Tutorial Letter 001/0/2021

Natural Sciences and Technology for Classroom 1

NST1501

Year Module: 2021

Department of Science and Technology

IMPORTANT INFORMATION

Please register on myUNISA, activate your myLife e-mail account and make sure that you have regular access to the myUNISA module website, NST1501, as well as your group website.

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Dear Student

ASSESSMENT CHANGES for 2021 ACADEMIC YEAR

Due to the ministerial request to extend the 2021 registration dates, Unisa had to amend both the year module(s) and semester dates and the assessment arrangements for the 2021 academic year.

The purpose of this TL001 is to inform you of the new assessment requirements for module NST1501 for students registered during 2021 for the one semester period.

1.1 Assignment due dates

Assignment Number	Unique Number	Due Date
Assignment 01	770529	09 April 2021
Assignment 02	675867	11 June 2021

1.2 The Assignments

ASSIGNMENT O1
NST1501
UNIQUE NUMBER: 770529
DUE DATE: 09 APRIL 2021

QUESTION ONE

1.1. The three basic components of an atom are: (2)

A. protons, neutrons, and ions

B. protons, neutrons, and electrons

C. protons, neutrinos, and ions

D. protium, deuterium, and tritium

E. neutrinos, ions, and protons

1.2 An element is determined by the number of: (2)

A. atoms

B. electrons

C. neutrons

D. protons

E. ions

1.3 The nucleus of an atom consists of: (2)

A. electrons

B. neutrons

C. protons and neutrons

D. protons, neutrons, and electrons

E. neutrinos, ions, and protons

1.4 A single proton has what electrical charge? (2)

A. no charge
B. positive charge
C. negative charge
D. either a positive or negative charge
E. both negatively and positively charged

1.5 Which particles have approximately the same size and mass as each other? (2)

A. neutrons and electrons
B. electrons and protons
C. protons and neutrons
D. none - all are different in terms of size and mass
E. electrons, protons, and ions

1.6 Which two particles would be attracted to each other? (2)

A. electrons and neutrons
B. electrons and protons
C. protons and neutrons
D. all particles are attracted to each other
E. protons and ions

1.7 The atomic number of an atom is: (2)

A. the number of electrons
B. the number of neutrons
C. the number of protons
D. the number of protons plus the number of neutrons
E. the number of neutrons, electrons, and ions.

1.8 Changing the number of neutrons of an atom changes its: (2)

A. isotope

B. element

C. ion

D. charge

E. proton

1.9 When you change the number of electrons on an atom, you produce a different: (2)

A. isotope

B. element

C. ion

D. atomic mass

E. neutron

1.10 According to atomic theory, electrons are usually found: (2)

A. in the atomic nucleus

B. outside the nucleus, yet very near it because they are attracted to protons

C. outside the nucleus- most of an atom's volume is the electron cloud

D. anywhere they want to be -no particular location is more likely than any other

E. around the atomic nucleus

1.11 What reactants are needed for cellular respiration. (2)

A. glucose and carbon dioxide

B. glucose and oxygen

C. carbon dioxide and oxygen

D. oxygen and lactic acid

E. carbon dioxide and lactic acid

1.12 **Which of the following is the correct sequence of events during cellular respiration?** **(2)**

A. glycolysis → fermentation → Krebs cycle

B. Krebs cycle → Electron Transport → glycolysis

C. glycolysis → Krebs cycle → Electron Transport

D. Electron Transport → Krebs cycle → glycolysis

E. fermentation → Krebs cycle → Electron Transport

1.13 **What happens during the Krebs cycle?** **(2)**

A. H^+ ions and oxygen form water.

B. Lactic acid is formed using fermentation.

C. A glucose molecule is broken down into 2 pyruvic acid molecules.

D. H^+ ions build up on one side the mitochondrial membrane.

E. Pyruvic acid is broken down in a series of steps into CO_2

1.14 **What happens during glycolysis?** **(2)**

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1.15 **What substance produced by alcoholic fermentation makes bread rise?** **(2)**

