NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF HEALTH, APPLIED SCIENCES AND NATURAL RESOURCES

DEPARTMENT OF HEALTH SCIENCES

QUALIFICATION : BACHELOR OF HUMAN NUTRITION	
QUALIFICATION CODE: 08BOHN	**LEVEL:** 6
COURSE NAME: MICROBIOLOGY	**COURSE CODE:** MIB611S
SESSION: JUNE 2022	**PAPER:** THEORY
DURATION: 3 HOURS	**MARKS:** 100

FIRST OPPORTUNITY QUESTION PAPER	
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INSTRUCTIONS
1. Answer ALL the questions. 2. Write clearly and neatly. 3. Number the answers clearly.

PERMISSIBLE MATERIALS
NONE

THIS QUESTION PAPER CONSISTS OF 5 PAGES (Including this front page)

SECTION A

QUESTION 1 **(10 MARKS)**

Evaluate the following statements in each numbered section and select the most appropriate answer from the given possibilities. Write the appropriate letter next to the number of the statement/phase in the ANSWER BOOK. *(Each question carries **1 mark**.)*

1.1 Food spoilage due to microbial activity can be prevented or delayed by:

A. Prohibiting the entry of micro-organisms in food
B. Physical removal of micro-organisms
C. Hindering the activity of micro-organisms
D. All of above

1.2 Vermin cause food spoilage through the following ways except:

A. Consumption of food
B. Transmission of pathogen
C. Breakdown of the food substrates in their gastrointestinal tract
D. Aesthetic aspect of their presence

1.3 The World Health Organisation (WHO) recommends that infants should not be given Honey. Which of the following could be the possible explanation:

A. Honey might cause teeth decay in infants
B. Honey is the main source of infant botulism
C. Honey is too sweet for the infant and therefore not necessary for their growth and development
D. Honey leads to a quick spurt of energy that may cause headaches in infants

1.4 Which of the following bacteria can be used as a starter culture in the food processing industry:

A. Saccharomyces cerevisiae
B. Aspergillus Flavus
C. Pseudomonas aeruginosa
D. Lactobacillus acidophilus

1.5 Microbial spoilage, chemical spoilage, and physical spoilage cause food delay. Which of the following describe microbial spoilage:

A. Souring of milk and shrinking of vegetables
B. Souring of milk and rotting of vegetables
C. Fermenting of milk and softening of banana fruit
D. Browning of meat and bitter flavour of juice

1.6 Define what is generation time:

A. The time when bacteria generate more cells
B. The time taken by the bacteria to double in number during a specified time period

C. The time when the division of the microbial cells and increase in number
D. All of above

1.7 Bacteria are classified as prokaryotes because:
A. They have cells that have a definite nuclei
B. They have cells without definite nuclei
C. They have cells that are motile
D. They have cells that are rod shaped and motile

1.8 Which of the following is not a gram-negative bacteria:
A. Staphylococcus aureus
B. Listeria monocytogenes
C. Compylobacter jejuni
D. Escherichia coli

1.9 _____ causes brown rot of citrus fruits and pineapples and soft rot of figs:
A. Aspergillus
B. Candida
C. Mucor
D. Fusarium

1.10 Microbiology has developed into a science that can be studied from a number of perspectives. Which of the following is defined as a study of fungi:
A. Mycology
B. Phycology
C. Virology
D. Protozoology

QUESTION 2 **(10 MARKS)**

Assess the following statements and decide whether they are **true or false**. Write only the number of the question and next to it indicate your answer as **true or false** in the ANSWER BOOK. *(Each question carries **1 mark**)*

2.1 Thermophile bacteria include *Bacillus* and *E. coli*.

2.2 Most fruits generally undergo moulds and yeasts spoilage because of their low pH.

2.3 The log phase is the first stage in the bacterial growth curve.

2.4 Aerobic microorganisms require a negative redox potential for their growth in food.

2.5 *Candida* is the type of mould which causes rancidity in butter and dairy products.

2.6 Alicin is an antimicrobial constituent found in garlic.

2.7 Molds are larger than bacteria and yeasts.

2.8 Yeast is the type of fungus grows in the form of multicellular filament forming a tough visible mass.

2.9 Lactic acid bacteria lack amylase enzyme to breakdown polysaccharides.

2.10 Nitrate (NO_3) and Nitrite (NO_2) are used in some cheeses to prevent gas blowing by *C. butyricum* and *C. tyrobutyricum*.

SECTION B

QUESTION 3 **(32 MARKS)**

3.1 Explain the following terms and concepts:

3.1.1 Foodborne illness (2)
3.1.2 Food spoilage (2)
3.1.3 Fermentation (2)
3.1.4 Food microbiology (2)
3.1.5 Facultative anaerobes (2)
3.1.6 Selective media (2)

3.2 Explain the four (4) ways microorganisms can be removed from food by physical methods? (8)

3.3 Outline six (6) ways by which microorganisms get into food, explain how each contributes to microbial food contaminations. (12)

QUESTION 4 **(21 MARKS)**

4.1 Mrs Smith attended a friend's wedding in the neighbourhood. Because the husband and children could not attend, she brought them some left over food. All the family members including her husband and three children consumed this food. After 12 hours, everyone in the house became sick and developed a range of symptoms that included. nausea, fever, abdominal pain, and stomach cramps, followed by diarrhoea, and some were vomiting.

4.1.1 What condition is this family suffering from? Justify your answer? (2)
4.1.2 What is the name of the causative agent responsible for this illness? (2)

4.1.3 Highlight three (3) characteristics of the organism responsible for this illness? (3)
4.1.4 Propose three (3) measures to control the transmission of this disease? (3)

4.2 Discuss the following mode of illness with relative examples:
4.2.1 Intoxication (2)
4.2.2 Toxicoinfection (2)
4.2.3 Infection (2)

4.3 Propose five (5) measures to control the transmission of *Escherichia coli*? (5)

SECTION C

QUESTION 5 **(27 MARKS)**

5.1 What is the main objective of heating food? (2)
5.2 Outline five (5) common Lactic Acid Bacteria (LAB) used in the production starter cultures? (5)
5.3 When microorganisms are inoculated and incubated in a given food medium the grow follows definite process. Discuss this growth curve in a food medium? (8)
5.4 The growth of microbial cells in food is influenced by parameters that are both within the food or the surrounding environment. Discuss four (4) factors within food and how they influence the microbial growth? (12)

GOOD LUCK!!!