Basic Education

KwaZulu-Natal Department of Education
REPUBLIC OF SOUTH AFRICA

LIFE SCIENCES

COMMON TEST

MARCH 2015

NATIONAL SENIOR CERTIFICATE

GRADE 11

MARKS: 60

TIME: 1 hour

N.B. 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 answer 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. ALL drawings should be done in pencil and labelled 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 must use a non-programmable calculator, protractor and a compass where necessary.
11. Write neatly and legibly.

SECTION A

QUESTION 1

1.1 Various possible options are provided as answers to the following questions. Choose the correct answer and write only the letter (A – D) next to the question number (1.1.1 – 1.1.5) in the answer book, for example 1.1.6 D.

1.1.1 Which ONE of the following is present in the Bryophytes?

A. Seeds
B. Xylem
C. Spores
D. Flowers

1.1.2 Viruses are regarded as non-living because ...

A. they are very small.
B. they do not mutate.
C. they can only reproduce when in another living organism.
D. they do not have any nucleic acid.

1.1.3 A bacterial cell ...

A. reproduces sexually.
B. is a prokaryote.
C. is a eukaryote.
D. contains mitochondria, vacuoles and plastids.

1.1.4 Which of the following is a feature of an insect-pollinated flower?

A. Petals are large and brightly coloured
B. Large anthers with long filaments
C. Small, light and smooth pollen
D. Stigmas are large and feathery

1.1.5 Which of the following is characteristic of the fungi?

A. Do not produce spores
B. Produce cones
C. Produce seeds
D. Do not possess chlorophyll

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

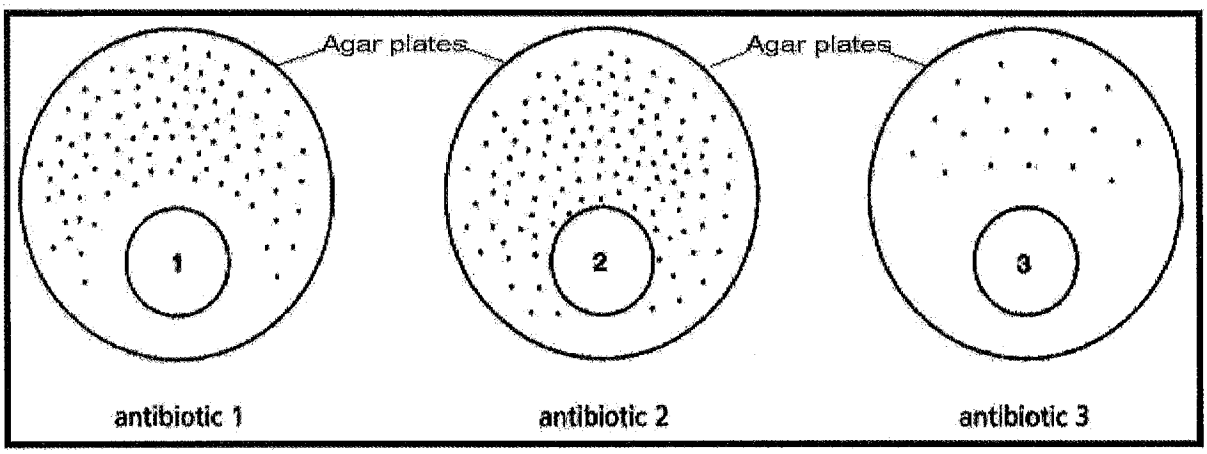
Total Section A (10)

SECTION B

QUESTION 2

2.1 Grade 11 learners wanted to compare the effect of different antibiotics on the growth of a bacterial species.

They set up agar plates containing nutrients as shown in the diagrams below. They placed sterile discs (**1**, **2** and **3**) containing three different antibiotics on each of the plates. The dots represent the bacteria.



2.1.1 Identify the following in the investigation:

(a) The dependent variable (1)

(b) The independent variable (1)

