Province of the
EASTERN CAPE
EDUCATION

Iphondo leMpuma Kapa: Isebe leMfundo
Provinsie van die Oos Kaap: Department van Onderwys
Porafensie Ya Kapa Botjahabela: Lefapha la Thuto

GRADE 10

LIFE SCIENCES PAPER 1

FINAL EXAMINATION

7 NOVEMBER 2024

Stanmorephysics.com

DURATION: 2½ hours **MARKS: 150**

This paper consists of 19 pages.

Copyright reserved *Please turn over*

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. Do ALL drawings in pencil and label them 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 a compass, where necessary.
11. Write neatly and legibly.

Kanmorephysics.com

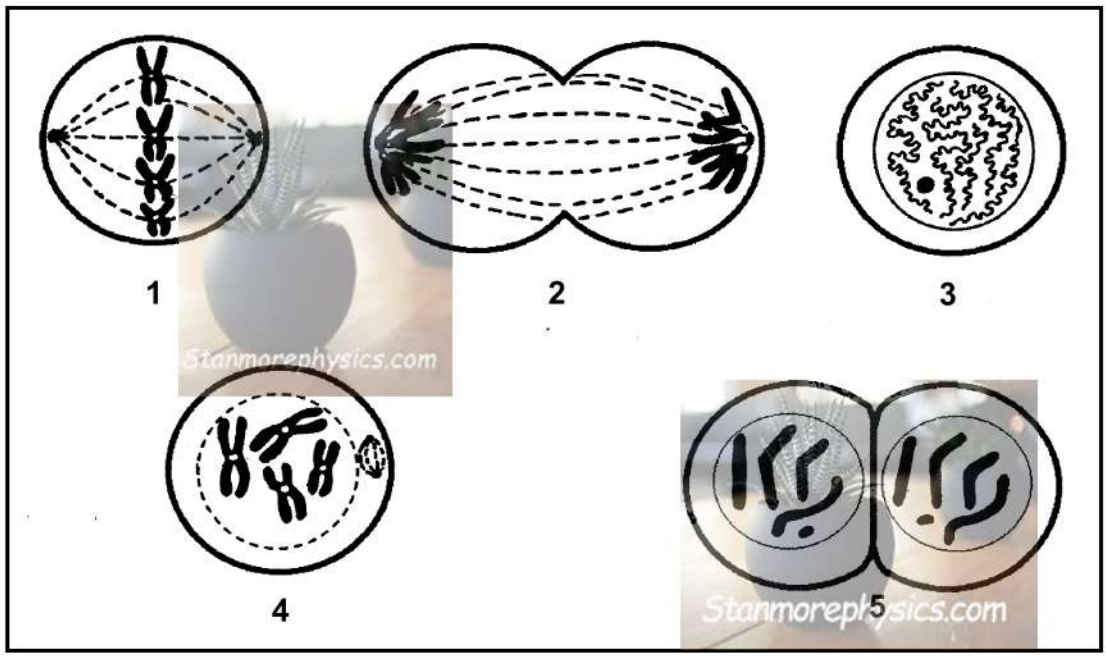
SECTION A
QUESTION 1

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

1.1.1 Which ONE of the following is a nucleic acid?

A Protein
B Lipid
C DNA
D Phosphorus

1.1.2 The diagram below shows events during cell division



The correct sequence of events is …

A 1-2-3-4-5
B 2-4-3-2-1
C 3-1-2-4-5
D 3-4-1-2-5

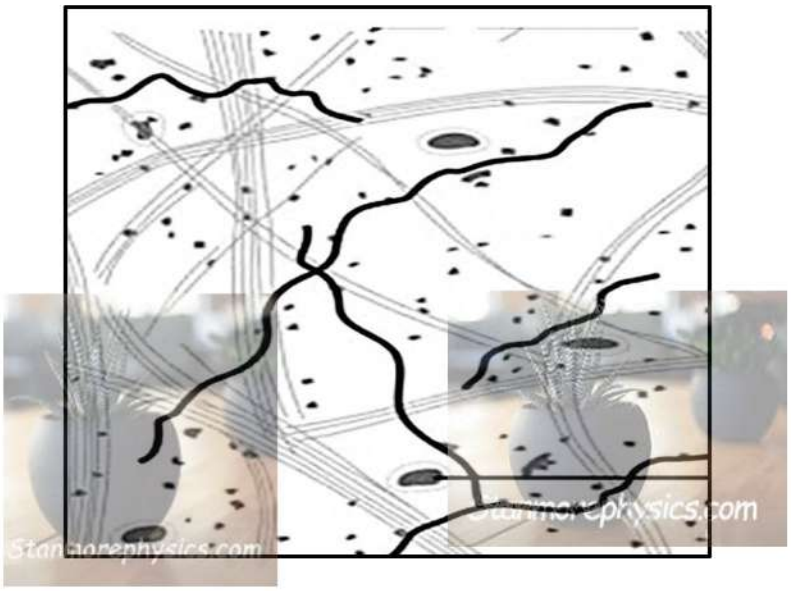
1.1.3 Mitosis is responsible for…

A forming daughter cells with an unequal chromosome number
B forming a sperm cell
C causing variation in sex cells
D repairing skin cells worn out through friction

1.1.4 The phase during which the centromere splits is …

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

1.1.5 The diagram below represents a type of connective tissue.



The type of tissue represented above is …

A hyaline cartilage.
B loose areolar connective.
C dense fibrous tissue.
D blood tissue.

