



education

Department of
Education
FREE STATE PROVINCE

GRADE 10

LIFE SCIENCES P1

NOVEMBER 2024

MARKS: 150

TIME: 2½ HOURS

This question paper consists of 18 pages.

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 answer 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 for each question.
6. ALL drawings should be done in pencil and labelled in blue or black ink.
7. Draw diagrams, tables 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 compass, where necessary.
11. Write neatly and legibly.

SECTION A

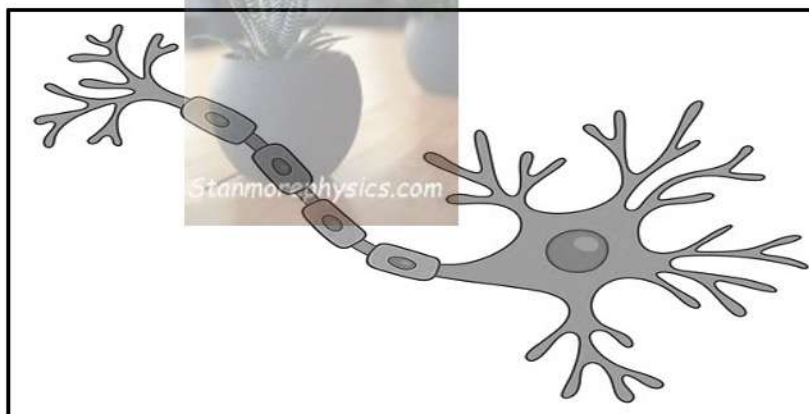
QUESTION 1

1.1 Various options are provided as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question numbers (1.1.1 to 1.1.9) in the ANSWER BOOK, for example, 1.1.10 D.

1.1.1 The organelles that synthesise proteins are called ...

- A ribosomes.
- B mitochondria.
- C chloroplasts.
- D nucleoli.

1.1.2 The diagram below represents a cell in an animal tissue.



The cell above is part of...

- A bone tissue.
- B blood tissue.
- C nerve tissue.
- D muscle tissue.

1.1.3 The first phase of mitosis is....

- A anaphase.
- B telophase.
- C metaphase.
- D prophase.



1.1.4 Forces responsible for the upward transport of water in a plant .

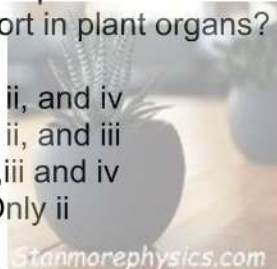
- A Water potential
- B Turgor pressure
- C Diffusion
- D Root pressure

The following is a list of plant tissues and refers to QUESTION 1.1.5.

- i Xylem
- ii Collenchyma
- iii Sclerenchyma
- iv Epidermis

1.1.5 Which plant tissue is responsible for strengthening and support in plant organs?

- A i, ii, and iv
- B i, ii, and iii
- C ii, iii and iv
- D Only ii

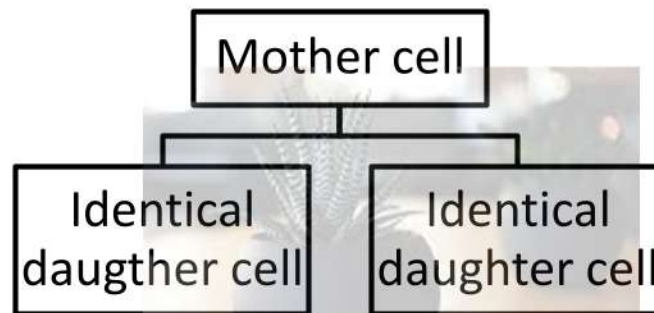


1.1.6 Tissue that continuously divides to cause growth at root tips and apical buds.

- A Meristematic tissue
- B Stem cells
- C Companion cells
- D Sieve tubes



THE DIAGRAM BELOW REFERS TO QUESTIONS 1.1.7 AND 1.1.8.



1.1.7 The process described in the diagram is ...

- A cytokinesis.
- B meiosis.
- C mitosis.
- D interphase.

