



**NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY**

FACULTY OF HEALTH AND APPLIED SCIENCES

DEPARTMENT OF NATURAL AND APPLIED SCIENCES

QUALIFICATION: VARIOUS	
QUALIFICATION CODE: VARIOUS	LEVEL: 4
COURSE NAME: BASIC SCIENCE	COURSE CODE: BSC410S
SESSION: NOVEMBER 2019	PAPER: THEORY
DURATION: 3 HOURS	MARKS: 100

FIRST OPPORTUNITY EXAMINATION PAPER	
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MODERATOR:	PROF HABAUKA KWAAMBWA

INSTRUCTIONS	
1.	Write all your answers in the answer booklet provided, using black/blue ink pen only.
2.	Read the whole question before answering.
3.	Begin each question on a new page.
4.	The Periodic Table is attached at the back of this question paper.

PERMISSIBLE MATERIALS

1. Examination script
2. Scientific Calculator

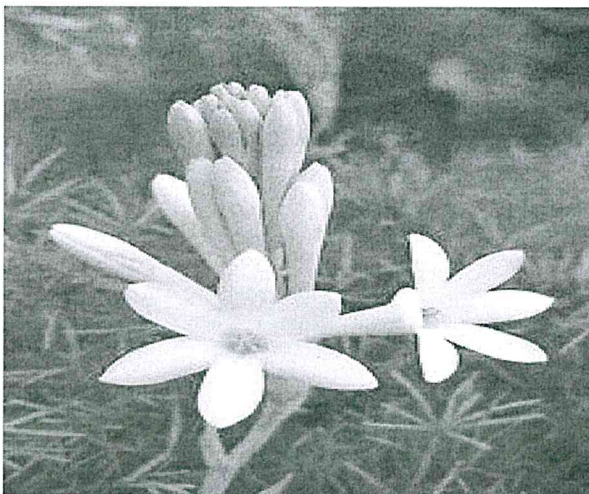
**THIS QUESTION PAPER CONSISTS OF 11 PAGES
(INCLUDING THIS FRONT PAGE AND PERIODIC TABLE)**

QUESTION 1

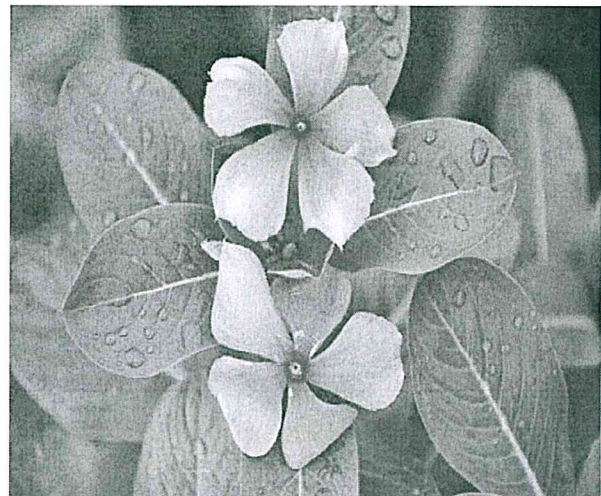
[20]

Question Type: Multiple Choice. Each correct answer carries 2 marks.

- 1.1 The main difference between a dead and a non-living thing is that _____. (2)
- A. A dead thing once possessed all the characteristics of living organisms while a non-living thing does not possess all the 7 characteristics
 - B. There is NO significant difference between the two, hence they are the same
 - C. A dead thing has more of the 7 characteristics of the living things than the non-living thing
 - D. A dead thing was never living while non-living stopped being alive
- 1.2 Fungi and Plants are classified in different kingdoms because _____. (2)
- A. Fungi have a cell wall and plants don't have a cell wall.
 - B. Fungi reproduce asexually and all plants reproduce sexually.
 - C. Fungi have chitin in their cell wall and lack chlorophyll, while plants have cellulose in their cell walls and have chlorophyll.
 - D. Fungi are prokaryotic while plants are eukaryotic
- 1.3 Algae are plant-like Protista because _____. (2)
- A. Algae are multicellular like plants
 - B. Algae have eukaryotic bound like plants
 - C. Algae live in damp places like all plants
 - D. Algae are photosynthetic like plants, hence they make their own food like plants
- 1.4 Which is the correct classification of the flowers (a) and (b) below? (2)