1.1.6 Which ONE of the following tissues prevents friction between the bones?

A Blood
B Cartilage
C Epithelium
D Muscle

1.1.7 A biological washing powder contains enzymes that break down the stains caused by organic substances.

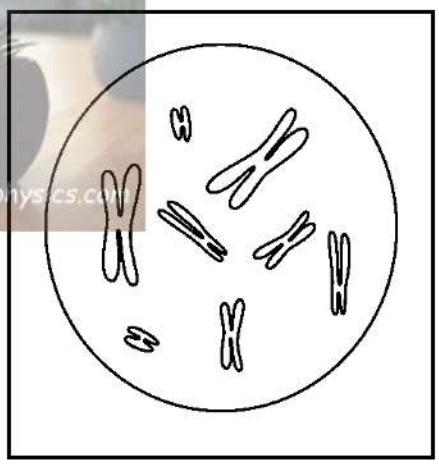
The table below shows the optimum functioning of enzymes.

Enzyme	Optimum pH
J	5
K	10
L	8
M	7 - 9

Which ONE of the following enzymes would be most effective in a washing powder that works in an acidic medium?

A **J**
B **K**
C **L**
D **M**

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



Which ONE of the statements describes the chromosome condition in the nucleus of the cell?

A 8 chromosomes, each with 4 chromatids
B 8 chromosomes, each with 2 chromatids
C 16 chromosomes each with 1 chromatid
D 16 chromosomes each with 8 chromatids

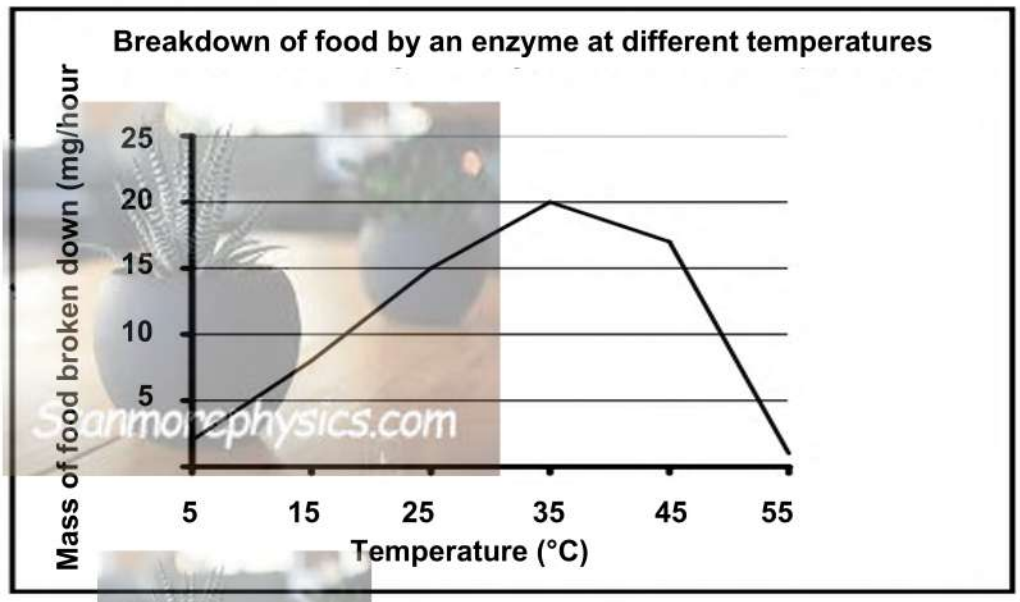
1.1.9 Below is a list of types of muscle tissues found in the human body.

(i) Cardiac muscle
(ii) Smooth muscle
(iii) Skeletal muscle

Which combination represents muscle tissue made up of muscle fibres?

A i), (ii), and (iii)
B (i) and (iii) only
C (ii) and (iii) only
D (i) and (ii) only

1.1.10 The graph below shows the enzyme activity at different temperatures.



Which ONE of the following is an explanation for the shape of the graph between 35 °C to 55 °C?

A The mass of food broken down increases, because as the temperature increases the enzyme activity increases.
B The mass of food broken down decreases, because as the temperature increases the enzymes activity decreases as enzymes denature.
C The temperature increases, because the mass of food broken down increases as the enzyme activity decreases as enzymes denature.
D The mass of food broken down increases, because as the temperature decreases the enzyme activity increases

(10 x 2) **(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 1.2.9) in the ANSWER BOOK.

