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LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF
EDUCATION

NATIONAL
SENIOR CERTIFICATE

GRADE 10

LIFE SCIENCES MID-YEAR EXAMINATIONS

20 MAY 2024

MARKS: 150

TIME: 2H30

This question paper consists of 16 pages including the cover page.

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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 your 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. Choose the correct answer and write only the letter (A-D) next to the question number (1.1.1 to 1.1.4) in the ANSWER BOOK, for example, 1.1.6.D

1.1.1. The most abundant organic compound found in cell walls of plant cells is: (2)

A Lipid
B Starch
C Cellulose
D Protein

1.1.2. The building blocks of nucleic acids is … (2)

A disaccharides.
B monosaccharides.
C amino acids.
D nucleotide

1.1.3. The chloroplast is the site of … (2)

A photosynthesis
B cellular respiration.
C cellular division
D cytokinesis

1.1.4. Which one of the following statements about enzymes is not true? (2)

A Enzymes are denatured at extreme temperatures
B Enzymes denatures below 37˚c
C Enzymes are used up in a chemical reaction
D Enzymes control and regulates all chemical reactions that takes place in a cell.

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1.1.5. Which of the following describes one function of the nucleus in cells: (2)

A Gives the cell its shape
B Allows certain substances through selectively
C Prevents loss of water
D Carries the hereditary characteristics

1.1.6. Which of the following sets of features is common to both plant and animal cells? (2)

A Chloroplasts, cell membrane, nucleus
B Cytoplasm, nucleus, cell membrane
C Cell membrane, cell wall, nucleus
D Cell membrane, cell wall, chloroplasts

1.1.7. The process of water movement through a plant and its evaporation from aerial parts. (2)

A capillarity action
B transpiration
C root pressure
D transpiration pull

1.1.8. A cell is studied under a microscope. Which of the following features will indicate that it is an animal cell? (2)

A A large vacuole is observed
B A large nucleus is observed
C The cytoplasm has many chloroplasts
D The cell is surrounded by thin cell membrane only

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1.1.9. Tracheids form part of: (2)

A Xylem tissue
B Chlorenchyma
C Stone cells
D Sieve tubes

1.1.10. The process of cell division that produces two genetically identical daughter cells. (2)

A Mitosis
B Karyokinesis
C Differentiation
D Cell cycle

(10x2) **(20)**

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 1.2.10) in your ANSWER BOOK.

