



KWAZULU-NATAL PROVINCE

EDUCATION
REPUBLIC OF SOUTH AFRICA



**NATIONAL
SENIOR CERTIFICATE**

GRADE 11

**LIFE SCIENCES
COMMON TEST
SEPTEMBER 2024**

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MARKS: 50

TIME: 1 hour

This question paper consists of 10 pages including this page.

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

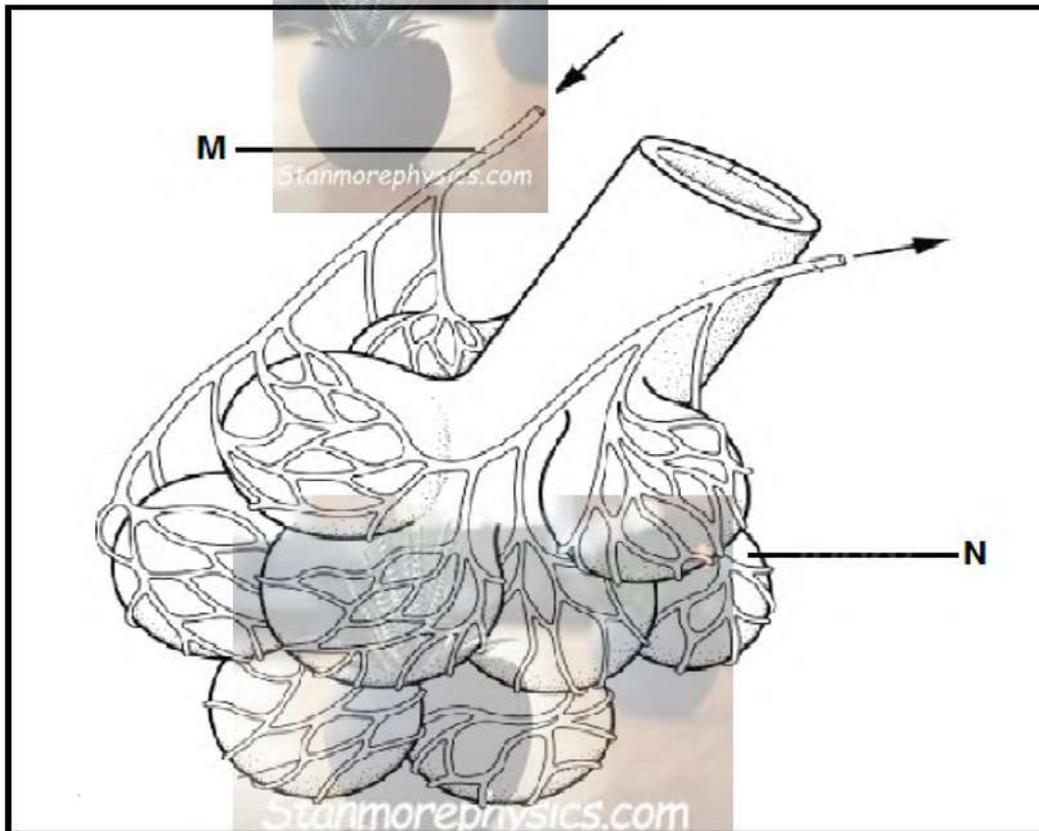
QUESTION 1

1.1 Various options are provided as possible answers to the following questions. Choose the correct answer and write only the letter (A to D) next to the question number (1.1.1 to 1.1.4) in your ANSWER BOOK, for example 1.1.5 D.

1.1.1 Which ONE of the following combinations of factors contribute to an increase in the size of a population?

- A Mortality and natality
- B Natality and emigration
- C Immigration and natality
- D Emigration and immigration

QUESTIONS 1.1.2 AND 1.1.3 ARE BASED ON THE DIAGRAM BELOW.



