



education

Department of
Education
FREE STATE PROVINCE

GRADE 11

LIFE SCIENCES

FORMAL TEST 2.2

SEPTEMBER 2024

TOTAL: 50

TIME: 50 minutes

This question paper consists of 9 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 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. Make 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.

SECTION A

QUESTION 1

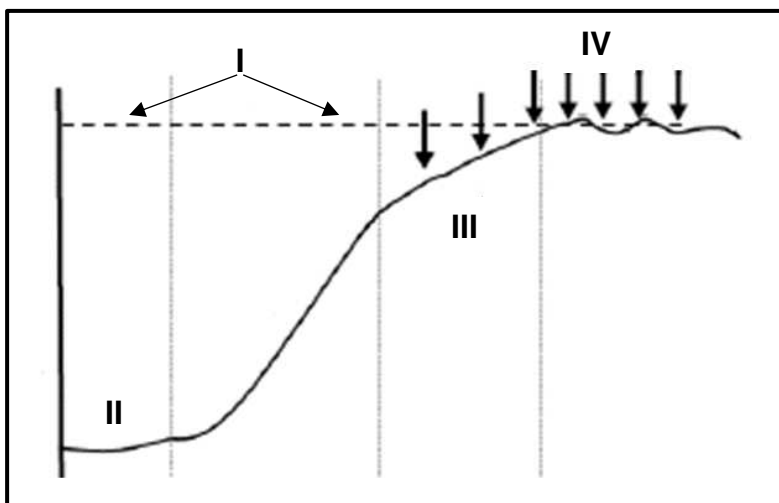
- 1.1 Various options are given as possible answers to the following questions. Choose the answer and write only the letter (A to D) next to the question number (1.1.1 to 1.1.5) in the ANSWER BOOK, for example 1.1.6 D.

1.1.1 A group of organisms of the same species in a specific habitat.

- A Community
- B Individuals
- C Ecosystem
- D Population

QUESTIONS 1.1.2 AND 1.1.3 REFER TO THE GRAPH BELOW:

1.1.2 The graph below represents a logistic growth curve.



Which ONE of the following is represented by I, II and III respectively?

	I	II	III
A	Equilibrium phase	Exponential phase	Lag Phase
B	Carrying Capacity	Lag Phase	Decelerating growth phase
C	Decelerating growth phase	Lag Phase	Carrying Capacity
D	Equilibrium phase	Decelerating growth phase	Carrying Capacity

1.1.3 A density- independent factor that regulates the population at **IV**

- A Disease
- B Drought
- C Competition
- D Size of the population

QUESTIONS 1.1.4 AND 1.1.5 REFER TO THE INVESTIGATION BELOW:

Scientists investigated the effect on the average number of red blood cells in the blood of people living at different altitudes.

They:

- Selected 10 male adults per altitude to participate in the investigation.
- Selected males that were of the same age.
- Calculated the average red blood cells for the 10 male adults, who lived at that altitude, for at least four months.

Their findings were recorded in the table below.

Altitude (metres)	Average number of red blood cells (millions/mm ³ of blood)
Sea level - 0	5.1
1 500	5.3
3 000	5.4
4 500	5.6
6 000	5.9
7 500	6.2

1.1.4 The independent variable is the...

- A number of red blood cells.
- B altitude in metres.
- C average number of red blood cells.
- D different altitudes.

1.1.5 This investigation can be considered as reliable because...

- A adults were used.
- B different altitudes were chosen.
- C 10 males were chosen per altitude.
- D the experiment was conducted for at least four months.

(5 x 2) **(10)**

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 1.2.4) in the ANSWER BOOK.

1.2.1 Death rate in a population

1.2.2 The study of interactions among living organisms and between living organisms and their environment

1.2.3 The mechanical process whereby air moves in and out the lungs

1.2.4 The specialised cells that line the Bowman's capsule of the kidney
(4 x 1) (4)

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.

