LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF
EDUCATION

NATIONAL

SENIOR CERTIFICATE

GRADE 10



LIFE SCIENCES

MID YEAR EXAMINATION

20 JUNE 2025

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Marks: 150

Time: 2½hours

This question paper consists of 15 pages

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INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. Answer ALL the questions.
2. Write ALL the answers in the ANSWER BOOK.
3. Start the answers to each question at the top of a NEW page.
4. Number the answers correctly according to the numbering system used in this question paper.
5. Present your answers according to the instructions of each question.
6. ALL drawings should be done in pencil and labelled in blue or black ink.
7. Draw diagrams or flow charts only when asked to do so.
8. The diagrams in this question paper are NOT necessarily drawn to scale.
9. Do NOT use graph paper.
10. You must use a non-programmable calculator, protractor and a compass.
11. Write neatly and legibly.



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SECTION A

QUESTION 1

1.1 Various options are provided as possible answers to the following questions. Choose the correct answer and write only the letter (A-D) next to the question number (1.1.1 to 1.1.10) in the ANSWER BOOK, for example, 1.1.11 B

1.1.1 Which ONE of the following compounds is normally found in the cell wall of a plant cell?

A Fat

B Cellulose

C Glucose

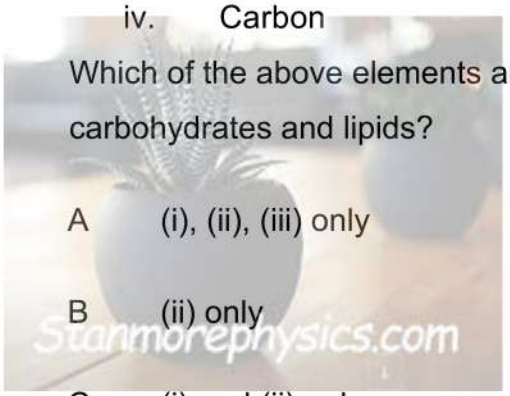
D Amino Acid



1.1.2 The following elements are found in some organic compounds:

i. Hydrogen
ii. Nitrogen
iii. Oxygen
iv. Carbon

Which of the above elements are found in proteins but not in carbohydrates and lipids?



A (i), (ii), (iii) only

B (ii) only

C (i) and (ii) only

D (iii) only

1.1.3 The building blocks of proteins are…

A Disaccharides

B Monosaccharides

C Amino acids

D Glycerol

1.1.4 Which one of the following statements about enzymes is INCORRECT?

A Enzymes are denatured at extreme temperatures

B Enzymes are denatured at extreme pH

C Enzymes are used up in a chemical reaction

D Enzymes control and regulate all chemical reactions that takes place in a cell

1.1.5 Which chemical reagent is used to test for the presence of glucose in a food sample?

A Iodine solution

B Alcohol

C Millon's reagent/Biuret solution

D Benedict's solution/Fehling's A and B

1.1.6 Mitochondria are the site of…

A Photosynthesis

B Cellular respiration

C Cell division

D Cytokinesis

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1.1.7 During which phase does cytokinesis start to take place?

A Metaphase

B Prophase

C Telophase

D Interphase

1.1.8 Companion cells are typically found in…

A Phloem tissue

B Xylem tissue

C Chlorenchyma tissue

D Sclerenchyma

1.1.9 The foramen magnum is found at the base of the…



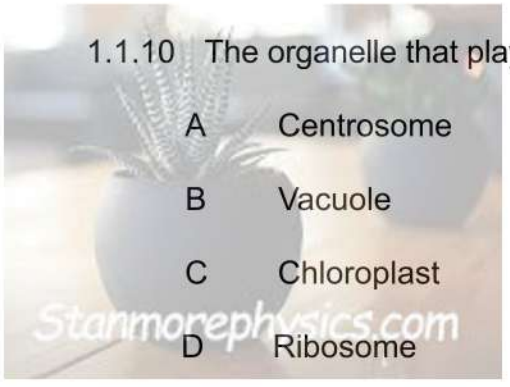
A Upper limb

B Lower limb

C Vertebral column

D Skull

1.1.10 The organelle that plays a role in cell division is…



A Centrosome

B Vacuole

C Chloroplast

D Ribosome

(10 x 2) **(20)**

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1.2 Give the correct **biological term** for each of the following descriptions. Write only the term next to the question number (1.2.1 to 1.2.7) in the ANSWER BOOK.

