

**Instructions to candidates**

**Duration:** 01 hour

**Number of questions:** 4 Essay

**Mark allocation:** 100 mark

Answer all questions

1.
  - a. A Chicken burger contaminated with *Staphylococcus aureus* was placed on a table for 8 hours. The number of bacterial generations during the time period was 24. What is the generation time of the *S. aureus*?  
(5 mark)
  - b. Suppose you were a microbiologist in a milk processing factory. You have observed an average of  $6 \times 10^4$  CFU/mL in milk samples you received. Using the following details calculate the number of organisms present after the pasturizing process.  
Usual processing time of milk at the plant = 9 sec (at 80 °C)  
 $D_{70} = 5$  min  
Z value = 5 °C  
F value = 6 min  
(15 mark)
2. Briefly discuss the “bacterial spoilage of food” giving relevant examples.  
(25 mark)
3. Briefly discuss extrinsic factors affecting microbial growth in food.  
(25 mark)
4. Write short notes on the following:
  - a. Starter cultures.  
(15 mark)
  - b. Biopreservatives of microbial origin.  
(15 mark)

