UNIVERSITY OF GHANA

BSC. SECOND SEMESTER EXAMINATIONS: 2016/2017

DEPARTMENT OF FOOD PROCESS ENGINEERING

FPEN 408: MICROBIOLOGICAL APPLICATIONS IN FOOD PROCESSING
(2 Credits)

INSTRUCTIONS: ***ANSWER ANY FOUR QUESTIONS***

TIME ALLOWED: TWO (2) HOURS

1.
   a. The activities of microorganisms within the food processing industry can result in either useful products or harmful consequences. Discuss two (2) situations each where microbial activities are either useful or harmful.
   b. Outline the key characteristics of an ideal probiotic.

2.
   a. Discuss any five (5) of the critical areas which must be considered in developing Good Hygienic Practices within a food processing facility.
   b. Explain the following:
      i. Commercial sterility
      ii. Microbiological specification
      iii. Critical Control Point
      iv. Prebiotic

3.
   a. With specific examples, explain how you will use a three class plan for microbiological criteria to either accept or reject a batch of product.
   b. The application of heat treatment in the preservation of foods requires a balance between effectiveness and maintenance of the quality attributes of the food. What factors will you consider in selecting an appropriate heat treatment? Explain your answer.

4.

a. Outline the sequence of events necessary for food spoilage.

b. A batch of raw milk was tested and found to contain a bacterial population of $8x10^6$cfu/ml. It is to be pasteurised at 72°C for 33 seconds. The average D value at 52°C for the mixed population is 11 min. The *z* value is 10°C.

   i. Explain the terms "D value" and "*z* value".

   ii. Calculate how many organisms will be left after pasteurisation.

   iii. How much time will be needed at 62°C to accomplish the same degree of lethality?

   iv. How much time will be needed at 82°C to achieve the same degree of lethality?

5.

a. Food preservation techniques are generally based on the manipulation of factors which influence microbial activity. Select any four preservation methods and explain the basis of their preservative effect.

b. Write brief comments on the different types of decay of foods that can occur as a result of microbial activities.