draw a simple diagram of Ammonia absorption system. 4
b) Define refrigerant. Describe the desirable properties that a refrigerant should possess. How refrigerant is designated? 6
8. a) List the parameters affecting human comfort. Draw a comfort chart and show how a certain effective temperature can be obtained? 5
b) Air enters the space at 40°C DBT and 10% RH with a flow rate of 100 m³/min. The boiling point is 760 mmHg, 50 kg/hr of water at 18.5°C is injected. Determine the resulting condition. 5

9. a) Design summer air conditioning system for Hot and dry outdoor conditions and represent its psychrometric process. 5
- b) Mention the initial cooling method for cold storage preservation and describe the forced air cooling method for preservation chamber. 5
10. a) Define acoustics and noise control. Mention the source of noise. 4
- b) Design a cold storage with respect to air flow. Write the beneficial effects of controlled atmosphere storage. 6

Chittagong Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 4th Year 1st Semester Final Examination, 2013
Subject: Renewable Energy in Food Processing
Course Code: RFP-401

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) Mention some renewable energy sources. 2
- b) What are the applications of renewable energy technology? 3
2. a) Describe the challenges and problems associated with the use of various energy sources. 8
- b) How can you analyze the performance of conventional solar heaters? 2
3. a) What do you mean by the term "Solar Photovoltaic"? Mention some advantages and disadvantages of solar PV technology. 4
- b) Why do usually the actual output power from a PV module is less than its rated power? 2
- c) Explain the construction details and working principle of a solar cell. 4
4. a) What do you mean by the term "Coefficient of Performance" of a wind turbine? Explain Betz criterion and using this concept show that the coefficient of performance for a wind turbine is 59% maximum. 7
- b) Design a biogas plant suitable to fulfill the cooking needs of a family of six members. The system design includes the estimation of total gas required, amount of feedstock or dung required and the number of animals required having feedstock of a given amount. Take the following assumptions into account: 3
 About 400 litres of Biogas required per day per person for cooking; Average production of dung per cow per day is 10 kg; 1000 litres of gas is equivalent to 1 m³ of gas; Average gas production from dung is about 40 litres/kg of fresh dung; Retention period of dung slurry in digester is 50 days; Specific gravity of slurry is about 1090 kg/m³
5. a) What is geothermal energy? Explain the geothermal energy as a source of renewable energy. 3
- b) What do you mean by term "Geothermal Reservoirs"? Explain the differential techniques used to generate Electricity from Geothermal sources in geothermal power plants. 4
- c) A boy's hostel in a school needs 5000 litres of hot water. Solar radiation available on the location is 6.2 kwh/m² day. Temperature of feed water is 27^oC and it is to be heated up to 60^oC. Find out the collector area required for the system. Efficiency of solar water heater is 0.40 3

SECTION: B

6. a) "Biomass is a renewable energy source"-Justify the statement. 2
- b) Mention different types of Biomass and their applications. 3
7. a) Write down the advantages and disadvantages of application of renewable energy technology in Bangladesh. 5
- b) Mention some renewable energy resource options for the food processing industries in Bangladesh. 5
8. a) What do you mean by the term "Tip Speed Ratio or TSP" for a wind turbine machine? Derive an expression for the optimal rotational frequency of rotor blades in a wind stream to extract maximum power. 4
- b) Explain the workings of different components in a horizontal axis wind turbine machine. 6
9. a) How does a biogas plant work? What are the reactions that take place in a biogas plant? Explain briefly. 5
- b) Give an explanation of the factors responsible for biomass fuels to be useful sources for energy production. 5
10. a) Explain the operation and construction details of a solar still and mention the parameters affecting the solar still performance. 6
- b) An industry wants to install a wind turbine to generate annual energy of 50000 kwh. The wind speed at the location is 7 m/s at a height of 10 metres from the ground. Which turbine would you suggest to the industry? Coefficient of performance Cp=0.40, Transmission losses (rotor to generator)=0.90, generator losses=0.90. 4

Chittagong Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 4th Year 1st Semester Final Examination, 2013
Subject: Statistics (Theory)
Course Code: STC- 401

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 is compulsory. Use separate answer script for each section. Split answer is discouraged.)