1.1.8 Which statement is correct regarding to this process?

- A Daughter cells have half the number of chromosomes as the mother cell.
- B Daughter cells have twice the number of chromosomes as the mother cell.
- C Daughter cells have exactly the same number of chromosomes as the mother cell.
- D This process is necessary for the formation of reproductive cells.

1.1.9 When viewing a specimen, the total magnification is 400x. If the magnification on the eyepiece is 10x then the magnification on the objective lens is ...

- A 4x.
- B 40x.
- C 200x.
- D 400x.

(9 x 2) (18)

1.2 Give the correct **biological term** for each of the following descriptions. Write only the term next to the question numbers (1.2.1 to 1.2.9) in the ANSWER BOOK.



- 1.2.1 Movement of water from a high concentration to a low concentration through a selectively permeable membrane
- 1.2.2 The form in which glucose is stored in animal tissue
- 1.2.3 Connective tissue that protect organs
- 1.2.4 Stores water and dissolved nutrients in the cell
- 1.2.5 Longest bone in the human body
- 1.2.6 Organelle that stores starch, lipids or proteins
- 1.2.7 Transports glucose from the leaves to other plant organs
- 1.2.8 Green pigment that enables plants to photosynthesize
- 1.2.9 Different tissues that work together to perform a common function



(9)

- 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 numbers (1.3.1 to 1.3.3) in the ANSWER BOOK.

	COLUMN I	COLUMN II
1.3.1	Excessive growth of algae caused by increased amount of nutrients in water	A: Photosynthesis B: Eutrophication
1.3.2	Cells without a nucleus	A: Eukaryotic B: Prokaryotic
1.3.3	Animal tissue that lines the mouth	A: Epithelium B: Neurons

(3 x 2)

(6)



1.4 The table below shows the results of different food tests.

FOOD TYPE	BENEDICT'S TEST	IODINE SOLUTION TEST
X	Blue	Blue-black
Y	Orange	Blue-black
Z	Orange	Brown

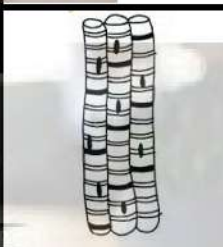
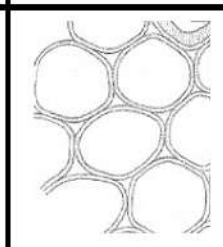
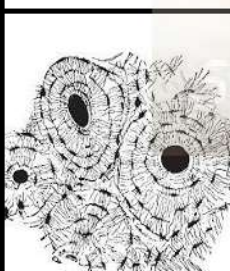
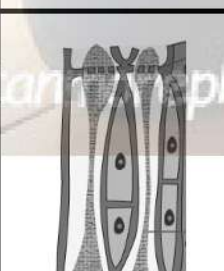
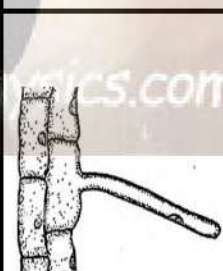
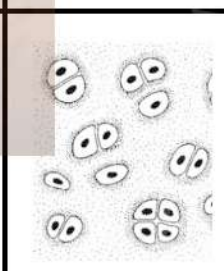
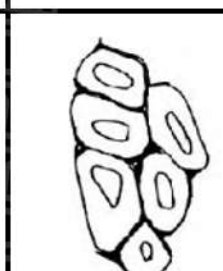
1.4.1 What organic substance is tested for when using iodine solution? (1)

1.4.2 Give the LETTER of the food type (X, Y or Z) which only contains glucose. (1)

1.4.3 Give the colour change for a positive outcome if testing for starch. (2)

1.4.4 What reagent will be used to test for proteins? (1)
(5)

1.5 The table below contains diagrams of animal tissues and plant tissues.

A	B	C	D	E
				
F	G	H	I	J
				



1.5 1.5.1 Write down ALL the LETTERS that represent animal tissue. (2)

1.5.2 Write down the LETTRE of the tissue that...

(a) is a fluid connective tissue. (1)

(b) forms the skeleton of mammals. (1)

(c) allows the heart to contract and relax. (1)

(d) allows voluntary movement. (1)

