

SECTION A

QUESTION 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 – 1.5) in the answer book, for example 1.6 D.

- 1.1 Which of the following requires a host cell because they are NOT able to make proteins on their own?

A Blue-green algae
B Bacteria
C Protozoans
D Viruses

- 1.2 The following flow diagram illustrates the stages in the life cycles of some plants:

gametophyte generation → gametes → sporophyte generation → seeds

Which one of the following do the stages in the life cycle apply to:

A Angiosperms and gymnosperms
B Gymnosperms and bryophytes
C Bryophytes and pteridophytes
D Pteridophytes and angiosperms

- 1.3 The structure or body layer that forms the different internal organs in a triploblastic animal embryo is the ...

A ectoderm.
B coelom.
C mesoderm.
D endoderm.

- 1.4 A unicellular organism like *Amoeba* is different from more complex organisms because it DOES NOT ...

A contain tissues.
B reproduce.
C respond to stimuli.
D contain chromosomes.

- 1.5 Fungi DO NOT play a role as ...

A saprophytes.
B producers.
C parasites.
D symbionts.

(5 x 2 = 10)
TOTAL SECTION A = 10

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SECTION C

QUESTION 4

Describe the importance of micro-organisms under the following headings:

- Ecological role of different micro-organisms
- Role of different micro-organisms in the production of medicine
- Role of fungi in the food and drink industry

Content: (9)
Synthesis: (4)
(4)
(17)
(03)
(20)

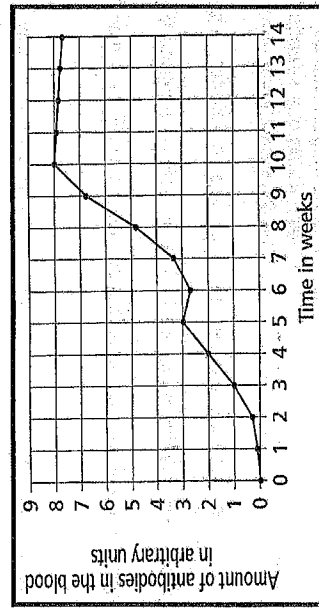
TOTAL MARKS: [60]

SECTION B

QUESTION 2

- 2.1 A person was injected with some dead cholera bacteria. A second injection was given a few weeks later. The person's body reacted to these injections by producing antibodies against cholera bacteria. For immunity to develop there has to be a minimum of 5 units of antibodies.

The graph below shows the levels of antibodies after the injections.



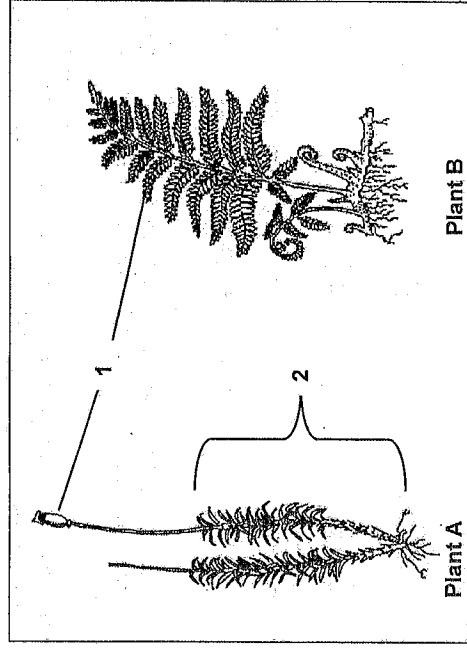
- 2.1.1 Which ONE of the following is the most likely time that the second injection was given?

A Week 2
B Week 9
C Week 6
D Week 4

- 2.1.2 By how many units did the level of antibodies increase between week 5 and week 10? Show your calculation.

- 2.1.3 How long did it take this person to develop immunity?

- 2.2 Study the diagram below and answer the questions that follow.



- 2.2.1 Identify the plant group to which each of plants A and B belong.

- 2.2.2 Which numbered structure in plant A is haploid?

- 2.2.3 Name the structure that produces spores in plant B?