1.2.1 A disease caused by uncontrolled mitotic division of cells

1.2.2 Movement of water molecules from a region of high water potential to a region of low water potential through a semi-permeable membrane

1.2.3 The type of blood cell that transports oxygen in the body

1.2.4 The division of the cytoplasm during mitosis

1.2.5 Organic substances required in small quantities

1.2.6 Nutrients that are needed in small quantities by the body

1.2.7 The openings in a leaf that are responsible for gaseous exchange

1.2.8 Parenchyma tissue with chloroplasts in the cells

1.2.9 A collective name for xylem and phloem tissue

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

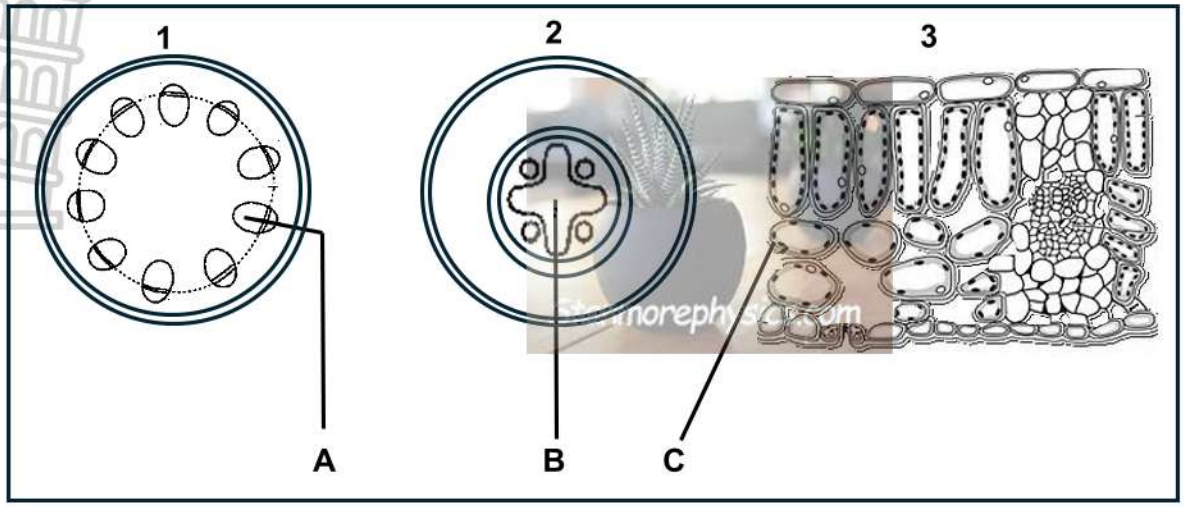
Stanmorephysics.com

1.3 Indicate whether each of the descriptions 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	The seven vertebrae in the neck region	A: Lumbar B: Cervical
1.3.2	Responsible for blood clotting	A: Platelets B: Red blood cells
1.3.3	Transmits impulses from the receptor to the central nervous system	A: Motor neuron B: Sensory neuron

(3 x 2) **(6)**

1.4 The diagram below represents internal structures of different plant organs.



1.4.1 Give the NUMBER (**1**, **2** or **3**) of the diagram that represents the:

(a) Root (1)

(b) Stem (1)

(c) Leaf (1)

1.4.2 Identify tissue:

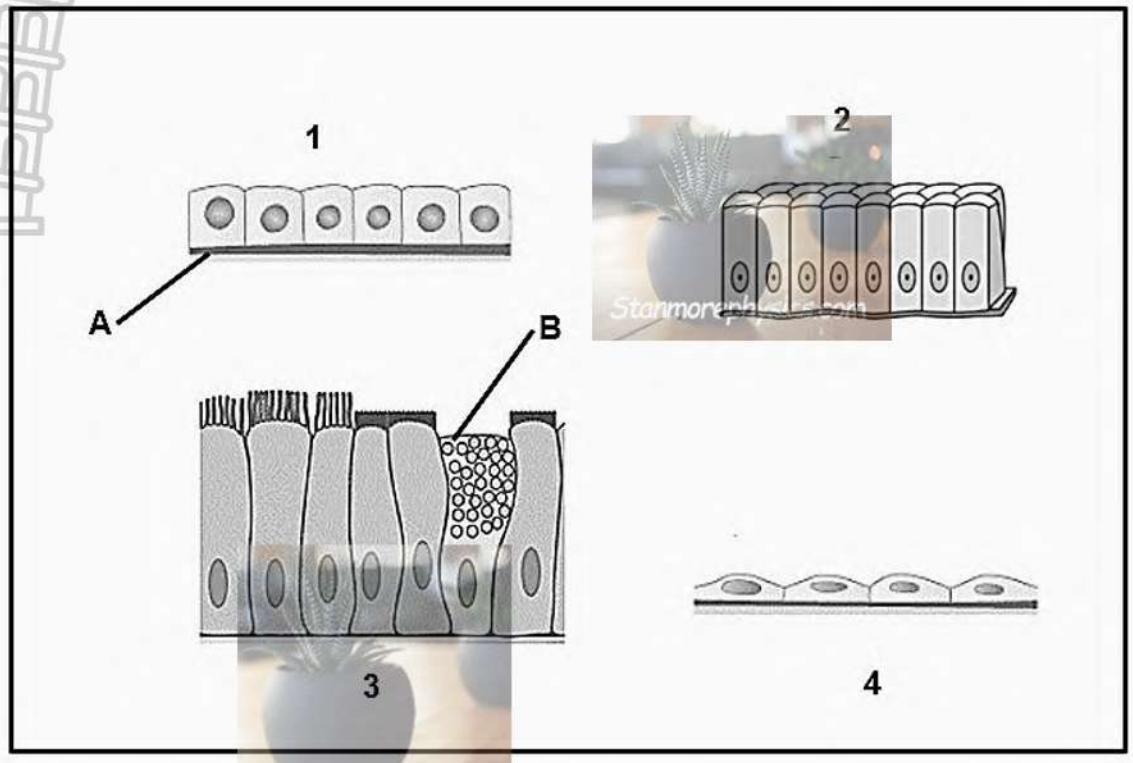
(a) **A** (1)

