Education

KwaZulu-Natal Department of Education
REPUBLIC OF SOUTH AFRICA

LIFE SCIENCES

COMMON TEST

SEPTEMBER 2017

NATIONAL SENIOR CERTIFICATE

GRADE 10

MARKS: 60

TIME: 1 hour

This question paper consists of 8 pages.

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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 must use a non-programmable calculator, protractor and a compass, where necessary.
11. Write neatly and legibly.

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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 1.1.5) in your ANSWER BOOK, for example 1.1.6 D.

1.1.1 Which ONE of the following is part of the Earth and its atmosphere where living organisms are found?

A Ecosystem
B Ecology
C Biosphere
D Biome

1.1.2 Study the characteristics listed below.

(i) Simple, single-celled
(ii) Complex, multicellular
(iii) Prokaryotic
(iv) Eukaryotic

Which ONE of the following combinations is characteristic of the kingdom Animalia?

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

1.1.3 Which consumer feeds on other animals only?

A Carnivores
B Herbivores
C Omnivores
D Decomposers

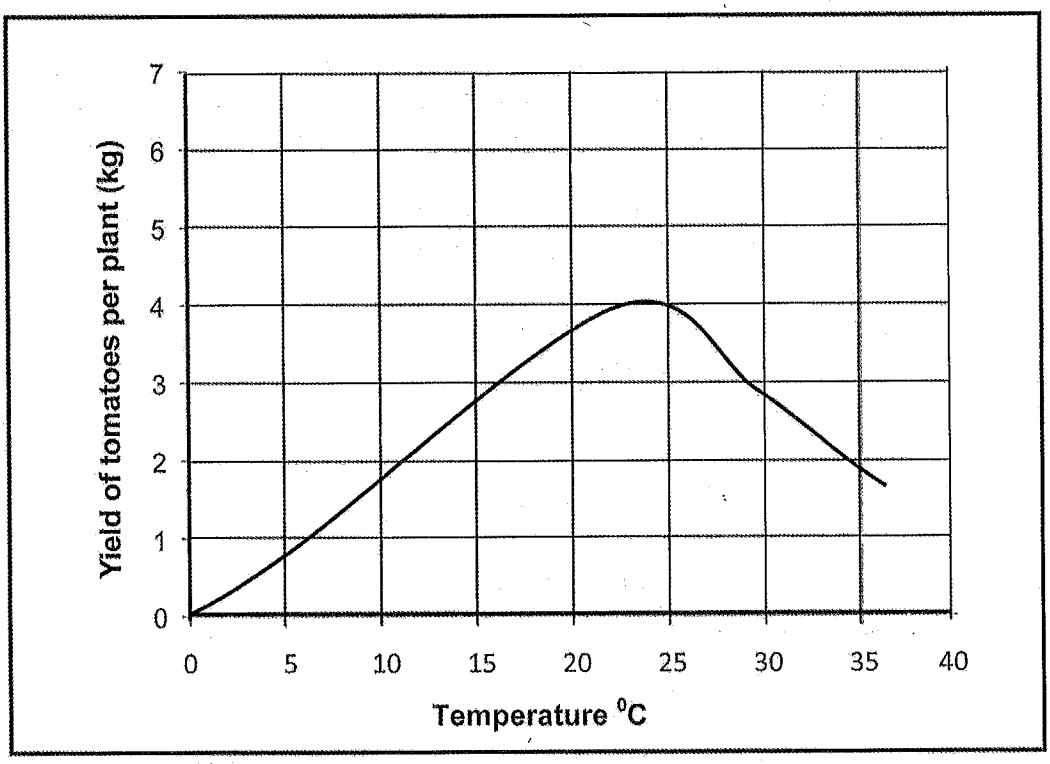
1.1.4 Which ONE of the following is a physiographic factor?

A Altitude
B pH of the soil
C Light intensity
D Temperature

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1.1.5 The graph below shows the effect of temperature on the yield of tomatoes.



A reasonable conclusion that can be made from this graph is that ...

A an increase in temperature increases the yield of tomatoes.
B a decrease in temperature increases the yield of tomatoes.
C an increase in temperature to about 23 ^{0}C increases the yield of tomatoes.
D an increase in the yield of tomatoes increases the temperature.

