



**NAMIBIA UNIVERSITY  
OF SCIENCE AND TECHNOLOGY**

**FACULTY OF HEALTH AND APPLIED SCIENCES**

**DEPARTMENT OF NATURAL AND APPLIED SCIENCES**

<b>QUALIFICATION:</b> BACHELOR OF SCIENCE (MAJOR AND MINOR)	
<b>QUALIFICATION CODE:</b> 07BOSC	<b>LEVEL:</b> 5
<b>COURSE NAME:</b> GENERAL BIOLOGY 1A	<b>COURSE CODE:</b> GNB501S
<b>SESSION:</b> JUNE 2019	<b>PAPER:</b> THEORY
<b>DURATION:</b> 3 HOURS	<b>MARKS:</b> 100

<b>FIRST OPPORTUNITY EXAMINATION QUESTION PAPER</b>	
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<b>INSTRUCTIONS</b>
<ol style="list-style-type: none"><li>1. Write clearly and neatly</li><li>2. Number the answers clearly</li><li>3. All written work <b>MUST</b> be done in blue or black ink</li><li>4. No books, notes and other additional aids are allowed</li><li>5. Mark all answers clearly with their respective question numbers</li></ol>

**THIS QUESTION PAPER CONSISTS OF 7 PAGES**  
(Including this front page)

## QUESTION 1

### MULTIPLE CHOICE QUESTIONS

[10]

- 1.1 What is the correct scientific name for humans? (1)
- (a) *sapiens homo*
  - (b) *sapiens Homo*
  - (c) *homo sapiens*
  - (d) *Homo sapiens*
- 1.2 You are examining a cell from a crime scene using an electron microscope. It contains ribosomes, DNA, a plasma membrane, a cell wall, and mitochondria. What type of cell is it? (1)
- (a) Lung cell
  - (b) Plant cell
  - (c) Prokaryotic cell
  - (d) Cell from the surface of a human fingernail
- 1.3 Which of the following represents the application of the “scientific method”? (1)
- (a) Comparing one experimental subject to one control subject
  - (b) Believing an explanation that is too complex to be tested
  - (c) Using control experiments to test falsifiable hypotheses
  - (d) Developing one testable hypothesis to explain a natural phenomenon
- 1.4 In macromolecules, lipids that are liquid at room temperature: (1)
- (a) Are fats
  - (b) Contain more hydrogen atoms than lipids that are solids at room temperature.
  - (c) If polyunsaturated, contain several double bonds in their fatty acid chains.
  - (d) Lack glycerol.
- 1.5 RNA differs from DNA because; (1)
- (a) RNA may contain the pyrimidine uracil, and DNA does not.
  - (b) RNA is always single-stranded when functioning, and DNA is always double-stranded.
  - (c) RNA is more stable and is broken down by enzymes less easily than DNA.
  - (d) RNA is a much larger molecule than DNA.
- 1.6 An electron micrograph shows that a cell has extensive amount of rough ER throughout. One can deduce from this that the cell is; (1)
- (a) Synthesizing and metabolizing carbohydrates.
  - (b) Synthesizing and secreting proteins.
  - (c) Synthesizing ATP.
  - (d) Contracting.

1.7 In the Table below, assume that the setup was left unattended. Which of the following statements is *correct*? (1)

Selectively permeable membrane	
Inside a cell	Outside fluids
Solvent 96%	Solvent 97%
Solute 4%	Solute 3%

- (a) The retention of the cell to its environment is isotonic.
- (b) The cell is in a hypertonic environment.
- (c) The net flow of solvent is into the cell.
- (d) The cell will soon shrink.

1.8 Phagocytosis illustrate which phenomenon? (1)

- (a) Receptor- mediated endocytosis.
- (b) Bulk-phase endocytosis.
- (c) Exocytosis.
- (d) Pinocytosis.

1.9 Chiasmata; (1)

- (a) Form during metaphase II of meiosis.
- (b) Occur between two nonhomologous chromosomes.
- (c) Represent chromosomes independently assorting.
- (d) Are sites of DNA exchange between homologous chromatids.