(b) **B** (1)

(c) **C** (1)

1.4.3 Describe the OBSERVABLE difference between organ 1 and 2 (2)
(8)

1.5 The diagrams below represent different epithelial tissues.



1.5.1 Identify:

(a) Part **A** (1)

(b) Epithelial tissue **2** (1)

(c) Epithelial tissue **4** (1)

1.5.2 Give the NUMBER of the tissue that is found lining the respiratory tract. (1)

1.5.3 Identify cell **B** that secretes mucus. (1)

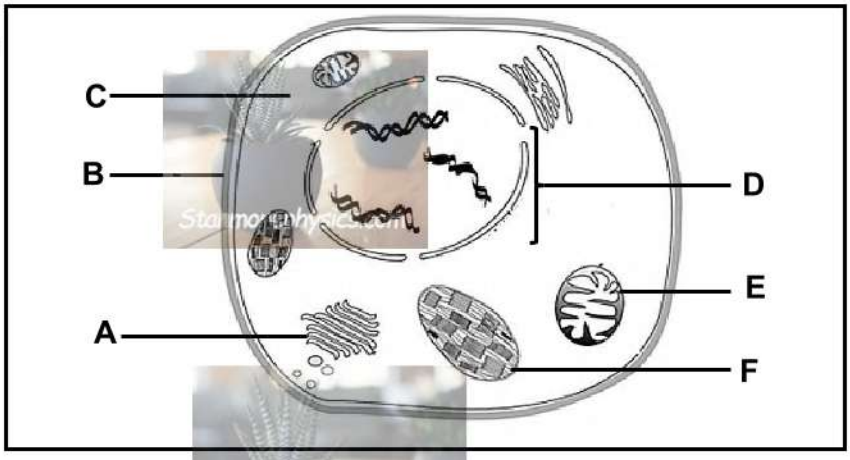
1.5.4 Explain the consequence if cilia in the epithelium lining respiratory passages become damaged. (2)
(7)

TOTAL SECTION A: 50

SECTION B

QUESTION 2

2.1 The diagram below shows a plant cell.



2.1.1 Give ONE observable reason why the cell in the diagram represents a plant cell. (1)

2.1.2 State ONE function of organelle:

(a) **A** (1)

(b) **E** (1)

2.1.3 Give LETTER and NAME of the organelle that contains genetic material. (2)

(2)

2.1.4 Why do animal cells contain more mitochondria than pant cells?

(2)

2.1.5 Name TWO organelles enclosed by a double membrane **(9)**

2.2 The table below shows the details of a meal eaten by a Grade 10 learner.

Food eaten	Carbohydrate (g)	Protein (g)	Fat (g)	Vitamin C (g)	Iron (mg)
Sausage	5	9	24	0	1
Fried potato chips	70	8	20	20	2
Beans	20	10	1	4	3
Fruit pie	60	2	25	1	1
Ice cream	20	0	12	0	0

2.2.1 Identify the food:

(a) With the most proteins (1)

(b) Suitable for a person with anaemia (1)

