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<b>QUALIFICATION : BACHELOR OF ENVIRONMENTAL HEALTH SCIENCES</b>	
<b>QUALIFICATION CODE: 08BOHS</b>	<b>LEVEL: 5</b>
<b>COURSE: MICROBIOLOGY AND PARASITOLOGY</b>	<b>COURSE CODE: MAP512S</b>
<b>DATE: NOVEMBER 2023</b>	<b>SESSION: 1</b>
<b>DURATION: 3 HOURS</b>	<b>MARKS: 100</b>

**FIRST OPPORTUNITY: QUESTION PAPER**

**EXAMINER:** *Dr Renatus Peter Shilangale*

**MODERATOR:** *Dr Larai Aku-Akai*

**INSTRUCTIONS:**

1. Answer all questions on the separate answer sheet.
2. Please write neatly and legibly.
3. Do not use the left side margin of the exam paper. This must be allowed for the examiner.
4. No books, notes and other additional aids are allowed.
5. Mark all answers clearly with their respective question numbers.

**PERMISSIBLE MATERIALS:**

1. Non-Programmable Calculator

**ATTACHEMENTS**

1. None

**This paper consists of 7 pages including this front page**

## QUESTION 1: MULTIPLE CHOICE QUESTIONS

[10 MARKS]

Evaluate the statements in each numbered section and select the most appropriate answer or phrase from the given possibilities. Fill in the appropriate letter next to the number of the correct statement/phrase on your ANSWER SHEET.

1.1	Disease caused by pathogenic organisms or toxins transmitted to humans by food	
1.2	Absence of significant contamination.	
1.3	Lives and reproduces only in the presence of oxygen	
1.4	Microorganisms that are used in food microbiology to signal microbiological problems that could impact on the quality, process, hygiene or safety of food.	
1.5	The process where food deteriorates to the point that it is not edible to humans or its quality of edibility becomes reduced.	
1.6	Complete destruction or removing all forms of microbial life (including endospores) in a material or an object	
1.7	The entry and development or multiplication of infectious agents in the body of humans or other animals	
1.8	Removing toxins	
1.9	Application of combination of food preservation techniques.	
1.10	Used to prevent contamination of surgical instruments, medical personnel, and the patient during surgery.	

- A. Sterilization
- B. Foodborne disease
- C. Decontamination
- D. Asepsis
- E. Hurdle technology
- F. Infection
- G. Aerobic
- H. Aseptic techniques
- I. Indicator microorganisms
- J. Food spoilage

**QUESTION 2: TRUE/FALSE QUESTIONS****[10 MARKS]**

Evaluate the statements and select whether the statement is true or false. Write the word 'True' or 'False' next to the corresponding number on your ANSWER SHEET.

2.1	Unlike eukaryotic cells, prokaryotic cells have a nucleus and membrane bound organelles.	
2.2	It takes more time to kill a large population of bacteria than it does to kill a small population, because only a fraction of organisms die during at any given time interval	
2.3	The difference in bacteria cell wall structure is a major feature used to classify them into Gram positive and Gram Negative bacteria.	
2.4	Archaea are microorganisms that often survive or found in extreme environments (extremophiles)	
2.5	Organisms that obtain their energy from preformed organic or inorganic molecules are called photosynthetic autotrophs.	
2.6	Lactic acid bacteria ( <i>Lactobacillus</i> spp.) is a group of bacteria that can metabolize lactose (a form of sugar) in milk products to alcohol and carbon dioxide.	
2.7	<i>Saccharomyces cerevisiae</i> is a specie of yeast that is also called baker's yeast.	
2.8	Bacteria is the only microorganisms that can cause spoilage in food and food products.	
2.9	Antibiotic are chemicals produced by bacteria and fungi that inhibit or kill other microbes.	
2.10	The most fundamental difference between prokaryotes and eukaryotes is the presence of a nuclear membrane in eukaryotes and its absence in prokaryotes.	

