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**University Examinations 2014/2015**

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

**AFT 3276: FOOD MICROBIOLOGY 1**

**DATE: APRIL 2015 TIME: 2 HOURS**

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

**QUESTION ONE (30 MARKS)**

1. Differentiate the following terms: (4 Marks)
2. CAP and MAP.
3. Osmophilic microorganisms and xerophilic microorganisms
4. Aflatoxins and fumonisins
5. CCP and CL
6. Discuss food classification based on their likelihood of spoilage (3 Marks)
7. (i) Discuss the different forms of salmohella food poisoning outbreaks (4 Marks)

(ii) Stating their sources, list four natural anti-microbial substances found in food (2 Marks)

(iii) With the aid of an illustration, discuss the standard bacterial growth curve (4 Marks)

1. (i) List five techniques used in rapid detection of microorganisms (5 Marks)

(ii) List and briefly discuss four salting procedures used in food preservation (4 Marks)

(iii) In lab experiment, the following values were obtained following isolation and

enumeration of Bacillus cereus in canned peas:

Colonies on the countable plate – 71CFU

The dilution from which above pour plate was made – 10-3

The amount used to make that pour plate – 0.5 ml

1. Calculate the number of Bacillus cereus cell present in 1 ml of the food (3 Marks)
2. Define capnophiles (1 Mark)

**QUESTION TWO (20 MARKS)**

1. In a pea canning industry, the killing of Clostridium botulinum spores at 250oF (121.1oC) and pH 6.2 was determined at 5 minutes intervals and mean viable numbers recorded as below:

|  |  |  |
| --- | --- | --- |
| **Time** | **Dilution** | **Mean** |
| 5 | 10-5 | 34 |
| 10 | 10-4 | 65 |
| 15 | 10-3 | 19 |
| 20 | 10-2 | 4.5 |
| 25 | 10-1 | 1.3 |

1. Determine the D-value of C. botulinum (5 Marks)
2. Calculate the F-value (F0) of the process (4 Marks)
3. What is 12 –D concept? (2 Marks)
4. If the D-value of the most resistance of the C. botulinum is 12 minutes. Calculate the 12-D for the process (2 Marks)
5. Briefly discuss intrinsic factors that influence microbial growth on food (4 Marks)
6. List three methods of filtration used in sterilization of food commodities (3 Marks)

**QUESTION THREE (20 MARKS)**

1. Describe classification of food-borne intoxication (4 Marks)
2. During a batch processing of yoghurt, you realize that the initial population of Streptococcus thermophilus was 104 CFU/ml. However, this population increases to 106CFU/ml in 2 hours. Define and calculate the generation time for S. thermophilus (4 Marks)
3. List the seven HACCP principles followed by food processors to ensure microbial food safety (5 Marks)
4. (i) Enterohemorrhagic Escherichia coli (EHEC) infection is a food-borne infection caused

by Escherichia coli serotype 0157:H7. Discuss the symptoms of EHEC infection

(4 Marks)

(ii) Discuss the symbiotic relationship in conventional yoghurt culture (3 Marks)

**QUESTION FOUR (20 MARKS)**

1. Differentiate between homolactic fermentation and heterolactic fermentation (2 Marks)
2. (i) Define starter culture (2 Marks)

(ii) Mentioning the media and all the necessary equipments and reagents, discuss the

procedures you would follow in the isolation, enumerating and identification of lactic

acid bacteria in cheese (7 Marks)

(iii) State three biological hazards in foods (3 Marks)

1. (i) Discuss two surveillance networks for food-borne disease (4 Marks)

(ii) List two main clinical symptoms of listeria monocytogenes (2 Marks)