1.5.3 Name the THREE types of cells that tissue **B** consists of. (3)

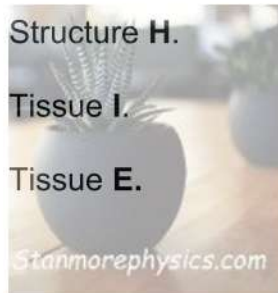
1.5.4 Give ONE function of:

a) Structure **H**. (1)

b) Tissue **I**. (1)

c) Tissue **E**. (1)

(12)



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TOTAL SECTION A: 50

SECTION B

QUESTION 2

2.1 The table below shows the energy, and some nutrients required each day by individuals of different ages.

Age in years	Body mass in kg	Energy in kJ	Protein in g	Calcium in mg	Iron in mg	Vit D in μg
1 (baby)	8.3	2800	23	2.4	5.5	10
17 (girl)	53	7500	52	0.7	11	2.7
17 (boy)	62	11200	78	1.1	9	2.7

2.1.1 Identify:

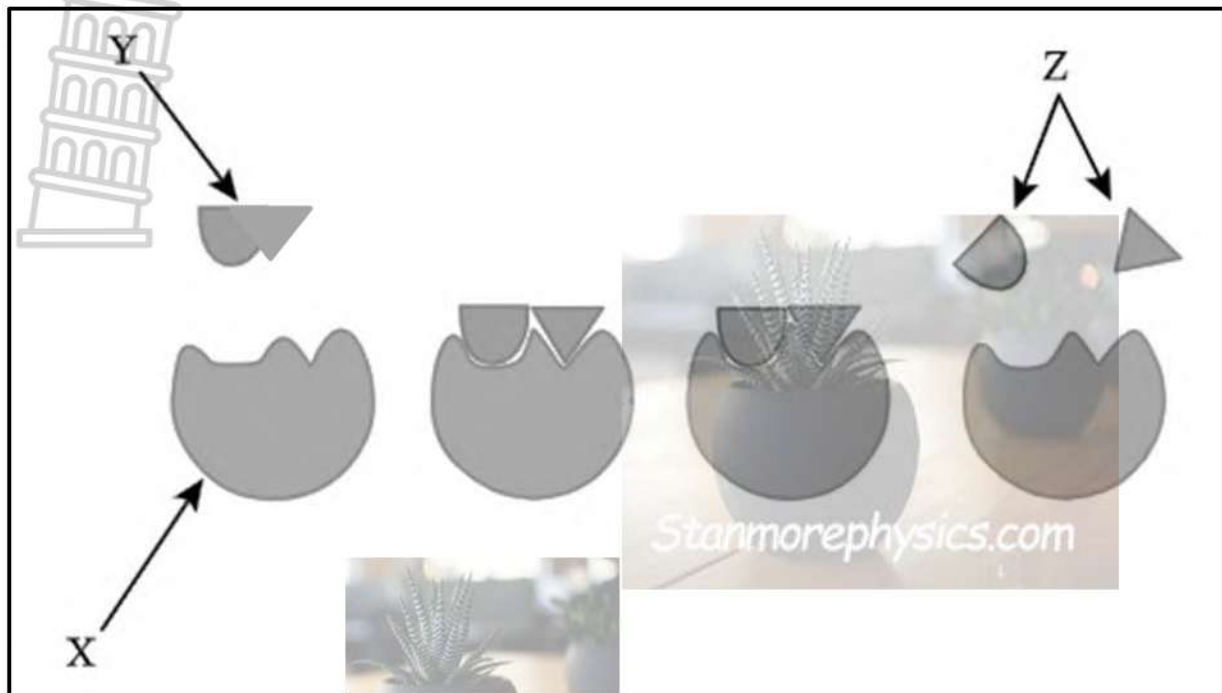
- Which one of the three individuals requires the most energy. (1)
- How much protein is required by the girl. (1)
- Which organic substance in the table above is required in small quantities. (1)

2.1.2 Explain why the boy requires more iron than the baby. (3)

2.1.3 Explain why the baby requires the most calcium. (3)

2.1.4 Name the deficiency disease the baby would suffer from if his/her vitamin D levels drop below the normal level of 10 μg . (1)
(10)