(a) Tuberose (*Polianthes tuberosa*)



(b) Periwinkle (*Catharanthus roseus*)

- A. Both flower (a) Tuberose and flower (b) Periwinkle are Dicotyledons
- B. Flower (a) Tuberose is a monocot while flower (b) Periwinkle is a dicot.
- C. Flower (b) Periwinkle is a monocot while flower (a) Tuberose is a dicot
- D. Flower (a) Tuberose is a gymnosperm while flower (b) is an angiosperm

1.6 Abiotic factors are elements that compose a given environment such as (2)

- A. light, temperature, minerals, water
- B. gases, atmospheric pressure, rocks, fungi
- C. water, sunlight, microorganisms, minerals
- D. soil, gases, animals, light

1.7. In symbiotic relationships, parasitism refers to _____. (2)

- A. Two species interacting with each other and both are organisms.
- B. Two species interacting with each other and both species benefit.
- C. Two species interacting with each other , one specie benefits and the other is unaffected.
- D. Two species interacting with each other, one species benefits and host species is harmed.

1.8. Which of the following pairs is an example of globular proteins? (2)

- A. Haemoglobin and Insulin
- B. Antibodies and Fibrin
- C. Lactose and Sucrose
- D. Fibrin and Collagen

1.9 Goitre and Anaemia are conditions caused by a deficiency of _____. (2)

- A. Iodine and Calcium
- B. Vitamin C and Iron
- C. Iodine and Iron
- D. Calcium and Vitamin D

1.10 The role of fermentation during yoghurt production is _____. (2)

- A. To convert glucose into ethanol and carbon dioxide
- B. To convert lactose into lactic acid to coagulate the milk protein
- C. To preserve the milk for spoiling
- D. None of the above statements

QUESTION 2

[15]

Question Type: Structured questions

2.1 State and describe the features that aid microorganisms such as bacteria to exhibit movement as a characteristics of living organisms. (2)

2.2 Study Diagram 1 below on the food chain to answer the questions that follow.

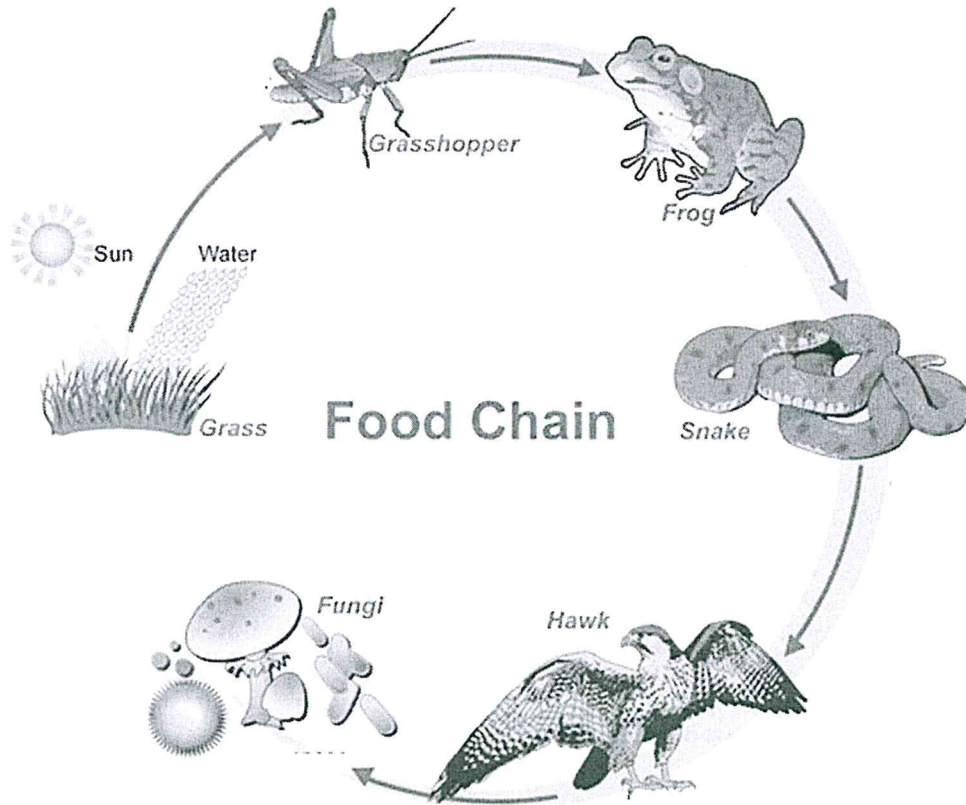


Diagram 1: Food Chain

2.2.1 Which organism is the following, a

- (a) Producer? (1)
- (b) Secondary consumer? (1)
- (c) Herbivore? (1)

