KWAZULU-NATAL PROVINCE

EDUCATION
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 11

LIFE SCIENCES

SEPTEMBER 2025

TEST

MARKS: 50

TIME: 1 hour

This question paper consists of 8 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. 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 may use a non-programmable calculator, protractor and a compass.
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 number (1.1.1 to 1.1.3) in the ANSWER BOOK, e.g. 1.1.4 D.

1.1.1 Total number of organisms of a particular species that can be supported by resources in the environment:

A Ecological niche
B Census
C Carrying capacity
D Population density

1.1.2 The part of the brain that stimulates heart muscles when a person is exposed to environment with high level of carbon dioxide is the ...

A cerebellum.
B medulla oblongata.
C hypothalamus.
D cerebrum.

1.1.3 The table below shows rate and depth of breathing in a healthy individual during a three-minute strenuous exercise.

Time of exercise (minutes)	Rate of breathing (number of breaths per minute)	Depth of breathing per minute (litres)
1	10	20
2	15	30
3	20	40

Which ONE of the following statements best describes the relationship between the time of exercise, rate and the depth of breathing?

A Time of exercise increases with the decrease in rate and depth of breathing
B Depth and rate of breathing decreases with the increases in time of exercise
C Depth and rate of breathing increases with the increase in time of exercise
D Time of exercise increases with the increase in rate and depth of breathing

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

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 1.2.2) in the ANSWER BOOK.

1.2.1 Specialised cells in the inner wall of the Bowman's capsule.

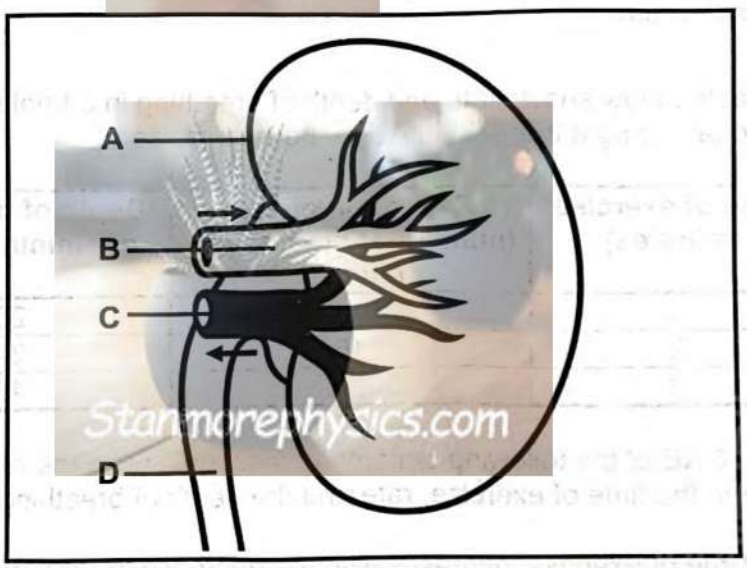
1.2.2 The process of eliminating metabolic waste product. (2 x 1) **(2)**

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	Blood vessel that carries deoxygenated blood from the heart to the lungs	A: Pulmonary artery B: Pulmonary vein
1.3.2	Sodium level increases in the blood	A: More aldosterone secreted B: Less aldosterone secreted
1.3.3	The air passages	A: Nostrils B: Bronchus

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

1.4 The diagram below shows a part of human urinary system.



1.4.1 Give the LETTER and NAME of the part that:

(a) Carry blood with nitrogenous waste to the kidney for filtration (2)

(b) Carry urine from the kidney to the bladder (2)

(c) Carries deoxygenated and filtered blood to the heart (2)