2.2 The diagram below shows the lock-and-key theory of enzyme action.



2.2.1 Define an *enzyme*. (2)

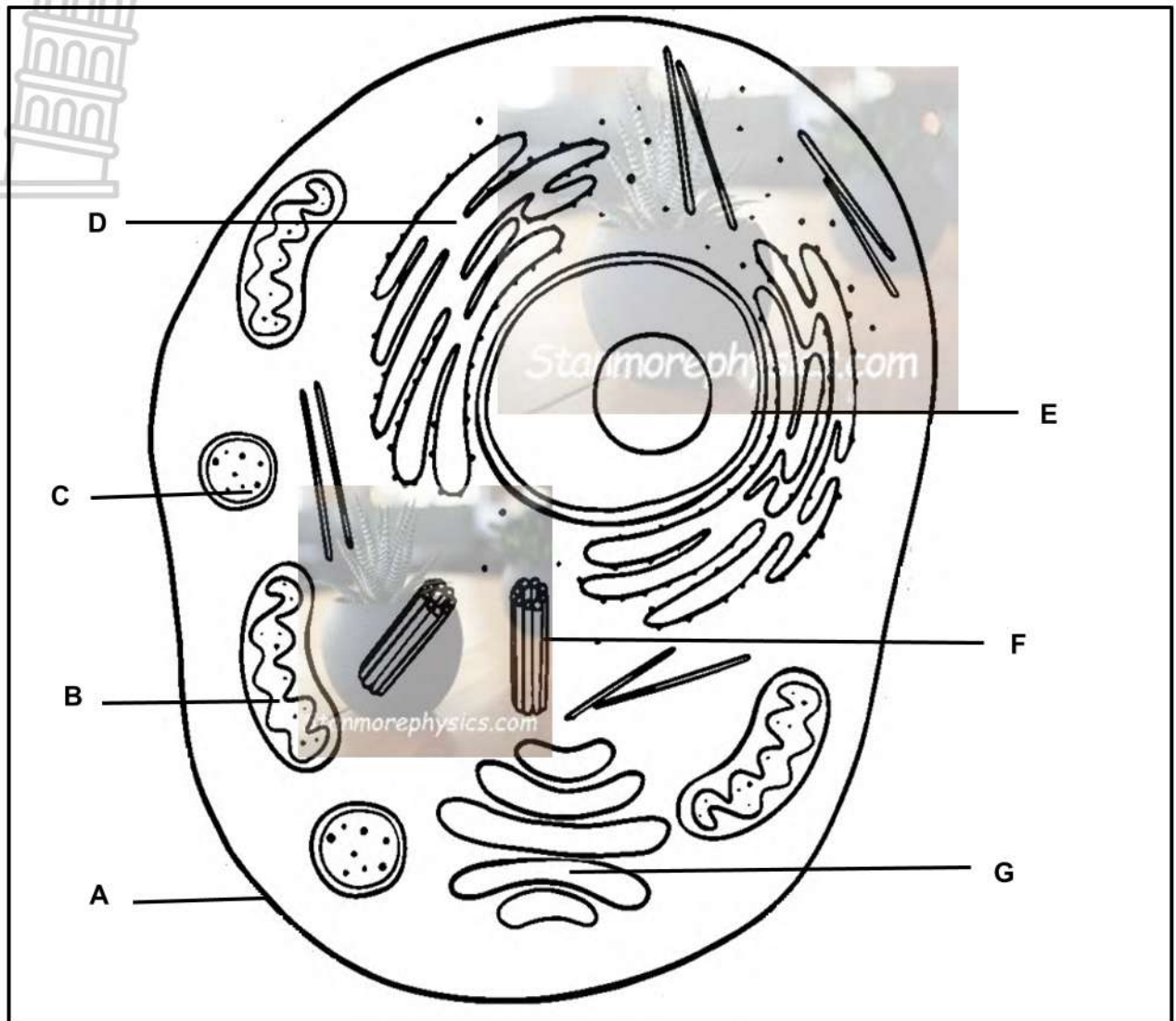
2.2.2 Which LETTER represents the enzyme? (1)