2.1.2 Formulate a hypothesis for this investigation. (2)

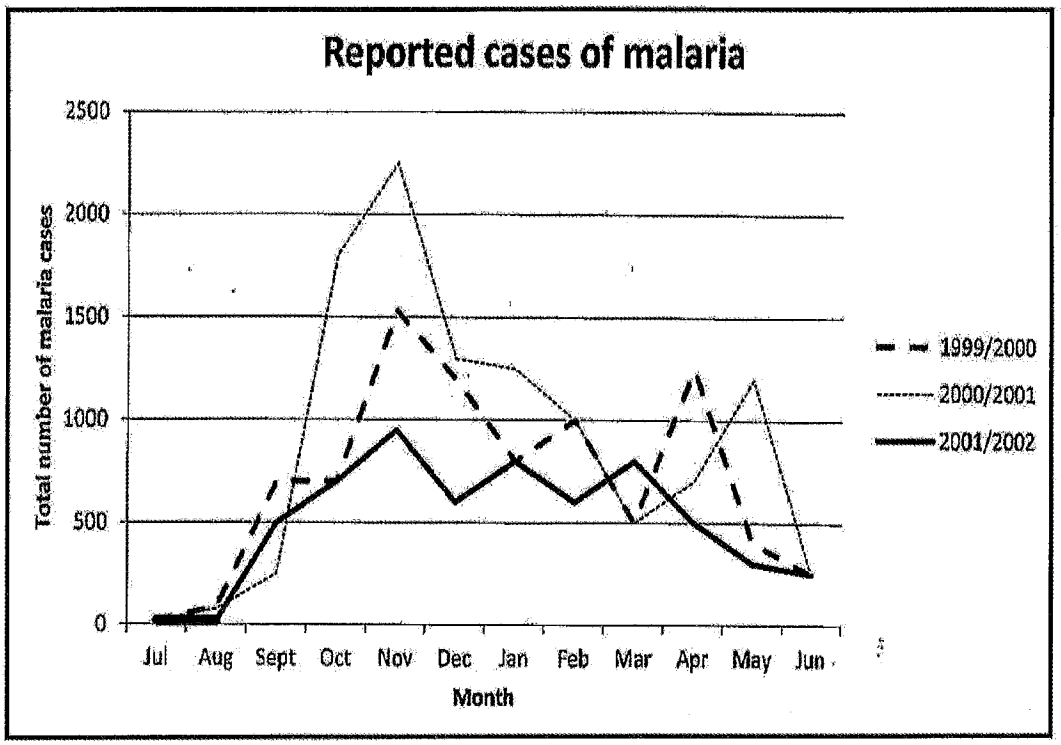
2.1.3 Which of the antibiotics (**1**, **2** or **3**) was least effective? (2)

2.1.4 State TWO ways in which learners could improve the reliability of this investigation. (2)

2.1.5 Which TWO factors must be kept constant in this investigation? (2)

(10)

2.2 Study the graph below which shows the number of malaria cases reported in Limpopo between 1999 and 2002.



2.2.1 In which month, in the period 1999/2000, was the highest number of malaria cases reported? (1)

2.2.2 How many cases of malaria were reported in the month of March 2000/2001? (1)

2.2.3 Suggest ONE way in which the data about the number of malaria cases was collected. (1)

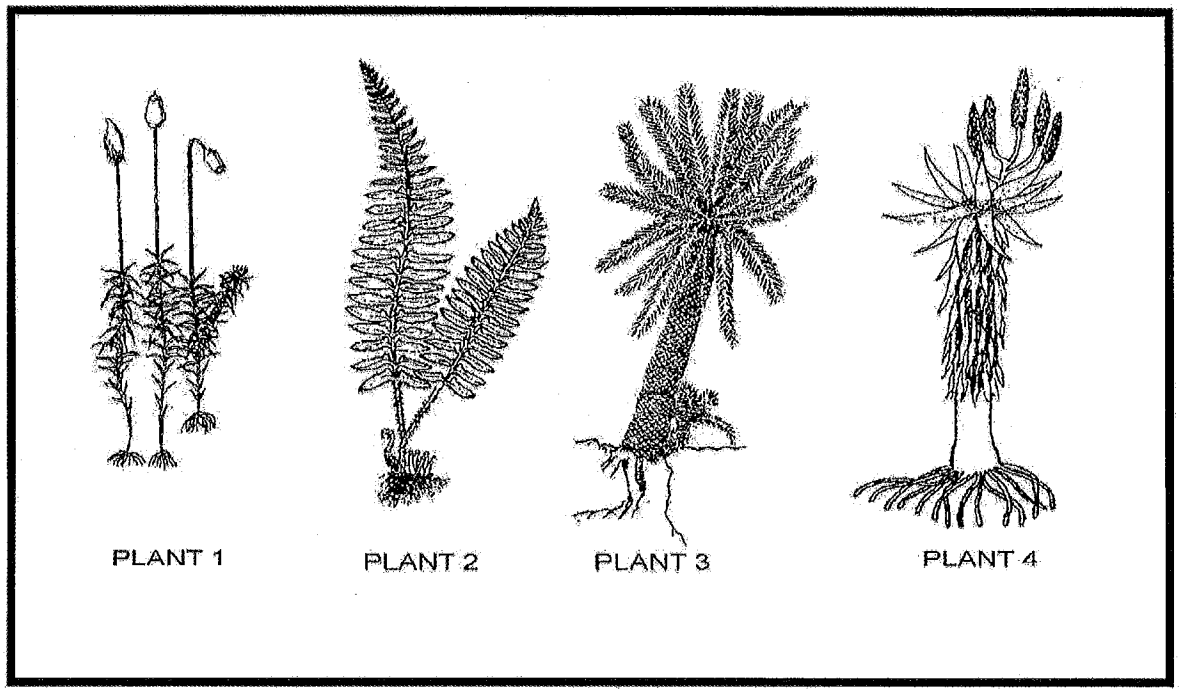
2.2.4 Explain why an increase in the number of malaria infections would affect the South African economy. (2)