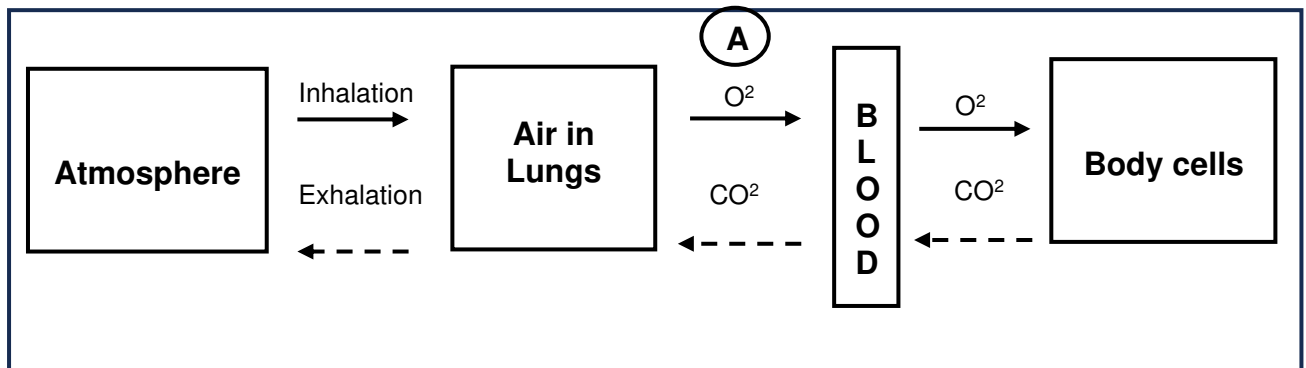
COLUMN I		COLUMN II
1.3.1	One-way, outward movement of individuals	A: Emigration B: Immigration
1.3.2	Pumps sodium ions	A: Loop of Henlé B: Collecting duct
1.3.3	Location of the Malpighian body	A: Cortex B: Medulla

(3 x 2) (6)
TOTAL SECTION A: 20

SECTION B

QUESTION 2

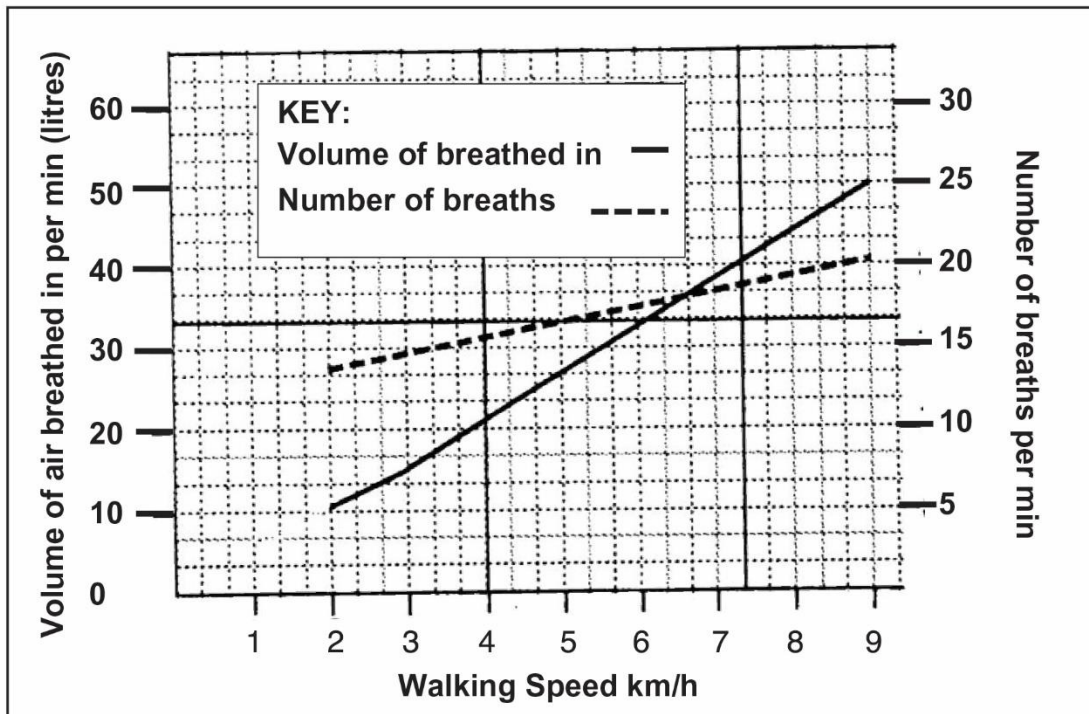
- 2.1 The flow diagram below represents the movement of gas between the atmosphere and body cells.