2.2.3 Give a reason for your answer to QUESTION 2.2.2. (1)

2.2.4 Is the reaction in the diagram above, anabolic or catabolic? (2)

2.2.5 Describe the influence of temperature on an enzyme function. (4)
(10)

2.3 The diagram below represents a cell.



2.3.1 Is this an animal cell or a plant cell? (1)

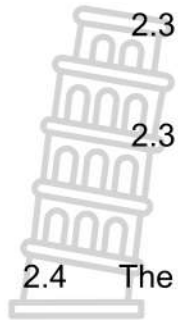
2.3.2 Give TWO visible reasons for your answer in 2.3.1. (2)

2.3.3 Give the LETTER and NAME of the organelle that:

a) Consists of DNA. (2)

b) Plays a role in cell division. (2)

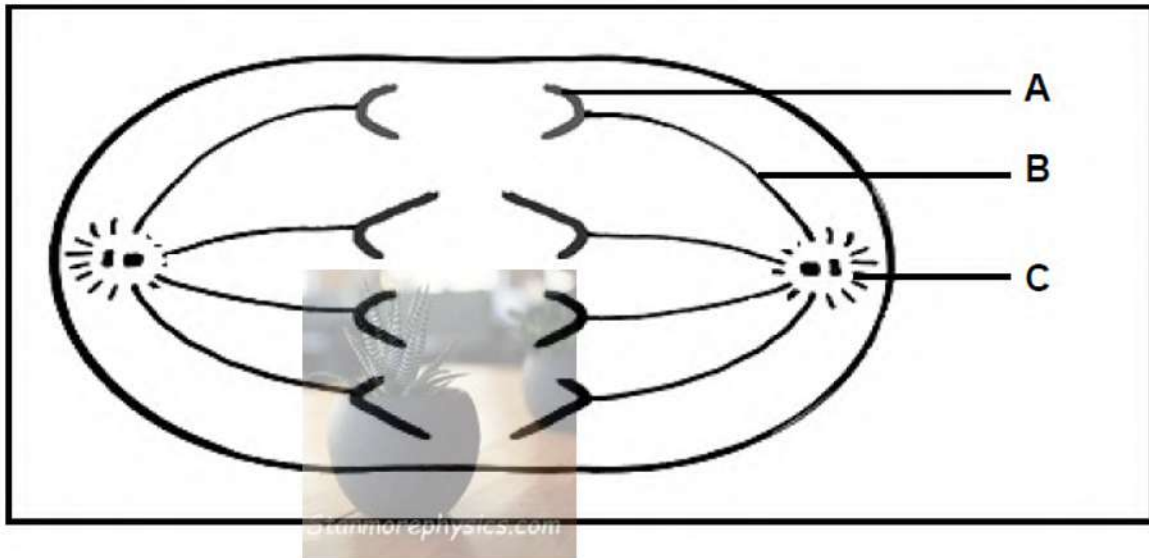
c) Contains strong enzymes. (2)