SECTION: A

1. a) Define population, sample and variable with examples. 3
 b) What are the measurements of scales? Cite one example for each. 3
 c) Identify the experimental unit, variable, types of variable and the measurement of scale of the following: 4
 - i. Variety of chickens
 - ii. Size of a poultry farm
 - iii. Number of calves given by a cow in her life
 - iv. Quantity of milk given by a cow per day.

2. a) What are the desirable properties of an ideal measure of central tendency? Arithmetic mean is the best measure of central tendency. Explain. 3
 b) ~~Six~~ Five determinations of magnesium content to the nearest milligram/100g from a food material are 20, 24, 18, 26, 27 and 20. Calculate mean, median and mode with interpretation. 3
 c) Show that the sum of squares of deviations from the arithmetic mean is minimum. 3

3. a) Define regression coefficient. State some important properties of regression coefficient. Show that the correlation coefficient is the geometric mean of the regression coefficients. 5
 b) The following data give the ages and blood pressures of 6 women:
 Age in Year (x) : 15 20 25 30 35 40
 Blood Pressure (y) : 110 115 120 125 130 135
 i. Obtain the regression line of y on x. 3
 ii. Predict the blood pressure of a women whose age is 45 years. 1

4. a) Define treatment, block and yield. What are the basic principles of an experimental design? Discuss randomisation. 4
 b) Discuss completely randomised ~~block~~ design in brief. 5

SECTION: B

5. a) What are the important measures of dispersion? Define variance and coefficient of variation. 3
 b) Which one is the best measures of dispersion and why? 2
 c) Suppose you want to buy 100 pieces of chickens for a birth day party of size one kg each. Two poultry farms are located in your area. The averages and standard deviations of the weights of the chickens are as follows:

Firm	A	B
Average weight	1.00 kg	1.00 kg
Standard deviation	0.90 kg	0.60 kg

 From which farm will you buy chickens and why? 4

6. a. Define with example: 3
 - i. Mutually exclusive event, ii. Random experiment and iii. Sample space.
 b) What is standardized normal distribution? Show that the mean and variance of standard normal distribution is 0 and 1. 3
 c) Machine A produces 60 % of the output and machine B produces the rest from a fruit juice pack factory. 1 % of the output of machine A is defective and 2 % of the output of machine B is defective. An item is selected at random from a day's output and is found to be defective. What is the probability that the defective item was produced by machine B? 3

7. a) What is correlation coefficient? Explain the value of 'r' when it takes values of -1, 0 and +1. 3
 b) Explain the situations to be preferred for Spearman rank correlation over Karl Pearson correlation. Write the formula of rank correlation with meaning of symbol. 3
 c) During training of a sensory panel; 'color intensity' was measured on a series of 6 samples containing different concentrations of a red food dye. The information regarding samples are given as $\Sigma x=2.56$, $\Sigma y= 282$, $\Sigma xy=182.46$, $\Sigma x^2=1.8776$. What will be the value of sensory color intensity for a dye concentration of 0.1? 3

8. a) Define test of hypothesis. Write down the procedural steps of hypothesis testing. 3
 b) Instrumental texture of 'bitterness' was taken on four random biscuits. How will you test the significant variation in bitterness of backed biscuit products? Write down the procedures of conducting this test. 3
 c) Define the following terms: 3
 - i. Error of first kind, ii. Critical value and iii. Level of significance

Chittagong Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 4th Year 1st Semester Final Examination, 2013
Subject: Leadership and Food Entrepreneurship Development(Theory)
Course Code: FED-401

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** is compulsory. Use separate answer script for each section. Split answer is discouraged)