1.2.1 A change in the structure of a protein as a result of high temperature

1.2.2 The division of the nucleus

1.2.3 The structure that connects the 2 chromosomes together during cell division

1.2.4 Permanent tissue that lines the surface of roots, stems and leaves

1.2.5 The results of uncontrolled mitosis

1.2.6 Vascular tissue that transport water present in the veins of the leaf

1.2.7 The structural and functional basic unit of life (1 x 7) **(7)**

1.3 Indicate whether each of the statements in COLUMN I applies to A ONLY, B ONLY, BOTH A AND B or NONE of the items in COLUMN II. Write A only, B only, Both A and B, or None next to the question number (1.3.1 to 1.3.4) in the ANSWER BOOK.

COLUMN 1	COLUMN II
1.3.1 A structure that transmits impulses to the cell body	A: Dendrite B: Axon
1.3.2 Joins bone to bone	A: Ligaments B: Tendons
1.3.3Tissue has a support function	A: Epidermal tissue B: Collenchyma Tissue
1.3.4 Nutrients that are required in large amount	A: micronutrient B: macronutrient

(2 x4) **(8**

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1.4 A group of Grade 10 learners looked at micrographs to observe cross sections of dicotyledonous roots and stems. One of the learners drew the following diagrams in her/his workbook.

DIAGRAM 1

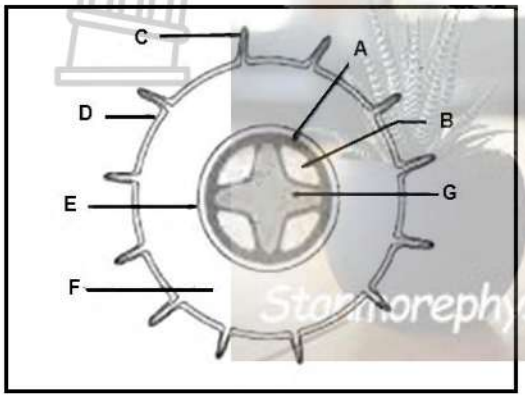
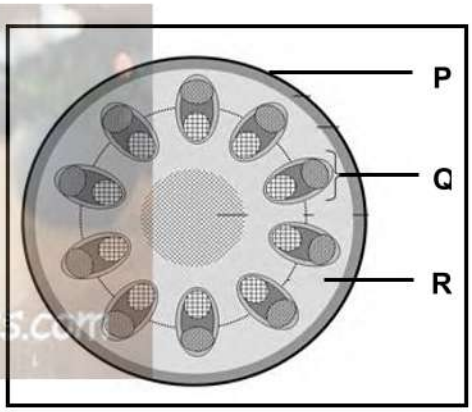


DIAGRAM 2



1.4.1 Which diagram (**1 or 2**) represents a dicotyledonous root? (1)

1.4.2 Give TWO visible reasons for your answer in QUESTION 1.4.1 above. (2)

1.4.3 Write down TWO LETTERS and THREE names of the parts that form the stele (central cylinder) in DIAGRAM 1 (5)

1.4.4 Identify the label **P** in DIAGRAM 2. (1)

1.4.5 Why would you say the diagrams above are representations of tissues? (2)

1.4.6 Xylem is a conducting tissue found in stems, roots and leaves. List TWO structural features of xylem that allows it to perform its function. (2)

1.4.7 Write down the LETTERS (A, B or C) of the tissue(s) that:

(a) Serve as strengthening tissue (1)

(b) Store food and water

(1)

(15)

TOTAL SECTION A: 50

SECTION B
QUESTION 2

2.1 Study the food label below and answer the questions that follow:

Nutritional information

Servings per package: **8**

Serving size: **47,5 g (1 sausage)**

Average values	Per 100g	Per sausage
Energy	**580 kJ (138 kcal)**	**276 kJ (65 kcal)**
Fat, Total	7 g	3,3 g
- Saturated	0,9 g	0,4 g
- Monosaturated	1,7 9	0,8 g
- Polyunsaturated	4,4 g	2,1 g
Carbohydrate	10,0 g	4,8 g
Of which sugar	1,3 g	0,6 g
Fibre	4 g	1,9 g
Protein	16,5 g	7,8 g
Sodium	800 mg (0,8 g)	380 mg (0,38 g)

2.1.1 What is meant by saturated fatty acids? Suggest a reason why eating food with high saturated fatty acid content is unhealthy. (3)