2.3.4 Explain why animal cells require more of organelle **B** than plant cells. (3)

2.3.5 Explain the function of part **A**. (2)
(14)

2.4 The diagram below shows a phase during mitosis.



2.4.1 Identify the phase shown in the above diagram. (1)

2.4.2 Name THREE reasons why cells undergo mitosis. (3)

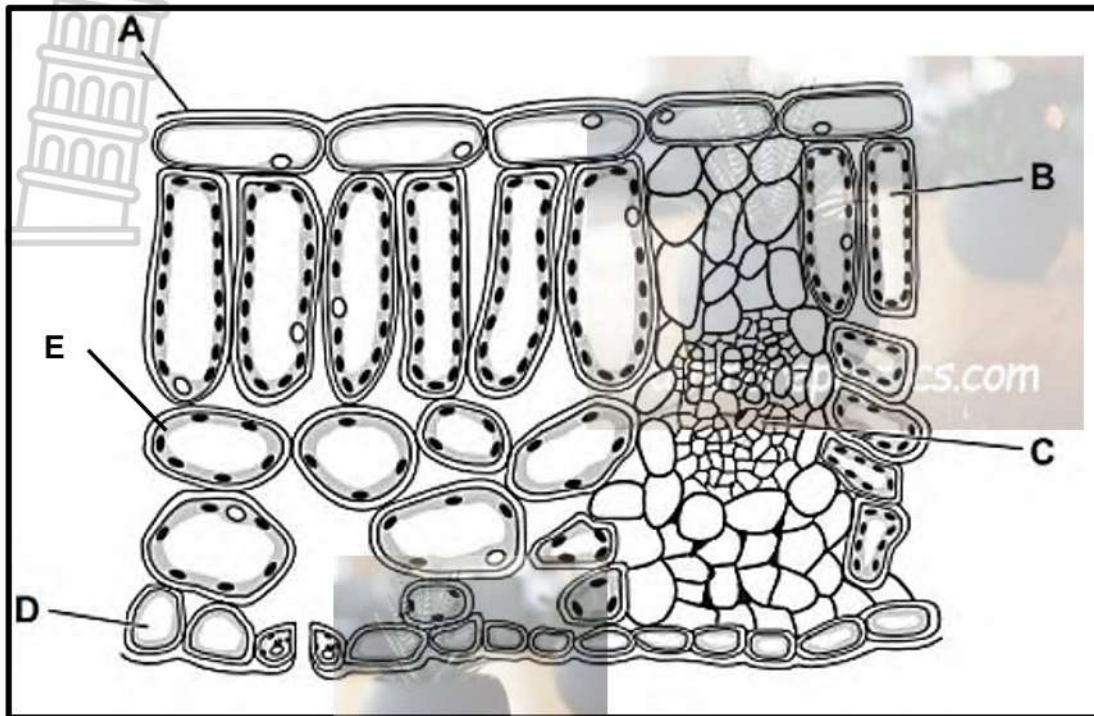
2.4.3 Identify how many centrioles are present in this diagram (1)

2.4.4 Give the function of part **B**. (1)

2.4.5 Name the phase that precedes the phase in the diagram above. (1)

2.4.6 Write down the LETTER and the NAME of the part that contains genetic material. (2)
(9)

2.5 The diagram below represent a plant organ.



2.5.1 Name the plant organ in the diagram above. (1)

2.5.2 Name ONE function of this plant organ. (1)

2.5.3 Give the LETTER of the:

a) Tissue mainly responsible for gaseous exchange. (1)

b) Part that protects the underlying tissue. (1)

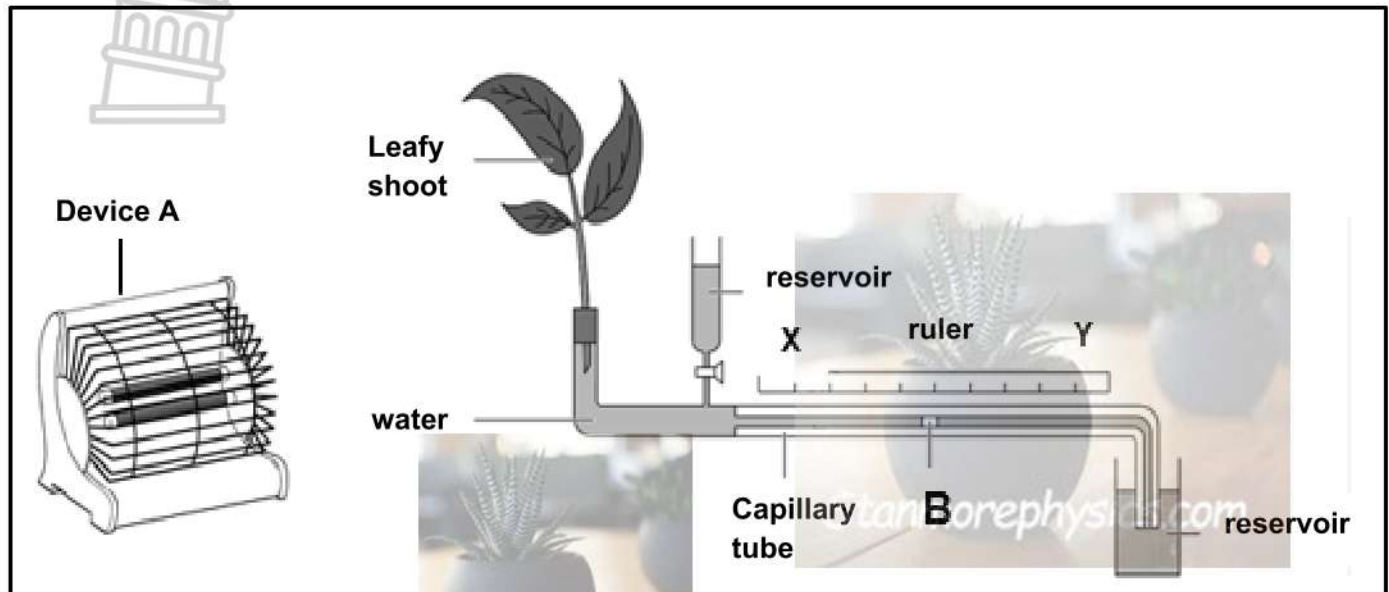
2.5.4 Explain what will happen to this plant organ if part **A** was absent. (3)