SECTION: A

1. a. What do you mean by leadership? State the different forms of leader. 2
b. Write the comparison between professional leaders and local leaders. 4
c. Discuss the qualities of a good leader in context of Bangladesh. 4
2. a. Distinguish between entrepreneur and entrepreneurship. State the characteristics of an entrepreneur. 2
b. "Entrepreneur and entrepreneurships are the catalysts in the process of economic development of a country."-Explain. 3
c. Briefly discuss the growth of entrepreneurship in context of Bangladesh. 4
3. a. Why is feed forward control the most desirable type of control in a food industry? Explain. 2
b. You are the managing director of a food processing factory. A plan has been formulated to achieve a production target. What type of control mechanism would you follow to ensure implementation of the plan? Justify your answer. 7
4. a. Define entrepreneurial mobility. 2
b. Write the different types of entrepreneurial mobility. 3
c. Briefly discuss the factors that influence entrepreneurial mobility. 4

SECTION-B

5. a. What do you understand by the term entrepreneurial competency? 2
b. State the qualities of a successful entrepreneur. 3
c. Discuss the process of developing competencies. 4
6. a. Define project. State the characteristics of a project. 3
b. Briefly discuss the project appraisal techniques that are adopted for selection of a project by an entrepreneur. 6
7. a. Define entrepreneurial motivation. 2
b. What factors do influence the emergence and development of entrepreneurship? 3
c. Explain the factors which prompt people becoming entrepreneur. 4
8. Write short notes (any three) (3x3)= 9
 - i. Opinion leadership
 - ii. Rural food entrepreneurship
 - iii. Entrepreneurial Development Program (EDPs)
 - iv. Intrapreneur

Chittagong Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 4th Year 1st Semester Final Examination, 2013
Subject: Marketing of Food Products and Business management(Theory)
Course Code: MFP-401

Full Marks: 70

Time: 3 hours

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

SECTION: A

1. a) Define marketing. Distinguish between marketing and selling. 2
b) What do you understand by marketing channel? Write the factors that are involved in selecting a marketing channel. 4
c) Briefly discuss the commodity and institutional approaches of marketing. 5
2. a) What are the basic difference between marketing participants and intermediaries? 2
b) Marketing intermediaries are always treated as parasites. Justify your answer. 4
c) Briefly discuss the role and functions of merchant's intermediaries in context of food marketing. 6
3. a) Define marketing margin with its different concepts. 2
b) Indicate the factors which increase the marketing margin. 5
b) Describe the approaches to the assessment of marketing efficiency. 5
4. a) Define marketing system. 1
b) Give the diagram of egg marketing channels and describe the functions of egg marketing system in context of Bangladesh. 7
c) Enumerate the meaning of cooperative marketing with its advantages and disadvantages. 4

SECTION: B

5. a) What is business? Write down the characteristics of business. 3
b) Discuss the functions of management. 5
c) Differentiate between trade, commerce and industry on the basis of their main characteristics. 3
6. a. Define working capital. 2
b) Write the different forms of working capital of small scale enterprises in Bangladesh. 5
c) Explain the factors that determine the requirement of working capital for small scale food enterprises. 5
7. a) Define inventory. 1
b) Write the motives and benefits of holdings inventory. 4
c) Briefly discuss the models of inventory management in case of food enterprises in Bangladesh. 7
8. a) **Write short notes on(any four):** 4x3= 12
 - i. Investment analysis
 - ii. Marketing cost and Margin
 - iii. Tools of quality control
 - iv. Manpower selection procedure
 - v. Working capital operational cycle

Chittagong Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 4th Year 1st Semester Final Examination, 2013
Subject: Extension Communication Management(Theory)
Course Code: ECM-401

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** is compulsory. Use separate answer script for each section. Split answer is discouraged.)