1.1.2 The blood vessel labelled **M** is a branch of the ...

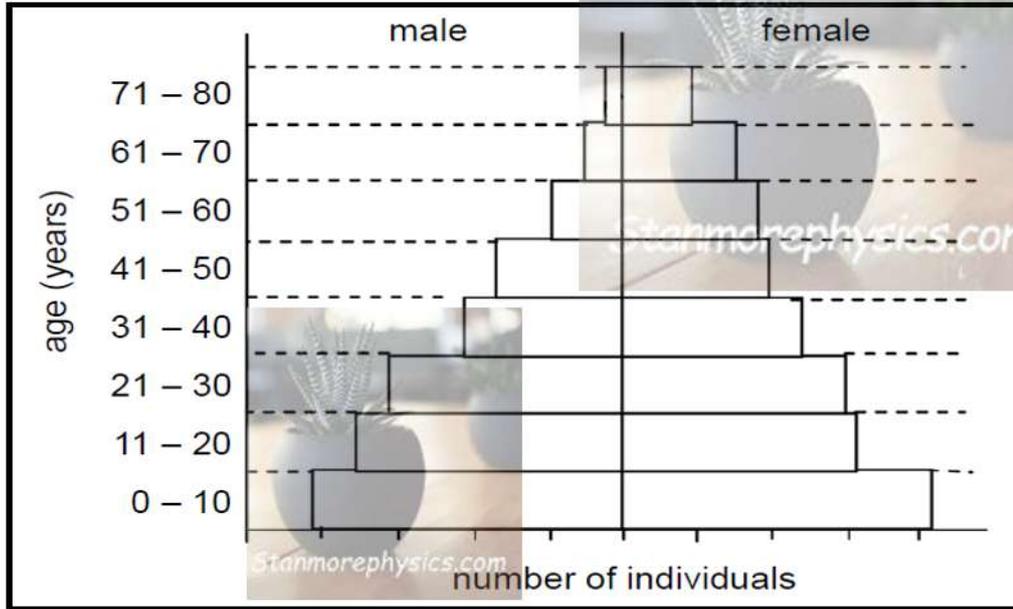
- A coronary vein.
- B aorta.
- C pulmonary vein.
- D pulmonary artery.

1.1.3 Part N represents the ...



- A bronchus.
- B alveolus.
- C bronchiole.
- D trachea.

1.1.4 The diagram below shows the Age-gender pyramid of a country.



Which ONE of the following is the correct interpretation of the population represented above?

- A Declining population; characteristic of a developing country
- B Stable population; characteristic of a developed country
- C Declining population; characteristic of a developed country
- D Rapidly growing population; characteristic of a developing country

(4 x 2) (8)

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 1.2.3) in the ANSWER BOOK.

1.2.1 A group of organisms of same species living in same habitat at the same time.

1.2.2 The maximum number of individuals that an area can support.

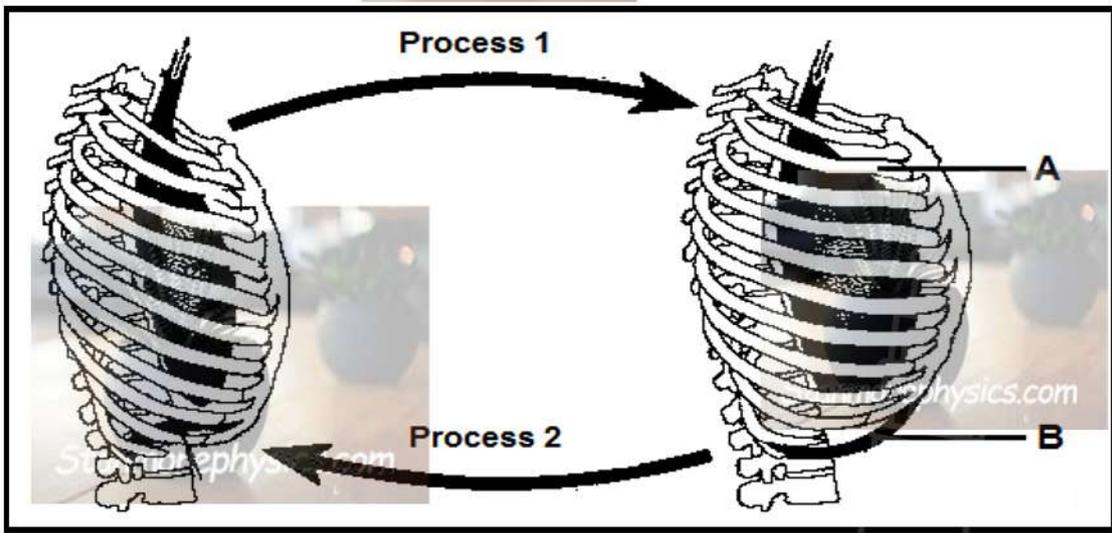
1.2.3 Tube that carries urine from the kidney to the bladder. (3 x 1) (3)

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 1.3.2) in the ANSWER BOOK.