(5)

[15]

QUESTION 3

3.1 Study the diagrams and answer questions that follow.



3.1.1 Which ONE of the plant groups (**2**, **3** or **4**) are dependent on water for fertilisation? (1)

3.1.2 State TWO characteristics of the group represented by **Plant 1** that prevent them from being as tall as the group represented by **Plant 3**. (2)

3.1.3 State which generation is dominant in:

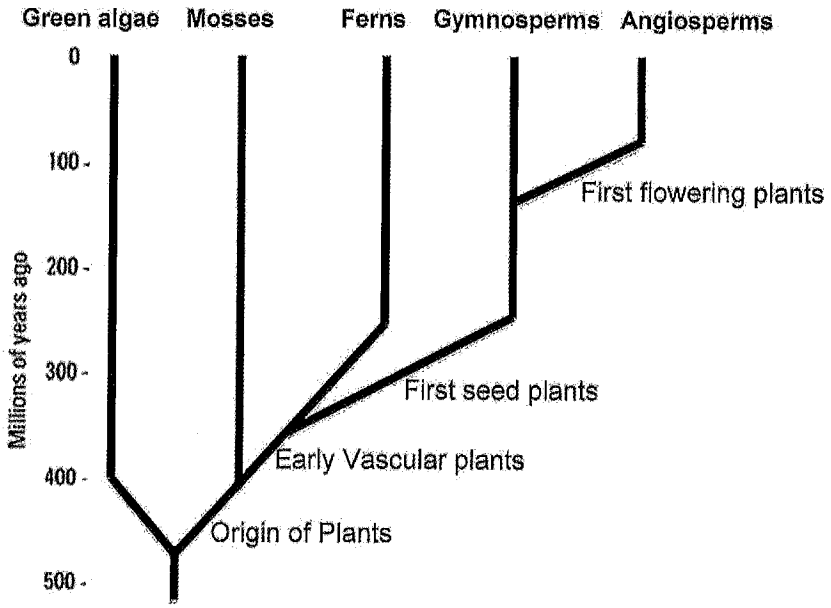
(a) **Plant 1**

(b) **Plant 4** (2)

3.1.4 Explain why the presence of flowers in the group represented by **Plant 4** have made them more successful as compared to the group represented by **Plant 3**. (2)

(7)

3.2 Study the phylogenetic tree showing possible relationships amongst the different plant groups.



3.2.1 According to the phylogenetic tree:

(a) How long ago did the mosses first appear (1)

(b) How long after the mosses did the first ferns appear (1)

(c) Which was the most recent plant group to appear on earth (1)

(d) What characteristic do ferns, gymnosperms and angiosperms have in common (1)

3.2.2 Name TWO plant groups represented that produce seeds. (2)

3.2.3 List TWO characteristics of seeds that make seed-bearing plants more successful over seedless plants. (2)

(8)

[15]

Total Section B (30)

SECTION C

QUESTION 4

Describe how the body plan of named examples of Cnidaria and Annelida relates to the mode of life of each organism.

NOTE: No marks will be awarded for answers in the form of tables, flow charts and diagrams.

Content : (17)
Synthesis: (03)
(20)

TOTAL MARKS: [60]

Gr 10 & 11 enclosed.

Basic Education

KwaZulu-Natal Department of Basic Education

REPUBLIC OF SOUTH AFRICA

LIFE SCIENCES

GRADE 11

MEMORANDUM

MARCH 2015

NATIONAL SENIOR CERTIFICATE

GRADE 11

MARKS : 60

This memorandum consists of 05 pages.