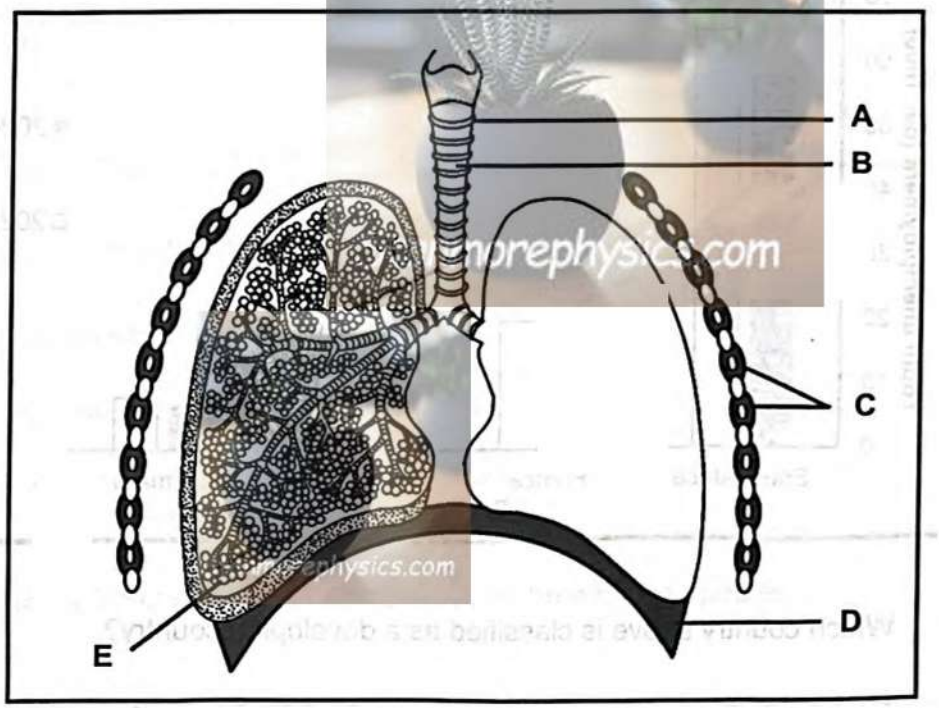
(6)

TOTAL SECTION A: 20

SECTION B

QUESTION 2

2.1 The diagram below shows the human lungs.



2.1.1 Identify part

(a) **B** (1)

(b) **E** (1)

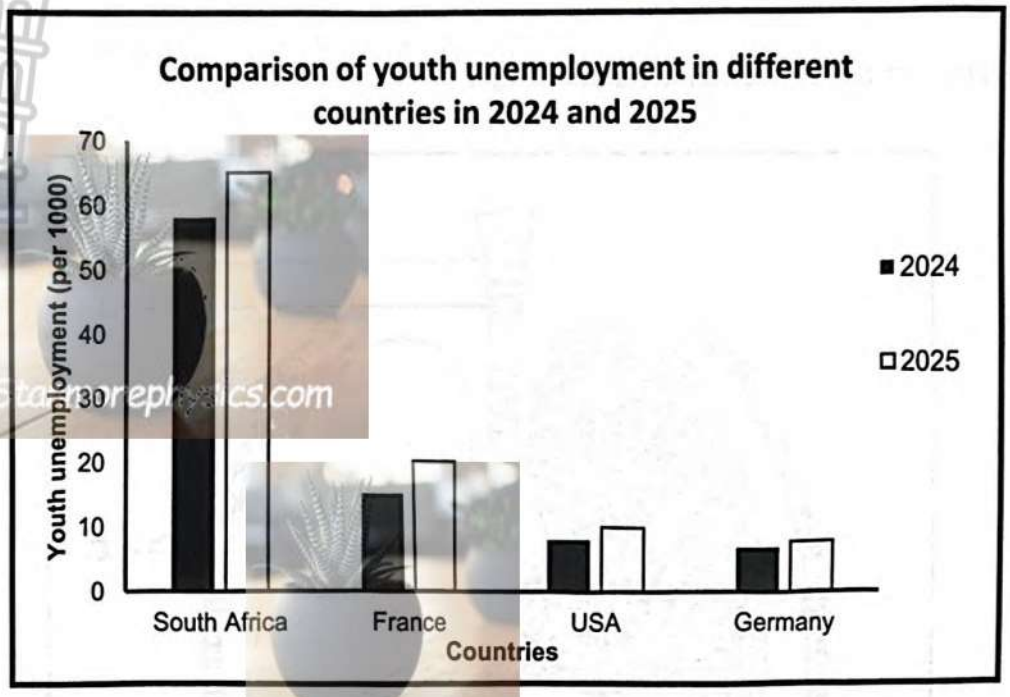
2.1.2 Describe the role of part **C** and **D** during exhalation. (4)

