



Province of the
EASTERN CAPE
EDUCATION

**NATIONAL
SENIOR CERTIFICATE**

GRADE 11

NOVEMBER 2016

LIFE SCIENCES P2

MARKS: 150

TIME: 2½ hours



This question paper consists of 14 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 EACH question on 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 and flow charts ONLY when requested to do so.
8. The diagrams in this question paper may NOT necessarily be drawn to scale.
9. The use of graph paper is NOT permitted.
10. Non-programmable calculators, protractors and compasses may be used.
11. Write neatly and legibly.

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 1.1.10) in your ANSWER BOOK, for example 1.1.11 D.

1.1.1 A virus consists of ...

- A RNA, DNA and a protein coat.
- B proteins, cell membrane and RNA.
- C RNA or DNA and a protein coat.
- D RNA or DNA and a cell membrane.

1.1.2 The use of antibiotics is an effective treatment for ...

- A bacterial and viral infections.
- B bacterial infections only.
- C viral infections only.
- D neither bacterial nor viral infections.

1.1.3 How does a vaccine work?

- A It prevents the disease-causing agent from entering the body.
- B It attacks the disease-causing agent as soon as it enters the body.
- C It triggers the immune system to produce antibodies to fight the disease-causing agent.
- D It allows the blood to filter out the disease-causing agent.

1.1.4 During the dominant stage of their life cycle, ferns are visible as ...

- A haploid gametophytes.
- B haploid sporophytes.
- C diploid gametophytes.
- D diploid sporophytes.

1.1.5 Conserving endemic seeds in South Africa will enable the following:

- A The protection of plants against diseases
- B A lot of money to be made for South Africa
- C The restoration of over-exploited medicinal plants
- D Food crops to be grown in dry conditions

1.1.6 Name the phylum to which the organism below belongs.



- A *Cnidaria*
- B *Arthropoda*
- C *Platyhelminthes*
- D *Annelida*

1.1.7 Which of the following is an **Annelid**?

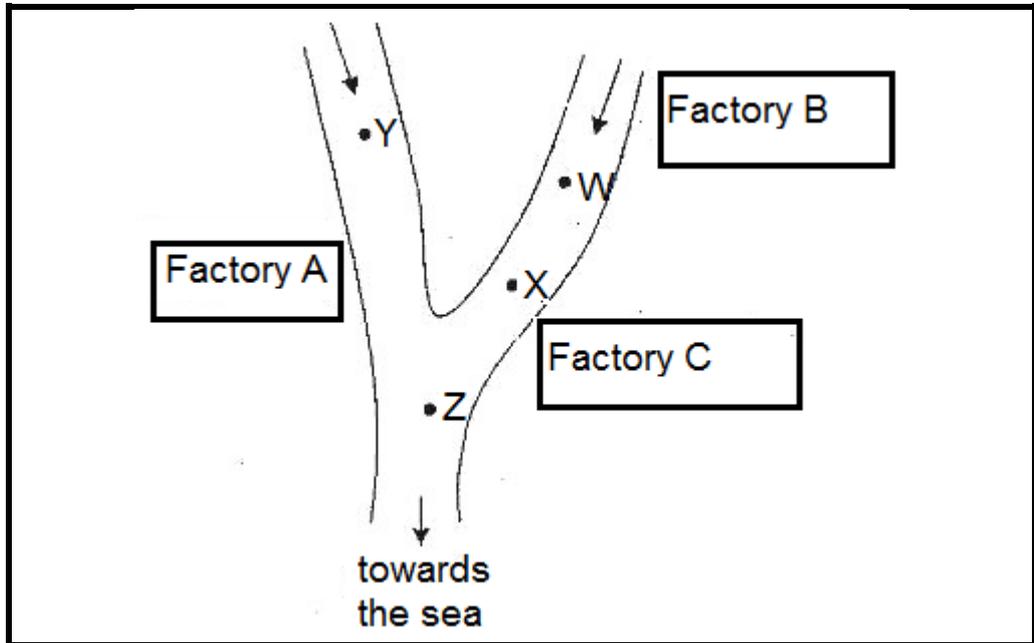
- A Earthworm
- B Jellyfish
- C Tapeworm
- D Starfish

1.1.8 Which element destroys ozone the most?

- A Helium
- B Hydrogen
- C Chlorine
- D Carbon

1.1.9 The diagram below shows the path of water flowing downstream towards the sea.

Situated near the water are three factories, A, B and C, which discharge the same type and same amount of chemical waste into the water daily.



