NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF HEALTH AND APPLIED SCIENCES

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 2019	**PAPER:** THEORY
DURATION: 3 HOURS	**MARKS:** 100

FIRST OPPORTUNITY EXAMINATION QUESTION PAPER	
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MODERATOR:	**DR LARAI AKU-AKAI**

INSTRUCTIONS
1. Answer ALL the questions. 2. Write clearly and neatly. 3. Number the answers clearly.

PERMISSIBLE MATERIALS

1. CALCULATOR

THIS QUESTION PAPER CONSISTS OF 6 PAGES (including this front page)

SECTION A

[45]

QUESTION 1

[10]

Select the correct answer. There is only one correct answer.

1.1 The most commonly used antimicrobial halogens: (1)

A. Rubbing alcohol
B Acetic acid
C Phenol
D. Chlorine

1.2 An example of an obligate parasite: (1)

A. *Acantamoeba*
B *Toxoplamsa gondii*
C *Strongyloides stercoralis*
D. *Naegleria fowleri*

1.3 The scientist that finally provided proof for the Germ Theory of Disease: (1)

A. Louis Pasteur
B Lazzaro Spallanzani
C Francesco Redi
D. Robert Koch

1.4 The main function of flagella in organisms that have them is for: (1)

A. Adhesion
B Reproduction
C Communication
D. Virulence

1.5 *Clostridium Botulinum* is known to be: (1)

A. A gram negative diplococcus
B A gram positive coccus
C A gram positive bacillus
D. A gam negative spiral bacillus

1.6 The acid-tolerant lactobacilli, primarily *Lactobacillus acidophilus*, are found in the human body as normal flora of: (1)

A. Mouth
B Female genital tract
C Urinary tract
D. Digestive tract

1.7 Which of the following is dry heat sterilizing method? (1)

A. Boiling
B Autoclaving
C Pasteurization
D. Flaming

1.8 *Trypanasoma cruzi* is the cause of: (1)

A. Sleeping sickness
B Chaga's disease
C Elephantiasis
D. Schistosomiasis

1.9 Sporozoite is the infective stage of which parasite: (1)

A. *Schistosoma haematobium*
B Hook worm
C *Taenia solium*
D. None of the above

1.10 Watson and Crick: (1)

A. Used plasmid vectors to clone genes in bacteria
B Proposed the double helical structure of DNA
C Developed the polymerase chain reaction.
D. Developed techniques (solid media) for obtaining pure cultures of microbes, some still in existence today.

QUESTION 2

[15]

Answer the following short questions.

2.1 Who developed the antibiotic penicillin? (1)

2.2 Name two of the major genera involved in food-borne intoxications? (2)

2.3 What type of organism has to acquire nutrition from other organisms such as plants or animals to survive? (1)

2.4 Which symbiotic relationship exists where one symbiont benefits, other is damaged? (1)

2.5 Describe the term primary metabolite and cite an example. (2)

2.6 What term describes the utilization of microbes to extract minerals from less concentrated ores? (1)

2.7 Identify three (3) classes of parasites that can cause diseases in humans. (3)

2.8 Which types of parasites are not constantly associated with the host and obtain nourishment from the host from time to time? (1)

2.9 Explain why sausage and other ground meat products might provide a better environment for the growth of food spoilage organisms than solid cuts of meats? (2)

2.10 The arrangements of flagella that is tufted at one end are called? (1)

QUESTION 3 [20]

Define the following terms:

3.1 Bioremediation (2)

3.2 Alternation of Generation (2)

3.3 Rhizofiltration (2)

3.4 Colony (2)

3.5 Commensalism (2)

3.6 Definitive host (2)

3.7 Decimal Reduction Time (D value). (2)

3.8 Exotoxin (2)

3.9 Disinfection (2)

3.10 Competition (2)

SECTION B [30]

QUESTION 4 [15]

4.1 Which bacterial microorganism is one of the most important model organism in molecular biology? Elucidate why this is. (4)

4.2 Outline the properties of a useful industrial microbe. (5)

4.3 Describe combinatorial biology/ recombinant gene therapy and explain the basic approach used in this technique? What types of major products have been created using combinatorial biology? (6)

QUESTION 5 [15]

