



**NATIONAL OPEN UNIVERSITY OF NIGERIA**  
**14/16 AHMADU BELLO WAY, VICTORIA ISLAND, LAGOS**  
**SCHOOL OF MANAGEMENT SCIENCES**  
**JUNE 2013 EXAMINATION**

**COURSE CODE: HCM 431**  
**UNIT: 2**

**CREDIT**

**COURSE TITLE: ADVANCED FOOD AND BEVERAGE PRODUCTION**

**TIME ALLOWED: 2 hrs**

**Instructions: 1. Attempt question Number one (1) and any other two (2).**

**2. Question number 1 is compulsory and carries 30 marks, while the other questions carry equal marks each**

**3. Present all your points in coherent and orderly manner**

1(a) Define microbiology and state the roles of microorganisms  
(10 marks)

(b) Identify the food borne pathogens common in our environment and briefly describe two of the identified pathogens  
(10 marks)

(c) Briefly discuss the following:

- i) Staining techniques
  - ii) Classification of bacteria based on microscopic morphology
- (5 marks each)

2(a) State and explain the extrinsic and intrinsic parameters that affect bacterial growth. (8 marks)

(b) Identify the sources of food contamination  
(12 marks)

3(a) What is food spoilage? Identify the causes of food spoilage  
(15 marks)

(b) Explain the effects of food spoilage on:

- i). Protein
  - ii). Fruits and vegetables
  - iii). Fats and oils
- (5 marks)

4(a) Define the term 'food preservation'  
(2 marks)

- (b) Outline 12 and describe at least 5 methods of food preservation  
(13 marks)
- (c) Discuss briefly, the uses of fermentation in the food industry  
(5 marks)

- 5(a) Define food additives  
(2 marks)
- (b) Classify the additives into:
- i) Additives that promote freshness and prevent deterioration
  - ii) Additives that amplify or promote sensory qualities  
(15 marks)
- (c) How is the safety of food additives evaluated?  
(3 marks)