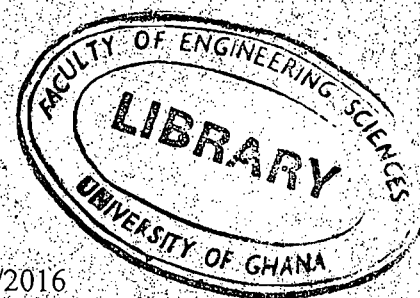


Student Index number _____ Department _____ Date _____



UNIVERSITY OF GHANA

(All rights reserved)

B.Sc. FIRST SEMESTER FINAL EXAMINATION: 2015/2016

DEPARTMENT OF NUTRITION AND FOOD SCIENCE

FOSC 303: FOOD MICROBIOLOGY AND SAFETY / FPEN 307: INTRODUCTION TO
FOOD MICROBIOLOGY

TIME ALLOWED: 2 HOURS

INSTRUCTIONS:

ANSWER ALL SECTIONS ON THE QUESTION PAPER

SECTION A: FILL IN THE BLANKS

1. In food ecology, the microorganisms in the food constitute the _____ and the food environment constitutes the _____.
2. Modern quality assurance, predictive modeling, risk analysis and functional use of microorganisms in fermented foods are based on _____ principles.
3. List 4 bacterial cell morphologies
 - a. _____
 - b. _____
 - c. _____
 - d. _____
4. Indicate the cell structure that corresponds to the following functions of eukaryotic cells in questions (a) to (d).

Structure

Function

- | | |
|----------|--|
| a. _____ | Environment for organelles and location for many metabolic processes |
| b. _____ | Intracellular digestion |
| c. _____ | Protein synthesis |
| d. _____ | Cell structure and movement, form cytoskeleton |
5. Good Hygienic Practices and Good Manufacturing Practices are foundational to HACCP and thus known as _____ programs.

Student Index number _____ Department _____ Date _____

6. Categorize each of the following factors that affect microbial growth.
- a. pH and acidity _____
 - b. Fermentation _____
 - c. Relative humidity _____
 - d. Time _____
 - e. Specific growth rate _____
 - f. Comminution _____
7. Organisms that grow best at 20-30 °C are called _____.
8. Organisms that grow best at 15 °C are called _____.
9. Organisms that grow best between Eh of +300 to -100mV are called _____.
10. Organisms that grow in high sugar concentrations are called _____.
11. Organisms that require O₂ levels between 2-10% are called _____.
12. _____ is an example of organisms that cause bacterial soft rot of plant products.
13. *Salmonella* _____ subsp. _____ serovar Typhi is the causative organism for typhoid fever.

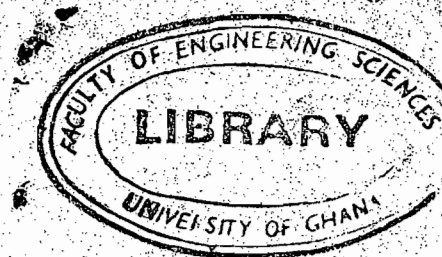
SECTION B: CIRCLE THE MOST APPROPRIATE ANSWER

14. All the following are animal based antimicrobials except _____.
- a. Conglutinin
 - b. Lectins
 - c. Lysozyme
 - d. Lactoferrin
15. The following are primary contaminants of freshly slaughtered cow except _____.
- a. Soil
 - b. GI tract
 - c. Animal skin
 - d. Slaughtering environment
16. Presence of fecal coliforms on thoroughly cooked meat suggests?
- a. Inadequate refrigeration
 - b. Limited shelf-life
 - c. Post process contamination
 - d. High initial microbial load
17. Microorganisms of fresh carcass are dominated by _____.
- a. Psychrophiles
 - b. Psychrotrophs
 - c. Mesophiles
 - d. Thermophiles

18. Which one of the following microorganisms falls within the categories of both psychrotrophs and mesophiles?
- a. *Listeria monocytogenes* b. *Escherichia coli* c. *Enterococcus faecalis*
d. *Serratia liquifaciens*
19. The first indication of spoilage of meat by aerobic bacteria is characterized by which of the following off odours?
- a. Putrid odour b. Fruity odour c. Sour odour d. Cheesy odour
20. All the following are temperature time combinations for pasteurization of milk except _____
- a. 60°C for 35 mins b. 63°C for 30 mins c. 72°C for 15 sec d. 90 °C for 0.5 sec