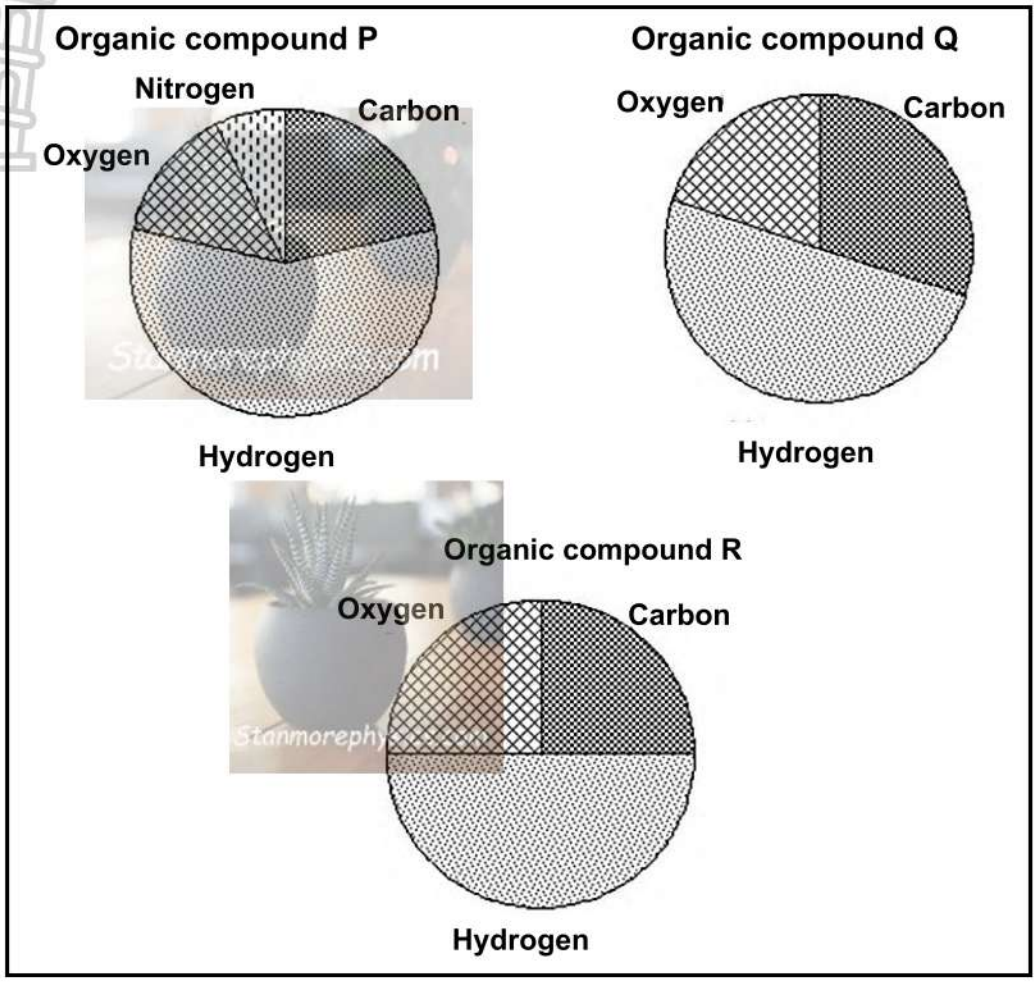
2.2.2 Which food has the LEAST overall nutritional value? (1)

2.2.3 The total energy value of this meal is 5 000 kJ. In one day, this learner requires a total of 15 000 kJ of energy.

Calculate the percentage of daily energy need that this meal provides. Show ALL working. (3)
(6)

Stanmorephysics.com

2.3 The following pie graphs show the composition of three organic compounds that are found in living organisms.



2.3.1 Identify compound **P**. (2)

2.3.2 Give a reason for your answer in 2.3.1 (1)

2.3.3 Give TWO reasons why compound **P** is biologically important. (2)

2.3.4 What is the ratio of Hydrogen to Oxygen in compound **R?** (1)

2.3.5 Explain why high temperature decreases enzyme activity. (3)
(8)

2.4 The rate of enzyme activity increases as the substrate concentration increases up to a point where all enzyme active sites are occupied by substrates to form an enzyme-substrate complex.

Catalase is an enzyme in potatoes that is able to breakdown hydrogen peroxide to release oxygen gas which forms bubbles.

A learner conducted an investigation to determine the effect of increasing hydrogen peroxide concentration on the enzyme activity.

The procedure was done as follows:

- Seven test tubes, each containing different concentrations of hydrogen peroxide, were used.
- Three drops of dishwashing liquid were added into each test tube so that bubbles form a foam.
- One drop of food dye was added so bubbles could be seen more clearly.
- The potato segments of the same size and weight were put in six test tubes
- A potato segment was not put in the seventh test tube.
- The reaction was observed for 30 seconds.
- To measure enzyme activity, the height of the bubble foam was measured after the 30 seconds.

2.4.1 Identify in this investigation the:

(a) Independent variable (1)

(b) Dependent variable (1)

