

FACULTY	EDUCATION & HUMAN SCIENCES		
DEPARTMENT	INTERMEDIATE & VOCATIONAL EDUCATION		
SCHOOL	SCHOOL OF EDUCATION		
SUBJECT	NATURAL SCIENCE & HEALTH EDUCATION 1A		
SUBJECT CODE	E3511IN		
DATE	JUNE 2026		
DURATION	3 HOURS	MARKS	100

FIRST OPPORTUNITY EXAMINATION

EXAMINER: MS. N. HOEPFNER

MODERATOR: DR. L. KAMBEYO

This question paper consists of 13 pages including this cover page

INSTRUCTIONS

1. Answer all questions.
2. Provide an example and/or sketch wherever applicable.
3. **Calculators may be used, but under NO circumstances being shared.**
4. Write neatly and legibly.
5. Answer on the spaces provided on question paper.

UNIVERSITY OF NAMIBIA EXAMINATIONS

Question 1

/20/

Cross out the letter representing the correct answer.

1. According to microscopic skills to focus a specimen, it is best to start with which objective lens?
 - A. Low power lens
 - B. High power lens
 - C. Scanning lens
 - D. Ocular lens

2. During which stage of the life cycle of an insect, an organism does not eat at all.
 - A. Egg stage
 - B. Larva stage
 - C. Pupa stage
 - D. Adult stage

3. From the following list, choose the correct pathway in which light passes through a light microscope?
 - A. Mirror-eyepiece-objective lens- slide
 - B. Slide-eyepiece-objective lens- mirror
 - C. Mirror-objective lens-eyepiece- slide
 - D. Mirror-slide-objective lens-eyepiece

4. If carrots are eaten daily, then there will be an improvement in vision. Based on this hypothesis, what is the independent variable?
 - A. improvement in vision
 - B. carrots eaten
 - C. people wearing glasses
 - D. preparation of carrots

5. Which of the following breakdown macromolecules such as nucleic acids, proteins and polysaccharides in the cell?
 - A. Ribosomes
 - B. Lysosomes
 - C. Vacuoles
 - D. Cytoplasm

6. Which of the following organisms can be found in extreme saline conditions?
- A. Eubacteria
 - B. Archaeobacteria
 - C. Cyanobacteria
 - D. Protists
7. What characteristics account for the movement of water up xylem vessels in a plant?
- A. Water is a universal solvent.
 - B. Cohesion.
 - C. Adhesion.
 - D. Choice B and C.
8. If the diploid number of a flowering plant is 36. What would be the chromosome number in its endosperm?
- A. 18
 - B. 36
 - C. 54
 - D. 46.
9. A unique trait that is used to construct a cladogram showing evolutionary relationships between organisms is called a _____
- A. taxon
 - B. molecular clocks
 - C. derived character
 - D. domains
10. Similar structures in different organisms, inherited from a common ancestor, are said to be:
- A. homologous
 - B. analogous
 - C. vestigious
 - D. anchestors
11. Which is the correct order for the five levels of organization in the human body, from **most to least complex**?
- A. Cell, tissue, organ, organ system, organism
 - B. Organism, organ, organ system, tissue, cell
 - C. Organism, cell, tissue, organ, organ system
 - D. Organism. Organ system, organ, tissue, cell

12. Which kingdom includes only multicellular heterotrophs?
- A. Protista
 - B. Animals
 - C. Plantae
 - D. Archaeobacteria
13. Which plasma membrane component can be either found on its surface or embedded in the membrane structure?
- A. Carbohydrates
 - B. Cholesterol
 - C. Glycolipid
 - D. Protein
14. Meiosis in the fern life cycle occurs in which structure to produce spores?
- A. Gametophyte
 - B. Sporangium
 - C. Archegonium
 - D. Prothallus
15. Which of the following would be found in an animal cell undergoing mitosis but not in a plant cell undergoing mitosis?
- A. Chromosome
 - B. Centriole
 - C. Spindle
 - D. Chromatid
16. Eutrophication is caused by:
- A. Low dissolved oxygen
 - B. Excess nutrients (nitrogen/phosphorus)
 - C. Heavy metals
 - D. Radioactive waste
17. Choose the correct option showing the correct sequence of processes involved in the water cycle:
- A. Evaporation, Transpiration, Condensation, Precipitation
 - B. Condensation, Evaporation, Transpiration, Precipitation
 - C. Precipitation, Evaporation, Transpiration, Condensation
 - D. Transpiration, Condensation, Evaporation, Precipitation

Question 2

[11]

2.1 Kariakurama kept track of his marks scored for his Natural Science tests.

Below is a list of his most recent test scores.

