



**NAMIBIA UNIVERSITY  
OF SCIENCE AND TECHNOLOGY**

**FACULTY OF HEALTH AND APPLIED SCIENCES**

**DEPARTMENT OF HEALTH SCIENCES**

<b>QUALIFICATION:</b> BACHELOR OF MEDICAL LABORATORY SCIENCES	
<b>QUALIFICATION CODE:</b> 08BMLS	<b>LEVEL:</b> 6
<b>COURSE CODE:</b> MMB611S	<b>COURSE NAME:</b> MEDICAL MICROBIOLOGY 2A
<b>SESSION:</b> JUNE 2019	<b>PAPER:</b> THEORY
<b>DURATION:</b> 3 HOURS	<b>MARKS:</b> 110

<b>FIRST OPPORTUNITY EXAMINATION QUESTION PAPER</b>	
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<b>MODERATOR:</b>	Ms Vanessa F. Tjijenda

<b>INSTRUCTIONS</b>
<ol style="list-style-type: none"><li>1. Answer ALL the questions.</li><li>2. Write clearly and neatly.</li><li>3. Number the answers clearly.</li></ol>

**THIS QUESTION PAPER CONSISTS OF 5 PAGES (Including this front page)**

**SECTION A (27 MARKS)****QUESTION 1****[7]**

Evaluate the statements in each numbered section and select the most appropriate answer or phrase from the given possibilities. Write the appropriate letter next to the number of the statement/phrase.

1.1 Culturing of *Mycobacterium tuberculosis* should be done using:

- A) Biosafety level I.
- B) Biosafety level II.
- C) Biosafety level III.
- D) Biosafety level IV.

(1)

1.2 Ketonuria is commonly associated with

- A) Carbohydrate-free diets.
- B) Uncontrolled diabetes.
- C) Starvation.
- D) All of the above.

(1)

1.3 After 18 – 24 hours of incubation on KIA, non-lactose fermenters will show:

- A) A red slant with a yellow butt.
- B) A yellow slant with no reaction on the butt.
- C) A yellow slant with a yellow butt.
- D) None of the above.

(1)

1.4 Chlorine has a:

- A) Bactericidal effect.
- B) Fungicidal effect.
- C) Sporocidal effect.
- D) Both A and B.

(1)

1.5 Bipartite toxins:

- A) Contain a B subunit that attaches to a specific host-cell receptor.
- B) Are extracellular proteins that bind structural peptides on host T-lymphocytes.
- C) Contain an A subunit that passes into the cell and interacts with the target.
- D) Both A and C.

(1)

1.6 Choose the most effective antimicrobial agent from the list below

- A) 95% Ethanol.
- B) 70% Ethanol.
- C) 100% Ethanol.
- D) 90% Ethanol.

(1)

1.7 The potassium hydroxide test yields

- A) A string formation for gram positive bacteria.
- B) A string formation for gram negative bacteria.
- C) Bubble production for gram positive bacteria.
- D) Bubble production for gram negative bacteria. (1)

## QUESTION 2

[8]

Assess the following statements and decide whether they are true or false. Write only the number of the question and TRUE for a true statement or FALSE for a false statement next to the number of the question. **IF the statement is FALSE, please give reason why you think it is false.**

- 2.1 Koch's postulates can be referred to as, the existence of infectious diseases.
- 2.2 Thiosulphate Citrate Bile Sucrose medium is a selective medium for *Corynebacterium diphtheria*.
- 2.3 All alpha-haemolytic streptococci possess an active autocatalytic enzyme that lyses the organism's own cell wall during cell division.
- 2.4 Phenols act by denaturing bacterial proteins and disrupting of bacterial cell membranes.
- 2.5 Biochemical structures that impart unique serological identity to gram negative species are the somatic antigens.

## QUESTION 3

[12]

3.1 Define the following:

- A) Differential culture media. (2)
- B) Selective culture media. (2)
- C) pH indicator in culture media. (3)
- D) Sanitization. (2)

3.2 Differentiate between a pathogen and an opportunistic pathogen. (3)

**SECTION B (24 MARKS)**

**QUESTION 4**

**[24]**

- 4.1 Justify why the delivering of microbiological specimens for diagnostic analysis to the laboratory needs to be done as soon as possible. (4)
- 4.2 Explain how normal flora can prevent a host from being infected with a pathogenic organism. (4)
- 4.3 Discuss how bacterial conjugation can result in a bacterial cell being resistant to an antibiotic to which it was sensitive previously. (6)
- 4.4 Classify the organisms in tubes a – e according to its oxygenic requirements. (5)

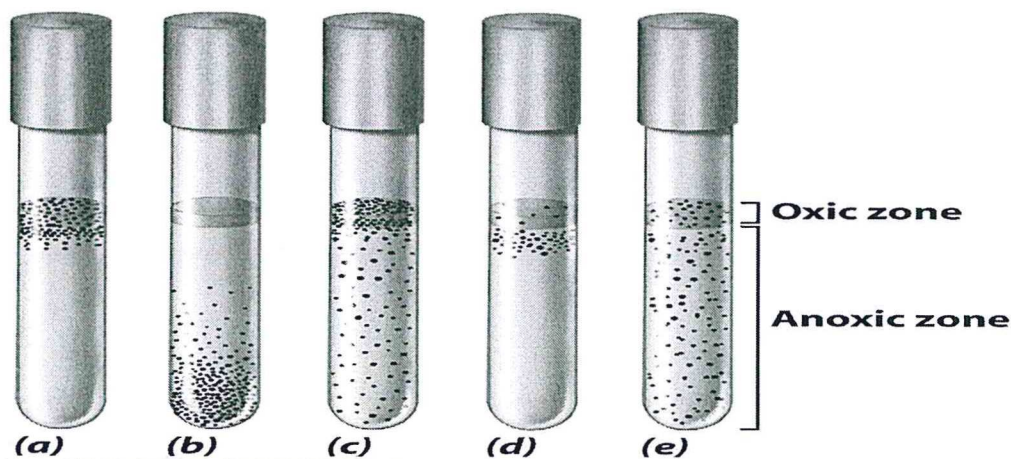


Figure 6-25 Brock Biology of Microorganisms 11/e  
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- 4.5 Predict how a pathogenic organism can evade the defence systems of the host. (5)

**SECTION C (59 MARKS)**

**[17]**

**QUESTION 5**

- 5.1 Evaluate the following statement and justify your opinion. The epidermis is not a good environment for colonization. (5)
- 5.2 You need to prepare media on which you will be able to grow *Haemophilus influenzae*.
  - A) Identify media that will support the growth of this organism? (1)
  - B) Justify the reason that this media will support the growth of this organism. (4)
  - C) Outline why the correct preparation of this media is crucial. (7)

**QUESTION 6**

**[42]**

- 6.1 Illustrate and explain what happens if a gram positive bacilli, such as *Bacillus anthracis*, is exposed to harsh conditions. (10)
- 6.2 Illustrate by means of a labelled graph, the bacterial growth curve in a fluid culture medium. (10)
- 6.3 Justify why gram positive and gram negative organisms stain a different colour during the gram stain procedure. (12)
- 6.4 Point out which ingredient is providing a MacConkey agar its selective and differential properties, and describe the effect of each of the listed ingredients. (10)