A. oxygen

B. lactic acid

C. CO_2

D. water

E. alcohol

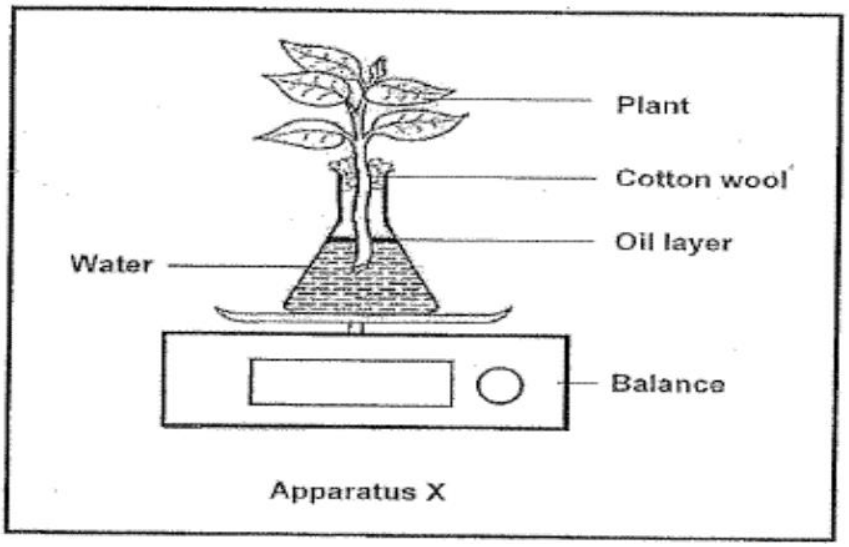
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QUESTION TWO

2.1 Discuss the process of the scientific method and clarify what is meant by the science process skills. (5)

2.2 An investigation was carried out to study the effect of light intensity on the opening and closing of the stomata.

- Apparatus X (shown in the diagram below) was used to measure the rate of water loss from the leaves at several light intensities.
- At each light intensity, the apparatus was left for 15 minutes before starting measurements.
- The water loss was recorded in the dark and at four different light intensities.



Apparatus X

The results of this investigation are shown in the table below.

Light intensity (kilolux)	Loss of water (g/hour)
0	1
10	15
20	20
30	22
40	20

2.2.1 State the dependant variable in the above investigation. (1)

2.2.2 Which evidence supports the statement that the stomata are fully open at a light intensity of 30 kilolux? (1)

2.2.3 What is the purpose of the oil layer over the water surface in the flask? (1)

2.2.4 Why is the apparatus left for 15 minutes at each new light intensity before starting the measurements. (1)

2.2.5 Predict how the results would be influenced by a lower temperature. (1)

2.3 A survey was carried out a local school. The findings of the survey detailing the nutritional content of the learners' breakfasts and the learners' concentration spans are given in the table below.

LEARNER NAME	CONCENTRATION SPAN	PROTEIN %	CARBOHYDRATES %	SUGAR %
Jamie	1 hour	15	20	65
Sipho	3 hours	75	20	5
Stefan	30 minutes	5	30	65
Thembi	2 1/2hours	40	40	20
Benny	4 hours	85	15	0

2.3.1 Provide a hypothesis for the above investigation. (2)

2.3.2 What advice would you give to Jamie in order to improve his concentration span at school? (2)

2.3.3 State THREE planning steps for this investigation. (3)

2.4 Discuss the special case of water in terms of its structure and properties. (10)

2.5 Tabulate TWO differences between Ionic bonds and Covalent bonds. (5)

2.6 Define the following terms:

2.6.1 Atom (2)

2.6.2 Chemical bond (2)

2.6.3 Covalent bond (2)

2.6.4 Element (2)

2.6.5 Compound (2)

QUESTION THREE

3.1 Choose the correct statement-WRITE ONLY THE LETTER *e.g. 3.1.6 A*

3.1.1 With respect to unicellular organisms: (2)

a. in unicellular organisms, tissues work in co-ordination to perform different functions.

b. unicellular organisms do not require food.

c. unicellular organisms respire and reproduce.

d. all unicellular organisms move by cilia.

3.1.2 Majority of cells cannot be seen directly with our naked eyes because: (2)

a. organisms are generally unicellular

b. cells are microscopic

c. cells are present only inside the body

d. cells are grouped into tissues

3.1.3 Read the different combinations of terms given below and answer the question below: (2)

a. cell wall, cell membrane, nucleus, plastid

b. cell wall, nucleus, ribosome, chromosome

c. cell membrane, mitochondria, ribosome, chromosome

d. cell membrane, ribosome, mitochondria, chloroplast.

The correct combination of terms with reference to an animal cell is _____.