- 2.1.1 Name the process that takes place at **A**. (1)
- 2.1.2 Name ONE way in which oxygen is transported in blood. (1)
- 2.1.3 Explain the homeostatic control of breathing during exercise. (6)
- (8)

- 2.2 An investigation was done to determine the volume of air inhaled as well as the number of breaths taken per minute, when walking at different speeds.

The results are shown in the graph below



2.2.1 Give the:

- a) Number of breaths per min at **9 km/h** (2)

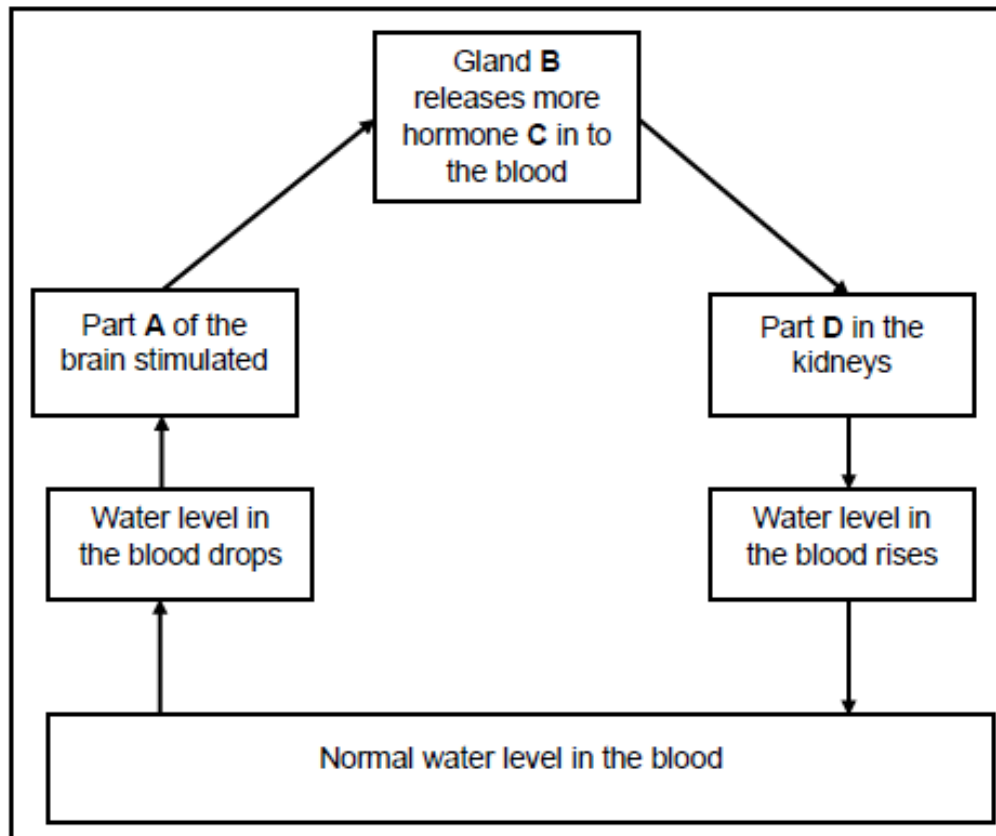
2.2.2 Describe the change in the thoracic cavity during inhalation. (2)