**QUESTION 3****[10 MARKS]**

Evaluate the statements in each numbered section and select the most appropriate answer or phrase from the given possibilities. Write only the appropriate letter next to the question in the ANSWER SHEET provided.

**3.1 Types of fermentation based on the end product formed are;**

- (A) Lactic acid fermentation
- (B) Alcohol Fermentation
- (C) Acetic acid Fermentation
- (D) Butyric acid Fermentation
- (E) All of the above

**3.2 Microbes can be removed from a liquid solution by the process of;**

- (A) Filtration
- (B) Freeze-drying
- (C) Osmosis
- (D) Desiccation
- (E) None of the above

**3.3 The process of making an object free from living organisms including bacterial and fungal spores and viruses is known as;**

- (A) Pasteurization
- (B) Antisepsis
- (C) Disinfection
- (D) Sterilization
- (E) All of the above

**3.4 The oxygen in the air is lethal to;**

- (A) Obligate thermophiles
- (B) Photosynthetic microbes
- (C) Microaerophilic microbes
- (D) Obligate anaerobes
- (E) None of the above



**3.5 Which term is used to describe the reduction in numbers of microbial population organisms on objects or in materials so that meets acceptable health standards (microbes are reduced to safe levels).**

- (A) Sanitation
- (B) Sterilization
- (C) Disinfection
- (D) Decontamination
- (E) Lyophilization

**3.6 Which of the following developed a set of postulates for determining whether a particular disease is caused by a particular pathogen?**

- (A) John Snow
- (B) Robert Koch
- (C) Joseph Lister
- (D) Louis Pasteur

**3.7 The phase of no growth in microbial growth curve is known as;**

- (A) Log phase
- (B) Stationary phase
- (C) Lag phase
- (D) Death phase
- (E) None of the above

**3.8 Environmental microbiology is field of science that extends to different fields of microbiology including;**

- (A) Aero microbiology
- (B) Soil Microbiology
- (C) Food safety
- (D) Water quality
- (E) All of the above

**3.9 A parasite that lives inside its host is called?**

- (A) Ectoparasite
- (B) Definitive Host

- (C) Zoonosis
- (D) Endoparasite
- (E) None of the above

**3.10 One of the following is not a parasitic infection;**

- (A) Amebiasis
- (B) Giardiasis
- (C) Cryptosporidiosis
- (D) Malaria
- (E) None of the above

**SECTION B: SHORT/LONG ANSWER QUESTIONS**

**[70 MARKS]**

Please answer ALL of the questions in this section.

**QUESTION 4**

**[20 MARKS]**

- 4.1 To control microbial growth, one would apply different physical and chemical methods. Briefly discuss five (5) physical methods that can be used to control microbial growth. [10]
- 4.2 What is a Parasite? [2]
- 4.3 Briefly explain different factors that may affect the control of microbial growth. [8]

**QUESTION 5**

**[20 MARKS]**

- 5.1 Bacteria exist in different shapes (morphology). Mention the four (4) major shapes of bacteria. [4]
- 5.2 All organisms need energy in order to survive. What are the three (3) ways which most bacteria use to get energy? [6]
- 5.3 What is cross contamination? [2]
- 5.4 What is Biological contamination? [2]
- 5.5 Food-borne illness caused by microorganisms is generally classified into different categories. Briefly, explain the three (3) different categories of foodborne illness. [6]

**QUESTION 6**

**[30 MARKS]**

- 6.1 Briefly explain the World Health Organisation (WHO) the Five (5) Keys to safer food. [10]
- 6.2 With examples, explain the two (2) factors that affect microbial growth in foods. [10]
- 6.3 You are asked by Head of Department to explain to some students about food contamination by microorganisms. Write a plan of what you will tell them, including explaining why microorganisms are dangerous and under what conditions they grow and multiply. [10]

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**END OF QUESTION PAPER**