



**PAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY**

FACULTY OF HEALTH, APPLIED SCIENCES AND NATURAL RESOURCES

DEPARTMENT: NATURAL AND APPLIED SCIENCES

QUALIFICATION : BACHELOR OF SCIENCE (MAJOR AND MINOR)	
QUALIFICATION CODE: 07BOSC	LEVEL: 7
COURSE CODE: MIB701S	COURSE NAME: MICROBIOLOGY
SESSION: JULY 2022	PAPER: THEORY
DURATION: 3 HOURS	MARKS: 100

SUPPLEMENTARY/SECOND OPPORTUNITY EXAMINATION QUESTION PAPER	
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Instructions

1. Answer **all** questions.
2. Answer the questions in the booklet provided
3. Write clearly and neatly
4. All written work **MUST** be done in blue or black ink
5. Mark all answers clearly with their respective question numbers

THIS PAPER CONSISTS OF 6 PAGES

(INCLUDING THIS FRONT PAGE)

SECTION A**(20)****QUESTION 1****(20)**

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 book provided.

- 1.1 A scientist studying the sequence of nucleotide in the rRNA of bacterial species is working on; (1)
- (A) Determining the evolutionary relatedness
 - (B) Bioremediation
 - (C) Recombinant DNA
 - (D) Nomenclature
- 1.2 Which groups of microorganism are thought to be the oldest living organisms? (1)
- (A) Eukaryotes
 - (B) Hetrotrophs prokaryotes
 - (C) Archaea
 - (D) Viruses
- 1.3 You can use a microscope to observe the difference between Gram negative and Gram positive cell wall because both have: (1)
- (A) Cell walls
 - (B) Carbohydrates
 - (C) Plasma membranes
 - (D) Genetic material
- 1.4 In microscopy, the wavelength plus the numerical aperture governs: (1)
- (A) Illumination
 - (B) Resolution
 - (C) Size of the field
 - (D) Magnification

- 1.5 The purpose of staining cells on a microscope slide is to: (1)
(A) Kill them
(B) Secure them to the slide
(C) Enlarge cells
(D) Add contrast in order to see them better
- 1.6 Who was the first to grow bacteria in pure culture and to identify *Bacillus anthracis* as the cause of anthrax? (1)
(A) Pasteur
(B) L  wenhoek
(C) Spallanzani
(D) Koch
- 1.7 Most algae are living in; (1)
(A) Acidic environment
(B) Aquatic environment
(C) Moist environment
(D) Dry environment
- 1.8 Endotoxin produced by Gram negative bacteria is present in: (1)
(A) Liposaccharide A
(B) Techoic acid
(C) Inner membrane
(D) None
- 1.9 Rod shaped bacteria are known as: (1)
(A) Cocci
(B) Comma forms
(C) Bacilli
(D) Pleomorphic forms
- 1.10 Thermal death time is; (1)
(A) Time required to kill cells at a given temperature.
(B) Temperature that kills all cells in a given time.
(C) Time and temperature needed to kill all cells.
(D) Time required to kill all the microorganisms in ten minutes.

- 1.11 A culture medium in which the exact composition is not known is called: (1)
(A) simple
(B) Complex
(C) Defined
(C) Natural
- 1.12 When food material are preserved at a temperature just above freezing temperature, the process is called: (1)
(A) Pasteurization
(B) Freezing
(C) Chilling
(D) Frosting
- 1.13 Rapid bacterial growth phase is known as: (1)
(A) Log phase
(B) Lag phase
(C) Stationary phase
(D) Death phase
- 1.14 The capacity of a given strain of microbial species' to produce diseases is called: (1)
(A) Pathogen
(B) Virulence
(C) Infection
(D) Mutagenic
- 1.15 Salt and sugar preserve foods because they: (1)
(A) Make the sour and sweet at the same time.
(B) Produce a hypotonic environment.
(C) Deplete all the nutrients.
(D) Produce a hypertonic environment.
- 1.16 Fermentation is the; (1)
(A) Production of alcoholic beverages by microorganisms
(B) Mass controlled culture of microbes to synthesize products
(C) Use of microbes in sewage and pollution control
(D) All of the above

- 1.17 Water treatment typically requires three stages to make it potable from sewage. which of the following is a secondary stage? (1)
(A) Skimming
(B) Settling
(C) Biodegradation
(D) filtration
- 1.18 Milk fermentation to produce cheese is done initially by inoculating with: (1)
(A) *Saccharomyces cerevisiae*
(B) *Streptococcus lactis* and *Lactobacillus spp*
(C) *Lactobacillus bulgaricus* and *Streptococcus thermophiles*
(D) *Acetobacter* and *Gluconobacter*
- 1.19 The “flash method” or “high temperature short time” method exposes fluids to: (1)
(A) heat below 100°C
(B) 62.3°C for 30 mins
(C) 72°C for 15 seconds
(D) 134°C for 1 second
- 1.20 What is the reservoir for *Balantidium coli*? (1)
(A) Dogs
(B) Soil
(C) Rodents
(D) Large intestines of pigs.

SECTION B (40)

QUESTION 2 (20)

- 2.1 Write short notes on the following;
- 2.1.1 General characteristics of viruses (5)
- 2.1.2 Botulism (5)
- 2.2 Discuss the application of different staining techniques. (5)
- 2.3 Describe the ideal conditions to be followed for a valid necessary for valid Gram staining procedure. (5)

- QUESTION 3** (20)
- 3.1 What is a pure culture? (2)
- 3.2 Explain the basis of having a pure culture in a laboratory (3)
- 3.3 What are the **two** advantages and **two** disadvantages of a pure culture? (4)
- 3.4 Outline factors that may lead to increase in antibiotic disease resistance in some microorganisms. (3)
- 3.5 Briefly discuss how the composition of a media that is both selective and differential such as mannitol salt agar (MSA) can isolate *Staphylococcus aureus*. (8)

SECTION C (40)

- QUESTION 4** (20)
- 4.1 Describe the main stages of bacterial growth curve. (8)
- 4.2 Several factors influence the effectiveness of antimicrobial treatment. Briefly describe how the following factors influence the death of microbes.
- 4.2.1 Types of microorganisms (3)
- 4.2.2 Environmental influences (3)
- 4.3 Evaluate the significance of thermal death reduction time in food industry. (3)
- 4.4 Evaluate the use of ionising radiation in the control the growth and spread of microorganisms. (3)

- QUESTION 5** (20)
- 5.1 Discuss the role of microorganism in the following industries.
- 5.1.1 Beer manufacturing (5)
- 5.1.2 Extraction of low-grade ores. (5)
- 5.2 Outline the role of microorganism in sewage and waste water treatment. (10)

END OF QUESTION PAPER