Test 1 - 81%; Test 2 - 95% ; Test 3 - 88% ; Test 4 - 81%

(a) Calculate the mean, mode, and range of Mario's test scores. (3)

(b) Mario wants to convince his parents that he is a math superstar. Which measure should Mario use?
Motivate your answer. (2)

2.2 Identify the dependent and independent variables in the following cases:

(a) People who smoke cigarettes have a higher incidence of lung cancer.

Independent variable: _____ Dependent variable: _____ (2)

(b) Explain your answers in (a) above. (2)

2.5 Write a hypothesis for the question: "Does fertilizer make plants grow taller?" (2)

Question 3

[10]

3.1 The figure below shows a photograph of an ant.



- (a) Label the following parts on your drawing: head; jointed hind leg; thorax; antenna; abdomen (3)
- (b) The size of an adult ant from head to the end of the abdomen is 5 cm.
Measure the length of the ant in the drawing and determine the magnification of this drawing.
Show your working (2)

3.2 List 5 properties of life.

(5)

Question 4

[9]

4.1 Figure 4.1 shows the drawing of a root hair cell and Figure 4.2 shows a drawing of a palisade cell inside a leaf.

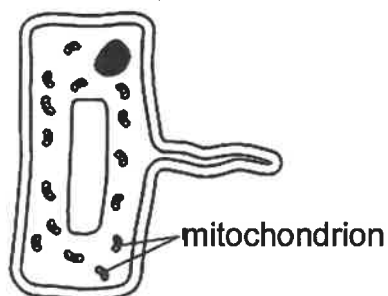


Fig. 4.1

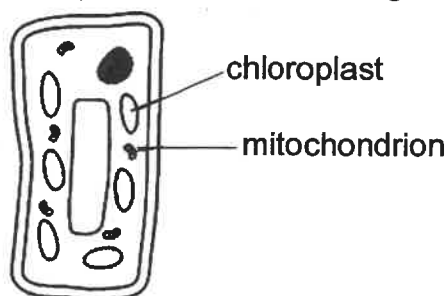
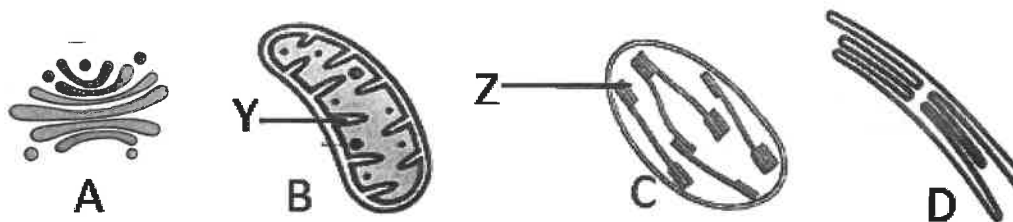


Fig. 4.2

Explain the reasons for the difference in the numbers of mitochondria and chloroplasts between the root hair cell and the palisade cell.

(4)

4.2 Study the organelles in the figure below and then answer the following questions:



a) Name the organelles A and D

(2)

A - _____

D - _____

b) Name the structures labeled Y and Z in organelles B and C

(2)

Y - _____ Z - _____

c) In what way are organelles A, B and C similar?

(1)

Question 5

[12]

5.1 Shortly explain how the fertilization process in the phylum Angiospermae will be different from the same process in all other plant groups.