- 2.2.4 Explain briefly why both plants A and B above require cool, damp conditions as an ideal environment to live in.

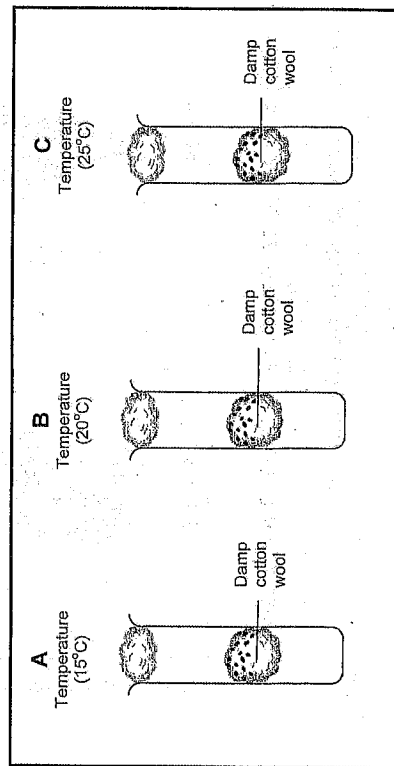
- 2.2.5 List FOUR features that appeared during the evolution of plants that were adaptations to a terrestrial mode of life.

QUESTION 3

- 3.1 Angiosperms are considered the most advanced plants and are also the most successful terrestrial plants. This group of plants bear seeds which are enclosed in fruits. Seeds will only germinate under the conditions which will favour their success.

The diagram below shows an investigation conducted to determine the influence of temperature on the germination of seeds placed in damp cotton wool under various temperature conditions.

Study the diagram and answer questions that follow.



- 3.1.1 State a hypothesis for this investigation. (2)

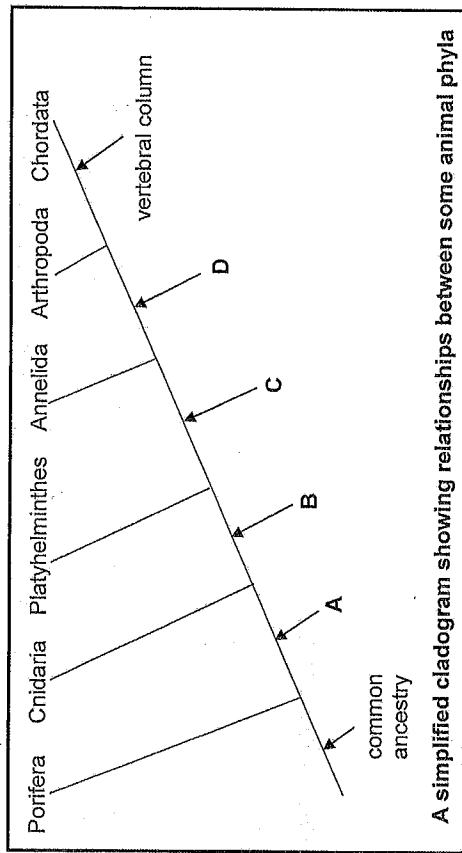
- 3.1.2 Identify the:

- (a) Dependent variable
(b) Independent variable (2)

- 3.1.3 State TWO other factors that should be kept constant in this investigation. (2)

- 3.1.4 State ONE way in which the reliability of the results obtained could be improved. (1)
(7)

- 3.2 The diagram below represents a cladogram (phylogenetic tree) showing relationships between animal phyla. The letters A to D, indicate the characteristics which are shared by different phyla of animals which follow the letter.



- 3.2.1 Study the following list of characteristics and answer the questions that follow.

bilateral symmetry, segmentation, cephalisation, radial symmetry, tissues.

State which characteristic/s appeared at the time represented by letter:

- (a) A
(b) B
(c) C
(d) D (4)

- 3.2.2 Explain ONE significance of the development of a coelom. (2)

- 3.2.3 State ONE role played by arthropods in agriculture. (1)

- 3.2.4 Which characteristic is shared by all organisms shown in the cladogram? (1)
(8)

[15]



Basic Education

KwaZulu-Natal Department of Basic Education
REPUBLIC OF SOUTH AFRICA

LIFE SCIENCES MEMORANDUM MARCH 2014

NATIONAL SENIOR CERTIFICATE

GRADE 11

MARKS : 60

TIME : 1 hr

This memorandum consists of 4 pages.