2.1.2 List **THREE** elements found in protein. (3)

2.1.3 List **THREE** functions of lipids. (3)

2.1.4 Write down the monomers of lipids. (2)

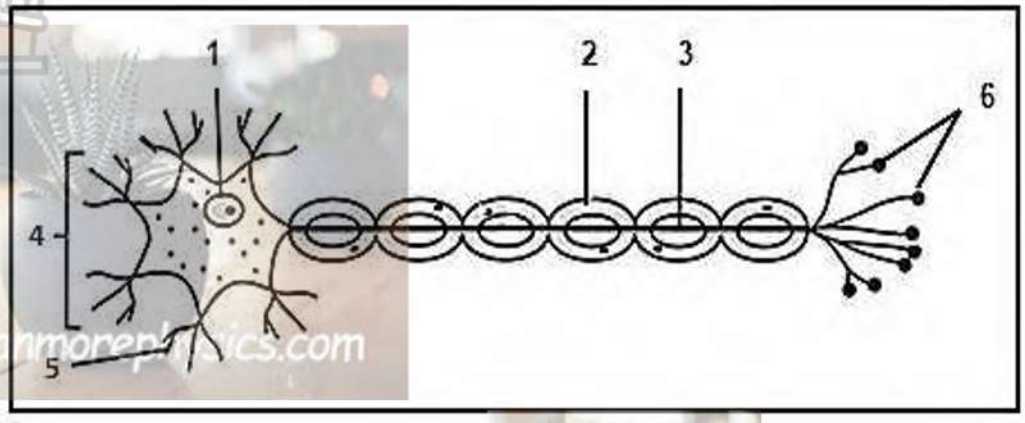
2.1.5 Would you consider this product a healthy choice in terms of fat content? Give a reason for your answer. (2)

2.1.6 Calculate the total amount of sodium if **THREE** sausages were eaten. Show **ALL** working. (3)

(16)

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2.2 The following diagram represents a type of nerve cell. Study the diagram and answer the questions that follow.



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2.2.1 What type of cell is illustrated above? (1)

2.2.2 State the functions of this type of nerve tissue in the human body? (2)

2.2.3 Identify the parts numbered **1, 2** and **5** (3)

2.2.4 State ONE function of the parts numbered:

(a) 5 (1)

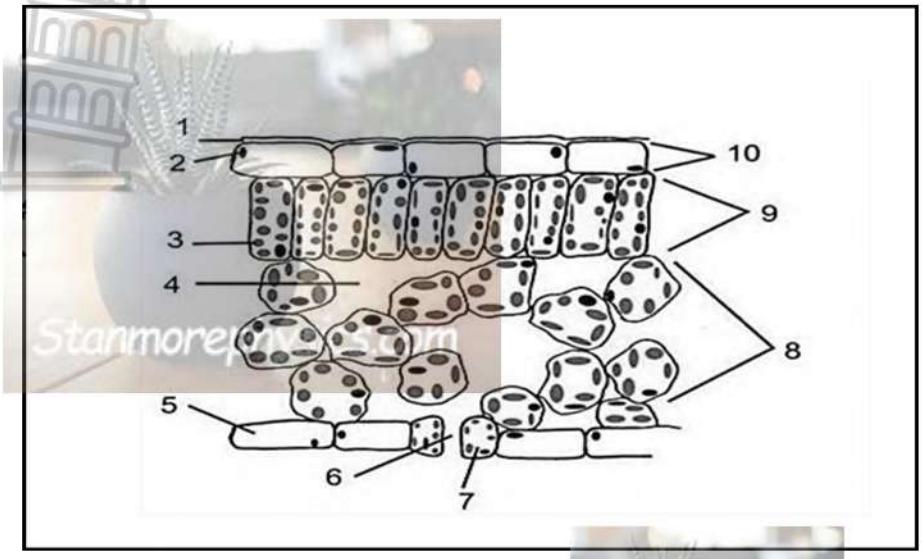
(b) 2 (1)

(c) 6 (1)

2.2.5 Define the word synapse. (1)

(10)

