



FIJI NATIONAL UNIVERSITY

COLLEGE OF ENGINEERING SCIENCE AND TECHNOLOGY

School of Electrical & Electronic Engineering

Certificate IV. Biomedical Engineering

BMT 442: Introduction to Human Biology and Infection Control

Final Examination: Quarter 03, 2019

Venue and Time as per Final examination Time-table

INSTRUCTIONS

Read the following instructions before writing:

1. Time Allowed: 2 hours with additional 10 minutes reading time.
2. All answers should be written in the Answer Booklet.
3. Write your ID Number on all the pages in your Answer Booklet and the additional sheets that you use.
4. Requirement: Score a minimum of 40% (20/50) to pass the course.
5. This is a closed book examination.

SECTIONS:	Marks:	Time Allocation:
A- (I) Multiple Choices (II) Matching	20 Marks	30 mins
B- Short Answers(All are Compulsory)	50 Marks	54 mins
Section C- Essays(Attempt any Two)	30 Marks	36 mins
Total	100 Marks	120 mins

SECTION A

PART I - MULTIPLE CHOICES

(15 MARKS)

Select the best option from the following below. Each question is worth 1 mark.

1. A scientific name includes information about
 - a. species and phylum
 - b. division and genus
 - c. genus and order
 - d. genus and species

2. The branch of biology concerned with animal behavior is
 - A. microbiology
 - B. zoology
 - C. botany
 - D. ethology

3. Single-celled organisms are also called
 - A. multicellular
 - B. bacteria
 - C. unicellular
 - D. viruses

4. A proposed solution or explanation of a scientific event in nature is called a
 - A. data
 - B. hypothesis
 - C. variable
 - D. theory

5. Short hair-like projections that produce movement in certain protists are
 - A. cilia
 - B. pseudopods
 - C. flagella
 - D. microtubules

6. A paramecium excretes excess water through the
- A. gullet
 - B. trichocysts
 - C. contractile vacuole
 - D. micronucleus
7. Red blood cell counts can be conducted using
- A. A hygrometer
 - B. A photometer
 - C. A haemocytometer
 - D. A sphygmomanometer
8. In the Gram staining technique, the counterstain
- A. Fixes the primary stain
 - B. Introduces the secondary stain
 - C. Stabilizes the Grams iodine
 - D. Fixes the Grams iodine
9. A salivary chromosome squash can be prepared by using
- A. An onion
 - B. A yoghurt
 - C. A blood sample
 - D. A fruit fly
10. Which two cell structures are common to both prokaryotic and eukaryotic cells?
- A. Nucleus and cytoplasm
 - B. Mitochondria and membranes
 - C. DNA and ribosomes
 - D. Chloroplasts and cellulose cell wall.
11. A prokaryote has
- A. a cell nucleus
 - B. a cell membrane
 - C. organelles
 - D. all of the above.

12. A cell membrane is composed of:

- A. lipids
- B. proteins
- C. nucleic acids
- D. lipids and proteins.

13. The function of the Golgi apparatus is to:

- A. synthesize proteins
- B. release energy
- C. process and package proteins
- D. synthesize lipids

14. Mitochondria:

- A. transport materials
- B. release energy
- C. makes proteins
- D. control cell division

15. The stomach is an example of:

- A. a tissue
- B. an organ
- C. an organ system
- D. none of the above

Part II – MATCHING:

(5MARKS)

Match the following by writing the letters of the best choice next to the numbers 1-5 in your answer booklet.

1. Aristotle	a. Specialized study of animal life and the relationship of animals to other living things
2. Paleontology	b. “Father of Biology”
3. Anton Van Leeuwenhoek	c. Study of life of past geological periods
4. Physiology	d. Study of structure of plants and animals tissues
5. Herpetology	e. “Father of Microbiology”
	f. Study of reptiles

SECTION B**SHORT ANSWER QUESTIONS****(50 MARKS)**

There are three (3) questions in this section. All questions are compulsory.

Question 1**(15 Marks)**

The kidney is one of the most important organs in the human body. This is because it facilitates the process of *homeostasis*.

(a) (i) Define the term homeostasis.

(1 mark)

(ii) Explain the role of the kidneys in homeostasis.

(3 marks)

(b) (i) Draw a labelled diagram of a nephron. Include blood vessels in your diagram.

(6 marks)

(ii) Describe the five importance(s) of the Skin.

(5 marks)

Question 2**(20 Marks)**

All animals have co-ordinated movements and have a certain type of circulatory system that enables them to survive on a daily basis.

a) State the different types of circulatory systems that animals possess.

(3 marks)

b) Briefly explain using appropriate examples, the differences between the systems in (a) above.

(6 marks)

c) (i) Draw and label the different parts of the human heart

(5 marks)

(ii) Briefly explain the functions of the cerebellum, cerebrum and the brain stem

(6 marks)

QUESTION 3:

(15 Marks)

- a) Compare and contrast between the mode of reproduction, feeding and locomotion between ciliates and sarcodines. (4 Marks)
- b) Describe with the use of examples the four main functions of the skin. (4 Marks)
- c) (i) Define the term *Trypanosomiasis*. (1 Mark)
- (ii) Discuss the African sleeping sickness and describe the process, vector organism and what happens to a person from infection to possible death. (6 Marks)

SECTION C

ESSAYS

(30 MARKS)

*Attempt any **TWO** questions from this section. These questions require detailed explanation, analysis and facts. Each question carries 15 marks with a total of 30 marks for this section.*

- Q1.** As a Biomedical Engineer, outline and explain how you would carry out the activities that would effectively control a certain viral infection in your community.
- Q2.** The heart is a vital organ to the body of any human being. Using appropriate examples and conditions, explain how the heart operates. This must include the various organs or other parts of the body that enables this organ to pump blood to the whole body.
- Q3.** Identifying and describing the different organs that plants and animal cells possess for their daily survival is essential when studying biology. Using appropriate examples compare and contrast the differences between plant and animal cells. This should include the different plant organs, their structures and function.
- Q4.** Using appropriate examples and illustrations describe the digestion process in humans, outlining the major organs, tissues and enzymes involved and their functions.

THE END