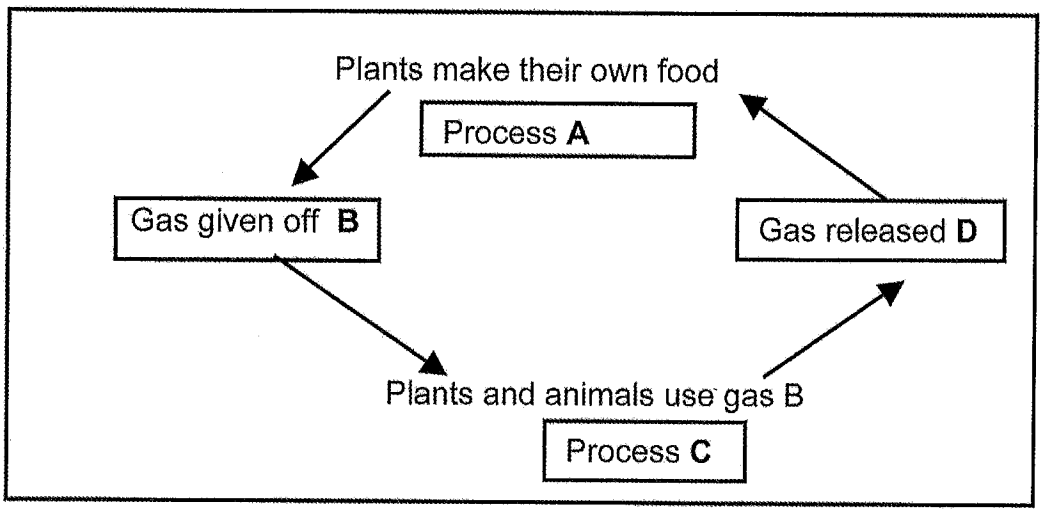
(5 x 2)

TOTAL SECTION A: 10

SECTION B

QUESTION 2

2.1 Study the diagram below showing one of the cycles in nature.



2.1.1 Identify gas:

(a) **B** (1)

(b) **D** (1)

2.1.2 Write down the LETTER and the NAME of the process that decreases the amount of oxygen in the atmosphere. (2)
(4)

2.2 Describe the role of bacteria in the nitrogen cycle during the breaking down of dead plants and animals. **(4)**

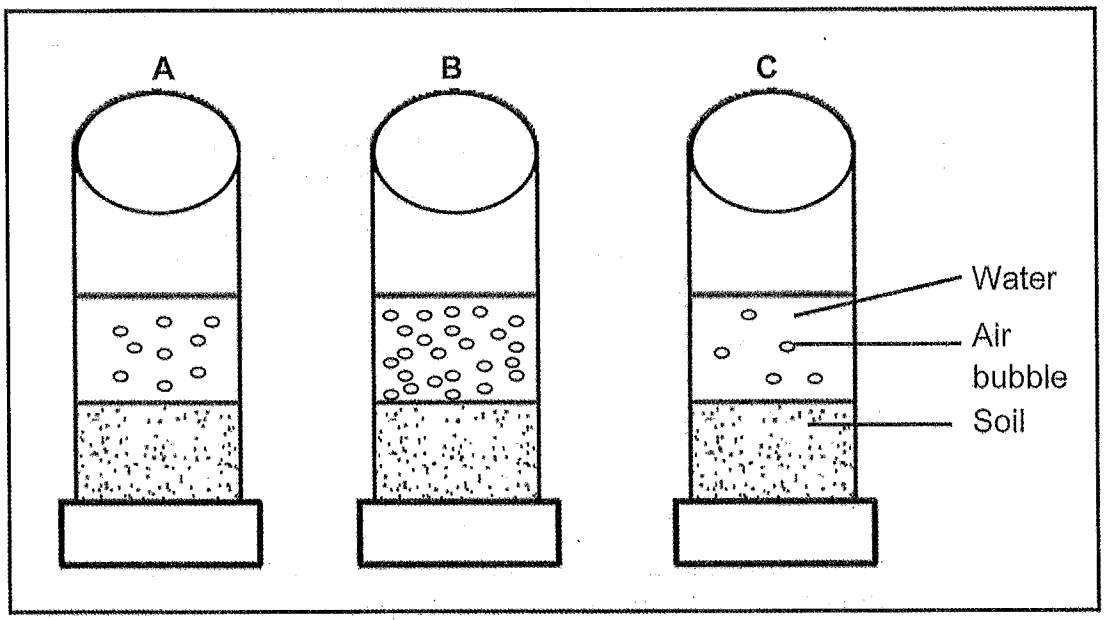
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2.3 An investigation was carried out to determine the air content of different soil types.

