



UNIVERSITY OF GHANA

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B.Sc. 1st SEMESTER EXAMINATIONS: 2014/2015

FPEN 307: INTRODUCTION TO FOOD MICROBIOLOGY (3 CREDITS)

INSTRUCTIONS

Answer All Questions.

Time Allowed: Two (2) hours

1. Explain the following food ecological principles:
 - (i) There are possible interactions between the microbial types present in food ecosystem. (1 Marks)
 - (ii) There are correlations between the growth and activity of individual microorganisms and the outcome of the product (quality and safety). (1 Marks)
 - (iii) The populations and types of microbial species and strains in a food commodity may change as the commodity moves through the food chain. (1 Marks)
2. Group the following factors under *Intrinsic*, *Extrinsic* and *Implicit* factors: (i) Temperature (ii) Relative humidity (iii) Salt concentration of foods (iv) antimicrobial substances (v) pH and acidity (vi) Affinity for substrates. (3 Marks)
3. Distinguish between the paired group of microorganisms: (i) Psychrophiles and Psychrotrophs; (ii) Thermophiles and Hyperthermophiles; (iii) Sternothermals and Eurythermals (6 Marks)
4. Group the following microorganisms under their family names: (i) *Bacillus coagulans* (ii) *Shigella flexneri* (iii) *Lactobacillus* spp. (3 Marks)
5. Outline microbial actions involved in the spoilage of foods. (5 Marks)

6. What are the estimated microbial counts of the *skin* and *gills* of freshly caught fish? (2 Marks)
7. Match the following 4 microorganisms - *Streptococcus*, *Pseudomonas*, *Photobacteria*, *Serratia*, to the following types of meat spoilage - *Surface slime*, *Fat hydrolysis (rancidity)*, *Phosphorescence*, *Pigmentation*, on the basis of which microorganism causes which type of spoilage. (4 marks).
8. List any three (3) antimicrobial factors present in eggs (3 Marks).
9. Describe three (3) types of egg spoilage and indicate any microorganism that causes spoilage in each case. (6 Marks)
10. Indicate any heat-resistant mould that may cause spoilage of fruit juices. (2 Marks).
11. State the names of three (3) of the predominant yeast species associated with Soft drinks. (3 Marks).
12. State two (2) each of microorganisms commonly isolated in raw milk due to (i) Udder infection; (ii) unhygienic milking equipment (4 Marks)
13. What types of food are normally processed to attain 'Commercial sterility'? (1 Marks).
14. Give three (3) indications of microbial spoilage of canned foods and also three (3) possible causes of microbial spoilage of canned foods (6 Marks).
15. Describe three (3) types of spoilage of low acid canned foods. (6 Marks).
16. Comment on the use of UV radiations in the disinfection of water being commercially processed for sale. (5 Marks)
17. With specific examples, discuss the principles in the exploitation of temperature for the control or prevention of microbial growth in foods. (6 Marks).
18. List six advantages offered by fermentation as a unit operation in food processing. (3 marks)

19. Distinguish between homolactic and heterolactic fermentations and give one example each of microorganisms that may carry out each of the two types of fermentation. (4 Marks).
20. Give three examples of foods that are produced using starter cultures? (3 Marks)
21. Distinguish between probiotics and prebiotics. (2 Marks)
22. Indicate 2 examples of (i) Gram negative bacteria (ii) protozoan parasites (iii) Human enteric viruses that may cause food-borne illnesses. (3 Marks)
23. Make a list of food safety issues in Ghana. (4 Marks)
24. Besides health impacts indicate two (2) global impacts of food-borne diseases. (1 Marks)
25. Describe the disease symptoms of (i) Escherichia coli 0157 infection. (3 Marks)
26. Showing the understanding of how food-borne illness may occur, explain how food borne diseases may be prevented. (8 Marks).