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Life Science (Memorandum)

Grade 11
2

March 2014 Test

SECTION A

QUESTION 1

- 1.1 D ✓✓
1.2 A ✓✓
1.3 C ✓✓
1.4 A ✓✓
1.5 B ✓✓

(5 x 2 = 10)
TOTAL SECTION A: [10]

SECTION B

QUESTION 2

- 2.1 2.1.1 C ✓
2.1.2 8 – 3 ✓ = 5 units ✓
2.1.3 8 weeks ✓
2.2 2.2.1 Plant A - Bryophyta ✓
Plant B - Pteridophyta ✓
2.2.2 2 ✓
2.2.3 Sporangium ✓
2.2.4 Both plants depend on water ✓ for sexual reproduction ✓
2.2.5
 - Cuticle ✓
 - Stomata ✓
 - A plant body differentiated into true roots, stems and leaves ✓
 - Vascular tissue / xylem and phloem ✓
 - Supporting / strengthening tissue ✓
 - Formation of seeds ✓

(Any 4 x 1)
(4)
(10)
[15]

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QUESTION 3

3.1

3.1.1 As the temperature increases/decreases the degree of germination increases /decreases

OR

Germination occurs best at 15°C / 20°C / 25 °C

OR

Changes in temperatures have no effect on germination (Any 2 x 1) (2)

3.1.2

(a) Seed germination/
(b) Temperature

- 3.1.3 - Seeds of the same species/
- Amount of water/
- Size of the test tube/
- Amount of cotton wool/
- Number of seeds/
(Mark first TWO only) (Any 2 x 1) (2)

3.1.4

Repeat the investigation
Increase the period of the investigation/
(Mark first ONE only) (Any 1) (1)

3.2

- 3.2.1 A - Tissues / radial symmetry/
B - Bilateral symmetry / cephalisation/
C - Segmentation
D - Exoskeleton (1)
(1)
(1)
(1)

3.2.2 It separates the gut from the body wall/
allowing for more extensive growth of organs and systems (2)

3.2.3 They are pollinators/
They are used in biological control of pests/
Important for seed dispersal/
(Mark first ONE only) (Any 1) (1)

3.2.4 All are multicellular organisms (1)
(8) [15]

TOTAL SECTION B: [30]**SECTION C****QUESTION 4**

Role of micro-organisms in maintaining balance in the environment

- Autotrophic bacteria and protists (algae) produce their own organic nutrients
- They use carbon dioxide and release oxygen during photosynthesis
- In this way oxygen and carbon dioxide balance is maintained
- Saprophytic bacteria break down dead organic matter to inorganic substances that can be recycled in the soil to make the soil more fertile
- These bacteria and fungi also release carbon dioxide and heat into the atmosphere
- Nitrogen fixing bacteria can convert nitrogen gas (N₂) to nitrates which can be absorbed by plants to produce proteins (Any 9)

Importance of bacteria and fungi in medicine

- Bacteria can be used to manufacture vitamins, proteins, antibiotics and hormones such as insulin by means of recombinant DNA technology / genetic engineering
- Fungi are also used for the manufacturing of antibiotics e.g. penicillin (Any 4)

Economic importance of fungi in the food and beverage industry

- Some fungi e.g. mushrooms / truffles / morels are food sources
- Some fungi are used in the production of certain cheeses e.g. Roquefort
- Yeast is used in the baking industry
- Yeast is used in the brewing of beer and the winemaking industry (Any 4) (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 in Q4.1	Only information relevant to ecological role, role in medicine and role in food and drink industry is given. (There is no irrelevant information)	Each role is linked to the appropriate micro-organism	All 3 aspects included: • Ecological role • Role in medicine • Role in food and drink industry
Mark	1	1	1

(3)
[20]**TOTAL MARKS: [60]**