



FACULTY OF SCIENCE

DEPARTMENT OF BIOTECHNOLOGY
DIPLOMA IN BIOTECHNOLOGY AND FOOD TECHNOLOGY

MODULE MCB1BM2/ MCB2MB1
 MICROBIOLOGY II

CAMPUS DFC

NOVEMBER FINAL ASSESSMENT

DATE: 14 November 2019

SESSION: 12h30-15h30

ASSESSOR(S):

DR A CROSSE

INTERNAL MODERATOR:

MR L ALAGIOZOGLOU

EXTERNAL MODERATOR:

N/A

DURATION 3 HOURS

MARKS 130

SURNAME AND INITIALS:

STUDENT NUMBER:

CONTACT NR: _____

NUMBER OF PAGES: 8 PAGES

INSTRUCTIONS:

ANSWER ALL THE QUESTIONS.

ANSWER QUESTION ONE ON THE MCQ CARD ISSUED.

HAND IN THE QUESTION PAPER SEPARATE FROM THE ANSWER BOOK.

REQUIREMENTS:

MCQ CARDS.

ONE ANSWER SCRIPT PER STUDENT.

ONE CALCULATOR PER PERSON.

QUESTION 1

Answer the following questions on the Multiple Choice Answer Sheet provided. Before filling in the required details on your answer sheet read the instructions carefully and make sure that you fill in your choices correctly.

- 1.1 Which of the following is not a method for construction of a classification system?
- A. Phenetically
 - B. Phylophenetically
 - C. Phylogenetically
 - D. Genotypically
- 1.2 What does the positive result of an oxidase test look like?
- A. Dark purple
 - B. Red pink layer on the top
 - C. Clotting
 - D. Blue
- 1.3 What test differentiates between *Staphylococcus aureus* and other *Staphylococci*?
- A. Indole
 - B. Oxidase
 - C. Coagulase
 - D. Urease
- 1.4 Does horizontal gene transfer involve mitosis?
- A. True
 - B. False

- 1.5 Which of the following are not one of the five major groups of *Euryarchaeota*?
- A. Sulphanogens
 - B. Halobacteria
 - C. Methanogens
 - D. Thermoplasms
- 1.6 Select the green non-sulphur bacteria
- A. *Chlorobi*
 - B. *Cyanobacteria*
 - C. *Firmicutes*
 - D. *Chloroflexi*
- 1.7 Which of the following bacteria cause nongonococcal urethritis
- A. *Chlamydia psittaci*
 - B. *Escherichia coli*
 - C. *Chlamydia trachomatis*
 - D. *Rickettsia prowazekii*
- 1.8 Which of the following lists the correct 5 proteobacteria?
- A. $\alpha\beta\delta\epsilon\gamma$
 - B. $\alpha\beta\delta\epsilon\lambda$
 - C. $\alpha\beta\delta\epsilon\sigma$
 - D. $\alpha\beta\delta\epsilon\rho$
- 1.9 Which class of *Firmicutes* does not have cell walls?
- A. *Clostridia*
 - B. *Bacilli*
 - C. *Enterococci*
 - D. *Mollicutes*
- 1.10 Who developed bacterial filters that were later used to discover viruses?
- A. Dimitri Ivanowski
 - B. Charles Chamberland
 - C. Billy Sturgen
 - D. Edward Jenner
- 1.11 Which of the following is not a method to purify viruses
- A. Gel electrophoresis
 - B. Precipitation
 - C. Denaturation of contaminants
 - D. Differential centrifugation

- 1.12 What do bacteriophages infect?
- A. Plants
 - B. Viruses
 - C. Bacteria
 - D. Mammals
- 1.13 An autoclave is an example of ___ in the control of microorganisms
- A. Dry heat
 - B. Moist heat
 - C. Freezing
 - D. Filtration
- 1.14 Nonpathogenic *E. coli* in the human colon is an example of”
- A. Mutualism
 - B. Predation
 - C. Commensalism
 - D. Parasitism
- 1.15 Which of the following is not a species of bacteria that participates in the Sulphur cycle
- A. *Chlamydia*
 - B. *Alteromonas*
 - C. *Clostridium*
 - D. *Desulfovibrio*
- 1.16 Are microbes able to reduce metals?
- A. True
 - B. False
- 1.17 Function of an organism in a complex system, including place of the organism, resources used in a given location, and time of use is defined as:
- A. Ecosystem
 - B. Microenvironment
 - C. Primary reducer
 - D. Niche
- 1.18 Soil constitutes the following microorganisms:
- A. Protozoa, Bacteria, Nematodes, Fungi
 - B. Protozoa, Bacteria, Nematodes, Grass
 - C. Moles, Bacteria, Nematodes, Fungi
 - D. Protozoa, Bacteria, Fungi, Ants

1.19 What is not an example of a ruminant?

- A. Goat
- B. Dog
- C. Cattle
- D. Sheep

1.20 Another name for syntrophism is:

- A. Satellite phase
- B. Lateral feeding
- C. Cross feeding
- D. Intra feeding

[20]

QUESTION 2

Define the following terms:

- 2.1 Taxonomy
- 2.2 Hyperthermophile
- 2.3 α -Hemolysis
- 2.4 Sterilization
- 2.5 Antiseptics
- 2.6 Virology
- 2.7 Infectious dose
- 2.8 Symbioses
- 2.9 Ecosystems
- 2.10 Endosymbiont

[10]

QUESTION 3

Phyletic classification systems make use of SSU rRNA nucleotide sequences

- 3.1 What is the other name for this type of classification? [1]
- 3.2 Why are these particular nucleotide units used? [5]