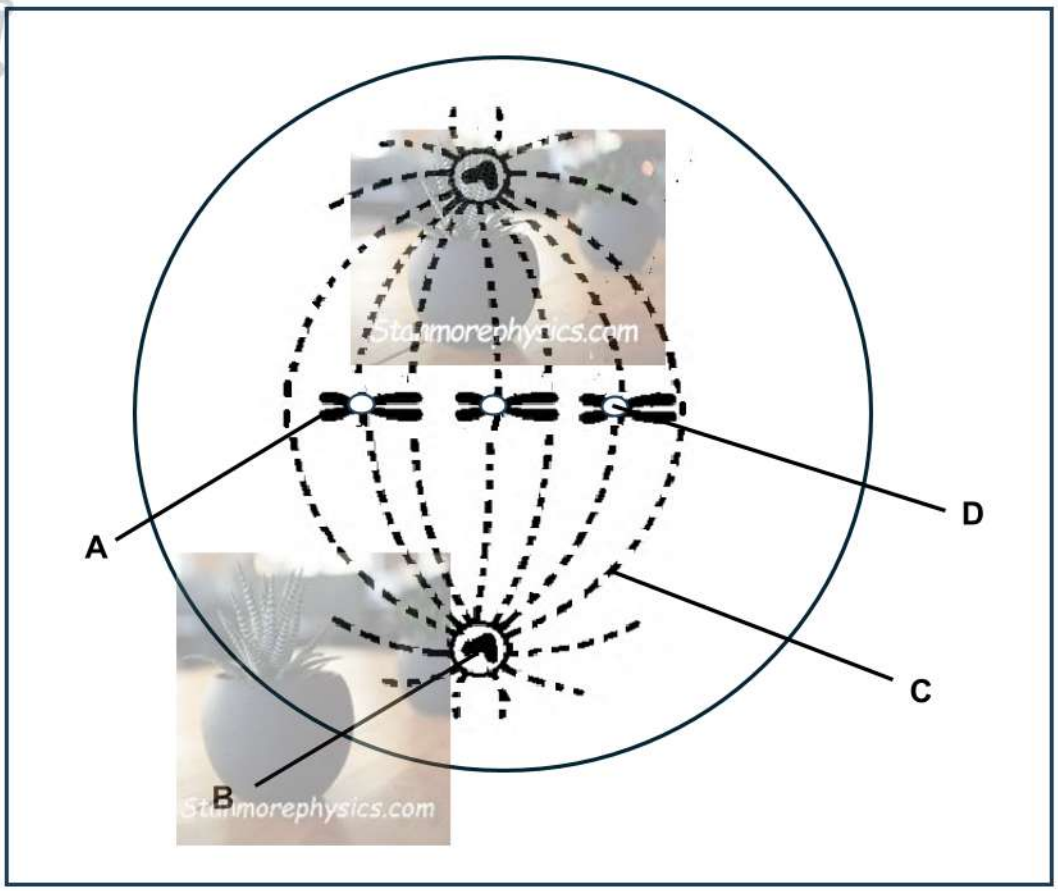
2.4.2 State TWO planning steps that were considered by the learners before doing the investigation. (2)

2.4.3 Give TWO factors that were kept constant in all the test tubes during the investigation. (2)

2.4.4 Which substance represents the substrate? (1)

2.4.5 Explain the purpose of the seventh test tube is in this investigation. (3)
(10)

2.5 The diagram below represents a phase during mitosis.



2.5.1 Identify part:

(a) **A** (1)

(b) **C** (1)

2.5.2 State ONE function of part:

(a) **B** (1)

(b) **D** (1)

2.5.3 How many chromosomes:

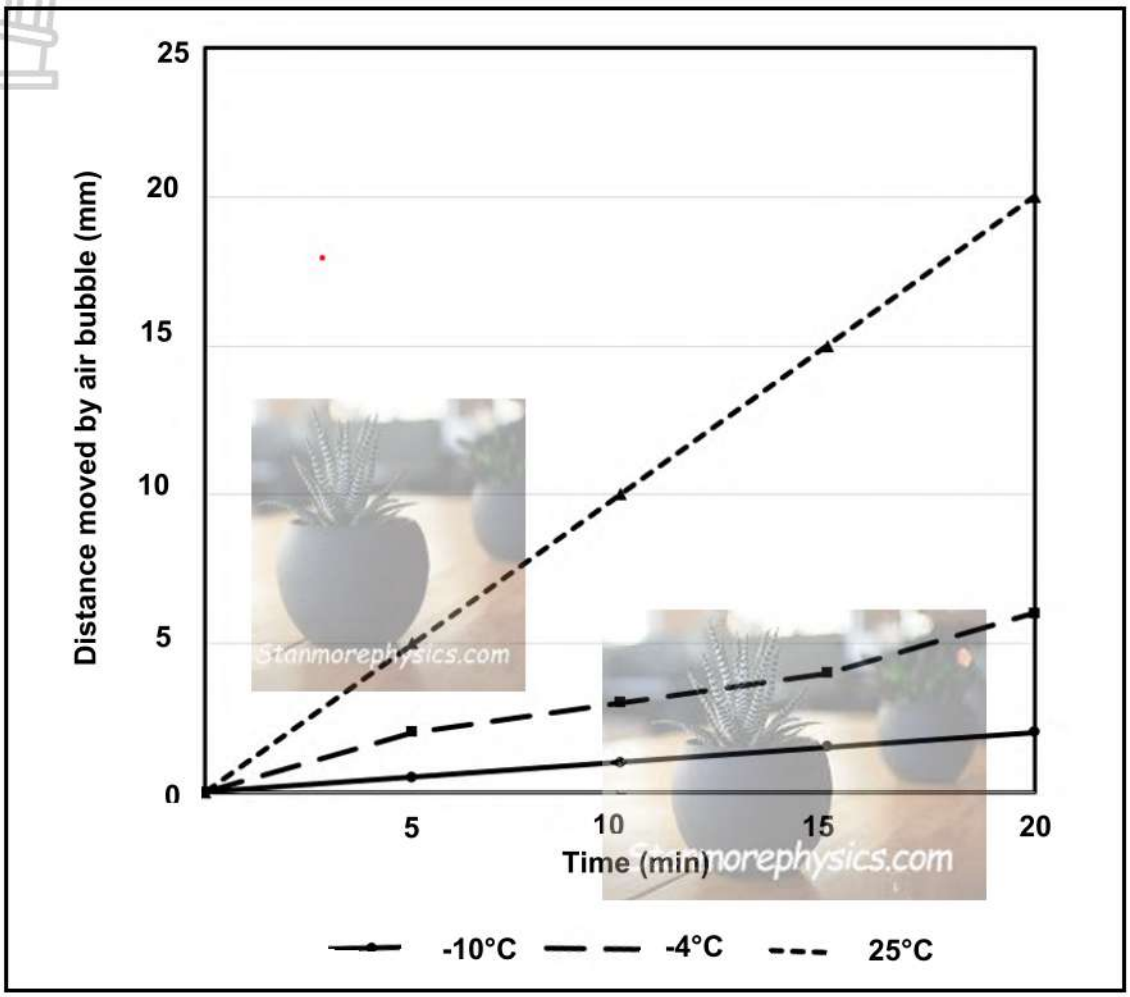
(a) Were present in the cell before the start of the cell division (1)