(7)

TOTAL SECTION A: 50

QUESTION 3

3.1 The diagram represents an investigation to determine the loss of water by a leafy shoot under different environmental conditions.



- 3.1.1 Identify this apparatus that is used to determine the water loss. (1)
- 3.1.2 Name the environmental factor being tested in the diagram above. (1)
- 3.1.3 Identify part **B**. (1)
- 3.1.4 Explain the movement of part **B** between point **X** and **Y** when both bars of device **A** are switched on. (2)
- 3.1.5 Name TWO other environmental conditions that will influence water loss in a leaf. (2)
- 3.1.6 What physiological process in plants is illustrated in the diagram above? (1)
- 3.1.7 Name the tissue in plants that is responsible for the transport of water. (1)
- 3.1.8 Describe TWO adaptations of the tissue mentioned in QUESTION 3.1.7 for water transport. (2)
- 3.1.9 Suggest TWO structural ways in which the leaves are adapted to prevent excessive water vapour loss. (2)



3.1.10 Draw a labelled diagram of specialized epidermal cells illustrating the stomata.

(4)
(17)

3.2 A learner did an investigation in his community to determine the number of back injuries found in different age groups.

The following steps were followed during the investigation:

- 200 people were interviewed
- People of all trades were chosen
- People's results were sorted into different age groups
- The data was summarized it in the table below

Age of person	Number of back injuries
Under 30	12
30 to 40	18
40 to 50	25
Over 50	45

3.2.1 Identify the:

- a) Dependent variable. (1)
- b) Independent variable. (1)

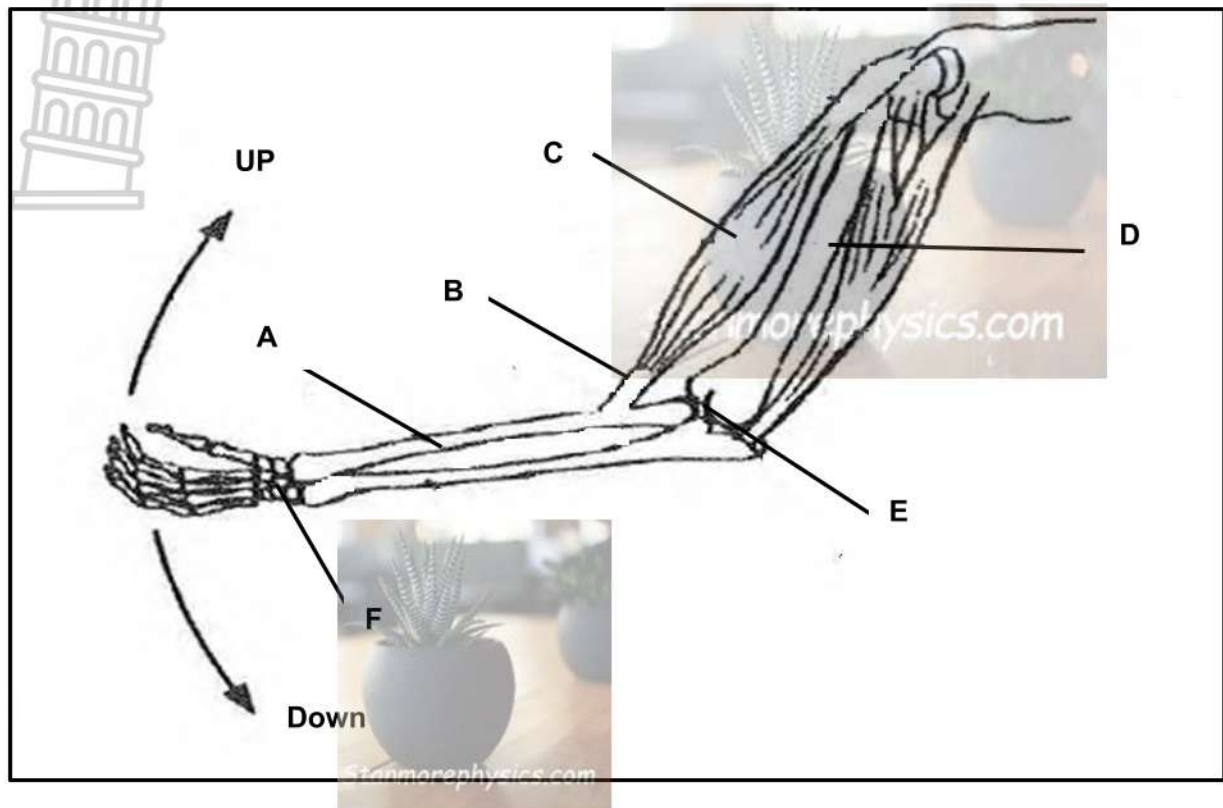
3.2.2 Why was the data of 200 people used for the investigation? (1)

