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TOTAL MARKS

Sequence number

NATIONAL SENIOR CERTIFICATE EXAMINATION
NOVEMBER 2025

LIFE SCIENCES: PAPER II

EXAMINATION NUMBER

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Time: 2 hours 100 marks

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

- 1. This question paper consists of 20 pages and a Source Material Booklet of 18 pages (i–xviii). Please check that your question paper is complete. Remove the Source Material Booklet from the middle of the question paper.
- 2. The question paper consists of three questions. Questions 1 and 2 are case studies, and Question 3 is an essay.
- 3. Read the sources provided in the Source Material Booklet and use this information and your own knowledge to answer all the questions.
- 4. Read the questions carefully.
- 5. Answer ALL the questions on the question paper and hand it in at the end of the examination. Remember to write your examination number in the space provided.
- 6. Use the total marks that can be awarded for each part of the question and the space provided as an indication of the detail required.
- 7. It is in your own interest to write legibly and to present your work neatly.
- 8. Two blank pages (pages 19 and 20) are included at the end of the question paper. Use these pages if you run out of space for a question. Clearly indicate the number of the question you are answering, should you use this additional space.

FOR OFFICE USE ONLY: MARKERS TO ENTER MARKS

	Q1	Q2	Q3	Total
Mark				
Marker Initial				
Moderated Mark				
Moderator Initial				
	30	30	40	100

SECTION A**QUESTION 1**

Refer to pages ii–v of the Source Material Booklet.

Use this information and your own knowledge to answer the questions that follow.

- 1.1 Study the table below, which consists of a term from the source material in **COLUMN 1** and two statements (numbered 1 and 2) in **COLUMN 2**.

Decide which statement from COLUMN 2 relates to the term in COLUMN 1 **with respect to the nature-based farming context**.

Write down your choice in the answer column, making use of the following code:

- 1 Only statement 1 relates to the term.
 2 Only statement 2 relates to the term.
 1 & 2 Both statements 1 and 2 relate to the term.
 None Neither statements 1 nor 2 relate to the term.

COLUMN 1	COLUMN 2	ANSWER
Ecosystem	1. Refers to, and includes, cows grazing on cover crops, earthworms breaking down organic matter, bees pollinating flowers, and birds preying on pests. 2. Refers to, and includes, grazing cows enriching the soil, plants fixing nitrogen, earthworms decomposing matter, bees pollinating crops, and predators controlling pests, all interacting with sunlight, rain, and nutrient-rich soil.	
Biodiversity	1. The variety of species in an area, including pollinators like bees, beneficial insects like ladybugs, various wild grass species, grazing herbivores like cattle and sheep, and wild carnivores like jackals. 2. The many different grazing herbivores found on an African livestock farm.	

(2)

1.2 The contribution of Agriculture to South Africa's Gross Domestic Product (GDP) has declined.

1.2.1 Calculate the percentage decrease in agricultural contribution to South Africa's GDP between 1920 and 2023.

Show all your workings. Round off your answer to one decimal place.

(3)

1.2.2 Identify ONE land cover category from Table 1.1 that could have resulted from poor agricultural practices.

(1)

1.3 Refer to Source 2 and Figure 1.2 on page iii of the Source Material Booklet.

1.3.1 State the type of plant succession that occurs when abandoned farmland recovers naturally.

(1)

1.3.2 Study the two rows of boxes below.

The blocks in the top row are different successional states.

The blocks on the bottom row are plant groups that colonise abandoned croplands.

Instructions:

Draw only TWO lines to link each successional state to its correct plant group; one from the pioneer species and one from the climax community.

Successional state	Pioneer species	Climax community
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Plant group	Closed woodland	Herbaceous plants	Small trees	Annual grasses	Shrubs
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(2)

1.3.3 Construct a table comparing the differences between nature-based farming practices and the natural recovery of abandoned farmland in terms of:

- **human involvement**, and
- the **biodiversity outcomes** of ecological succession.

(No heading is required.)

(3)

1.4 1.4.1 State the ecological term that describes the coexistence of two or more species in an ecosystem by using the same resource in different ways.

(1)

1.4.2 Explain how plants with different rooting depths illustrate the concept you named in Question 1.4.1 above.

Provide an example from the Source Material to support your answer.

(2)

1.5 The introduction of beehives into nature-based farms can improve crop productivity.

1.5.1 (a) Describe the division of labour in ONE eusocial insect colony you have studied.

(3)

(b) Briefly explain how the division of labour you described in Question 1.5.1 (a) above provides a survival advantage to the colony.

(1)

1.5.2 Explain why increased pollination would boost crop productivity.

(1)

- 1.5.3 Explain why bee colonies on nature-based farms face less food scarcity and are likely to maintain larger population sizes.