(b) Will be present in each daughter cell at the end of this division (1)

2.5.4 Explain what would happen if part **C** failed to contract. (3)
(9)

2.6 A learner investigated the effect of temperature on the rate of transpiration in a leafy twig. She measured and recorded the distance travelled by the air bubble inside the capillary tube.

The graph below represents the results recorded by the learner.



2.6.1 Provide a suitable caption for the graph. (1)

2.6.2 Name the apparatus that can be used to measure the rate of transpiration in plants. (1)

2.6.3 Give a reason why the leafy twig had to be cut under water. (1)

2.6.4 Explain why the distance moved by the air bubble was the highest at 25^0C . (2)

2.6.5 Explain how using a needle shaped leaf twig would affect the rate of transpiration (2)

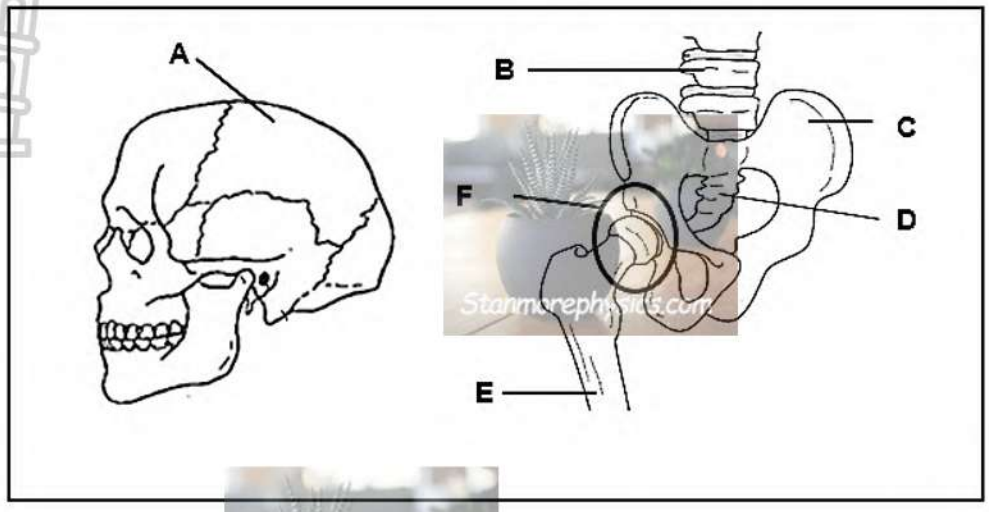
2.6.6 Name ONE other environmental factor that increases the rate of transpiration (1)

(8)

[50]

QUESTION 3

3.1 The diagram below represents the skull and pelvis.



3.1.1 Identify parts:

(a) **B** (vertebrae) (1)

(b) **C** (1)

(c) **D** (1)

