NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF HEALTH, APPLIED SCIENCES & NATURAL RESOURCES

DEPARTMENT OF HEALTH SCIENCES

QUALIFICATION : BACHELOR OF ENVIRONMENTAL HEALTH SCIENCES	
QUALIFICATION CODE: 08BOHS	**LEVEL:** 5
COURSE CODE: MAP512S	**COURSE NAME:** MICROBIOLOGY AND PARASITOLOGY
SESSION: NOVEMBER 2022	**PAPER:** THEORY
DURATION: 3 HOURS	**MARKS:** 120

FIRST OPPORTUNITY EXAMINATION PAPER	
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MODERATOR:	Dr LARAI AKU AKAI

INSTRUCTIONS
1. Answer ALL the questions in the answer book provided. 2. Write clearly and neatly. 3. Number the answers clearly. 4. All written work MUST be done in blue or black ink.

PERMISSIBLE MATERIALS

1. Scientific Calculator

THIS QUESTION PAPER CONSISTS OF 8 PAGES (including this cover page)

SECTION A: MULTIPLE CHOICE QUESTIONS [20]

- There are 15 multiple choice questions in this section.
- Answer **ALL** questions by selecting the letter of the correct answer.

  (Each question carries 1 mark)

QUESTION 1 (20)

1.1 Most eukaryotic cells produce by:

A. Budding
B. Spore formation
C. Binary fusion
D. None of the above
E. All the above

1.2 *Clostridium botulinum* is known to be:

A. A gram-negative diplococcus
B. A gram-positive coccus
C. A gram-positive bacillus
D. A gram-negative spiral bacillus
E. All the above

1.3 A slippery outer covering in some bacteria that protects them from phagocytosis by host cells is:

A. Peptidoglycan
B. Capsule
C. Cell wall
D. Flagellum
E. Peptidoglycan

1.4 Sporozoite is the infective stage of which parasite:

A. *Schistosoma haematobium*
B. Hook worm
C. *Strangeaides stercorais*
D. *Taenia sulium*
E. None of the above

1.5 Concerning malaria parasites the infective form of the parasite to man is:

A. Schizont
B. Trophozoite
C. Ring form
D. Sporozoite
E. All the above

1.6 A bactericide is a substance that:

A. Slows down bacterial growth
B. Kills some bacteria while allowing some to grow
C. Have no effect on bacteria
D. Kills bacteria
E. None of the above

1.7 Which of the following chemical-based preservatives do not act on fungi:

A. Propionic acid
B. Sorbic acid
C. Benzoic acid
D. Dihydroacetic acid
E. None of the above

1.8 Which alga can be used as food for the human being?

A. Chlorella
B. Polysiphonia
C. Ulothrix
D. Spirogyra
E. None of the above

1.9 Tuberculosis is a:

A. Water borne disease
B. Air borne disease
C. Food borne disease
D. Arthropod borne disease
E. None of the above

1.10 HACCP is the acronym for:

A. Health Analysis and Critical Cause Prevention
B. Hazard Analysis and Critical Cause Prevention
C. Health Analysis and Critical Control Point
D. Hazard Analysis and Critical Control Point
E. None of the above

1.11 Which of the following chemical-based preservatives act on *Clostridia*:

A. Sodium diacetate
B. Dihydroacetic acid
C. Sorbic acid
D. Sodium Nitrite
E. None of the above

1.12 The application of UV radiation in food preservation is for:

A. Killing microbes in moist food
B. Creating peroxides that oxidize cellular constituents
C. Removing or displacing electrons
D. Sterilizing surfaces of food-handling equipment
E. None of the above

1.13 Which of the following are not effects of probiotics?

A. Control diarrhea
B. Immunomodulation
C. Anti-cancer effects
D. Improve blood circulation
E. None of the above

1.14 *Clostridium perfringens* is found in high-risk foods such as:

A. Water
B. Cooked, dished meat and poultry
C. Unpasteurized fruits and vegetables
D. Raw eggs
E. All of the above

1.15 Most human pathogens prefer temperatures near that of the human body. They are called:

A. Psychrophiles
B. Thermophiles
C. Mesophiles
D. Halophiles
E. None of the above

1.16 Who was the first to observe "animalcules" under the microscope?

A. Antonie van Leeuwenhoek
B. Ötzi the Iceman
C. Marcus Terentius Varro
D. Robert Koch
E. None of the above

1.17 Which of the following is a prokaryotic microorganism?

A. Helminth
B. Protozoan
C. Cyanobacterium
D. Mold
E. All of the above

1.18 Which of the following is acellular?

A. Virus
B. Bacterium
C. Fungus
D. Protozoan

1.19 If a culture starts with 50 cells, how many cells will be present after five generations with no cell death?

A. 200
B. 400
C. 1600
D. 3200
E. Not enough information given to determine

1.20 *Streptococcus mutans* is a major cause of cavities. It resides in the gum pockets, does not have catalase activity, and can be grown outside of an anaerobic chamber. The bacterium is probably which of the following?

A. A facultative anaerobe
B. An obligate aerobe
C. An obligate anaerobe
D. An aerotolerant anaerobe
E. Not enough information given to determine

SECTION B [100]

QUESTION 2 (20)

Define the following terms *(Each correct answer earns 2 marks):*

2.1 Bacteriocin

2.2 Antiseptic technique

2.3 Thermal death point

2.4 Autoclaving

2.5 Phytoremediation

2.6 Symbiosis

2.7 Resolving power

2.8 Genetic engineering

2.9 Pilus (plural = Pilli)

2.10 Microaerophile

QUESTION 3 (21)

3.1 Define endomycorrhiza and ectomycorrhiza and list three (3) major characteristics of both. (8)

3.2 Differentiate between selective and differential media and provide three (3) forms that solid media are prepared as. (5)

3.3. List four (4) types of fermentation that can be used in food microbiology and mention an associated organism for each. *(Write your answer in the form of a table as below in the answer booklet).* (8)

Type of Fermentation	**Organism**

QUESTION 4 (10)

4.1 Several biochemical tests are available to aid in the identification of microorganisms. For each of the following (A-J) fill in the missing information. *(Each correct answer earns 1 mark)*

Test	Positive Result	Negative Result	Target
A	Bubble formation	No bubbles	Peroxide
Slide coagulase	**B**	Clear solution on slide	CRF
Tube coagulase	Broth thickens	**C**	CRF
Oxidase	Purple pigment	No pigment	**D**
Spot indole	**E**	No pigment	Tryptophanase
Bile solubility	Clear broth	**F**	Autolytic enzyme
PYR	**G**	Pink/red	Pyroglutamyl-aminopeptidase
Urease	**H**	Yellow/orange	Urea
DNase	Opaque medium	**I**	DNA/ Nucleic material
Hippurate hydrolysis	Purple Violet	Clear	**J**

QUESTION 5 (25)

5.1 Identify three (3) classes of parasites that can cause diseases in humans and give an example for each of them. (6)

5.2 Distinguish the three (3) classifications of protozoa based on their movement and provide a sketch for each. (9)

5.3 With the aid of a diagram describe the life cycle of tapeworm, *Taenia saginata.* (10)

QUESTION 6 (24)

6.1 With the aid of a diagram explain the life cycle of the Intestinal hookworm (10)

6.2 Mention four (4) critical points where foodborne illnesses may occur. (4)

6.3 Plants can be genetically engineered with useful genes placed on the Ti plasmid of Agrobacterium tumefaciens. With the aid of diagrams, briefly outline the 7 steps to produce a drought resistant plant with the hypothetical (dR-gene) using *Agrobacterium tumefaciens* (10)

THE END