



LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF
EDUCATION

NATIONAL SENIOR CERTIFICATE

VHEMBE EAST DISTRICT

GRADE 11

LIFE SCIENCES INFORMAL TEST 8

TOPIC TEST 8: POPULATION ECOLOGY

04 SEPTEMBER 2023

MARKS: 50

DURATION: 1 HOUR

This question paper consists of 8 pages, including the cover page.

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. This paper consists of THREE QUESTIONS. 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, flow charts or tables 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 an approved scientific calculator (non-programmable and non-graphical).
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 – D) next to the question number (1.1.1 to 1.1.2) in the ANSWER BOOK, for example 1.1.3 A

1.1.1 Which of the following will cause an increase in the size of a population?

- (i) emigration
- (ii) immigration
- (iii) natality
- (iv) predation

- A (i) and (iii)
- B (ii) and (iv)
- C (i) and (iv)
- D (ii) and (iii)

1.1.2 The following limitations on population size are all considered density dependent factors, except for ...

- A Competition
- B Spread of disease
- C Predation
- D Wild fires

(2 × 2) (4)

- 1.2 Give the correct biological **term** for each of the following descriptions. Write only the term next to the relevant question number (1.2.1 to 1.2.6) in the ANSWER BOOK.

1.2.1 Method of determination of population size by counting the individuals in
Representative sample area

- 1.2.2 Co-existence of different species living in the same habitat by using resources differently
- 1.2.3 A symbiotic relationship in which one organism benefits and the other one is unaffected
- 1.2.4 Countries with a characteristic high birth rate and decreased life expectancy
- 1.2.5 A group of organisms of the same species occupying a particular habitat and having the ability to interbreed randomly
- 1.2.6 The tendency of certain species to defend an area within a habitat that they occupy against intruders

(6 × 1) (6)

- 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.

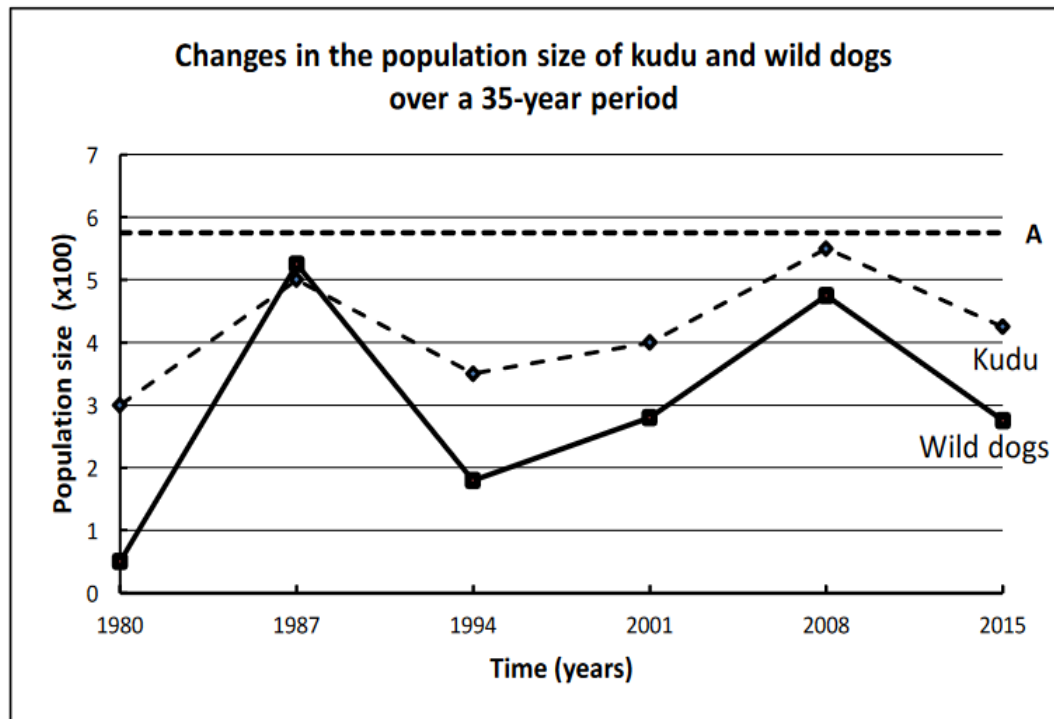
	COLUMN I	COLUMN II
1.3.1	Example of social organization that increases the chances of survival.	A: division of labour in bees B: a herd of zebras
1.3.2	Kittens competing for their mother's milk.	A: interspecific competition B: intraspecific competition

(2 × 2) (4)