2.2.2 Discuss briefly why the grass and fungi are indispensable to the smooth functioning of this food chain in the ecosystem. (2)

2.3 State two effects of a diet that is lacking proteins (2)

2.4 Discuss the role of homogenisation and pasteurisation during the production of yoghurt . (4)

2.5 Briefly discuss why fermentation is important in the production of bread (bread baking)? (2)

SECTION B: CHEMISTRY [35]

QUESTION 3: [20]

Question Type: Multiple Choice. Choose and write a letter corresponding to the correct answer. Each correct answer carries **2 marks**.

3.1 The two physical quantities that define any sample of matter are: (2)

- A. weight and energy
- B. mass and area
- C. mass and volume
- D. weight and volume

3.2 In terms of Kinetic Theory of matter, which of the following statement is true? (2)

- A. The intermolecular spaces increase and the intermolecular forces decrease when the temperature is increased.
- B. The intermolecular spaces decrease and the intermolecular forces increase when the temperature is increased.
- C. The intermolecular spaces increase and the intermolecular forces decrease when the temperature is decreased.
- D. The intermolecular spaces decrease and the intermolecular forces decrease when the temperature is increased.

3.3 The process of condensation is classified as an _____ process and involves the _____ in energy of the particles which make up the sample of matter. (2)

- A. Endothermic and increase
- B. Exothermic and increase
- C. Endothermic and decrease
- D. Exothermic and decrease

3.4 The identity of an element on the Periodic Table is determined by the: (2)

- A. Number of electrons in the shell
- B. Number of protons and neutrons in the nucleus
- C. Number of protons in the nucleus only
- D. Number of protons, neutrons and electrons

- 3.5 The variety of steels which are produced commercially are obtained by the mixture of the following two elements: (2)
- A. Iron and Chromium
 - B. Iron and Carbon
 - C. Iron and Nickel
 - D. All of the above
- 3.6 Which of the following statements is true about elements on the Period Table? (2)
- A. Elements in the same period have the same number of shells around the nucleus.
 - B. Elements in the same group have the same number of valence electrons and have similar chemical properties.
 - C. Elements in the same period have the same number of shells around the nucleus and have different physical properties.
 - D. All of the above is correct
- 3.7 The products formed when an acid and a metal react are: (2)
- A. Salt and Water
 - B. Salt and Hydrogen
 - C. Salt, Hydrogen and Water
 - D. Salt, Carbon dioxide and Water
- 3.8 The common name for the salt sodium hydrogen carbonate is; (2)
- A. Caustic soda
 - B. Washing Soda
 - C. Baking Soda
 - D. Antacid
- 3.9 The ability of a measurement to be as close to the true value as possible is defined as: (2)
- A. accuracy
 - B. precision
 - C. significant figure
 - D. all of the above
- 3.10 If the temperature of a freezer is equal to -55.22°F , what would the temperature of a freezer be in $^{\circ}\text{C}$? (2)
- A. -4.84°C
 - B. -48.46°C
 - C. 12.90°C
 - D. None of the above

QUESTION 4

[15]

Question Types: Brief statement responses.

4.1 Provide definitions for the following terms: (4)

- a. Heterogeneous mixture
- b. Qualitative measurement
- c. Ions
- d. Amphoteric substance

4.2 Distinguish between a **dilute solution** and a **saturated solution**. Name a suitable **physical separation technique** that can be used to separate a solution of two miscible liquids with different boiling points. (3)

4.3 Carry out the following calculations and record the answer to the correct number of significant figures:

a. $2.860 - 1.040$ (1)

b. $820 / 3.6$ (1)

c. $(5.650 \times 10^{-4} / 2.55 \times 10^{-4}) \times 2.25 \times 10^4$ (2)

4.4 What is meant by a corrosion reaction and state one method of preventing such a reaction from taking place? (2)

4.5 List **two uses** for sulphuric acid. (2)

QUESTION 5

[15]

Question Type: Multiple Choice. Each question has **2 marks**.

