



FACULTY OF SCIENCE

DEPARTMENT OF BOTANY AND PLANT BIOTECHNOLOGY

MODULE:	MICROBIOLOGY (BACTERIOLOGY & VIROLOGY)
CODE:	MCB2A01; MCB02A2
CAMPUS	APK

DATE:	July 2019	SESSION:	8.00 AM– 11.00AM
ASSESSOR:			MR GODFRED TANIH
INTERNAL MODERATOR:			MRS RENE TONG
DURATION	3 HOURS	MARKS:	150

NUMBER OF PAGES: 6 PAGES

INSTRUCTIONS: The paper consists of TWO sections:

SECTION A:	Bacteriology	(4 Questions)
SECTION B:	Virology	(5 Questions)

ANSWER ALL THE QUESTIONS (9 Questions)

REQUIREMENTS: ANSWER QUESTIONS IN THE BOOKLETS PROVIDED
READ ALL QUESTIONS CAREFULLY
PLEASE WRITE NEATLY

NAME & SURNAME: _____

STUDENT NUMBER: _____

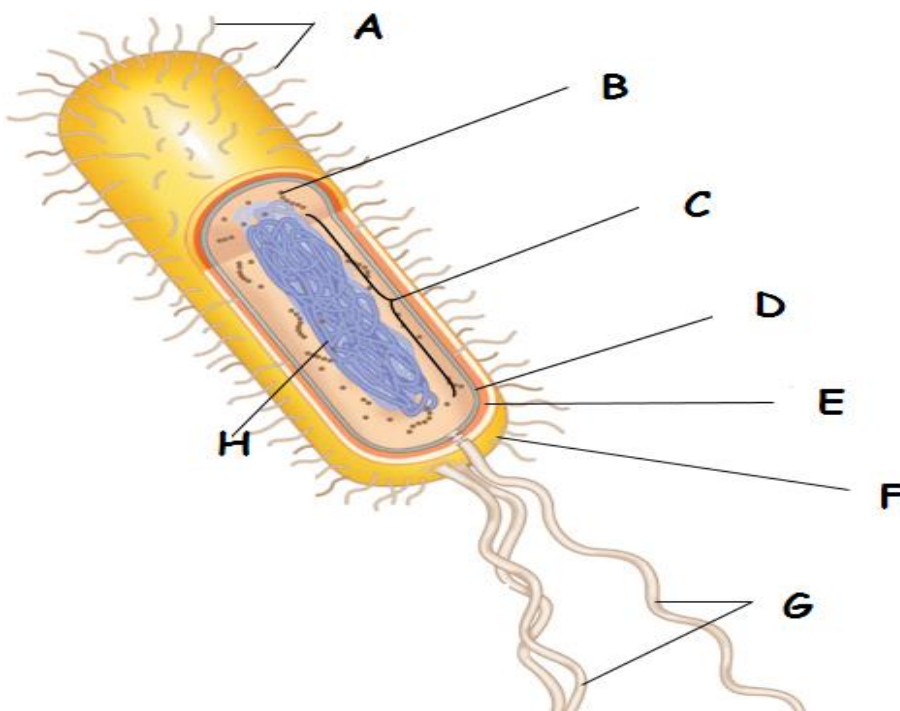
TOTAL MARKS :

/ 150

%

SECTION A -- BACTERIOLOGY**Question 1****[28]****A. Draw the correct structures of the following bacterial morphologies: (10 x 1/2 = 5)**

- a. Bacillus
- b. Coccus
- c. Spirillum
- d. Spirochetes
- e. Comma shape
- f. Streptococcus
- g. Staphylococcus
- h. Diplococcus
- i. Streptobacillus
- j. Sarcinae

B. Correctly Label the following illustration.**(8 x 1/2 = 4)**

- I. What is an endospore? (1)
- II. Outline the process of endospore formation (7)
- III. Draw and label the structure of an endospore (5)
- IV. What is the purpose of doing a Gram stain on a bacteria culture? (2)
- V. What are the stains used in the process (primary and secondary) (2)
- VI. What are the different the results you would expect? (2)

