



**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 CODE: MIB611S	COURSE NAME: MICROBIOLOGY
SESSION: JULY 2022	PAPER: THEORY
DURATION: 3 HOURS	MARKS: 100

SUPPLEMENTARY /SECOND 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 Which of the following is the characteristics of micro-organisms:
- A. Too small to be seen with the naked human eye
 - B. Cells are relatively simple and less specialized than those plants and animals
 - C. Can be handled and cultured in the laboratory
 - D. All of above
- 1.2 *Saccharomyces cerevisiae* is:
- A. Bacteria
 - B. Mold
 - C. Yeast
 - D. Virus
- 1.3 The characteristics of yeast include:
- A. Unicellular and usually egg-shaped
 - B. Reproduce by spores
 - C. Larger than molds, smaller than bacteria
 - D. Reproduce by spores
- 1.4 Pasteurization heat treatment is designed to kill primarily:
- A. Vegetative cells
 - B. All forms of microorganisms
 - C. Spore cells
 - D. Vegetative and spore cells
- 1.5 Shiga toxin-producing strains are caused by:
- A. *Clostridium perfringens*
 - B. *Escherichia coli*
 - C. *Campylobacter jejuni*
 - D. *Staphylococcus aureus*
- 1.6 It is not recommended to eat raw eggs because:
- A. Raw eggs could be contaminated with *Clostridium perfringens* causing severe abdominal pain
 - B. Raw eggs cannot easily be digested and may cause abdominal clamps
 - C. Raw eggs could be contaminated with *salmonella* resulting into severe infections

- D. Natural antimicrobial such as lysozyme occurring in egg white prevent all microbial growth
- 1.7 Which of the following is the first method used for controlling microbial growth of in food processing plant:
- A. Control by antimicrobial preservatives
 - B. Control by heat
 - C. Control by low temperature
 - D. Control of microorganisms by physical removal
- 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 Which of the following is the main carbohydrate in milk:
- A. Lactose
 - B. Lactic acid
 - C. Fructose
 - D. Maltose
- 1.10 The following are some of the extrinsic factors which affects microbial growth in food:
- A. pH and temperature of storage
 - B. Presence and concentration of gases in the environment
 - C. The biological structure of the food
 - D. Relative humidity and moisture content

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 Micro aerophiles can grow in environments with adequate oxygen.
- 2.2 *Penicillium digitatum* is the type of microorganisms responsible for spoilage in oranges.
- 2.3 During the second stage of bacterial curve growth, the viable count remains in equilibrium, the dying cells, and the newly formed cells are equal.
- 2.4 The lag phase is the first stage in the bacterial growth curve.
- 2.5 Osmophilic yeast tolerates and grows in high osmotic pressure.

- 2.6 Eugenol is an antimicrobial constituent found in clove.
- 2.7 Aerobic microorganisms require positive Reduction Potential (Eh) value (oxidized) for growth.
- 2.8 Sulfur dioxide is used to control microorganisms in soft fruits and fruit juices.
- 2.9 True yeast converts sugar into alcohol and carbon dioxide e.g production of wine and beer.
- 2.10 Lactic acid bacteria lack amylase enzyme to breakdown polysaccharides.

SECTION B

QUESTION 3

(28 MARKS)

- 3.1 Differentiate between following terms and concepts:
 - 3.1.1 Good bacteria and bad bacteria (4)
 - 3.1.2 Food poisoning bacteria and food spoilage (4)
 - 3.1.3 Selective media and non-selective media (4)
 - 3.1.4 Controlled fermentation and back slopping fermentation (4)
 - 3.1.5 Facultative anaerobes and anaerobes bacteria (4)
- 3.2 Outline any four (4) main characteristics of yeast and moulds each? (8)
- 3.3 Why is it important to understand the sources of microorganisms in food? (4)

QUESTION 4

(19 MARKS)

- 4.1 Mrs Didi prepared a home-made beverage drink called *Oshikundu*. She uses sorghum flour and previous *Oshikundu* as a starter culture and it was contaminated with presence of flies, cockroaches, and rats. All the family members including her husband and four children consumed this beverage drink. After 72 hours, everyone in the house became sick and developed a range of symptoms that included: stomach cramps, vomiting, bloody diarrhea, headache, body aches, fever, and chills.
 - 4.1.1 What is the mode of causation of this illness? (1)
 - 4.1.2 What condition is this family suffering from? Justify your answer? (2)
 - 4.1.3 What is the name of the causative agent responsible for such illness? (2)
 - 4.1.4 Highlight four (4) main characteristics of the organism responsible for this illness?

- 4.1.5 Propose five (5) measures to control the transmission of this disease? (4)
(5)
- 4.2 Propose five (5) measures to control the transmission of *Vibrio cholerae*? (5)

SECTION C

QUESTION 5

(20 MARKS)

- 5.1 Microorganisms grow and cause food spoilage, which for some foods could be relatively high based on the water activity. With relative examples, outline three (3) different categories in which food can be classified. (6)
- 5.2 Write a short summary on the following terms as they are related to controlling microorganisms by access:
- 5.2.1 CIP (5)
- 5.2.2 COP (5)
- 5.3 Outline four (4) groups of sanitizers use in food processing plants for effective removal of pathogens and reduce microbial load after cleaning? (4)

QUESTION 6

(13 MARKS)

- 6.1 Describe the four (4) steps in processing semi-dry sausages in controlled fermentation? (4)
- 6.2 Briefly explain the major three (3) factors that need to be considered for effective control of micro-organisms in food under heat treatment? (9)

GOOD LUCK!!!