3.1.4 Which one of the following term is not a part of the nucleus? (2)

a. ribosome

b. chromosome

c. nucleolus

d. gene

3.1.5 A suitable term for the various components of cells is: (2)

a. tissue

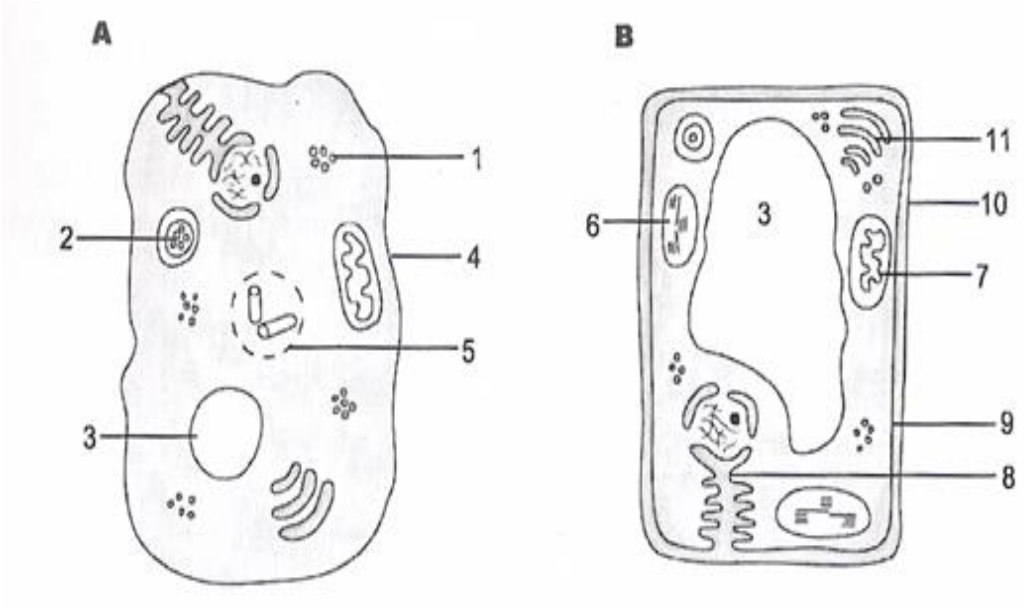
b. chromosomes

c. cell organelles

d. genes

QUESTION FOUR

4.1 Study the following diagrams of cells and answer the questions that follow.



4.1.1 Which diagram, A or B represents the plant cell? (2)

4.1.2 Tabulate two visible differences between cell A and B. (4)

4.1.3 Structure 3 plays an important role in cell B. List TWO functions of this structure. (2)

4.1.4 Name the organic substance that part 10 in cell B mainly consists of. (1)

4.1.5 State and explain the transport mechanisms across the cell membrane (5)

4.1.6 Justify why the cell is the basic unit of life? (2)

4.1.7 What is the difference between prokaryotic cells and eukaryotic cells? (2)

TOTAL: 100

ASSIGNMENT O2

NST1501

UNIQUE NUMBER: 675867

DUE DATE: 11 JUNE 2021

QUESTION ONE

1.1	Describe the characteristics of Kingdom Protista, Plantae, Fungi and Animalia	(20)
1.2	Discuss the Domains of Life: Bacteria and Archaea.	(20)

QUESTION TWO

2.1	Define vascular and non-vascular plants	(3)
2.2	Describe the function of vascular tissues.	(3)
2.3	Describe the life cycle of plants.	(6)

QUESTION THREE

3.1	Critically describe the relationship between cells, tissues, organs and organ systems	(20)
3.2	Define the different types of tissues	(8)
3.3	Describe the different organ systems	(40)

QUESTION FOUR

4.1	Discuss the mechanisms of evolution	(12)
4.2	Explain the evidence of evolution	(8)
4.3	Discuss human evolution	(10)

TOTAL: 150

1.4 The examination

An examination will be scheduled for this module and the length of the examination is **2 hours**. This module is a year module in 2021. This means that you will write the examination in October/November 2021. During the year, the Examination Section will provide you with information regarding the examination in general, examination venues, examination dates and examination times.

Refer to my *Studies @ Unisa* brochure for general examination guidelines and examination preparation guidelines.

In order to gain admission to the examination, you must **complete** Assignment **01**.

Your tutorial letter, assignments, activities, reading, and study notes form an important part of your preparation for the examination. **Please ensure that you master all the outcomes listed tutorial letter 101.**

For all other information regarding module NST1501, you should still refer to **Tutorial letter 101.**

Regards,

Ms. K. Masikane