1.2.1. The pressure that forces water to move through the roots and up the stem of a plant (1)

1.2.2. Gene-containing thread-like structure in the nucleus that is conspicuous during mitosis. (1)

1.2.3. Specialized cell in ciliated columnar epithelial tissue which produce mucus (1)

1.2.4. Nerve fibers that conduct nerve impulses to the cell body (1)

1.2.5. Part of the human skull that encloses and protects the brain (1)

1.2.6. A structure that attaches bone to bone (1)

1.2.7. Structural unit of the nervous system (1)

1.2.8. The membrane system in a cell on which ribosomes sometimes occur (1)

1.2.9. Apparatus used to measure the rate of transpiration. (1)

(9 x 1) **(9)**

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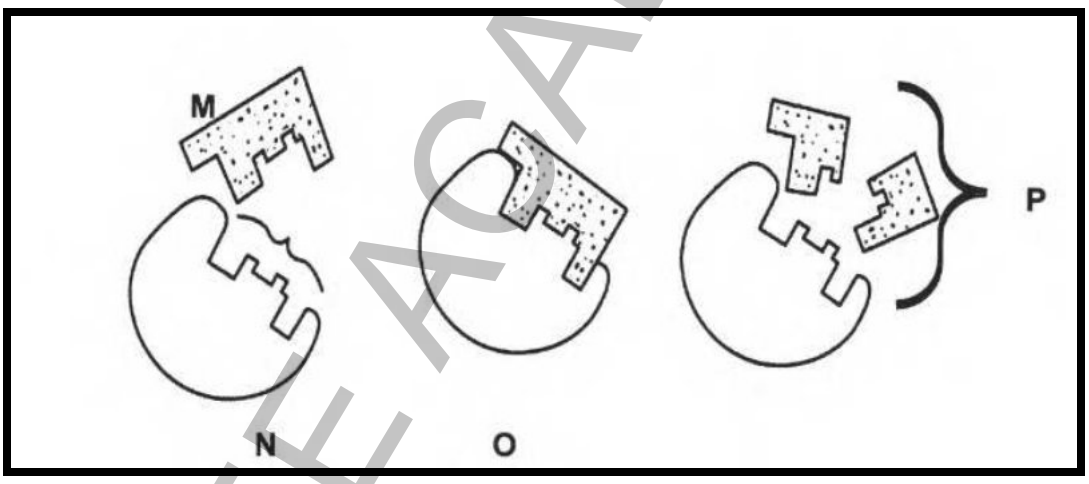
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1.3. Indicate whether each of the statements in COLUMN I applies to A ONLY, B ONLY, BOTH A AND B or NONE of the items in COLUMN II. Write **A only**, **B only**, **Both A and B**, or **None** next to the question number (1.3.1 to 1.3.3) in the ANSWER BOOK

	COLUMN I	**COLUMN II**	
1.3.1.	Nerve fibres that conduct nerve impulses to the cell body	A: Neuron B: Axon	(2)
1.3.2.	Tissue that joins muscle to bone	A: Muscle Tissue B: Tendons	(2)
1.3.3.	A pore in the epidermis of the leaf between two guard cells	A: Stoma B: Stroma	(2)
			(3x2) **(6)**

1.4 The diagram below shows a certain organic compound



1.4.1 Give labels for the following

(a) M (1)

(b) O (1)

(c) P (1)

1.4.2 Name the mechanism shown in the diagram above (1)

1.4.3 State the properties of enzyme illustrated the diagram above (1)

1.4.4 List TWO properties of enzymes other than the one mentioned in QUESTION 1.4.3 (2)

1.4.5 Explain why part **P** has broken (1)

(8)

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1.5. The table below shows the composition of four kinds of food (A, B, C and D):

Food	Kilojoules per 100g	Composition per 100g					
		Protein	Fats	Carbohydrates	Vitamins C	Vitamin D	Iron
A	3800	0,4g	86g	0	0	40mg	0
B	130	1,2g	0	8g	220mg	0	0
C	1150	8,8g	1,5g	60g	0	0	0
D	400	2,0g	0,1g	25g	10mg	0	6mg

1.5.1 Which food (A, B, C or D) would….

(a) Help to prevent anemia? (1)

(b) Suitable for a child with Kwashiorkor? (1)

(c) Be highly recommended for a person who has bleeding gums? (1)

(d) The daily vitamin C intake for a 16 year old should be 30mg. (3)
What mass of food D will supply this amount? Show calculations

1.5.2 Rice contains starch and proteins but no glucose. (1)
Which food (A, B, C, or D) is probably rice?

(7)

TOTAL SECTION A: (50)