Question 2**[15]**

A. Choose the correct person from the table below, who is credited with the following statements:

- i. Developed the vaccination against Small pox
- ii. Developed the first Rabies vaccination
- iii. First proof of germ theory with *B. anthracis*
- iv. Discovered viruses
- v. Proved that mosquitoes carried the Yellow Fever agent
- vi. Discovered carbon dioxide
- vii. Devised the compound microscope and illuminating system
- viii. Did tests to disprove Spontaneous Generation

Walter Reed	Christian Gram	Jean Baptista Von Helmont
Antony Leeuwenhoek	Louis Pasteur	Alexander Fleming
Francesco Redi	Ignaz Semmelweis	Robert Hooke
Martinus Beijerinck	Joseph Lister	Dmitri Isifovich Ivanovski
Sir Isaac Newton	Aristotle	Edward Jenner

B. Give the correct definition of the following terms:

(7)

- i. Sterilisation
- ii. Disinfection
- iii. Disinfectant
- iv. Prebiotics
- v. Antiseptic
- vi. Food borne infection
- vii. Food borne intoxication

Question 3**[16]**

- i. Differentiate between broad spectrum and narrow spectrum antibiotics (2)
- ii. Antibiotics are effective against many bacteria due to their different modes of action. List five supported with an example of an antibiotic. (5)
- iii. Name five classes of antibiotics (5)
- iv. How do chemical agents affect the activity of microorganisms (4)

Question 4**[16]**

A. There are three different methods normally used to pasteurise milk to help prevent disease and prolong shelf life. Compare these methods stating the correct names and temperatures and times used. (6)

i. Method 1

ii. Method 2

iii. Method 3

B. Describe the process incineration of bacterial control (2)

C. Give the disease caused by the following bacterial species (5)

i. *Clostridium perfringes*

ii. *Neisseria gonorrhoeae*

iii. *Treponema pallidum*

iv. *Listeria monocytogens*

v. *Shigella dysenteriae*

D. Briefly discuss cholera disease in terms of the causative agent, morphology and transmission. (3)

TOTAL**[75]****End of Section A**

SECTION B -- VIROLOGY**Question 1 [16]**

- I. Viruses are different from bacteria cell. State five of the important properties of viruses. (5)
- II. Viruses contain both *structural* and *non-structural* proteins.
- a. What are these proteins (2)
- b. Provide two major functions of each of these proteins in (a) (4)
- III. Viruses are group into different families and subfamilies groups based on their capsid symmetry. List the five types of viral capsid giving examples in each case. (5)

Question 2 [18]

- a) Complete the following table by placing an "x" in the appropriate box. [20 x 1/2 = 10]

Virus	DNA	RNA	Single	Double	Enveloped	Naked	Helical	Icosahedral	Cone	Rod	Complex
Herpes simplex -											
Bacteriophages-											
Tobacco mosaic											
Human immunodeficiency-											
Polio -											

- b) With aid of a diagram describe the Productive Infective cycle of a virus in a bacteria (8)

Question 3 [10]

- I. Draw the graph of viral replication in bacteria cell. (5)
- II. Provide the correct term for each of the following statements: (5)
- a. An assay in which each inoculated subject either responds or it does not.
- b. Vaccine for Rabies
- c. A portion of infectious nucleic acid, without the protein coat.

- d. Cone shapes capsid consisting of hollow molecules composed of hexagonal and pentagonal groups of atoms.
- e. Host cell is infected by virus for its lifetime and is also accompanied by changes to the protein composition of host's cell.
- f. Infection that results in production of more infectious viruses at the end than at the start.

Question 4 **[16]**

Explain the following terminologies often used in virology:

- a. Inactivated virus vaccine
- b. Attenuated virus vaccine
- c. Recombinant virus vaccine
- d. Adaptive immunity
- e. Innate immunity
- f. Incubation period
- g. Reservoir
- h. Antibody
- i. Antigen

Question 5 **[15]**

- I. Name and describe four methods used in the identification of viruses (4)
- II. What is meningitis? (2)
- III. List three major symptoms of meningitis (3)
- IV. Name the two types of yellow fever (2)
- V. List four major symptoms of severe infection of yellow fever (2)

TOTAL **Section B** **[75]**

End of Paper