SECTION: A

1. a) Explain the term extension. State the objectives of extension. 4
b) Discuss in brief the principles of extension. 6
2. a) What do you mean by education? Why extension education is non-formal? 5
b) List the elements of learning process. Describe the most important elements of learning. 4
3. Define innovativeness and adopter categories. Mention the features of two important adopter categories in context of Bangladesh. 9
4. a) Explain the concepts of program and program planning. 4
b) Describe the importance and principles of program planning. 5

SECTION-B

5. a) Define extension organization. 2
b) List major features of extension organization in context of Bangladesh. 3
c) Define with examples of various types of leadership in an ideal extension organization. 4
6. a) What is meant by communication? State the functions of communications. 4
b) Explain the term feedback in communication. Why it is important for increasing communication efficiency? 5
7. a) Define monitoring and evaluation. 3
b) Discuss the steps of extension project evaluation with appropriate example. 6
8. a) What is meant by human resource and human resource development? Enumerate different techniques of human resource development management. 4
b) State and discuss in brief different types of training in extension services. 5

Chittagong Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 4th Year 1st Semester Final Examination, 2013
Subject: Poultry Products Technology (Theory)
Course Code:– PPT 401(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. **1 is compulsory**. Use separate answer scripts for each section. Split answer is discouraged.)

SECTION: A

- 1 (a) Define poultry product, poultry products technology and meat technology. 3
(b) Describe types and characteristics of meats of different species of poultry. 4
(c) Breast meat of broiler chickens is considered to be the best one” –give your opinion and justify. 3
2. (a) What is meat quality? Describe the parameters with which you can estimate the meat quality of food animals. 5
(b) Narrate the functions and applications of various additives used in the preparation of meat products. 4
3. Describe the different steps involved in industrial processing of broilers including storage and distribution. 9
4. (a) Mention the names of popular poultry meat products available in the market. 2
(b) Write down the raw materials and methods of preparing turkey salami, turkey ham, chicken or turkey bologna and chicken nuggets. 5
(c) State the food value and chemical composition of chicken. 2

SECTION B

5. (a) What is egg? Write down the uses of different forms of eggs and egg products in a tabular form. 4
(b) Enumerate the food and the nutritive values of eggs. 3
(c) Write a short note on egg recipes. 2
- 6 (a) Describe the various methods of processing and storage of poultry eggs and egg products. 7
(b) Mention the functional properties attributed to egg protein in food system. 2
- 7 (a) Discuss the preparation of liquid egg, frozen eggs and pasteurized liquid egg products. 5
(b) Enumerate the common microorganisms associated with poultry food products with their remedial measures. 4
8. Write short notes (any three) 3x3= 9
(a) Traditional 33-egg omelet;
(b) Scrambled eggs with sun-dried tomato;
(c) Fermenting egg white;
(d) French toast griddle sandwich;
(e) Egg-filled focaccia; and
(f) Kentucky fried chicken

Faculty of Food Science and Technology
BFST 4th Year 1st Semester Final Examination, 2013

Subject: Food Quality Control and Assurance

Course Code: FQA-401

Full Marks: 70

Time: 3 Hours

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

Section: A

- What do you mean by Quality Control and Quality Assurance? Give an example. What are the objectives of them? 5
- a) Which information is necessary for raw material specifications? 5
- b) How product failures are related to raw materials? 5
- a) Write the names of most common coloring agents with their chemical structures. 4
- b) Using spectrophotometer, describe the procedure of identification of food dye. 6
- a) What is mass spectroscopy? Describe the function of mass spectrometer with flow diagram. 6
- b) Discuss in details the nature of an atom when absorbed electromagnetic radiation. 4
- a) What is chromatography? How does chromatography work? 5
- b) Discuss the function of GLC with flow diagram. 5

Section: B

- a) What is theoretical plate? How can you determine the efficiency of a column using theoretical plate? 5
- a) Describe in details the Munsell color system. 5
- b) What do you mean by Hunter Lab and CIE Lab? What are the relations between Hunter Lab and CIE Lab? 5
- a) What is Beer-Lambert law? Derive the equation of Beer-Lambert law. 6
- b) Describe the deviation of Beer-Lambert law. How can you use this equation for chemical analysis? 4
- a) What is HPLC? Discuss in details the instrumentation of HPLC. 6
- b) What are HPLC phases? Write down the separation technique of reverse phase HPLC. 4
- a) What do you mean by Carbon Load and End capping? 4
- b) What is interaction? Discuss the nature of interaction of benzene, naphthalene and anthracene in reverse phase HPLC. 6