



**NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY**

FACULTY OF HEALTH, NATURAL RESOURCES AND APPLIED SCIENCES

DEPARTMENT OF NATURAL RESOURCE SCIENCES

| | |
|---|--|
| QUALIFICATION: BACHELOR OF NATURAL RESOURCE MANAGEMENT | |
| QUALIFICATION CODE: 07BNRS | LEVEL: 7 |
| COURSE CODE: BNS511S | COURSE NAME: Biology for Natural Sciences |
| SESSION: JUNE 2025 | PAPER: THEORY (PAPER 1) |
| DURATION: 3 HOURS | MARKS: 120 |

| | |
|---|------------------|
| FIRST OPPORTUNITY EXAMINATION QUESTION PAPER | |
| EXAMINER(S) | Mrs. G.L. THERON |
| MODERATOR: | Mr. H TJIKURUNDA |

| |
|--|
| INSTRUCTIONS |
| <ol style="list-style-type: none">1. Answer ALL the questions.2. Read all the questions carefully before answering.3. Number the answers clearly |

THIS QUESTION PAPER CONSISTS OF 5 PAGES (Including this front page)

QUESTION 1

[15]

Give the scientific term for each of the following:

- 1.1 What forms when multiple elements bond together during a chemical reaction?
- 1.2 The process whereby a solid turns directly into a gas.
- 1.3 The process used to separate blood cells from blood plasma.
- 1.4 The motile structure used by Trypanosoma.
- 1.5 The building blocks for proteins.
- 1.6 The vitamin known as the "Blood clotting" vitamin.
- 1.7 The opening (not the groove), where food enters the body of Paramecium.
- 1.8 The Phylum that Laminaria belongs to.
- 1.9 Gametes with the same shape and mobility but they differ in size.
- 1.10 A sperm-producing gametangium.
- 1.11 The science of describing, naming, and classifying living organisms.
- 1.12 An atom that has lost one or more electrons.
- 1.13 Archaeobacteria found in extreme salty conditions.
- 1.14 The granular cytoplasm of Amoeba, involved in forming the pseudopodia.
- 1.15 Non-motile spores that cannot move by themselves.

QUESTION 2

[10]

Explain the difference between the following pairs of terms.

- 2.1 Isomorphic and heteromorphic generations of algae.
- 2.2 Plasmogamy and Karyogamy
- 2.3 Isotopes and Ions
- 2.4 Lysosomes and Vacuoles
- 2.5 Coenocytic hyphae and Septate hyphae (fungi)

QUESTION 3

[15]

State whether each of the following statements is True OR False.

- 3.1 Solids have more intermolecular force than liquids.
- 3.2 The horizontal above-ground hyphae found in some fungi is known as a rhizome.
- 3.3 The tsetse fly is the causal agent of African sleeping sickness.
- 3.4 All Bacillariophyta are autotrophic.
- 3.5 Impurities raise the freezing point of a substance and lower its boiling point.
- 3.6 Water-soluble vitamins should be taken daily.
- 3.7 Foraminifera are responsible for Red Tide in Namibia.
- 3.8 The Golgi body is the organelle that directs traffic in the cell.
- 3.9 Members of the Phylum Deuteromycota reproduce asexually by conidia.
- 3.10 Yeast cells belong to the Deuteromycota and are used in the production of beer.
- 3.11 Sperm and egg cells are examples of anisogametes.
- 3.12 The firm, flexible body covering of Euglena is known as the pellicle.
- 3.13 Agar is a cell wall substance found in green algae and used to prepare growth media for the cultivation of bacteria.
- 3.14 The aerial hyphae found in Rhizopus are known as sporangiophores
- 3.15 The capsid of all viruses is surrounded by an envelope.

SUB – TOTAL (40)

QUESTION 4

[15]

- 4.1 For each of the following sentences, choose the correct term from the two options (underlined) given. Write down **ONLY the numbers 4.1.1 – 4.1.4** and the **correct term** next to each letter. Do NOT re-write the sentences. (4)
- 4.1.1 Polyunsaturated fats have multiple double bonds between multiple Oxygens/Carbons in the molecule.
- 4.1.2 Simple distillation/Fractional distillation should be used to extract salt from seawater.
- 4.1.3 A solution containing a lot of solute in a given amount of solvent is known as a concentrated/saturated solution.
- 4.1.4 When a banana ripens it is a chemical/physical change that is taking place.
- 4.2 In what way are elements in the same group on the periodic table similar? (3)
They have similar chemical properties, have the same number of valence electrons and will form the same kinds of ions.
- 4.3 Explain what “Bio-fertilisers” are and provide TWO examples. (2)
Organisms that enrich the nutrient quality of the soil. Ex. Bacteria, Fungi, Cyanobacteria.
- 4.4 Explain how we can use our faeces to improve our quality of life. (Biotechnology!) (4)
Bacteria that naturally occur in the faeces undergo anaerobic fermentation and then produce Methane gas. The gas can be used in gas stoves to cook our food, it can be used to produce light for our houses, or used in gas heaters to warm our houses during winter. (Only how it can be used to improve **our** quality of life!)
- 4.5 Explain why you find “holes” in your loaf of bread. (2)
The yeast in the dough produces carbon dioxide, which makes air pockets in the dough. The carbon dioxide later escapes from the dough – leaving only the holes behind.