Which ONE of the following parts of the water would be least polluted?

- A W
- B X
- C Y
- D Z

1.1.10 Which of the following is NOT TRUE of genetically modified crops?

- A Increase in genetic diversity
- B Reduced reliance on pesticides
- C Withstand long periods of drought
- D Increasing yields

(10 × 2) (20)

1.2 Give the correct **biological term** for each of the following descriptions. Write only the term next to the question number (1.2.1 to 1.2.9) in your ANSWER BOOK.

1.2.1 Virus which infects bacteria

1.2.2 Whip-like structures which are used for movement in bacteria

1.2.3 Plants that have parallel venation pattern and flower parts in multiples of three

1.2.4 A reproductive structure found in gymnosperms and angiosperms only, that consists of a plant embryo within a protective coat

1.2.5 The differentiation of the anterior (front) end of an animal into a definite head

1.2.6 Blood-filled cavity found in Arthropoda

1.2.7 A plant discovered by the San (Bushmen) to control hunger and thirst

1.2.8 Cultivating one crop species year after year

1.2.9 A rod-like structure in Chordata that is usually replaced with a vertebral column

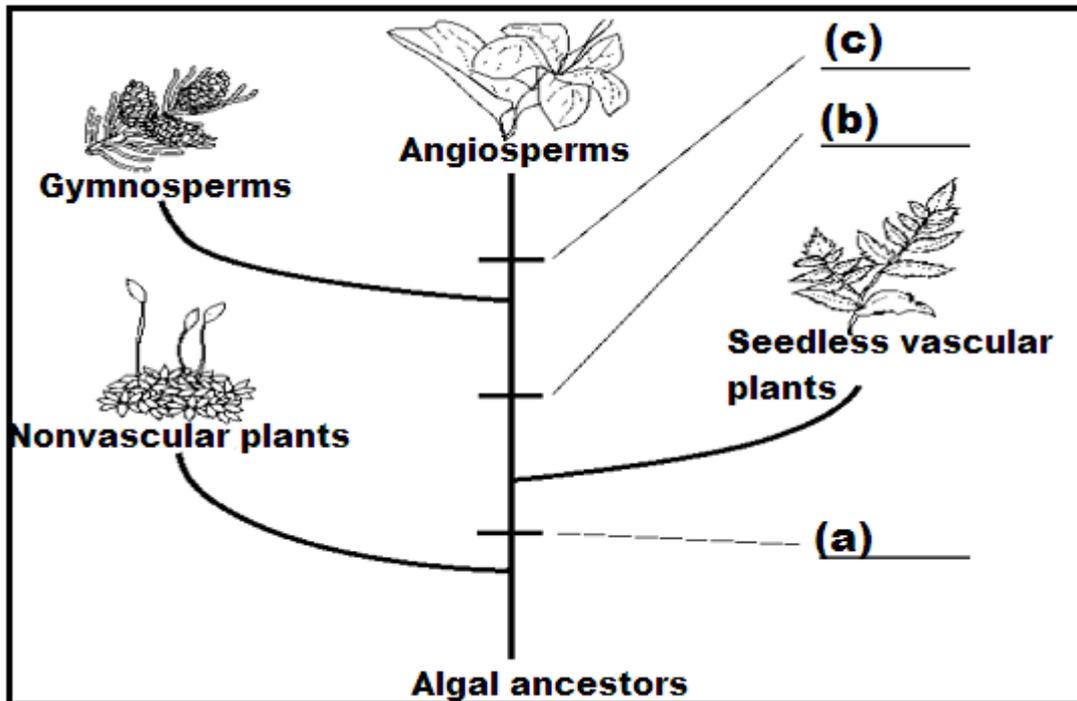
(9)

1.3 Indicate whether each of the statements 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 1.3.6) in your ANSWER BOOK.