TOTAL SECTION A: 14

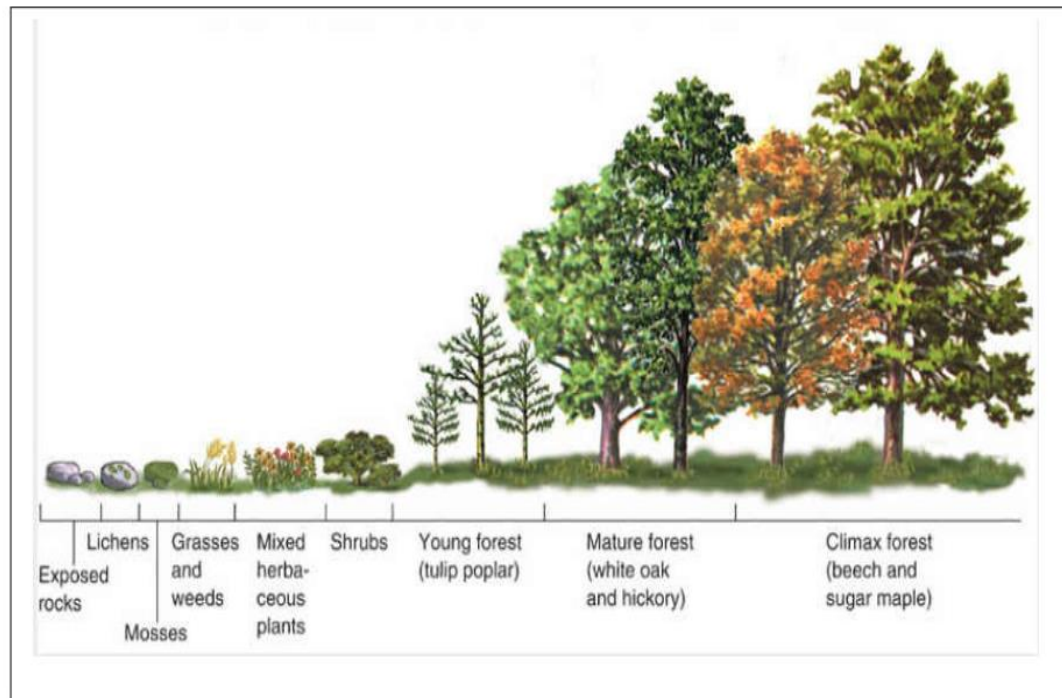
SECTION B**QUESTION 2**

- 2.1 The graph below represents changes in the population size of kudu and wild dogs in a specific closed habitat over a 35-year period.



- 2.1.1 Identify the relationship shown in the graph. (1)
- 2.1.2 What does the line A represent? (1)
- 2.1.3 Calculate the percentage increase in the wild dog population from 1980 to 2001. Show ALL working. (3)
- 2.1.4 Explain the possible consequence for the wild dogs in this habitat if the number of kudu exceeded 700. (3)
- (8)**

2.2 The diagram below represents ecological succession in a forest over 500 years.



- 2.2.1 What is ecological succession? (2)
- 2.2.2 Name the type of ecological succession shown in the diagram. (1)
- 2.2.3 Explain your answer in QUESTION 2.2.2. (2)
- 2.2.4 Identify ONE example from the diagram that may be regarded as part of pioneer community in this habitat. (1)
- 2.2.5 Explain the importance of the pioneer species in the type of ecological succession you identified in QUESTION 2.2.4. (2)

[8]

[16]

QUESTION 3

- 3.1 The table below shows the changes in the population size of impala (a type of fast moving buck) in a game reserve over a 10-year period.

YEAR	NUMBER OF IMPALA
1995	18
1996	20
1997	23
1998	48
1999	82
2000	145
2001	150
2002	151
2003	147
2004	135

- 3.1.1 Draw a line graph to represent the data in the table. (6)

- 3.1.2 Name one direct method that may have been used to calculate the size of the impala population over this time period? (1)

- 3.1.3 In 2007, a fire broke out in a part of the game reserve reducing the carrying capacity for impala population in the reserve to 140. To compare the population size to the carrying capacity, 15 impala were captured, marked and released. One month later 40 impala were recaptured and of these 5 were found to be marked.

- (a) Calculate the size of the impala population.

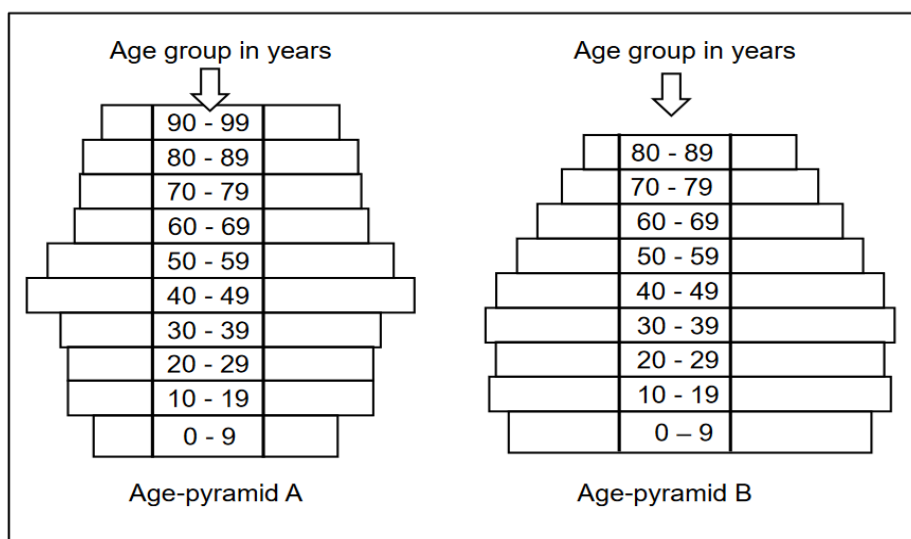
Use the Lincoln-Petersen Index: $N = \frac{M \times C}{R}$ (3)

- (b) Is the impala population size above or below the carrying capacity of the reserve? (1)

- 3.1.4 List TWO precautions that must be followed when using the method described in QUESTION 3.1.3 to estimate population size. (2)

(13)

- 3.2 Study the age-gender pyramids below representing a developing country and a developed country. Both pyramids have been drawn to the same scale.



- 3.2.1 Which pyramid represents the population distribution of a developed country? (1)
- 3.2.2 Give ONE reason for your choice in question 3.2.1. (1)
- 3.2.3 Which group (male or female) has the larger percentage reaching old age in Pyramid B? (1)
- 3.2.4 Which two age groups have exactly the same percentage of male and female population in Pyramid A? (2)
- 3.2.5 Give TWO reasons why it is important for a country to know the age and gender structure of its population. (2)

[7]

[20]

TOTAL SECTION B: 36**GRAND TOTAL: 50**