QUESTION 5

[15]

- 5.1 Provide the correct term for each of the following statements: (4)
- 5.1.1 Viruses exist as infectious particles known as
- 5.1.2 Viruses that invade members of the Kingdom Eubacteria.
- 5.1.3 The group of archaeobacteria that live in the deep oceans.
- 5.1.4 The group of bacteria that feeds by obtaining food from dead organic matter.
- 5.2 Explain four (4) DIFFERENT ways how viruses can be transmitted from one host to another. (4)
- 5.3 Write a report on how bacteria improve/benefit **OUR lives**. (No ecological benefits!) (5)
- 5.4 Bacteria cannot survive in an environment with less than 15-20% moisture. Explain how we can use this to our advantage. (2)

QUESTION 6

[10]

- 6.1 Provide the correct term for each of the following. (4)
- 6.1.1 Motile organ(s) of *Amoeba*.
- 6.1.2 The infectious stage of members of the Phylum Apicomplexa.
- 6.1.3 The firm, flexible body covering of Euglena.
- 6.1.4 The vector for sleeping sickness.
- 6.2 Compare the “Plankton” Protoctista discussed in class. Re-draw and complete the following table. (6)

| Phylum | Cell-wall component | Unique characteristic |
|--------------|---------------------|-----------------------|
| | | 2 flagella |
| | Silica | |
| Foraminifera | | |

QUESTION 7

[10]

7.1 Distinguish between (Compare) Red Tide and Eutrophication. Re-draw and complete the following table. (4)

| | Red Tide | Eutrophication |
|--------------------|----------|----------------|
| Similar: Point 1 | | |
| Point 2 | | |
| Different: Point 1 | | |
| Point 2 | | |

7.2 Name the 3 cell-wall components found in seaweeds that we use to improve our daily lives. (3)

7.3 For the following sentences, choose the correct term from the two options (underlined) given. Write down **ONLY the numbers 7.3.1 – 7.3.3** and the **correct term** next to each letter. Do NOT re-write the sentences. (3)

In the life cycle of *Ulva* (Chlorophyta) one finds alternation of generations. The mature Sporophyte produces ... 7.3.1 haploid/diploid... spores. The spores germinate and grow into a ... 7.3.2... haploid/diploid Gametophyte. At maturity, the Gametophyte produces gametes by ... 7.3.3 ...meiosis/mitosis. The two gametes fuse to produce a zygote, which develops into a Sporophyte.

QUESTION 8

[15]

8.1 Re-draw and complete the following table to compare the fruiting structures of the Ascomycota and Basidiomycota. (3)

| | Ascomycota | Basidiomycota |
|------------------------------|------------|---------------|
| Name of fruiting body | | |
| Type of spores | | |
| Structure holding the spores | | |

8.2 Explain the difference between Plasmogamy and Karyogamy. (2)

8.3 Give the scientific term for each of the following: (4)

8.3.1 The haploid phase in the life cycle of organisms with alternation of generations.

8.3.2 A gametangium that produces sperm.

8.3.3 A gametangium that produces egg cells.

8.3.4 The structures of the Phaeophyta equivalent to the leaves of plants.

8.4 Re-draw and complete the following table to compare the different types of lichens found in the Namib desert. (6)

| Type of lichen (morphology) | Attached or unattached | Characteristic |
|-----------------------------|------------------------|-------------------------|
| | Attached | |
| | Attached | Raised, dried up leaves |
| | | Fern-like bushes |
| Vagrant | | Leaf-like, curled up |

QUESTION 9**[15]**

9.1 Fill in the blanks. [Write down **only** the LETTERS (a-d) and the ANSWER to each]. (2)

The Calvin Cycle takes place in the __ (a) __ of the chloroplast, where __ (b) __, __ (c) __, and __ (d) __ are used to produce glucose.

9.2 Complete the table below by filling in the missing information for the external factors affecting photosynthesis. [Write down **only** the LETTERS (a-d) and the ANSWER to each]. (4)

| Factor | Optimum condition or source | Effect if below and/or above optimum |
|-----------------|--------------------------------|--------------------------------------|
| Temperature | 10°C to 35°C | (a) |
| Carbon Dioxide | (b) | Seldom limiting; needs open stomata |
| Soil Water | Only 1% used in photosynthesis | (c) |
| Light Intensity | Optimum varies by plant | (d) |

9.3 Name the **FOUR (4)** stages of respiration and state where in the cell each stage takes place. (8)

9.4 Define the term transpiration. (1)

SUB – TOTAL (80)

TOTAL [120]