

Chittagong Veterinary and Animal Sciences University
Department of Applied Chemistry and Chemical Technology
M.S. in Food Chemistry & Quality Assurance (January- June, 2018)
Subject: Advanced Food Chemistry
Course Code: AFC-501

Full Marks: 40

Time: 02 hours

[Figures in the right margin indicate full marks. Answer four (4) questions. Split answers are discouraged.]

1. a) What is carbohydrate? Mention some processes to control enzymatic browning reaction. 02+05
- b) Discuss about the effect of P^H on degradation of pectic substance. 03

2. a) Write down the following reactions in protein: 02x3=6
 - i) Reaction with mineral acids
 - ii) Reaction with formaldehyde
 - iii) Reaction with nitrous acid
- b) Briefly discuss about denaturation of protein. 04

3. a) How do you define enzyme? Mention some sources of enzyme. 02+02
- b) Elaborately discuss about the role of enzyme in juice or beverage industry. 06

4. a) Define lipid. Briefly classify lipid. 01+03
- b) Write a short note on the following: 03x2=06
 - i) Lypolysis
 - ii) Auto oxidation

5. a) Write a short note on "Maillard Reaction". 05
- b) What is resistant starch? Discuss about potential health benefits of resistant starch. 01+04

Chittagong Veterinary and Animal Sciences University
Department of Applied Chemistry and Chemical Technology
M.S. in Food Chemistry & Quality Assurance (January- June, 2018)
Subject: Food Additives
Course Code: FA-501

Full Marks: 40

Time: 02 hours

[Figures in the right margin indicate full marks. Answer four (4) questions. Split answers are discouraged.]

1. a) Define food additives. Why are they called "Additives"? 04
b) Analyze the differences between food additives and preservatives. 03
c) Give an illustration about E- numbering. 03

2. a) Write down the mechanisms of antioxidants prior to retard oxidation. 04
b) Characterize the ways of rancidity. 03
c) Enlist the most common chelating agents with their applications. 03

3. a) Demonstrate the subcritical extractor with working principle. 04
b) Define and classify color retention agents. 03
c) Enlist the color retention agents with ADI level and their usages. 03

4. a) Discuss about the flavor stabilization techniques. 04
b) What do you mean by stabilization of flavor? Why is flavor stabilized? 03
c) Write down the different types of humectants with their functions. 03

5. a) Define and classify sweeteners. 04
b) Enlist the functions of anti-caking agents. 03
c) State the working principle of an emulsifier. 03

Chittagong Veterinary and Animal Sciences University
Department of Applied Chemistry and Chemical Technology
M.S. in Food Chemistry & Quality Assurance (January- June, 2018)
Subject: Food Quality Management
Course Code: FQM-501

Full Marks: 40

Time: 02 hours

[Figures in the right margin indicate full marks. Answer four (4) questions. Split answers are discouraged.]

1. a) Define TQM. Enlist the statistical tools of quality control with their usages. 04
b) Write down the quality management principles used in both ISO 9001:2000 and ISO 9004:2000. 03
c) Discuss about Malcolm Baldrige National Quality Award. 03
2. a) State the importance of quality control manual. List the name of quality control manuals. 04
b) Briefly discuss about product research and development. 06
3. a) Define control chart. State the characteristics of a control chart with graphical representation. 05
b) Classify control chart. Discuss about “in control” and “out control” process charts with appropriate sketch. 05
4. a) Define product specification. How can you specify a product or ingredients of a product? 05
b) What do you mean by process specification? Discuss about the differences between product specification and process specification. 05
5. a) Define panel test. Discuss about different types of panels. 03
b) Briefly describe about methods of sensory evaluation. 04
c) What do you mean by product recall? Why would a product be recalled? 03

Chittagong Veterinary and Animal Sciences University
Department of Applied Chemistry and Chemical Technology
M.S. in Food Chemistry & Quality Assurance (January- June, 2018)
Subject: Food Toxicology
Course Code: FT-501

Full Marks: 40

Time: 02 hours

[Figures in the right margin indicate full marks. Answer four (4) questions. Split answers are discouraged.]

1. a) Which heavy metals are considered as toxicants in food? Write a short note on "Cr contamination". 05
b) Briefly describe about food adulteration in Bangladesh. 05
2. a) Define food toxicity. 02
b) With the help of a flow chart describe the fate and effect of toxicants in human body. 03
c) Write down five major air pollutants with their sources and health effects. 05
3. a) Describe the types of liver injuries by toxicants. 02
b) Discuss different types of toxic response in respiratory system. 04
c) Which heavy metals are found as nephrotoxicants? Describe. 04
4. a) Which factors increase the complexity of toxicants elimination process in human body? Explain. 03
b) Discuss about industrial lung toxicants with their associated injuries 03
c) Which are major routes of toxic elimination from human body? Describe renal elimination. 04
5. a) Define with examples : 2*5=10
 - i) Dose - response relationship
 - ii) Dose and threshold dose
 - iii) Individual susceptibly and sensitive sub population
 - iv) Toxicology and applied toxicology
 - v) Toxicants and toxin

Chittagong Veterinary and Animal Sciences University
Department of Applied Chemistry and Chemical Technology
M.S. in Food Chemistry & Quality Assurance (January-June, 2018)
Subject: Food Analysis and Instrumentation
Course Code: FAI-501

Full Marks: 40

Time: 02 hours

[Figures in the right margin indicate full marks. Answer four (4) questions. Split answers are discouraged.]

1. a) State Beer's Lambert's law. Derive the expression of intensity from this law. 02+04
b) Discuss the applications of UV spectroscopy. 04
2. a) Discuss in detail about sample preparation techniques in AAS. 05
b) Write the principles of atomic spectroscopy. 05
3. a) What type of samples are IR active? 03
b) Write the factors influence in producing fewer peaks. 03
c) Discuss the terms rotational energy and vibrational energy. 04
4. a) Why double beam UV-Visible spectrophotometer is commonly used now-a-days? 04
b) What do you mean by calibration curve? How unknown concentration of a sample can be determined by this process? 06
5. a) Discuss in detail about molecular orbital theory. 05
b) What are auxochromes? How different bonding and groups make different shifts in UV? 05

Chittagong Veterinary and Animal Sciences University
Department of Applied Chemistry and Chemical Technology
M.S. in Food Chemistry & Quality Assurance (January- June, 2018)
Subject: Waste Management in Food Industry
Course Code: WMI-501

Full Marks: 40

Time: 02 hours

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1. a) Design a diagram of ETP plant for dairy industry. 05
b) How do you evaluate the performance of ETP plant for dairy industry? 05
2. a) Elaborate different types of biodegradable waste treatment processes. 08
b) Differentiate between ETP and STP. 02
3. a) How does chain management help to minimize waste in food industry? 05
b) Discuss different key reasons to minimize wastes in food industry. 05
4. a) Illustrate good housekeeping recommendations for different food industries to reduce wastes. 07
b) Differentiate among the following terms: by-product, co-product and waste. 03
5. a) Explain different methods for utilizing industrial wastes. 05
b) Shortly explain the procedure of bio-fuel production from industrial wastes. 05