2.3 Study the diagram below of a cross section of a dicotyledonous leaf, and respond to the questions that follow.



2.3.1 Give **ONE** main function of this plant organ (1)

2.3.2 Provide labels for parts **1** and **2** (2)

2.3.3 Give **ONE** function of structures **1** and **3** (2)

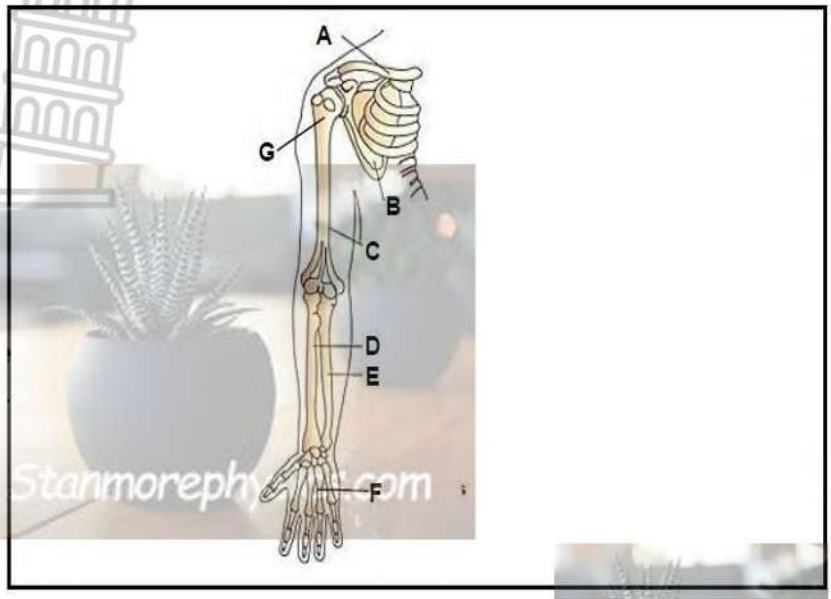
2.3.4 Structure **6** is involved in gaseous exchange. Name TWO gases that are exchanged through the opening at **6** (2)

2.3.5 Give **TWO** structural differences between tissues labelled 8 and 9. (4)

(11)

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2.4 Study the diagram of a region of the human skeleton. Answer the questions that follow:



2.4.1 Mention **TWO** functions of the human skeleton. (2)

2.4.2 Referring to the diagram:

(a) Give the **LETTERS** that point out the radius and ulna (2)

(b) What is the collective name for the parts labelled **A**, **B** and **G**? (1)

2.4.3 Give the **LETTER** that indicates the following in the diagram above.

(a) Metacarpals (1)

(b) Humerus (1)

2.4.4 Two sets of muscles are attached to the front and back of the humerus respectively.

(a) Name **ONE** of those muscles. (1)

(b) Name the substance that builds and repairs muscle tissue. (1)

(c) Mention **ONE** function of the above sets of muscles. (1)

2.4.5 (a) Predict what would happen if the muscle attached to the back of the humerus cannot function. (1)

(b) Name **TWO** diseases that affects the skeleton (2)

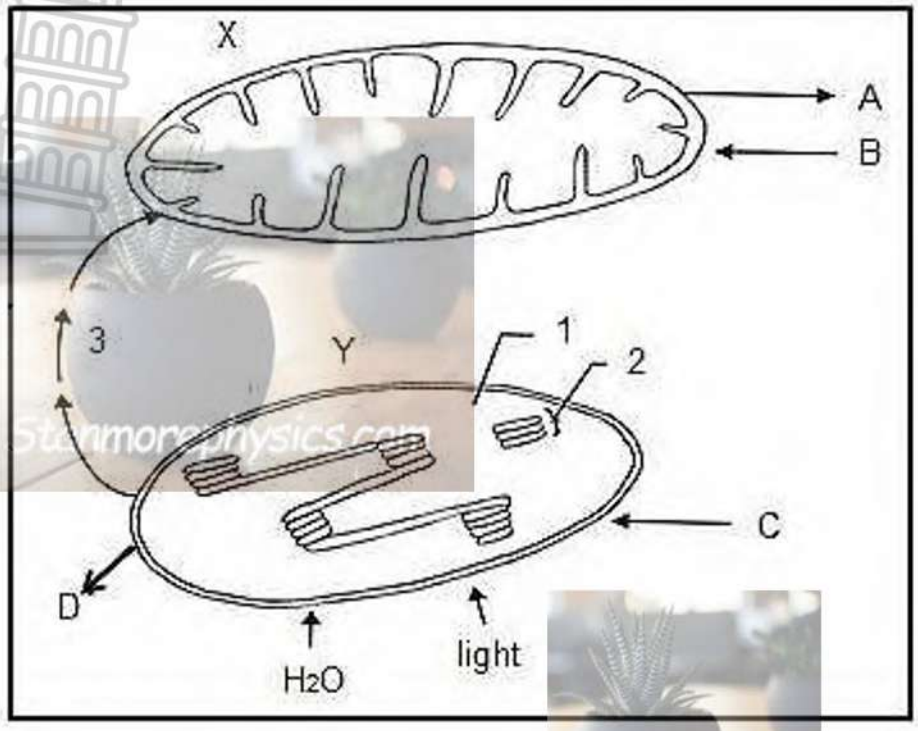
(13)