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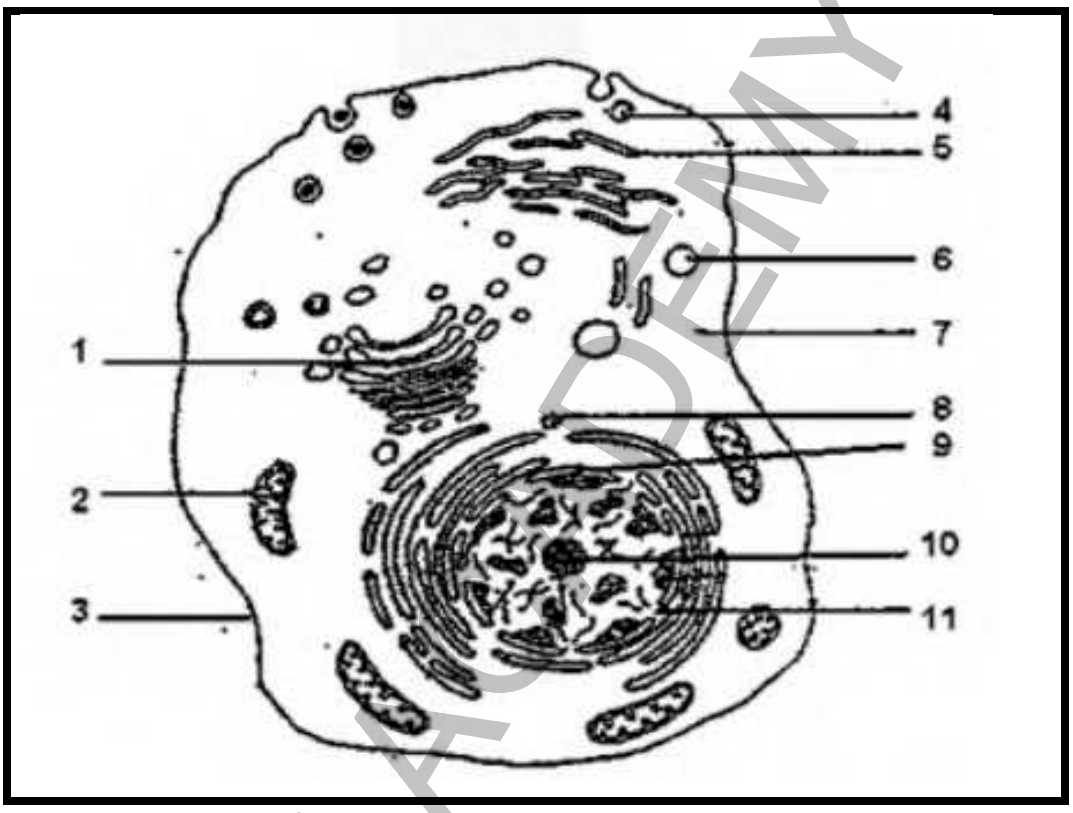
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SECTION B

QUESTION 2

2.1 Study the diagram of a cell and answer the questions that follow:



2.1.1. Is the diagram above, of a plant or animal cell? (1)

2.1.2 Give TWO visible reasons from the diagram to support your answer to question 3.2.1 above. (2)

2.1.3 Give the number only of the part that is said to be differentially or semi-permeable. (1)

2.1.4. Label 1, 2 and 3. (3)

2.1.5. Tabulate **TWO** differences between a plant and an animal cell. (5)

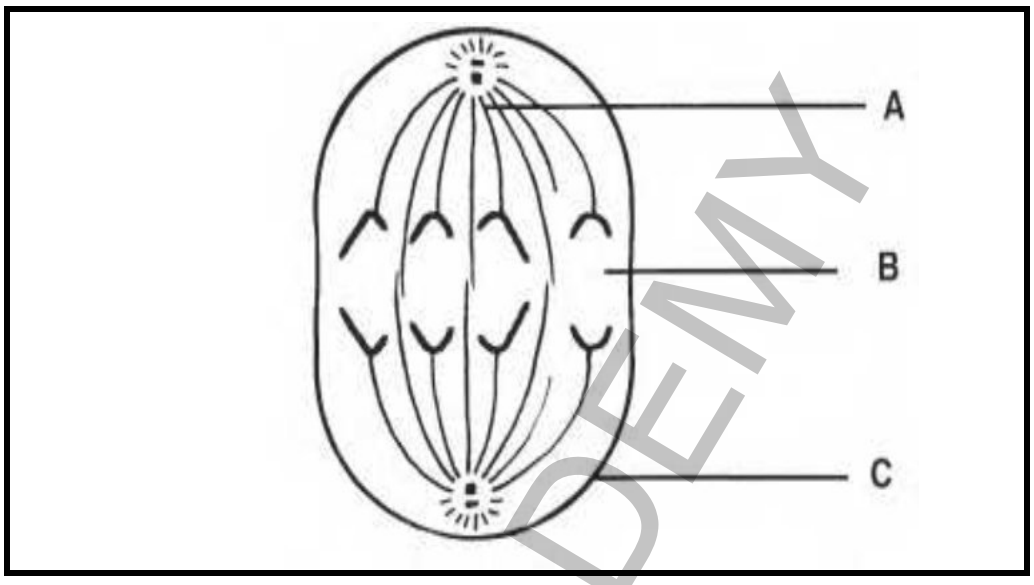
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2.2 The diagram below shows a cell during a phase in mitosis.