2.1.3 Bronchoalveolar Carcinoma is a rare form of lung cancer that originates and damages the cells lining part **E.**

Explain how this disease may result in death if it is not detected earlier. (3)

(9)

2.2 The bar graph below shows a comparison between youth unemployment in different countries in 2024 and 2025.



2.2.1 Which country above is classified as a developing country? (1)

2.2.2 Explain ONE reason for your answer in QUESTION 2.2.1. (2)

2.2.3 Calculate the percentage increase in the youth unemployment in France between 2024 and 2025. Show ALL working. (3)

(6)

[15]

QUESTION 3

3.1 Read the extract below.

THE ECOLOGICAL ROLES OF LIONS

Lions are the apex predator of the African savanna since they hunt in packs. They play the critical role of managing large herbivores population of buffalos, impalas, zebras, and even elephants and giraffes. In a balanced ecosystem, the number of herbivores needs to be kept in balance. If there are too many herbivores the ecosystem will inevitably degrade.

3.1.1 Name the type of relationship between lions and the herbivores (1)

3.1.2 Explain why:

(a) lions are successful predators in the savanna. (2)

(b) the number of herbivores needs to be kept in balance in the ecosystem. (2)

3.1.3 Name TWO symbiotic interactions that benefit one species. (2)

(7)

3.2 Grade 11 learners conducted an investigation to determine the effect of drinking water on urine production.

A healthy athlete was requested not to drink water or eat food for 24 hours before the investigation. The investigation was conducted over a period of five days.

The following procedure was followed:

- Day 1 and 2, the athlete was given 500ml of water to drink each day.
- Day 3, the athlete was given 660ml of water to drink.
- Day 4, the athlete was given 870ml of water to drink.
- Day 5, the athlete was given 990ml of water to drink.
- On each day of the investigation, the amount of urine produced by the athlete was measured and recorded over a 5-hour period after drinking water.

Results were recorded in the table below:

DAY	AMOUNT OF WATER CONSUMED (mL)	AMOUNT OF URINE PRODUCED (mL/day)
1	500	410
2	500	410
3	660	604
4	870	823
5	990	902

3.2.1 State ONE:

(a) way in which the reliability of the investigation was ensured. (1)

(b) reason why the participant was asked not to consume water or food for 24 hours before the investigation. (1)

(c) planning step the learners considered for this investigation. (1)

3.2.2 Name the hormone responsible for water balance in the body. (1)

3.2.3 Explain the role of the hormone mentioned in QUESTION 3.2.2 in homeostatic response after day 3. (4)

(8)

[15]

TOTAL SECTION B: 30

GRAND TOTAL: 50

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GRADE 11

LIFE SCIENCES

MARKING GUIDELINES

SEPTEMBER 2025

TEST

MARKS: 50

This marking guideline consists of 6 pages.

PRINCIPLES RELATED TO MARKING LIFE SCIENCES SEPTEMBER 2025

1. **If more information than marks allocated is given**
   Stop marking when maximum marks are reached and put a wavy line and 'max' in the right-hand margin.

2. **If, for example, three reasons are required and five are given**
   Mark the first three irrespective of whether all or some are correct/incorrect.

3. **If whole process is given when only part of it is required**
   Read all and credit relevant part.

4. **If comparisons are asked for and descriptions are given**
   Accept if differences / similarities are clear.

5. **If tabulation is required but paragraphs are given**
   Candidates will lose marks for not tabulating.

6. **If diagrams are given with annotations when descriptions are required**
   Candidates will lose marks

7. **If flow charts are given instead of descriptions**
   Candidates will lose marks.

8. **If sequence is muddled and links do not make sense**
   Where sequence and links are correct, credit. Where sequence and links is incorrect, do not credit. If sequence and links become correct again, resume credit.

9. **Non-recognised abbreviations**
   Accept if first defined in answer. If not defined, do not credit the unrecognized abbreviation but credit the rest of answer if correct.