3.2.3 Describe the relationship between the age of a person and the percentage of back injuries. (2)

3.2.4 The student interviewed 200 people. How many people under 30 years of age have had a back injury? Show all your calculations. (3)

3.2.5 Draw a pie chart to illustrate the percentage of back injuries. (6)
(14)

3.3 The diagram below is an illustration of the upper arm of the human body.



3.3.1 Identify:

- a) **A.** (1)
- b) **D.** (1)

3.3.2 Give the name of bones, similar to **F**, in the foot of the human body. (1)

3.3.3 What type of bone is bone **D**? (1)

3.3.4 Identify the tissue that:

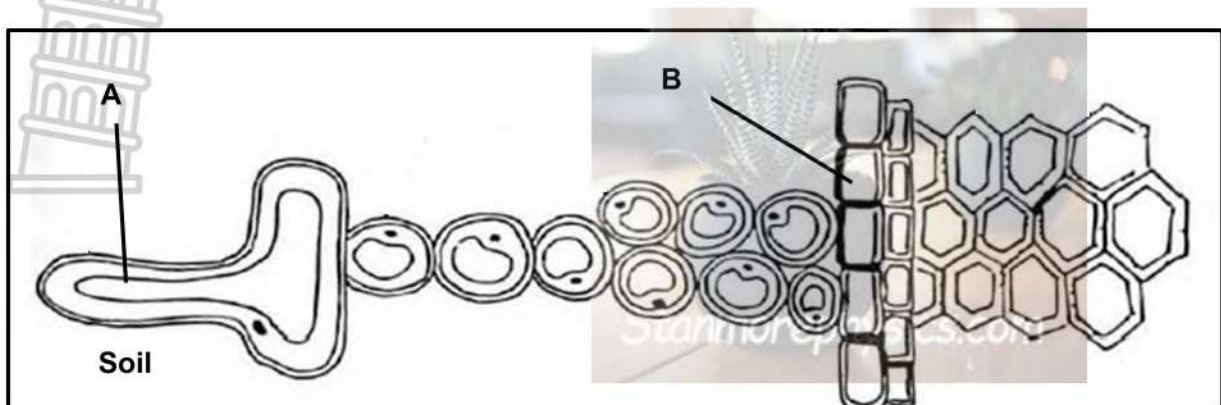
- a) Attaches the bones at part **E**. (1)
- b) Forms part **C**. (1)

3.3.5 What is the function of part **B**? (1)

3.3.6 State FOUR functions of the skeleton. (4)

(11)

3.4 The diagram below represents part of a cross section through a plant root.



3.4.1 Identify:

- a) Structure **A**. (1)
- b) Tissue **B**. (1)

3.4.2 Explain the movement of water from the soil to structure **A**. (6)
(8)

QUESTION 3: 50
TOTAL SECTION B: 100
PAPER TOTAL: 150