2.2.1 Label part A, B, C on the diagram above (3)

2.2.2 Discuss the main events that occur before the phase represented in the diagram. (3)

2.2.3 Mention TWO ways in which process of mitosis is biologically importance (2)

2.2.4 Explain why the phase above is anaphase (2)

2.2.5 At a time cells may continue to divide by mitosis uncontrollably. Such cells are referred to as being cancerous

(a) Name THREE causes of cancer. (3)

(b) In what TWO ways cancer may be treated. (3)

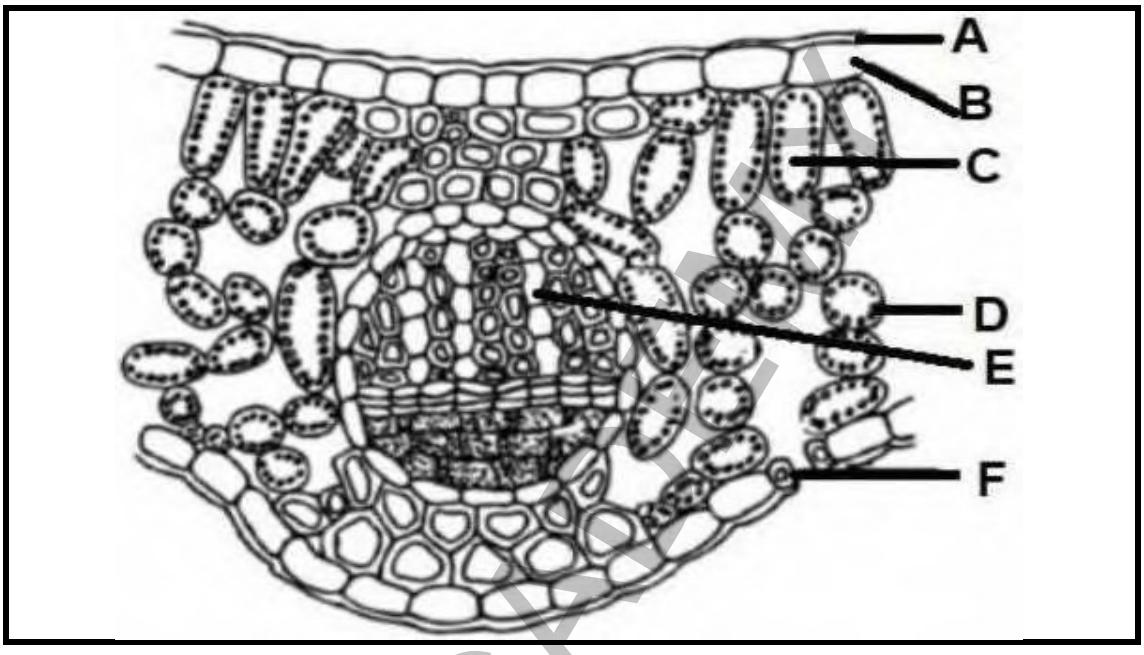
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2.3 The diagram shows the cross section of the dicotyledonous leaf.