- 5.1 _____ must be drawn with reference to 360° ? (2)
- A. Histogram
 - B. Pie Chart
 - C. Line graph
 - D. Smooth curved line
- 5.2 The process by which the nuclei of a nuclide emit α , β or γ ray is known as (2)
- A. Transmutation
 - B. Radioactive Decay
 - C. Isotopes
 - D. Nucleons
- 5.3 The dependent and independent variables are being plotted on _____ and _____, respectively. (2)
- A. Horizontal and vertical axis
 - B. Vertical and y axis
 - C. Vertical and horizontal
 - D. None of the above
- 5.4 An interval on a graph is defined as _____. (2)
- A. The amount between one value and the next.
 - B. The size of a graph
 - C. The speed-time values on the bar graph
 - D. The minimum and maximum value
- 5.5 Isotopes are defined as atoms with identical _____ numbers but different _____ numbers (2)
- A. mass and atomic
 - B. atomic and mass
 - C. mass and proton
 - D. protons and electrons

5.6 The ability or capacity to do work is known as _____ . (2)

- A. Energy
- B. Power
- C. Work
- D. Newton

5.7 Which decay process is shown in figure 1.1 below? (2)

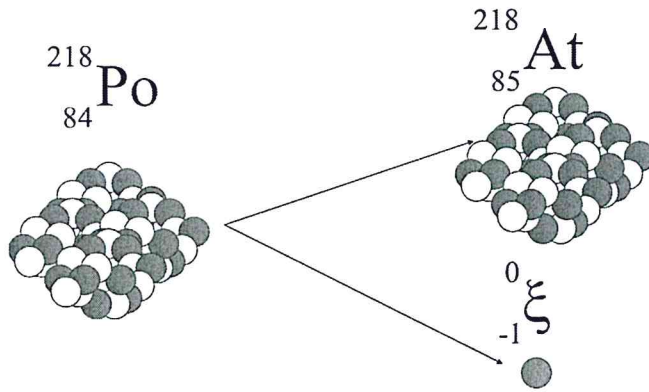


Figure 1.1

- A. Alpha decay
- B. Beta decay
- C. Gamma rays
- D. None of these

5.8 A car of mass 100 kg can produce an acceleration of 8 m/s^2 . Calculate the force produced by the engine, ignoring friction (2)

- A. 8000 N
- B. 800 N
- C. 10000 N
- D. 100000 N

5.9 The following are examples of renewable energy except _____ . (2)

- A. Wind energy
- B. Geothermal
- C. Nuclear energy
- D. Biofuels

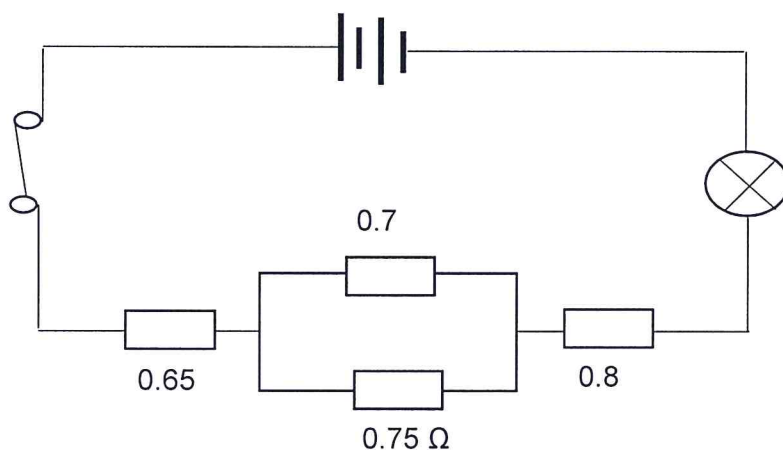
- 5.10 What does hydroelectric energy use to turn turbines? (2)
- A. Fossil fuel
 - B. Heat
 - C. Water
 - D. Steam

QUESTION 6 [10]

Question Type: Structured questions.

- 6.1 Define Electric Current (2)

- 6.2 What is the total resistance of the circuit in the figure below? (3)



- 6.3 State Isaac Newton's first law of motion. (2)

- 6.4 What are the applications of radioactive isotopes in our daily life? (3)

END OF EXAM