10. **Wrong numbering**
    If answer fits into the correct sequence of questions but the wrong number is given, it is acceptable.

11. **If language used changes the intended meaning**
    Do not accept.

12. **Spelling errors**
    If recognizable accept provided it does not mean something else in Life Sciences or if it is out of context.

13. **If common names given in terminology**
Accept provided it was accepted at the National memo discussion meeting.

14. **If only letter is asked for and only name is given (and vice versa)**
No credit

15. **If units are not given in measurements**
Candidates will lose marks. Memorandum will allocate marks for units separately

16. Be sensitive to the **sense of an answer, which may be stated in a different way**.

17. **Caption**
All illustrations (diagrams, graphs, tables, etc.) must have a caption

18. **Code-switching of official languages (terms and concepts)**
A single word or two that appears in any official language other than the learners' assessment language used to the greatest extent in his/her answers should be credited, if it is correct. A marker that is proficient in the relevant official language should be consulted. This is applicable to all official languages.

SECTION A

QUESTION 1

1.1	1.1.1	C✓✓			
	1.1.2	B✓✓			
	1.1.3	C✓✓	(3 x 2)		**(6)**
1.2	1.2.1	Podocytes✓			
	1.2.2	Excretion✓	(2 x 1)		**(2)**
1.3	1.3.1	A only✓✓			
	1.3.2	B only✓✓			
	1.3.3	Both A and B✓✓	(3 x 2)		**(6)**
1.4	1.4.1	(a) B✓ - renal artery✓			(2)
		(b) D✓ - ureter✓			(2)
		(c) C✓ - renal vein✓			(2)
					(6)

TOTAL SECTION A: [20]

SECTION B

QUESTION 2

2.1 2.1.1 (a) Trachea✓ (1)

(b) Alveolus✓ (1)

2.1.2
- Diaphragm ✓ relaxes and become arched✓/Diaphragm relaxes pushing air/ CO_2
- External intercoastal muscles✓ relaxes to lower the rib cage✓ This decreases the volume of the thoracic cavity✓

(Mark first FOUR only) Any (4)

2.1.3
- surface area available for gaseous exchange is reduced✓/ blockage of air-passage by tumours
- leading to less/no oxygen entering the blood✓
- less /no oxygen reaching tissues /heart muscles✓
- More carbon dioxide being trapped✓/not exhaled which dissolves in water forming carbonic acid✓ resulting in heart failure✓

(Mark first THREE only) Any (3)

(9)

2.2 2.2.1 South Africa✓ (1)

2.2.2 - has highest youth unemployment rate✓ (2)
- due to high population in young age✓

2.2.3 $\left[\frac{20 - 15}{15}\right]$ ✓ x 100✓

= 33.33% ✓

OR

$\left[\frac{20\,000 - 15\,000}{15\,000}\right]$ ✓× 100 ✓

= 33,33 % ✓ (3)

(6)

[15]

QUESTION 3

3.1 3.1.1 Predator-prey✓ (1)

3.1.2 (a) - they hunt in packs✓
- to increase the chances of successful hunting✓ (2)

(b) - to prevent overgrazing of the land✓ /land degradation
- which can result in reduced carrying capacity✓ (2)

3.1.3 - Commensalism✓
- Parasitism ✓

(Mark first TWO only) (2)

(7)

3.2 3.2.1 (a) - The investigation was conducted over a period of five days✓ (1)

(b) - to ensure there is less water in the blood before the investigation ✓
- to improve validity of the investigation✓

(Mark first ONE only) (1)

(c) - Ask learner's permission ✓
- Decide on the instrument to collect the urine produced ✓
- Decide on how to record the results ✓
- Decide on time ✓/ venue of the investigation

(Mark first ONE only) (1)

3.2.2 ADH✓ (1)

3.2.3 - less ADH is secreted into the blood✓
- less ADH causes the walls of distal convoluted tubule and collecting tubule to become less permeable✓
- less water leaves the tubule by osmosis✓
- more water thus remains in the tubule✓
- more water is released through diluted urine✓

(Mark first FOUR only) (4)

(8)

[15]

TOTAL SECTION B: 30

GRAND TOTAL: 50