NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF HEALTH AND APPLIED SCIENCES

DEPARTMENT OF HEALTH SCIENCES

QUALIFICATION: BACHELOR OF MEDICAL LABORATORY SCIENCES	
QUALIFICATION CODE: 08BMLS	**LEVEL:** 6
COURSE CODE: MMB621S	**COURSE NAME:** MEDICAL MICROBIOLOGY 2B
SESSION: NOVEMBER 2019	**PAPER:** THEORY
DURATION: 3 HOURS	**MARKS:** 120

FIRST OPPORTUNITY EXAMINATION QUESTION PAPER	
EXAMINER(S)	**Mrs Fredrika Engelbrecht**
MODERATOR:	**Prof Sylvester R Moyo**

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

THIS QUESTION PAPER CONSISTS OF 4 PAGES (Excluding this front page)

SECTION A (29 MARKS)

QUESTION 1 [10]

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 Brucella is an organism known to be:

A) often transferred from person to person.
B) a zoonotic infection.
C) only causing infections amongst animals.
D) not a pathogenic organism. (1)

1.2 For primary syphillus to occur you need:

A) > 10 *Treponema pallidum* spirochaetes to be introduced in the body.
B) < 10 *Treponema pallidum* spirochaetes to be introduced in the body.
C) 50 - 100 *Treponema pallidum* spirochaetes to be introduced in the body.
D) > 100 *Treponema pallidum* spirochaetes to be introduced in the body. (1)

1.3 Mycoplasma can be defined as:

A) the smallest self-sufficient bacteria.
B) an intracellular parasite.
C) a gram negative bacilli.
D) a common causative organism of eye infections. (1)

1.4 Patients infected with enterotoxigenic serotypes of *E.coli* usually presents with:

A) presence of mucous and blood in faeces samples.
B) watery, bloody diarrhoea.
C) watery diarrhoea with little or no fever.
D) infantile enteritis. (1)

1.5 The most common organism responsible for gas gangrene is known to be:

A) an anaerobic spore forming gram positive bacilli.
B) an aerobic spore forming gram positive bacilli.
C) an anaerobic gram negative bacilli.
D) an aerobic gram negative bacilli. (1)

1.6 Urine samples for microbiological analysis, transported at room

temperature, should reach the diagnostic laboratory:

A) 30 minutes after collection.
B) 24 hours after collection.
C) 1 – 2 hours after collection.
D) 12 hours after collection.

(1)

1.7 The PorB/Protein I of Neisseria species:

A) is the major porin protein which assists the organism to penetrate the columnar epithelial cells of the host in order to cause an infection.
B) is the protein that is present in the outer membrane of the Neisseria and promotes adherence of the gonococcus to the host cells.
C) is the protein which inhibits the phagocytes of the organism by host cells species.
D) blocks the antibodies that have been produced against the Neisseria.

(1)

1.8 The reverse CAMP test can be used for the identification of:

A) *Bacillus cereus.*
B) *Bacillus subtilis.*
C) *Clostridium tetani.*
D) *Clostridium perfringens.*

(1)

1.9 The Quinolone mechanism of action is:

A) Inactivation of enzymes.
B) Inhibition of DNA synthesis.
C) Inhibition of cell wall synthesis.
D) Drug efflux.

(1)

1.10 Protein A of *S. aureus:*

A) inhibits opsonisation and phagocytosis.
B) breaks down lipids & enables the organisms to invade the cutaneous tissues.
C) hydrolyses hyaluronic acid in the matrix of connective tissue.
D) destroys erythrocytes & causes skin destruction.

(1)

QUESTION 2

[11]

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 *Yersinia enterocolitica* grow optimally at 37°C.

2.2 *Campylobacter* species are one of the organisms associated with infections caused by contaminated food products.

2.3 Heparinase that contributes to intravascular clotting is part of the virulence factors presented by *Bacteroides fragilis*.

2.4 Severe Q fever may result in chronic febrile disease, granulomatous liver disease or chronic infection of the heart valves.

2.5 Transient bacteraemia is presence of bacteria in the blood over several hours/days.

2.6 The presence of sulphur granules in collected pus is associated with a diphtheria infection.

2.7 *R. prowazekii* enters the human body directly and cause and infection.

QUESTION 3

[8]

3.1 Categorise the following drugs by means of its mechanism of action.

A)	Gentamycin	(1)
B)	Metronidazole	(1)
C)	Vancomycin	(1)
D)	Ciprofloxacin	(1)

3.2 Match the organism with the test used to identify this organism.

3.2.1	*C. diphtheria*	A)	CAMP test	(1)
3.2.2	*C. perfringens*	B)	Elek test	(1)
3.2.3	*S. agalactiae*	C)	Optochin sensitivity	(1)
3.2.4	*S. pneumoniae*	D)	Nagler reaction	(1)

SECTION B (17 MARKS)	
QUESTION 4	**[17]**
4.1 Design a corrective action plan for an antibiotic that showed an out-of-range control result for quality control purposes.	(5)
4.2 Differentiate (in a table form) between *N. gonorrhoea, N. meningitides* and *M. catarrhalis* using the following criteria: A) Oxidase reaction B) Catalase reaction C) Utilization of glucose D) Utilization of maltose E) Utilization of lactose F) Utilization of sucrose G) Nitrate reduction H) DNAse production	(1/2 x 24 = 12)
SECTION C (74 MARKS)	
QUESTION 5	**[42]**
5.1 Present a positive satelletism test by means of a **labelled illustration** and explain the principle of the test.	(9)
5.2 For *Bacillus anthracis* A) Classify the possible routes of infection and the diseases that arise from each route of infection.	(6)
B) Outline its morphological characteristics.	(4)
C) Point out its cultural characteristics.	(5)
5.3 Propose factors affecting the quality of the final microbiological report, and explain why these factors affects the quality.	(10)
5.4 Illustrate the different stages of syphilis **using a graph**.	(8)
QUESTION 6	**[32]**
6.1 Justify why it is difficult to treat and completely recover from Lyme's disease, also indicate the pathogen responsible for causing Lyme's diseases.	(7)
6.2 Design a flow chart that would enable you to differentiate between the different Streptococcus species.	(15)
6.3 Discuss the pathogenesis of typhoid fever.	(10)
END OF PAPER.	