COLUMN I		COLUMN II	
1.3.1	Kittens competing for their mother's milk	A:	interspecific competition
		B:	intraspecific competition
1.3.2	Excretory organ	A:	Skin
		B:	Liver

(2 x 2) (4)

1.4 The diagram below shows a mechanical process of air moving in and out of the lungs in humans.



1.4.1 Identify:

- (a) Process 1 (1)
- (b) Process 2 (1)
- (c) Part B (1)

1.4.2 State the changes in structure labelled **A (lifted or lowered)** during:

(a) Process 1

(1)

(b) Process 2

(1)

(5)

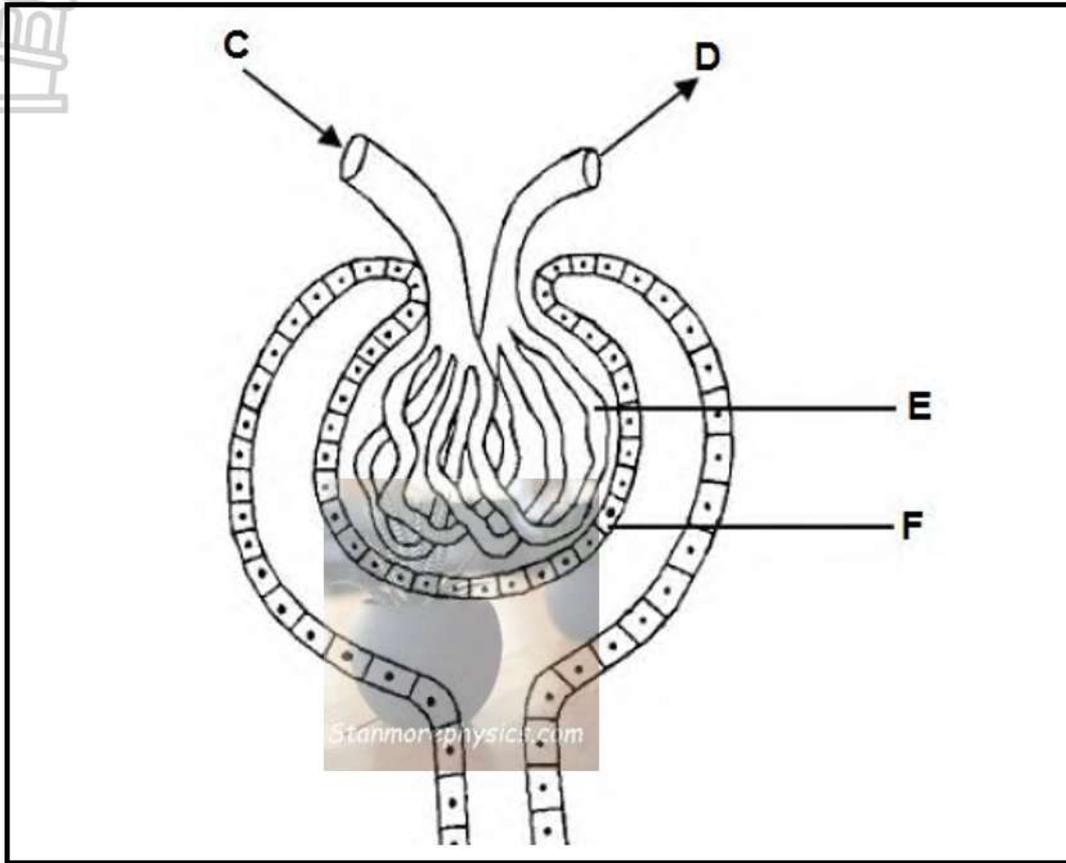
TOTAL SECTION A: 20



SECTION B

QUESTION 2

2.1 The diagram below shows part of a human nephron.



2.1.1 Identify:

- (a) Part of the nephron shown in the diagram. (1)
- (b) Part labelled **F**. (1)

2.1.2 Name the process that takes place in part **E**. (1)

2.1.3 Give the LETTER and NAME of the part that contains single layer of endothelial cells that assists in the process named in QUESTION 2.1.2. (2)

2.1.4 Explain the significance of part **C** being wider than **D**. (2)

(7)

2.2 The table below shows the composition of inhaled air and exhaled air.

GAS	INHALED AIR	EXHALED AIR
Oxygen	21%	16%
Carbon dioxide	0,04%	4%
Nitrogen	78%	78%

- 2.2.1 Give ONE reason why the oxygen concentration of exhaled air is lower than the inhaled air. (1)
- 2.2.2 Calculate the difference between the carbon dioxide concentration of exhaled air and inhaled air. Show ALL workings. (2)
- 2.2.3 Describe the homeostatic control of carbon dioxide when it is high in the blood. (5)



(8)

TOTAL QUESTION 2: [15]

QUESTION 3

3.1 Read the extract below on Diabetes insipidus.

Diabetes insipidus (DI) is a condition in which the kidneys are unable to prevent the excretion of water. DI is not the same as diabetes mellitus types 1 and 2. However, untreated, both DI and diabetes mellitus cause constant thirst and frequent urination. People with diabetes mellitus have high blood sugar (glucose). Those with DI have normal blood sugar levels, but their kidneys are not able to balance fluid and salt in the body.