Use the following ecological terms in your answer:

- **habitat diversity**, and
- **carrying capacity**.

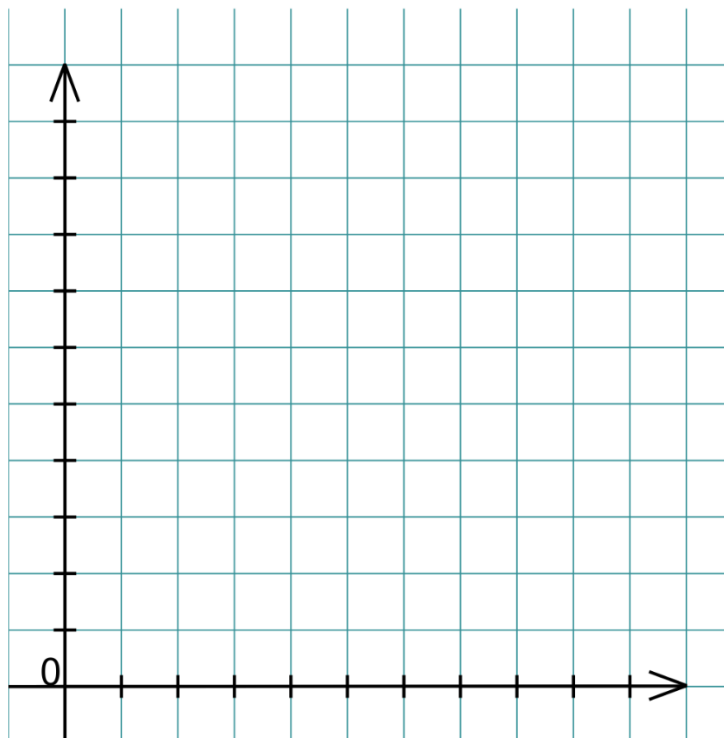
(2)

- 1.6 Consider the possible ecological knock-on effects of nature-based farming.

- 1.6.1 On the set of axes below, draw a simplified sketch graph depicting the response of the rodent population to the reintroduction of barn owls in Kenya (Figure 1.5 A, page v of the Source Material Booklet).

Draw TWO lines: one for the rodent population and one for the barn owl population.

(No heading is required. The plotting of actual population numbers is not necessary.)



(4)

- 1.6.2 State ONE observation scientists would make in a wildlife game reserve if a population of large mammalian herbivores had exceeded its carrying capacity.

(1)

- 1.6.3 Explain how the carrying capacity of natural grasslands in South Africa could increase under nature-based farming practices through the addition of more large herbivores (Figure 1.5 B, page v).

Provide facts from the Source Material Booklet to support your answer.

(3)
[30]

QUESTION 2

Refer to pages vi–ix of the Source Material Booklet.

Use this information and your own knowledge to answer the questions that follow.

- 2.1 A *population* is defined as a group of individuals of the same species, inhabiting the same location at a designated time.

State how these THREE *population* criteria are expressed in terms of the West African lion in the source material on page vi.

(3)

- 2.2 Lions are considered to be apex predators.

2.2.1 Why are lions classified as *predators*?

(1)

- 2.2.2 Complete the table below by filling in ONE physical feature of lions. For the physical feature, state how it enables a lion to hunt its prey successfully.

Physical feature	How the feature is used in hunting

(1)

- 2.2.3 Lions are considered the only truly social cats. Describe TWO ways in which the pride system enhances their survival.

(2)

2.2.4 Refer to Source 5 and Figures 2.6–2.9 and answer the questions that follow.

- (a) Construct a simplified food web for the WAP complex.

Use the following organisms in your food web:

- **Lion,**
- **Buffalo,**
- **Kob antelope,** and
- **Grass.**

(No heading is required. Do NOT draw diagrams of the individual organisms.)



(4)

- (b) What is an ecological *niche*?

(1)

- (c) Identify ONE prey species that became MORE nocturnal because of human disturbance.