The procedure was as follows:

- Three identical beakers were used.
- Beakers **A**, **B** and **C** were filled with an equal volume of different soil types.
- An equal amount of water was added to each beaker.
- The air content of each soil type was determined by observing the amount of air bubbles released from the soil.

The results of the investigation are shown in the diagram below.



2.3.1 Identify the:

(a) Dependent variable (1)

(b) Independent variable (1)

2.3.2 Write down the LETTER of the beaker that contains clay soil. (1)

2.3.3 Give ONE visible reason for your answer in QUESTION 2.3.2. (1)

2.3.4 State TWO factors that were kept constant during the investigation. (2)

2.3.5 State ONE way in which the reliability of the results can be increased. (1)
(7)

(15)

QUESTION 3

3.1 The table below shows the number of each endemic species in South Africa.

ORGANISM	NUMBER OF ENDEMIC SPECIES
Marine fish	97
Mammals	35
Birds	16
Amphibians	52
Reptiles	121
Vertebrates	41
Total	362

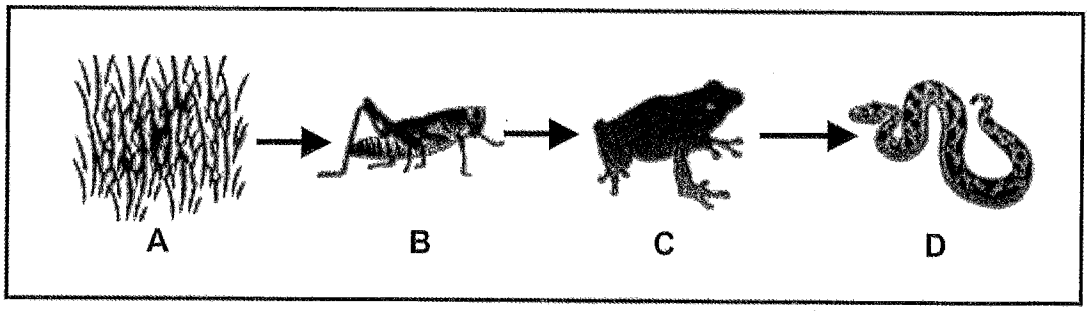
3.1.1 Define *endemic.* (2)

3.1.2 Which organism has the lowest number of endemic species in South Africa? (1)

3.1.3 Calculate the percentage of endemic species in South Africa which are reptiles. Show ALL working. (3)

3.1.4 Suggest TWO reasons why humans need to conserve endemic species. (2)
(8)

3.2 Study the diagram of a food chain below.



3.2.1 Write down the LETTER only of the organism that represents a/an:

(a) Secondary consumer (1)

(b) Autotroph (1)

3.2.2 Describe the role of decomposers in the ecosystem where the above food chain occurs. (2)

3.2.3 Explain what would happen if all of organism **B** died in an ecosystem with limited biodiversity. (3)
(7)

[15]

TOTAL SECTION B: (30)

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SECTION C

QUESTION 4

Describe the negative impact that human activities may have on the environment and reasons why humans should conserve wetlands. Also describe the effect of temperature (day/night and seasons) on the movement and behavior of animals.

Content: (17)
Synthesis: (3)

(20)

NOTE: NO marks will be awarded for answers in the form of flowcharts or diagrams.

TOTAL SECTION C: 20

GRAND TOTAL: 60

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GR 10 + P1

Education

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LIFE SCIENCES

MARKING GUIDELINE

COMMON TEST

SEPTEMBER 2017

NATIONAL SENIOR CERTIFICATE

GRADE 10

This marking guideline consists of 4 pages.

