# MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

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## University Examinations 2015/2016

THIRD YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN FOOD SCIENCE AND TECHNOLOGY AND BACHELOR OF SCIENCE IN FOOD SCIENCE AND NUTRITION

**AFT 3325: FOOD MICROBIOLOGY II**

**DATE: NOVEMBER 2015** **TIME: 2 HOURS**

**INSTRUCTIONS:** *Answer question **one** and any other **two** questions*

**QUESTION ONE (30 MARKS)**

a) Distinguish the following terms:

(i) Viralence and resistance.

(ii) Indicator and index organisms. (2 Marks)

b) (i) State four mechanisms through which fungal toxins cause pathology. (4 Marks)

(ii) Yeasts of importance in food industry can be classified in a number of ways. On the basis of sporeforming ability describe the groups of yeasts. (4 Marks)

(iii) Define toxicological risk analysis (TRA). (2 Marks)

c) (i) The effectiveness of lethal processes delivered to a food product may be influenced by a number of factors. Briefly discuss the factors affecting lethality of heating and preservatives to microbial food contaminants. (4 Marks)

(ii) Aided by a diagram, briefly explain the prediction of microbal death and survival following heat treatment of a food product. (4 Marks)

d) (i) Briefly describe host-mediated pathogenesis. (4 Marks)

(ii) The contamination of food with *Eschrichia coli* is of great importance to both the food processor and the consumer as it causes diarrhoeic disease. Mention four categories of *E. Coli* associated entero diseases. (4 Marks)

(iii) Food spoilage yeasts and molds are very important. Stating the food they affect mention two examples of each. (2 Marks)

**QUESTION TWO (20 MARKS)**

a) For a food borne disease to occur, several events have to take place. Discuss the sequence of events leading to a food borne disease. (10 Marks)

b) Several methods have been used to detect mycotoxins more particularly the aflatoxins. Discuss any five methods utilized in the identification of the toxins in food. (10 Marks)

**QUESTION THREE (20 MARKS)**

(a) Define and describe bacterial virulence factors. (10 Marks)

(b) The liver is the primary detoxication organ in the body. Describe the steps/phases occurring in the liver for removing undesirable/harmful lipid soluble compounds from the system. (10 Marks)

**QUESTION FOUR (20 MARKS)**

(a) Several rapid and automated methods have been developed for the detection of food microbes. Explain any five immunoassays used for rapid detection of pathogens in foods. (10 Marks)

(b) Microbiological Risk Assessment (MRA) has emerged as a comprehensive and systematic approach for addressing the risk of pathogens in specific foods and/or processing. Discuss the core elements of a MRA of food. (10 Marks)