DI caused by a lack of ADH (Anti diuretic hormone) is called central diabetes insipidus. When DI is caused by a failure of the kidneys to respond to ADH, the condition is called nephrogenic diabetes insipidus.

3.1.1 State ONE difference in people with diabetes insipidus and diabetes mellitus. (2)

3.1.2 Apart from lack of ADH, state ONE other cause of diabetes insipidus mentioned in the passage. (1)

3.1.3 With reference to the extract, explain why:

(a) Lack of ADH results to diabetes insipidus. (2)

(b) A person with DI will have constant thirst and frequent urination as a person with diabetes mellitus. (2)

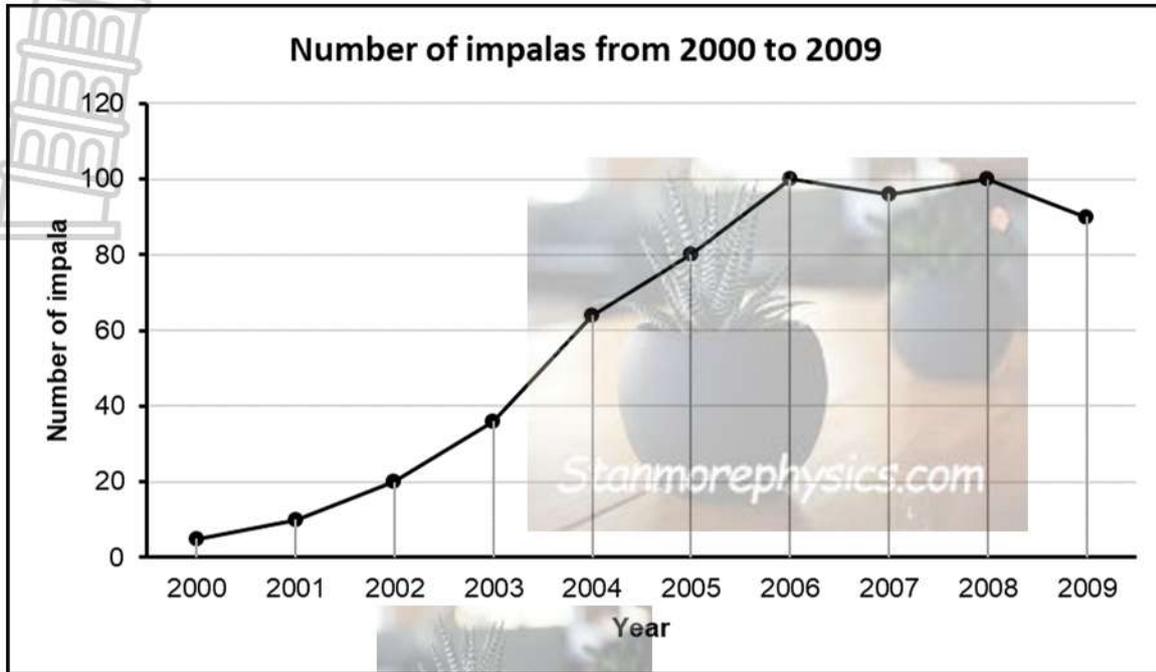
(7)

3.2 An investigation was conducted to determine the changes in the population size of impala in a nature reserve over time.

The procedure was as follows:

- Mark re-capture method was used every year from 2000 to 2009 to determine the population size of impala in the nature reserve.
- Each year, during the month of April, first sample of impala was captured, marked and released back to the nature reserve.
- The impalas were given 3 weeks after release to mix in their habitat after which the second sample was taken.
- The number of marked and unmarked impalas were counted.
- The population of the impala was determined using the Petersen index.

The graph below illustrates the result of the investigation.



3.2.1 State:

- (a) The aim of the investigation. (2)
- (b) the dependent variable. (1)

3.2.2 State ONE way in which validity was ensured in the investigation. (1)

3.2.3 Identify the type of growth form show on the graph. (1)

3.2.4 Name the growth phase from 2000 to 2002. (1)

3.2.5 Explain the pattern of growth in the phase mentioned in QUESTION 3.2.4. (2)

(8)

[15]

TOTAL SECTION B: 30

GRAND TOTAL: 50

FINAL



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LIFE SCIENCES

MARKING GUIDELINES

COMMON TEST

Stanmorephysics.com

SEPTEMBER 2024

MARKS: 50

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This marking guideline consists of 5 pages.

