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University Examinations 2012/2013

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

AFS 2201: PRINCIPLES OF MICROBIOLOGY

DATE: APRIL 2013 **TIME: 2 HOURS**

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

QUESTION ONE – 30 MARKS

a. What is the significance of microscopy in microbiology? (2 Marks)
b. List two types of staining in microbial analysis. (2 Marks)
c. Give an example of a gram positive and gram negative bacteria. (2 Marks)
d. With an example, define a contaminant. (2 Marks)
e. Draw six bacterial shapes. (3 Marks)
f. What is the key difference between a liquid broth and a solid media. (1 Mark)
g. Draw the microbial growth curve. (3 Marks)
h. Define asepsis. (2 Marks)
i. What is the most appropriate pit range for the growth of:
    i. Bacteria (1 Mark)
    ii. Yeasts (1 Mark)
    iii. Filamentous fungi (1 Mark)
j. Give the name of a food product whose p^H effect:
    i. Produces unpleasant taste (2 Marks)
    ii. High pH does not produce an unpleasant taste and why? (2 Marks)
k. Between fish and meat, which spoil more rapidly under chill conditions and why? (2 Marks)
l. Define redox potential and give its effect on microbial stability. (2 Marks)
m. Giving examples, define an obligate anaerobe. (2 Marks)

QUESTION TWO – 20 MARKS

a. Indicate the most probable spoilage organisms for each of the following foods: (10 Marks)
    i. Mouldy bread
    ii. Off flavour of orange juice concentrate
    iii. Slimy odor of poultry meat
    iv. Green rot of eggs
b. Discuss three microbial growth methods. (6 Marks)
c. What is the contribution of the cell wall of the organism during gram staining? (2 Marks)
d. List two stains used in microbiology. (2 Marks)

QUESTION THREE – 20 MARKS

a. Describe the following: (10 Marks)
   i. General purpose media
   ii. Enriched medium
   iii. Selective medium
   iv. Differential medium
   v. Miscellaneous media

b. Define the following: (10 Marks)
   i. Incubation
   ii. Mixed culture
   iii. Contaminated culture
   iv. Simple staining
   v. Differential staining

QUESTION FOUR – 20 MARKS

a. With two example organisms discuss the following:
   i. Indicator organisms (2 Marks)
   ii. Index organisms (2 Marks)
   iii. Food poisoning organism. (2 Marks)
   iv. Organisms which propose toxins in foods. (2 Marks)
   v. Infectious organisms (2 Marks)

b. With an explanation indicate what you would tell an average retailer on the potential microbial contaminants for the following products
   i. Fresh meat (2 Marks)
   ii. Fresh fish (2 Marks)
   iii. Fresh poultry (2 marks)
   iv. Biscuits (2 Marks)
   v. Diary products (2 Marks)

QUESTION FIVE – 20 MARKS

a. How many types of microbiological criterion have been discussed by the international commission on microbiological specification of foods? (3.5 Marks)
b. Discuss the three aspects that comprise microbiological quality of foods. (4 Marks)
c. Indicate the model for YERSINIA ENTEROCOLITICA (2 Marks)
d. Describe a sample model for predicting potential microbial growth. (10 Marks)