(50)

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QUESTION 3

3.1 Study the diagram below and answer the questions that follow.



3.1.1 Identify the cell organelles **X** and **Y** (2)

3.1.2 Which metabolic process is associated with:

(a) X (2)

(b) Y (2)

3.1.3 Identify the parts numbered **1** and **2**. (2)

3.1.4 Identify the gases **A**, **B**, **C** and **D** respectively. (4)

3.1.5 State THREE ways in which organelle **X** is structurally suitable for its function. (3)

(15)

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3.2 The thickness of the annual rings in stems indicates the type of environmental condition that was occurring during the time of the tree's development. A thin ring usually indicates a rough period of development such as lack of water, forest fires, or insect infestation. A thick ring means a prosperous period of development. An investigation done in two forests (**A** and **B**) provided the following results:

Age of trees (years)	Average thickness of annual rings in Forest A (millimetres)	Average thickness of annual rings in Forest B (millimetres)
10	20	24
20	24	28
30	30	35
40	34	38
50	41	45
60	46	51

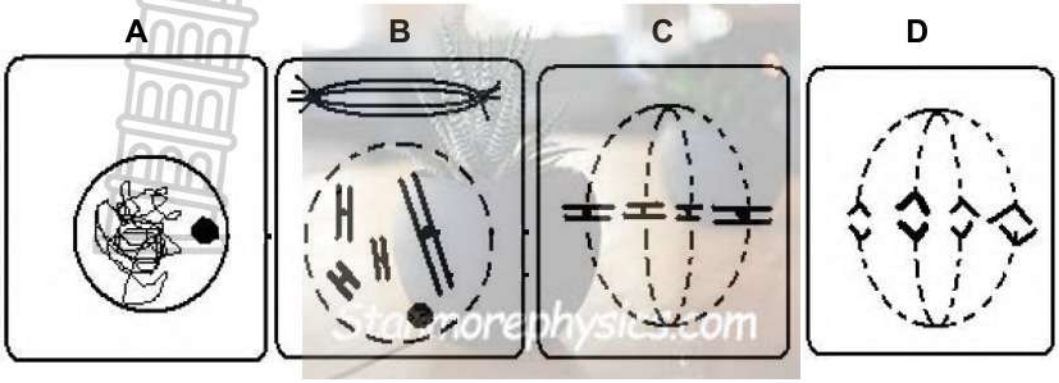
3.2.1 Draw line graphs on the same system of axes that show the information in the table. (6)

3.2.2 What was the average thickness of annual rings for all trees found in Forest **B**? Show all calculations (4)

3.2.3 What was the average thickness of the annual rings for 40-year-old trees in Forest **A**? (1)

3.2.4 Based on the data, what can be concluded about the comparative health (condition) of trees from Forest **A** and Forest **B** and what is the relationship between the ages of trees and the average thickness of the annual rings? (4)
(15)

3.3 Study the following diagram and answer the questions that follow.



3.3.1 Identify phases **A** and **B** (2)

3.3.2 (a) Name the phase shown in diagram D (1)

(b) Discuss the main events that occur during phase. (3)

3.3.3 What is mitosis? (2)

3.3.4 Give THREE reasons why mitosis is biologically important. (6)

(14)

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3.4 A learner carried out **four** different food tests to investigate the composition of onions, potatoes and peanuts.

The results are recorded in the table below.

Chemical reagent	Onions	Potatoes	Peanuts
Iodine solution	-	+	-
Benedict's / Fehling's solution	+	-	-
Ethanol and water	-	-	+
Biuret / Millon's test	-	+	+

KEY:
+ = positive
- = negative

From the above results identify the food types contained in each of the following:

3.4.1 Onions (2)

3.4.2 Potatoes (2)

3.4.3 Peanuts (2)

(6)

[50]

TOTAL SECTION B: 100

GRAND TOTAL: 150

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