5.1 Enumerate conditions that favour bacterial spoilage of the food products shown in the picture below. (10)

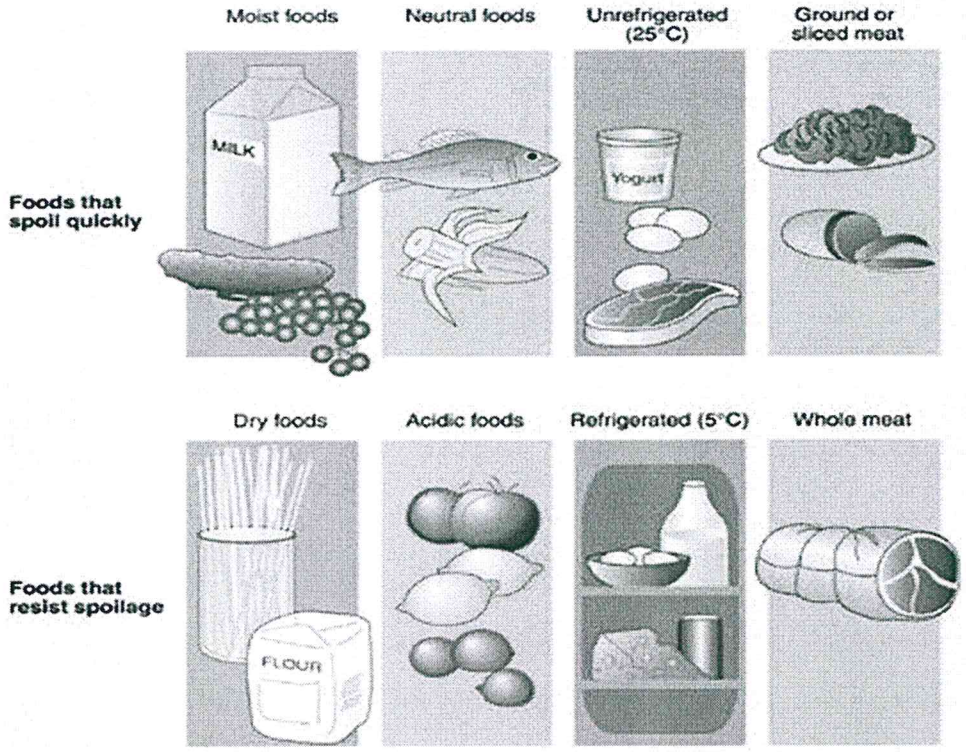

Figure 1. Conditions that favour bacterial food spoilage in food products.

5.2 The bacteriocins, Nisin, can be used particularly in low-acid foods to improve inactivation of *Clostridium botulinum* during the canning process. Describe the various mechanisms in which it functions. (5)

SECTION C

[25]

QUESTION 6

[25]

6.1 Designate the conditions necessary for successful endemic parasitism. (4)

6.2 One of the effects of parasites on hosts are to deprive the host of essential substances. Describe how the hookworm goes about this action. (2)

6.3 Below is the life cycle of *Plasmodium* species. Answer the questions below relating to malaria parasites.

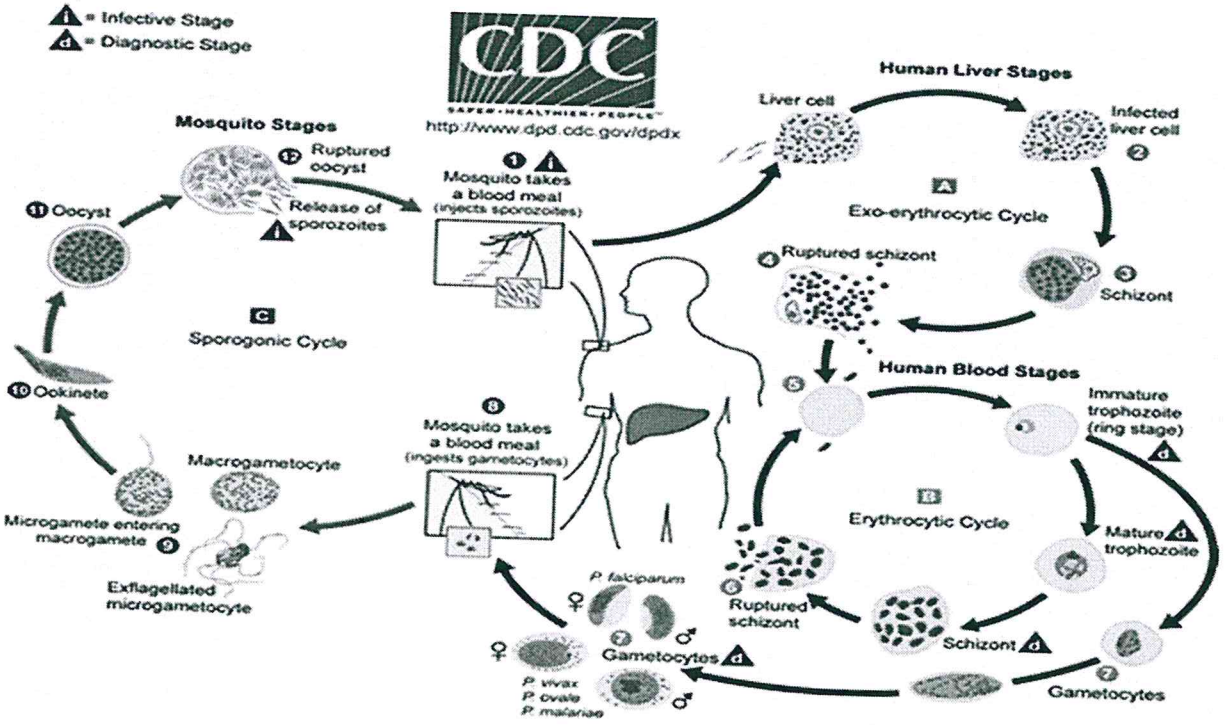

Figure 2. Life Cycle of *Plasmodium* species

6.3.1 Describe how man is infected by this parasite. (5)

6.3.2 Discuss the infective stage of this parasite to man. (4)

6.3.3 Which measures can be taken to prevent infections caused by this parasite? (5)

6.3.4 What is the definitive host of the parasite and explain the developmental process that takes place in this host? (5)

END OF EXAMINATION