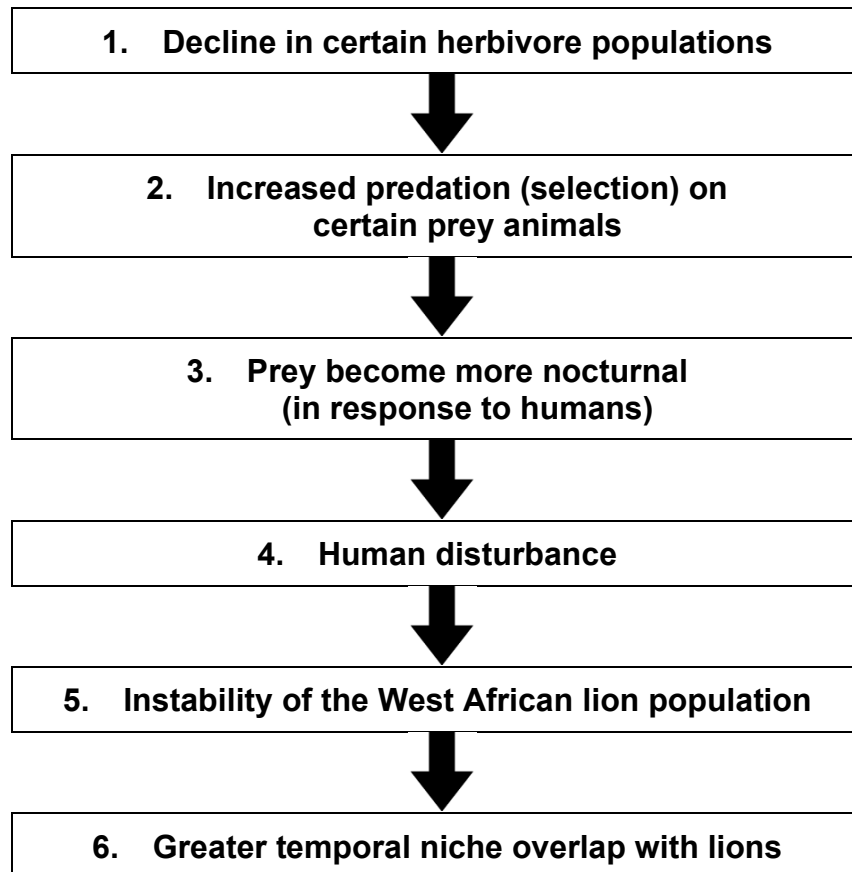
(1)

- (d) Refer to Figure 2.8 on page ix of the Source Material Booklet and describe how increasing pastoralist activities and livestock encroachment in the WAP complex alters the temporal activity of lions.

(2)

- (e) The flow chart below depicts several steps illustrating the effect of human disturbance on the temporal niches of West African lion prey species. The steps are shown in an incorrect order.

Arrange the steps correctly. Write down only the numerical sequence in the space provided below the flow chart.



Answer: _____ (3)

2.3 The W-Arly-Pendjari complex spans three of the poorest African countries.

2.3.1 Benin, Burkina Faso, and Niger can all be classified as less-developed countries.

Provide TWO pieces of evidence from Figure 2.2 on page vii of the Source Material Booklet to support this statement.

(2)

2.3.2 Explain ONE way in which the high fertility rates and economic challenges in Benin, Burkina Faso, and Niger could increase human-wildlife conflict.

(2)

2.3.3 Refer to Figure 2.9 on page ix of the Source Material Booklet and calculate the rate of decrease per year of West African lion numbers between 2012 and 2025 in the WAP complex.

Show your workings. Give your answer to the nearest whole number.

(3)

2.3.4 Lion population numbers in the WAP complex remain far below the ecosystem's carrying capacity.

Describe ONE positive and ONE negative consequence that might result from increased lion numbers, given the human-wildlife conflict in and around this Transfrontier Park.

Positive: _____

Negative: _____

(2)

2.4 Can wildlife conservation and agriculture successfully coexist in poorer countries? Provide TWO biologically sound arguments to support your stance.

(3)

[30]

60 marks

SECTION B**QUESTION 3**

Refer to pages x–xviii of the Source Material Booklet.

Consider the following statement:

'The sampling methods used to determine the size of African lion populations provide an accurate estimate of their numbers.'

Using the source material and your own knowledge, discuss your opinion on this statement in the form of an essay of 2½–3 pages.

In your response, you are expected to:

- Read the source material carefully.
- Take a definite stand on the statement.
- Plan your essay before you start writing. Your planning will be marked.
- Present a debated argument. Use the relevant information from Sources A–F as well as your own knowledge of Life Sciences to support your point of view.
- Arrange the information to best develop your argument.
- Write in a scientifically appropriate way.

Ensure you discuss at least NINE different facts from the sources in your essay.

40 marks

Total: 100 marks

PLANNING:

ESSAY:

[illegible]

[illegible]

[illegible]

[illegible]

ADDITIONAL SPACE (ALL QUESTIONS)

**REMEMBER TO CLEARLY INDICATE AT THE QUESTION THAT YOU USED THE
ADDITIONAL SPACE TO ENSURE THAT ALL ANSWERS ARE MARKED.**

[illegible]

[illegible]