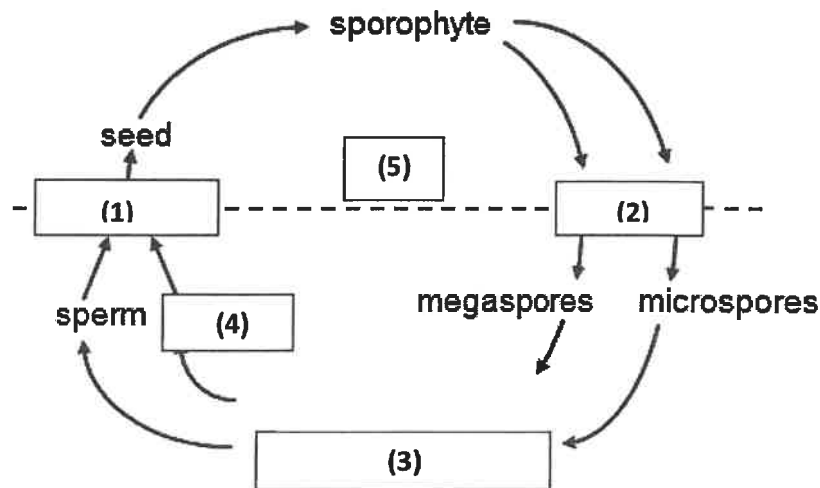
(2)

5.2(a) Give an example of a naked-seed plant

(1)

(b) Study the diagram below, indicating the life cycle of this seed plant, and complete the questions that follow:

(4)



(i) Name the processes taking place at no. (1) and (2)

(2)

1 - _____ 2 - _____

(ii) Identify the structures in the life cycle numbered (3) and (4)

(2)

3 - _____ 4 - _____

(iii) What will the chromosome number be for cells found at stage (5) of the life cycle?

(1)

Question 6

[7]

6.1 The following images (A and B) are examples of insects with different types of metamorphosis throughout their life cycles.



Identify the different types of metamorphosis in each insect, and shortly differentiate between the different processes.

(4)

6.2 Regarding the metamorphosis of the fish, define the following terms:

(a) Fry: _____

(b) Spawning: _____

(c) External fertilization: _____ (3)

Question 7

[12]

7.1 Distinguish between the following two processes taking place in the bodies of living organisms, and give an example of each:

(a) Anabolism: _____ (2)

(b) Catabolism: _____ (2)

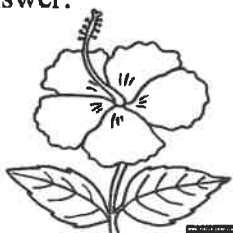
7.2 Define the following concepts regarding the levels of Biological organisation and give an example of each: (4)

(a) Biosphere: _____

(b) Ecosystem: _____

7.3 Identify the level of biological organisation illustrated by each of the following pictures and explain your answer:

(a)



_____ (2)

(b)



_____ (2)

Question 8 [9]

8.1 Name the three domains of life and distinguish them based on the organisms they contain. (6)

8.4 Use the dichotomous key given to identify the five leaves below:



Dichotomous key:

- 1(a) Leaf is oval shaped _____ Go to 2
(b) Leaf is star shaped _____ Go to 3
- 2(a) Leaf is shorter and wide _____ Go to 4
(b) Leaf is longer and narrow _____ Hickory
- 3(a) Leaf has smooth edges _____ Sweetgum
(b) Leaf has jagged edges _____ Sugar Maple
- 4(a) Leaf has 4 veins on each side _____ Birch
(b) Leaf has 5 veins on each side _____ Beech

Names of leaves:

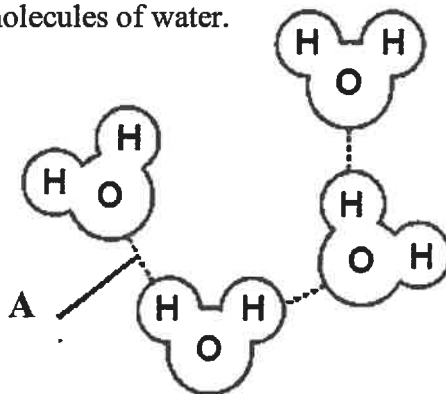
- A - _____
B - _____
C - _____
D - _____
E - _____

(3)

Question 9

[10]

9.1 The diagram below shows four molecules of water.



(a) Name the type of bond labelled A on the diagram. _____ (1)

(b) Explain why water molecules are described as bipolar. (2)

(c) One of the properties of water is that it has a high specific heat capacity.

(i) Define the term '*High specific heat capacity*'. (2)

(ii) Explain why this property is important for humans as well as organisms that live in water. (3)

(d) Explain why water can be described as a '*universal solvent*'. (2)