2.3.1 Give the LETTER of the part that:

(a) transparent and impermeable to water (1)

(b) transports water and mineral salts (1)

2.3.2 Give collective term for part **C** and **D** (1)

2.3.3 Describe the influence sunken stomata of this diagram on transpiration rate. (3)

2.3.4 Explain TWO ways in which part **C** is structurally adapted for its function of photosynthesis (4)

(10)

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2.4. The following nutritional information is printed on a box of breakfast cereal. Study the table and answer the questions that follow.

Nutrients present in cereal	**30 g of cereal contain:**
Proteins	4.2 g
Carbohydrates	22.4 g
Fat	0.5 mg
Iron	18 mg
Vitamin B_1	1.5 mg
Fibre (roughage)	5.7 g

2.4.1. Which type of nutrient makes up the largest part of 30g of above cereal? (1)

2.4.2 Name the building blocks of the type of nutrient named in question (2)

2.4.3 Name FOUR functions of protein in the human body. (4)

2.4.4. Draw a simple diagram to show the structure of a lipid, label the parts clearly. (4)

2.4.5. Name an inorganic nutrient in this cereal. (1)

(12)

[50]

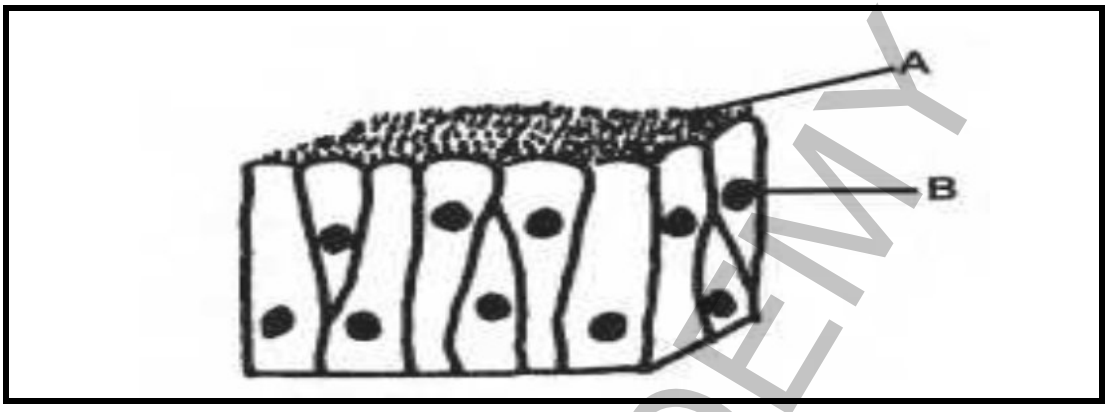
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QUESTION 3