SECTION C: UNDERLINE THE MOST APPROPRIATE ANSWER

21. Commercial sterility of canned foods means foods are completely sterile. True/False?
22. The 12-D Botulinum cook refers to 12 heating cycles of canned foods. True/False?
23. D value is the time required in a given food matrix for 10-fold reduction in the number of organisms at a specific temperature. True/False?
24. Presence of Enterobacteriaceae in food indicates fecal contamination of the food. True/False?
25. Codex Alimentarius Commission formulates food laws for its member countries. True/False?



Student Index number _____ Department _____ Date _____

SECTION D: USE SHORT PHRASES TO ANSWER THE FOLLOWING QUESTIONS

26. List 4 primary sites for heat induced damages to bacterial cells.

- a. _____
- b. _____
- c. _____
- d. _____

27. List one (1) characteristics of each of the phases of the bacteria growth curve in a batch culture.

- a. _____
- b. _____
- c. _____
- d. _____

28. Match the following symptoms/disease to the most appropriate foodborne pathogen

<u>Characteristic</u>	<u>Organism</u>
a. Meningitis	1. <i>E. coli</i> O157:H7
b. Renal failure	2. <i>Bacillus cereus</i>
c. Flaccid paralysis	3. <i>Clostridium botulinum</i>
d. Emetic foodborne disease	4. <i>Listeria monocytogenes</i>

29. List the three (3) aspects of microbial quality control.

- a. _____
- b. _____
- c. _____

Student Index number _____ Department _____ Date _____

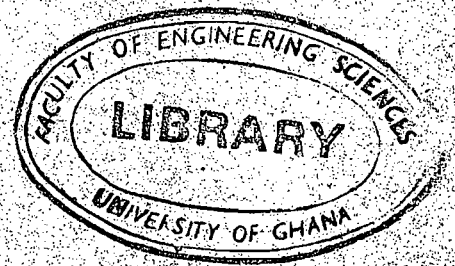
30. List the three (3) types of microbiological criteria and one (1) characteristic of each.

a. _____

b. _____

c. _____

31. What is the difference between HACCP, Food Safety Management System and Food Safety System Certification?



32. What is the significance of the phosphatase test in milk?

33. Explain how the prerequisite programs are fundamental to HACCP.

34. How does packaging influence redox-potential of food products?

35. Chilling affects growth rates of microorganisms by

Student Index number _____ Department _____ Date _____

36. List 2 ways by which freezing can cause lethal effects on microorganisms

37. Match the following terms with the meanings provided: Radurization; Radicidation; Radappertization (3 marks)

- | | |
|---------|------------------------------------|
| a. | To destroy pathogens |
| b. | To destroy spoilage microorganisms |
| c. | To sterilize foods |

38. List four (4) advantages that fermentation as a unit operation in food processing offers

39. Name the two (2) most common lactic acid bacteria isolated from Ghanaian fermented foods.

40. Define the term 'starter culture' and state the composition of a starter culture used in yoghurt production.

Student Index number _____ Department _____ Date _____

41. Provide the names of one (1) acetic acid bacteria and one (1) yeast used in fermentation

- a. Acetic acid bacteria:
- b. Yeast :

42. Distinguish between probiotics and prebiotics.

43. Explain the following terms and give the name of one microbial pathogen that produces each of them:

a. Enterotoxin:

b. Exotoxin:

c. Endotoxin:

d. Neurotoxin:

e. Mycotoxin:



44. Explain the term food hazard and state two common food safety hazards in Ghana?

Student Index number _____ Department _____ Date _____

45. Give two examples each of the two major types of microbial food borne diseases, indicating the names of the pathogens involved.

46. List two properties that make human enteric viruses quite different from bacterial food-borne pathogens

47. List three (3) types of mycotoxins that may be found in foods

48. With two (2) examples, state two (2) ways in which food-borne illnesses may manifest

49. Outline a strategy you would adopt to prevent the occurrence of food-borne diseases

Student Index number _____ Department _____ Date _____

50. Provide a diagram to illustrate the conditions that may lead to food-borne diseases outbreak.