3.1.2 Name the bone that encloses the brain. (1)

3.1.3 Give TWO letters of the parts that are classified as part of the axial skeleton. (2)

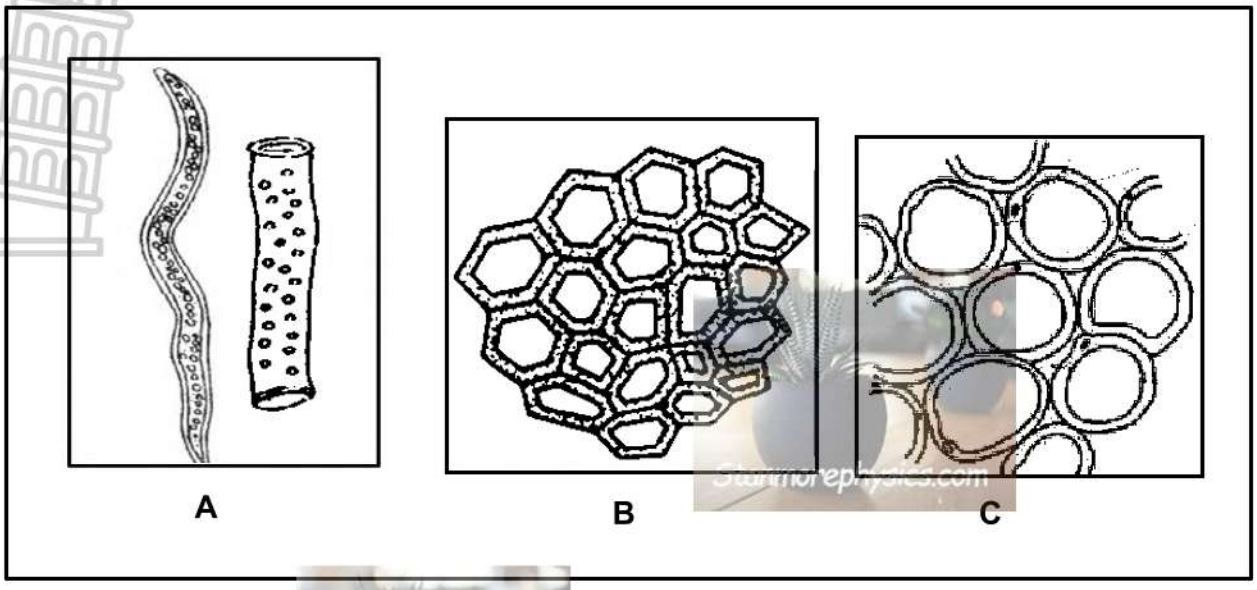
3.1.4 Give FOUR functions of the human skeleton. (4)

3,1,5 Name the opening at the base of the skull. (1)

3.1.6 State the function of the part mentioned in QUESTION 3.1.5 (1)
(12)

3.2 Tabulate TWO differences between tendons and ligaments. **(5)**

3.3 The diagrams below represent types of permanent tissues in plants.



3.3.1 State what is meant by a *permanent tissue*. (1)

3.3.2 Identify the tissue represented as:

(a) **A** (1)

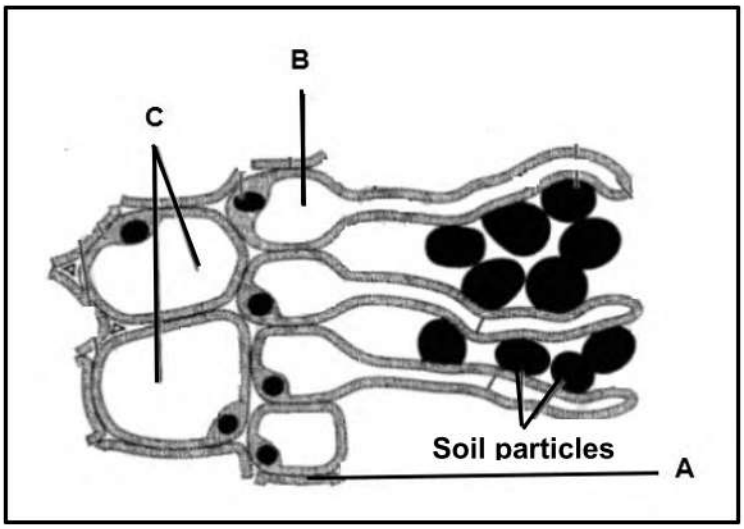
(b) **B** (1)

3.3.3 State ONE function of tissue **C**. (1)

3.3.4 Explain TWO ways in which tissue **A** is structurally suited for its function. (4)
(8)

Stanmorephysics.com

3.4 The diagram below represents the outer tissues of a root showing the root hair.



3.4.1 Identify part:

(a) **A** (1)

(b) **B** (1)

3.4.2 Give TWO ways in which the root hair is structurally suited for the absorption of water. (2)

3.4.3 Describe TWO ways water can move through layer **C** to reach the endodermis. (2)

3.4.4 Explain the effect of soil water with a high salt concentration on part **B**. (3)
(9)

3.5 Describe the THREE forces involved in the upward movement of water. **(6)**

3.6 The table below shows the results obtained in an investigation to determine the relationship between age of the leaf and the number of ribosome present in the leaf cells.

Age of a leaf (days)	Number of ribosomes (per $10cm^2$)
5	17
15	32
20	40
30	45
35	45

3.6.1 State the relationship between the age of the leaf and the number of ribosomes. (2)

3.6.2 Calculate the percentage increase of ribosomes from day 5 to day 35. Show ALL working. (2)

3.6.3 Draw a line graph to represent the data in the table. (6)
(10)
[50]



TOTAL SECTION B: 100
GRAND TOTAL: 150

Copyright reserved