3.1. The diagram below shows the animal tissue



3.1.1 Identify tissue above (1)

3.1.2. Label part A and B (2)

3.1.3. Name TWO areas in the human body where the tissue is found (2)

3.1.4. Give TWO functions of the tissue identified in QUESTION 3.1.1. (2)

3.1.5. Describe ONE way in which the tissue is structurally suited for its function (2)

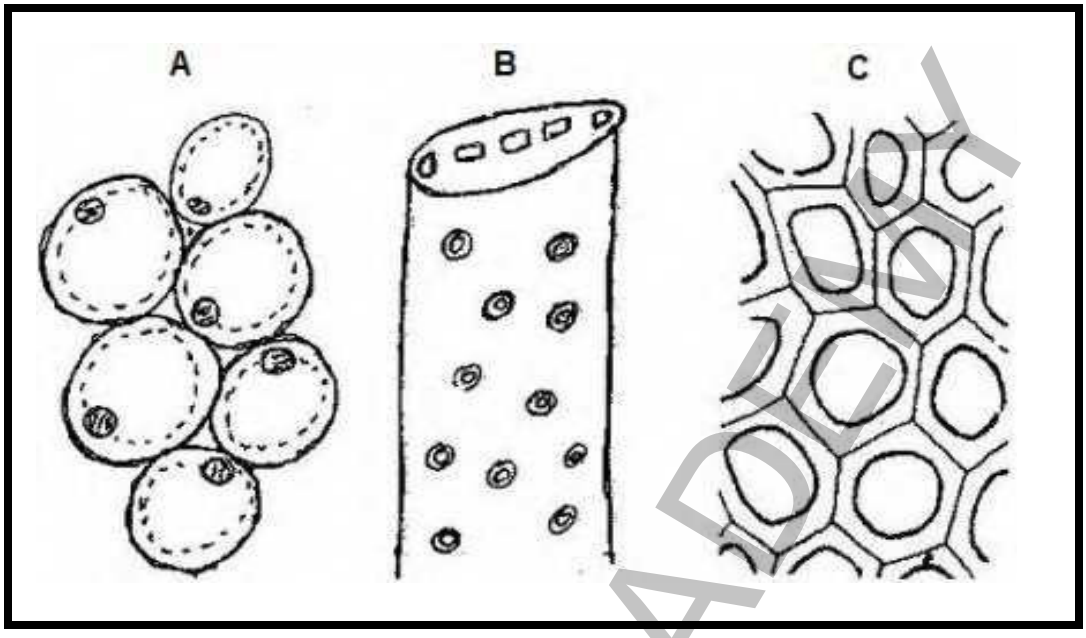
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3.2 Study the following plant tissues and answer questions that follow:



3.2.1 Give the LETTER and the NAME of the tissue which:

(a) Transports water and minerals up the plant. (2)

(b) Provides mechanical support to the plant. (2)

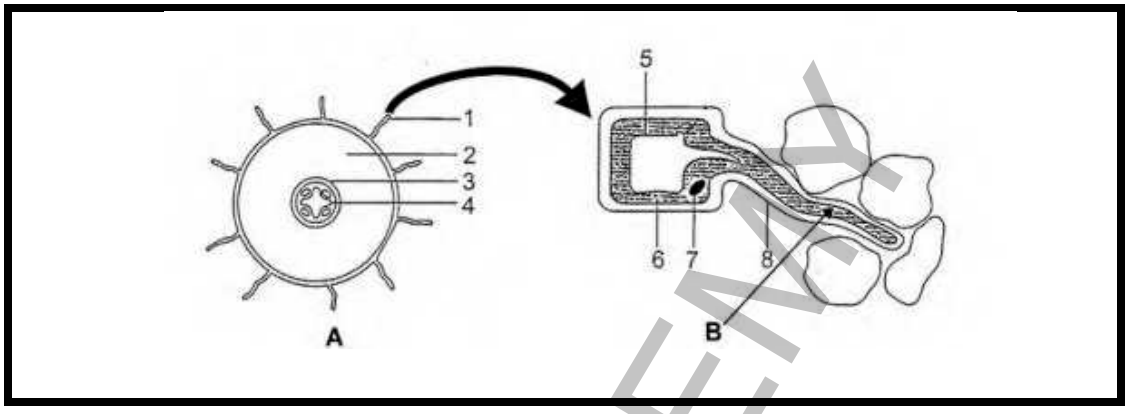
3.2.2 Explain TWO ways in which tissue **B** is structurally suited for its function. (4)

(8)

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3.3 The diagram below represents the plant organ



3.3.1 Identify organ represented by diagram A. (1)

3.3.2 Explain TWO structural adaptations which enable effective functioning of part labeled 4 (4)

(5)

3.4. Grade 10 learners conducted the investigation to determine the effect of different light intensities on the rate of transpiration in leaves.