1.10 Metaphase in mitosis is similar to what stage in meiosis? (1)

- (a) Prophase I
- (b) Prophase II
- (c) Metaphase I
- (d) Metaphase II

## **QUESTION 2**

FILL IN THE BLANK SPACES

[10]

- 2.1 The **hypothesis** of a scientific method must be \_\_\_\_\_ . (1)
- 2.2 \_\_\_\_\_ look like **stacks of flattened sacs** and have a **shipping** or \_\_\_\_\_ face and a receiving or \_\_\_\_\_ face. (3)
- 2.3 **Uncoiled chromosomes** are called \_\_\_\_\_ . (1)
- 2.4 The chlorophyll molecules at the reaction center of **photosystem I** absorb at a wavelength of \_\_\_\_\_ nm. (1)
- 2.5 **Water is split** during \_\_\_\_\_, while **NADPH is made** during \_\_\_\_\_ . (2)
- 2.6 The **ETC occurs** across the inner membrane of the \_\_\_\_\_ and produces \_\_\_\_\_ as an end product. (2)

## **QUESTION 3**

ONE WORD ANSWERS

[10]

- 3.1 Name the kingdom that belongs to the **domain archaea**. (1)
- 3.2 What did Hershey and Chase use in their **experiments to prove that DNA** was the cell's genetic material? (1)
- 3.3 What is the branch of science that deal with naming, describing and classifying organisms called? (1)
- 3.4 The approach that scientists employ to gather information is known as the \_\_\_\_\_. (1)
- 3.5 Who was the scientist that showed the amount of **4 nitrogen bases** present in **DNA**? (1)
- 3.6 Name the process in which water is removed when two monomers join to form a macromolecule. (1)
- 3.7 What are the lipids containing phosphorus in cell membranes called? (1)

3.8 The bond that occurs between the acid group of one amino acid and the amino group of another amino acid is termed? (1)

3.9 State the **purines**. (2)

**QUESTION 4**

DEFINE THE FOLLOWING TERMS: [10]

4.1 Control group (2)

4.2 Endosymbiosis (2)

4.3 Alcoholic fermentation (2)

4.4 Helicase (2)

4.5 Hypertonic (2)

**QUESTION 5**

DISTINGUISH BETWEEN THE FOLLOWING TERMS: [10]

5.1 Dependent variable; independent variable (2)

5.2 Domain; kingdom (2)

5.3 Osmosis; turgor pressure (2)

5.4 Decarboxylases; dehydrogenases (2)

5.5 Chromatid; centromere (2)

**QUESTION 6**

SHORT ANSWERS

[35]

6.1 Discuss the cell theory. (4)

6.2 In terms of safety, discuss what you would do **after using the microscope**. (3)

6.3 Distinguish between a monosaccharide, a disaccharide and a polysaccharide, giving an example of each. (6)

6.4 What are the **THREE (3)** most common lipids in living organisms? (3)

6.5 What gives the amino acids their individual properties? (1)

6.6 Name **THREE (3) steroids** found in organisms. (3)

6.7 Name the different stages in **aerobic respiration**. (2)

6.8 In a table, compare the DNA structure to that of RNA. (3)

6.9 What is the plasma membrane, and what are its main functions? (2)

6.10 Give the complementary sequence of the following DNA sequence, **GGCATAGGT**. (1)

6.12 An ancient cat has a homozygous dominant individual (AA) is crossed with an individual that is heterozygous for the same trait (Aa). What are the possible genotypes of the offspring, and what percentage of the offspring is likely to show the dominant phenotype? (2)

6.13 Mercy with blood group A and Brian with blood group B had three children, with blood groups O, A and B. Explain the pattern of inheritance by means of a genetic diagram. (5)

**QUESTION 7**

ESSAY QUESTION

[15]

(a) Define meiosis

(1)

(b) Discuss the **main stages** involved in it.

(14)

**END OF EXAM**