2.2.3 Use the results represented in the graph to draw a conclusion from this investigation. (3)
(7)

TOTAL QUESTION 2: 15

QUESTION 3

3.1 The diagram represents the homeostatic control of low water levels in blood.



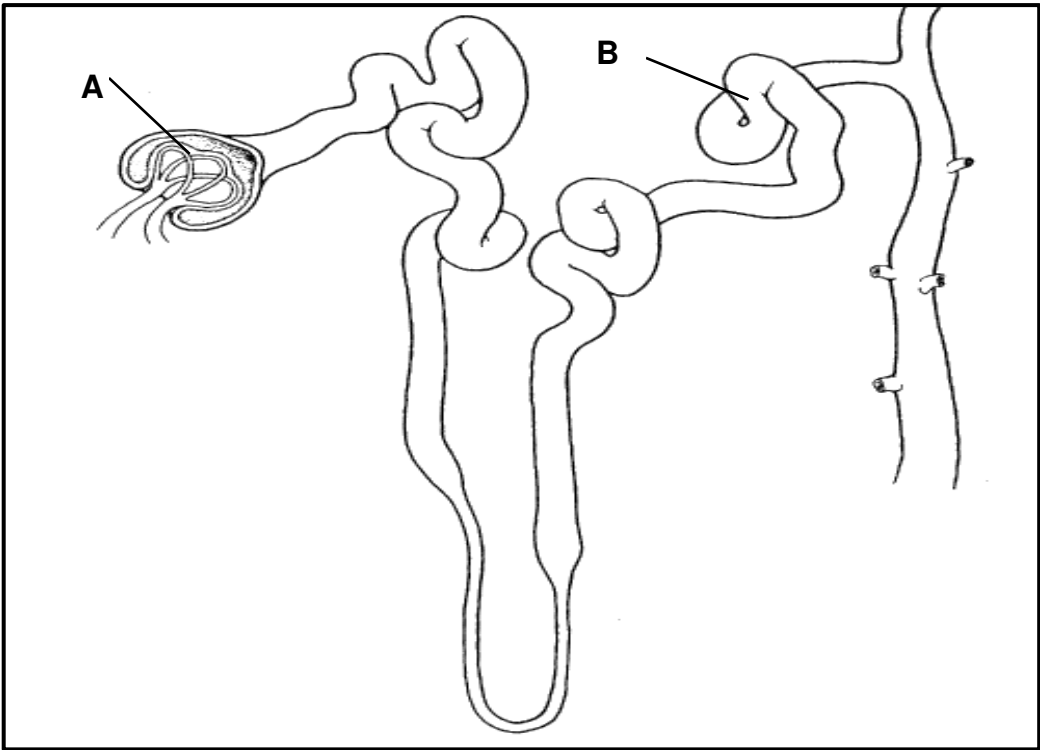
3.1.1 Identify:

- a) Part **A** (1)
- b) Gland **B** (1)
- c) Hormone **C** (1)
- d) Structure **D** (1)

3.1.2 State the effect of hormone **C** on structure **D** in this person (2)

3.1.3 Name ONE physiological process that would lead to low water levels in the blood of this person. (1)
(7)

3.2 The diagram represents a nephron in the kidney.



The table below shows the amount of each substance entering the nephron and the amount of each substance present in urine over a 24 - hour period.

Substance	Amount filtrated into the structure above	Amount in Urine
Water	180ℓ	1,5ℓ
Sodium	500g	15g
Glucoses	220g	0g
Urea	40g	42g

- 3.2.1 Identify:

a) Part **A**(1)

b) Tube **B**(1)
- 3.2.2 Calculate the amount of filtered sodium that is reabsorbed.
Show all calculations.(3)
- 3.2.3 Explain why the glucose concentration is 0g in the urine, but 500g in the nephron.(3)

(8)

TOTAL QUESTION 3: 15
GRAND TOTAL: 50