The following procedure was followed:

- 2 leafy shoots of the same plants were used.
- The leafy shoots were of the same age.
- The leafy shoots were than labelled leafy shoot A and leafy shoot B.
- Leafy shoot A was exposed to different light intensities.
- Leafy shoot B was placed in a dark area.
- All other factors affecting transpiration rate were kept constant.
- Potometer was used to measure the rate of transpiration in both leafy shoots.
- The results of the investigation were recorded hourly for shoot A and B

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The results for leafy shoot A are shown in the table below:

Light intensities (Lux)	5	10	15	20	25
Rate of transpiration (ml)	2	4,8	4,9	5	5

3.4.1 Identify:

(a) dependent variable (1)

(b) independent variable (1)

3.4.2 State the effect of increasing the light intensity on transpiration rate from 5 to 10 (1)

3.4.3 List TWO ways in which learners could increase the reliability of the investigation (2)

3.4.4 Draw a line graph representing the data on the table above. (6)

3.4.5 State the conclusion for the above investigation. (2)

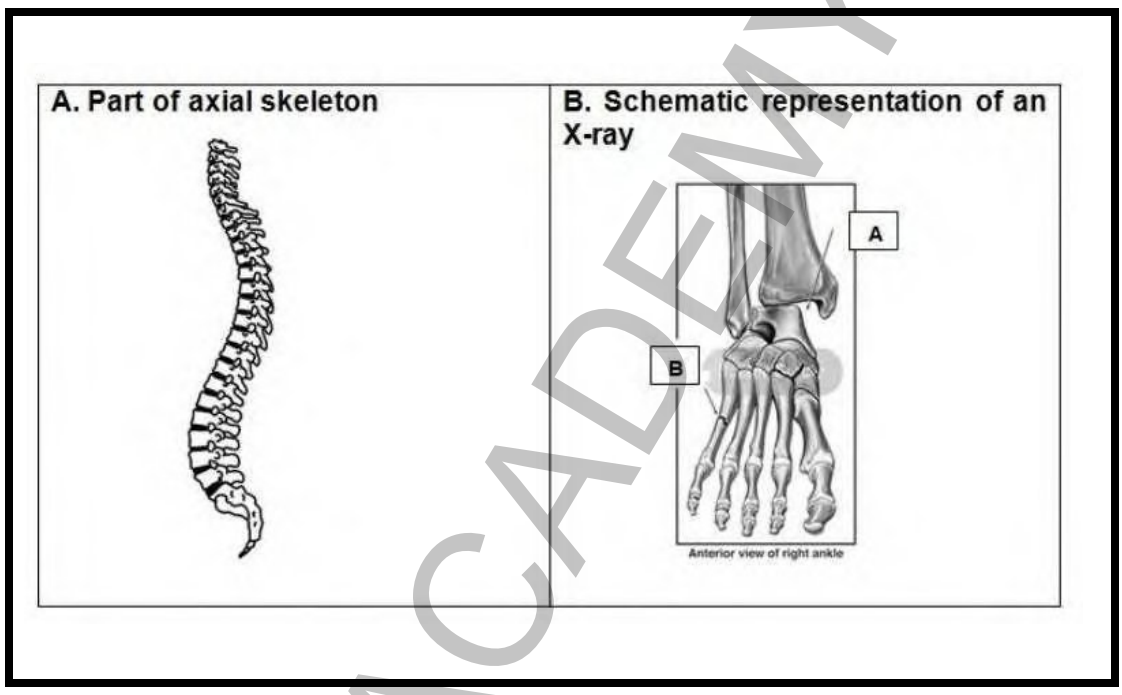
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3.5 Study the diagrams below A (x- ray) and B (part of axial skeleton) and answer the questions that follow.



3.5.1 Refer to diagram B (x- ray). Name the bone that is:

(a) Broken (1)

(b) Dislocated (1)

3.5.2 Differentiate between a sprain, fracture and dislocation. (6)

3.5.3 Identify the part of the axial skeleton shown in diagram A above. (1)

3.5.4 State the main function of the part of the skeleton identified in question 3.5.3 above. (2)

3.5.5 Name FOUR advantages of an exoskeleton. (4)

(15)

: **[50]**

TOTAL SECTION B: [100]

GRAND TOTAL: 150

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