PRINCIPLES RELATED TO MARKING LIFE SCIENCES

1. **If more information than marks allocated is given**
Stop marking when maximum marks is 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 a part of it is required**
Read all and credit the relevant part.
4. **If comparisons are asked for, but descriptions are given**
Accept if the 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 are 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 unrecognised abbreviation, but credit the rest of the 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 recognisable, accept the answer, provided it does not mean something else in Life Sciences or if it is out of context.
13. **If common names are given in terminology**
Accept, provided it was accepted at the national memo discussion meeting.
14. **If only the letter is asked for, but only the name is given (and vice versa)**
Do not 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.

SECTION A

QUESTION 1

1.1 1.1.1 C ✓✓

1.1.2 D ✓✓

1.1.3 B ✓✓

1.1.4 D ✓✓

(4 x 2) (8)

1.2 1.2.1 Population ✓

1.2.2 Carrying capacity ✓

1.2.3 Ureter ✓

(1 x 3) (3)

1.3 1.3.1 B only ✓✓

1.3.2 Both A and B ✓✓

(2 x 2) (4)

1.4 1.4.1 (a) Inhalation ✓

(b) Exhalation ✓

(c) Diaphragm ✓

(1)

(1)

(1)

1.4.2 (a) Lifted ✓

(b) Lowered ✓

(2)

(5)

TOTAL SECTION A: 20



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SECTION B

QUESTION 2

- 2.1 2.1.1 (a) Malpighian body ✓ (1)
 (b) Podocyte cell ✓ / Bowman's capsule (1)

2.1.2 Glomerular filtration/ Ultra-filtration ✓ (1)

2.1.3 E ✓- capillary ✓ / glomerulus / capillary network (2)

- 2.1.4 - Allows blood to be under high pressure ✓
 - for substances to be forced out of the glomerulus ✓ (2)

(7)

2.2 2.2.1 Oxygen has been used by body cells for cellular respiration ✓ (1)
(Mark the first ONE only)

2.2.2 $4\% - 0,04\% \checkmark = 3,96\% \checkmark$ (2)

- 2.2.3 - Receptors in the carotid artery are stimulated ✓ and
 - impulses are sent to the medulla oblongata ✓
 - stimulating the heart to beat faster ✓
 - The breathing muscles (intercostal muscles and diaphragm) contract more actively ✓
 - more carbon dioxide is taken to the lungs ✓
 - And the rate/ depth of breathing increases ✓
 - More carbon dioxide is exhaled ✓
 - The carbon dioxide level in the blood decreases ✓ / returns to normal

Any (5)

(8)

[15]

QUESTION 3

3.1 3.1.1 - People with DI have normal blood sugar level while people with diabetes mellitus have high blood sugar level. ✓✓



OR

- People with DI have kidneys that are not able to balance fluid and salt while people with diabetes mellitus have kidneys that are able to balance fluids and salt. ✓✓

Any (2)

(Mark the first ONE only)

3.1.2 Failure of the kidneys to respond to ADH ✓

(1)

(Mark the first ONE only)

3.1.3 (a) - Low level of ADH in the blood ✓
 - leads to decrease in permeability of the kidney tubules ✓
 - Hence less water reabsorbed back to the blood ✓ / More water excreted with the urine

Any (2)

(b) - Kidneys are unable to prevent the excretion of water ✓
 - Therefore, more water leaves with the urine ✓ / large volume of urine is formed/ dilute urine formed.
 - decreasing the level of water in the blood ✓

Any (2)

(7)

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3.2 3.2.1 (a) To determine the changes in the population size of impala in a nature reserve over time. ✓✓

(2)

(b) Population size of impala ✓ / number of impala

(1)

3.2.2 - Mark and recapture method was used every year ✓
 - Procedure was always done in April
 - Impalas were given 3 weeks to mix in their environment ✓ before 2nd sample was taken
 - Population is determined using same Petersen index ✓
(Mark first ONE only)

(1)

3.2.3 Logistic growth form ✓

(1)

3.2.4 Lag ✓ / establishment phase

(1)

3.2.5 - Population growth is slow ✓
 - Impala still acclimatising to the area ✓

(2)

(8)

[15]

TOTAL SECTION B: 30

GRAND TOTAL: 50