- 3.3 The technique of nucleic acid base composition measures what? [1]
- 3.4 Due to the explosion in nucleotide sequencing there has been a call for a new taxa. [10]
- 3.4.1 Name this taxa [1]
- 3.4.2 Where would it be placed in the current taxonomic rank? [2]

QUESTION 4

- 4.1 Archaea are considered to have features in common with both eukaryotes and prokaryotes. What features are these? [4]
- 4.2 How many phyla of Archaea does Bergeys manual have? Name them. [3]
- 4.3 Which genus of Archaea grows in refuse piles at coal mines? [1]
- [8]

QUESTION 5

- 5.1 What does the “*D*” in *D. radiodurans* stand for? [1]
- 5.2 What phylum does the bacteria in 5.1 belong to? [1]
- 5.3 How does the bacteria mentioned in 5.1 survive high levels of radiation? [2]
- 5.4 Which is the largest and most diverse group of photosynthetic bacteria? [1]
- 5.5 Name three different structures that are involved in photosynthesis of the bacteria described in 5.4 [3]
- 5.6 Name two symbiotic relationships that the bacteria in 5.4 form [2]
- 5.7 The genus *Chlamydia* is known for very small or large gnomes? [1]
- 5.8 Name one pathogenic species of the *Chlamydia* [1]
- [12]

QUESTION 6

Name the 5 different groups of proteobacteria and give two examples of three of them. [10]

QUESTION 7

- 7.1 Which genera of *Mollicutes* is penicillin resistant? [1]
- 7.2 Name 2 species of *Clostridium* and what their importance is [4]
- 7.3 Which *Firmicute* made headlines in news across South Africa last year? What disease does this pathogen cause? [2]
- 7.4 Name 3 products that *Lactobacilli* are responsible for [3]
- [10]**

QUESTION 8

Write a paragraph describing the importance of *Actinobacteria*. Describe what habitat they are found in, their general characteristics and name one useful and one pathogenic species **[10]**

QUESTION 9

- 9.1.1 What is the name of the protein layer that protects a virus? [1]
- 9.1.2 Name a virus that has a helical capsid [1]
- 9.1.3 Name another shape of capsid [1]
- 9.2 How big are virions? [1]
- 9.3 Name four different types of virus DNA [4]
- 9.4 What is binal symmetry? [1]
- 9.5 What symptom do viruses cause on plants? [1]
- [10]**

QUESTION 10

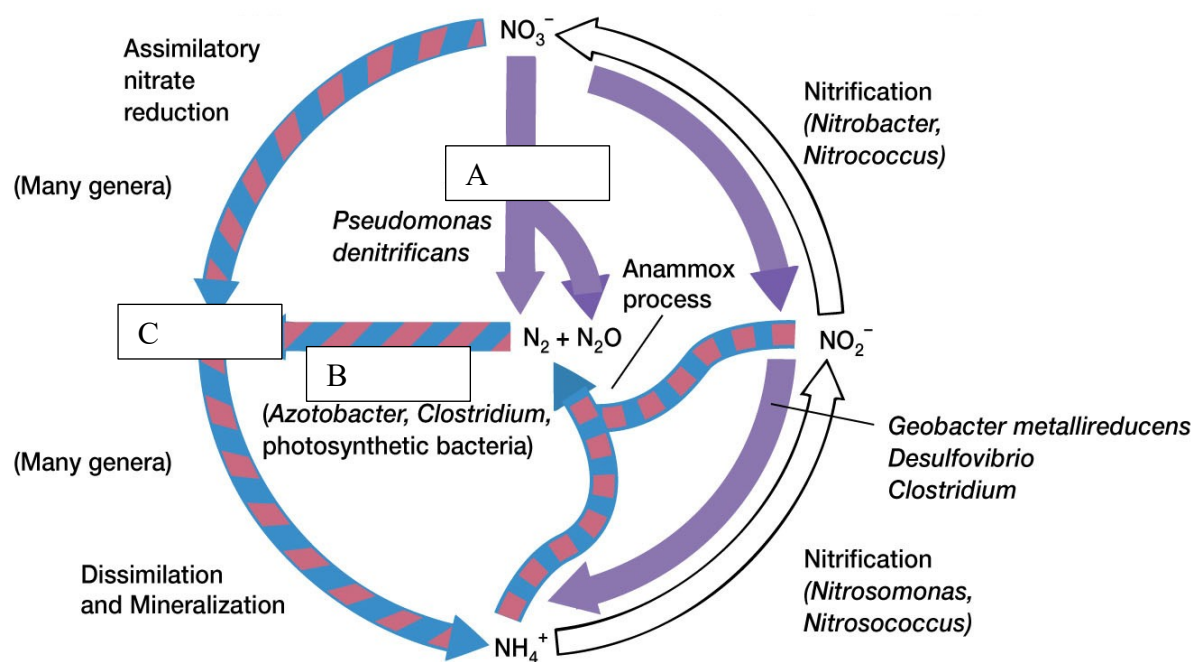
- 10.1 What is the difference between -static and -cidal? [2]
- 10.2 Name three conditions that influence the effectiveness of antimicrobial agent activity and how they influence it [6]
- 10.3 Name two methods of physical control of microorganisms [2]
- [10]**

QUESTION 11

11.1 What is a biofilm? [2]

11.2 Name 2 roles of organisms in ecosystems [2]

11.3 What do the labels A – C represent in the following diagram. Write the answers in your answer booklet.



11.4 Give two examples of predation [2]

11.5 Explain what genomic reduction is [2]

11.6 Name two factors that influence the degradation of organic matter [2]

11.7 What is mineralization? [2]

11.8 Name and describe two methods in which individual cells can be isolated [4]

[20]