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SECTION A

QUESTION 1

1.1

1.1.1 C✓✓
1.1.2 D✓✓
1.1.3 A✓✓
1.1.4 A✓✓
1.1.5 C✓✓

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

TOTAL SECTION A **10**

SECTION B

QUESTION 2

2.1

2.1.1 (a) Oxygen✓ (1)

(b) Carbon dioxide✓ (1)

2.1.2 **C**✓ Respiration✓ (2)
(4)

2.2 - Nitrogen is released into the soil as ammonia✓
- Nitrite bacteria✓
- convert ammonia into nitrites✓
- Nitrate bacteria✓
- convert nitrites into nitrates✓
- Nitrates are absorbed by plants✓

Any **(4)**

2.3

2.3.1 (a) Air content✓ (1)

(b) Different soil types✓ (1)

2.3.2 **C**✓ (1)

2.3.3 - Holds small amounts of air✓/has less air bubbles (1)

2.3.4 - Identical beakers✓
- Volume of different soil types✓
- Amount of water added to each beaker✓

Any (2)

2.3.5 - Repeat the investigation✓
- Increase the number of beakers with each soil type✓

Any (1)

(7)

[15]

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QUESTION 3

3.1

3.1.1 - Species found in a particular area or country✓
- and nowhere else✓ (2)

3.1.2 Bird✓ (1)

3.1.3 121 ÷ 362✓× 100%✓

= 33%✓/ 33.4% (3)

3.1.4 - For medicinal value✓
- For ecotourism✓
- To prevent extinction of species✓
- Economic benefit for humans✓ Any (2)

(Mark first TWO only)

(8)

3.2

3.2.1 (a) **C**✓ (1)

(b) **A**✓ (1)

3.2.2 - They break organic compounds into simple nutrients✓
- to enrich the soil✓ (2)

3.2.3 - Frogs/**C** population would decrease✓
- causing the snake/**D** population to decrease✓
- due to shortage of food✓
- Population of **A** will increase✓
- since there is nothing to feed upon it✓ Any (3)

(7)

[15]

SECTION C

QUESTION 4

Negative impact of human activities on the environment
- Global warming✓/air pollution/burning of fossil fuels
- speed up climate change✓
- Natural habitats are destroyed✓
- during cultivation of land✓
- Natural vegetation is cleared✓
- during city or town development✓
- destroying the habitat of organisms✓
- Human population growth✓
- use more natural resources✓
- Poaching✓
- leads to the extinction of certain species✓ Any (8)

Importance of wetlands
- Provide water for people and domestic animals✓
- Provide a habitat and breeding place for plants and animals✓
- Purify water naturally✓
- Prevent flooding during heavy rainfall✓
- Keeps rivers and streams flowing during dry seasons✓
- Some wetlands attract tourists✓
- thus creating jobs✓ Any (4)

Effects of temperature
- In winter the temperature drops✓
- Some animals migrate✓
- Other animals hibernate✓
- due to shortage of food✓
- In summer the temperature rises✓
- Other animals aestivate✓/become dormant
- to avoid the high temperature✓
- Some organism burrow✓
- to avoid the heat of the day✓
- Some organisms are more active at night✓/nocturnal
- when it is cooler✓ Any (5)

Content **(17)**
Synthesis **(3)**
[20]

ASSESSING THE PRESENTATION OF THE ESSAY

RELEVANCE	LOGICAL SEQUENCE	COMPREHENSIVE
All information provided is relevant to the topic	Ideas arranged in a logical/ cause-effect sequence	Answered all aspects required by the essay in sufficient detail
All information is relevant to: - Negative human impact - Importance of wetlands - The effect of temperature There is no irrelevant information	Correct sequence of events for: - Negative human impact - Importance of wetlands - The effect of temperature	At least the following points are included: - Negative human impact (5/8) - Importance of wetlands (2/4) - The effect of temperature (3/5)
1 mark	1 mark	1 mark

TOTAL SECTION C:20
GRAND TOTAL: 60