SECTION A

QUESTION 1

1.1

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

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

TOTAL SECTION A: [10]

SECTION B

QUESTION 2

2.1

2.1.1

(a) Growth of a bacterial species✓ (1)
(b) Different antibiotics✓ (1)

2.1.2 Antibiotic 1/2/3 was most effective in destroying the bacterial species✓✓
OR
All/None of the antibiotics were effective in destroying the bacterial species ✓✓ (2)

2.1.3 Antibiotic 2✓✓ (2)

2.1.4

- Repeat the investigation✓
- Use more than one agar plate for each antibiotic✓
- Increase the period of the investigation✓ Any (2)

(Mark first TWO only)

2.1.5

- Keep all plates under the same environmental conditions✓/temperature etc.
- Ensure that the plates have the same amount of nutrients✓
- The plates/sterile discs should be of the same size✓
- Use the same amount/concentration of antibiotic✓ Any (2)

(Mark first TWO only)

(10)

2.2

2.2.1 November✓ (1)

2.2.2 500✓ (1)

2.2.3 From hospital records✓/clinic records/surveys (1)
(Mark first ONE only)

2.2.4 - Increased medical costs✓ required to treat malaria patients✓
- Loss of income✓ due to inability to work✓ Any 1 x 2 (2)

(5)
[15]

QUESTION 3

3.1

3.1.1 Plant 2✓ (1)
(Mark first ONE only)

3.1.2
- No cuticle✓
- No vascular/conducting tissue✓
- No strengthening tissue✓
- No true roots, stems and leaves✓ Any (2)

(Mark first TWO only)

3.1.3
(a) Gametophyte✓
(b) Sporophyte✓ (2)

3.1.4
- Flowers are specialized to attract different pollinating agents✓
- and thus pollination can occur all year round✓/pollination not restricted to windy seasons only/greater chances of pollen reaching other flowers (2)

(7)

3.2

3.2.1
(a) 400 million years✓ (1)
(b) 50 million years✓ (1)
(c) Angiosperms✓ (1)
(d) Vascular/conducting tissue✓ (1)

3.2.2
Gymnosperms✓
Angiosperms✓ (2)
(Mark first TWO only)

3.2.3
- Seeds have a longer lifespan✓
- Seeds have food reserves✓
- Seeds can remain dormant✓
- Seeds have a tough outer coat✓

(Mark first TWO only) Any (2)

(8)
[15]
TOTAL SECTION B: [30]

SECTION C

QUESTION 4

Cnidaria e.g. *Hydra/ sea anemone /jelly fish /* corals ✓*

- No cephalisation✓
- Organism is radially symmetrical✓
- with tentacles arranged in a ring around the mouth✓
- allowing the hydra to obtain food from all sides✓
- Nerve cells are located over the entire body surface ✓
- allowing it to sense danger/food from all sides✓
- This is useful to the hydra which is sedentary/sessile/attached to substrate✓

- The hydra is diploblastic✓
- The endoderm lines a cavity called a coelenteron✓
- which acts as a blind gut✓
- Water in the coelenteron✓
- acts as a hydrostatic skeleton✓
- Hydra has no blood system✓
- since food diffuses directly into all cells✓

- The hydra has a single digestive opening✓
- which serves as a mouth and an anus✓
- The opening can only be one since the other end is attached✓
- The position of the tentacles allow for food to be captured and inserted into the mouth✓

1 compulsory* + any 8 (9)

Annelida e.g. *Lumbricus/ earthworm/ ragworm/leeches* ✓*

- It is bilaterally symmetrical✓
- allowing for forward movement✓
- Shows cephalisation,✓
- As a result the front end of the earthworm is more sensitive to the environment✓
- allowing danger to be detected before entering a new environment✓

- The earthworm is triploblastic ✓
- There is a body cavity in the mesoderm called a coelom✓
- Containing a coelomic fluid✓
- which acts as a hydrostatic skeleton✓
- and also keeps the skin moist for gas exchange✓

- The earthworm has a through gut✓
- With a separate mouth and anus✓
- This allows food to pass in one direction✓
- Preventing mixing of digested and undigested food✓
- The gut also allows sand to pass through during burrowing✓

1 compulsory* + any 7 (8)
(17)

Criterion	Relevance (R)	Logical sequence (L)	Comprehensive (C)
Generally	All information provided is relevant to the topic	Ideas are arranged in a logical/cause-effect sequence	All aspects required by the essay have been sufficiently addressed
In this essay	All information provided is relevant to • The body plan of the two groups • The mode of life of the two groups (There is no irrelevant information)	The various aspects of the body plan for each organism are appropriately linked to the mode of life of the organism	AT least **5** points included on each of: • Cnidaria • Annelida
Mark	1	1	1

(3)
[20]

TOTAL MARKS: [60]