COLUMN I		COLUMN II	
1.3.1	Produce/s spores in fungi	A.	Sporangiophores
		B.	Sporangia
1.3.2	Comma-shaped bacteria	A.	Cocci
		B.	Bacilli
1.3.3	Dominant generation in the life-cycle of Bryophytes	A.	Gametophyte
		B.	Sporophyte
1.3.4	Thallus plants	A.	Bryophytes
		B.	Pteridophytes
1.3.5	Plant/s known for its immune boosting properties	A.	Devil's Claw
		B.	African potato
1.3.6	Gel-like non-cellular layer in Cnidaria	A.	Mesoderm
		B.	Mesoglea

(6 × 2) (12)

1.4 The diagram below is a phylogenetic tree of plants and their algal ancestors. Study the diagram and answer the questions which follow.



- 1.4.1 Name the most important adaptation(s) that evolved at each of the positions labelled (a), (b) and (c). (3)
- 1.4.2 Which division of plants is represented as nonvascular plants in the diagram? (1)
- 1.4.3 Explain why the seedless vascular plants are able to grow taller than the nonvascular plants. (2)
- 1.4.4 In what way are the seeds of gymnosperms different to seeds of angiosperms? (2)
- 1.4.5 What is the collective name for all seed-bearing plants? (1)

TOTAL SECTION A: 50

SECTION B**QUESTION 2**

2.1 Liso carried out an experiment to find out what factors help mould to grow on bread.

She took 4 slices of white bread and put different substances on each slice of bread as follows:

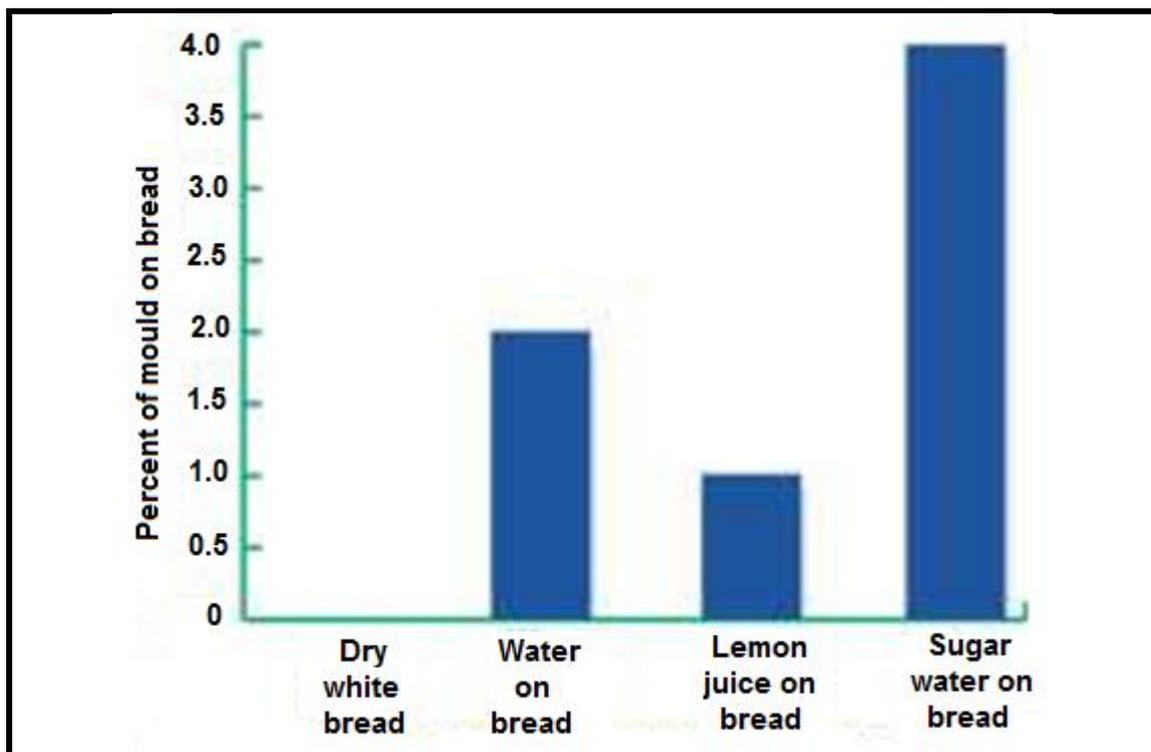
Slice 1: Was left dry

Slice 2: 20 ml of tap water

Slice 3: 20 ml of lemon juice

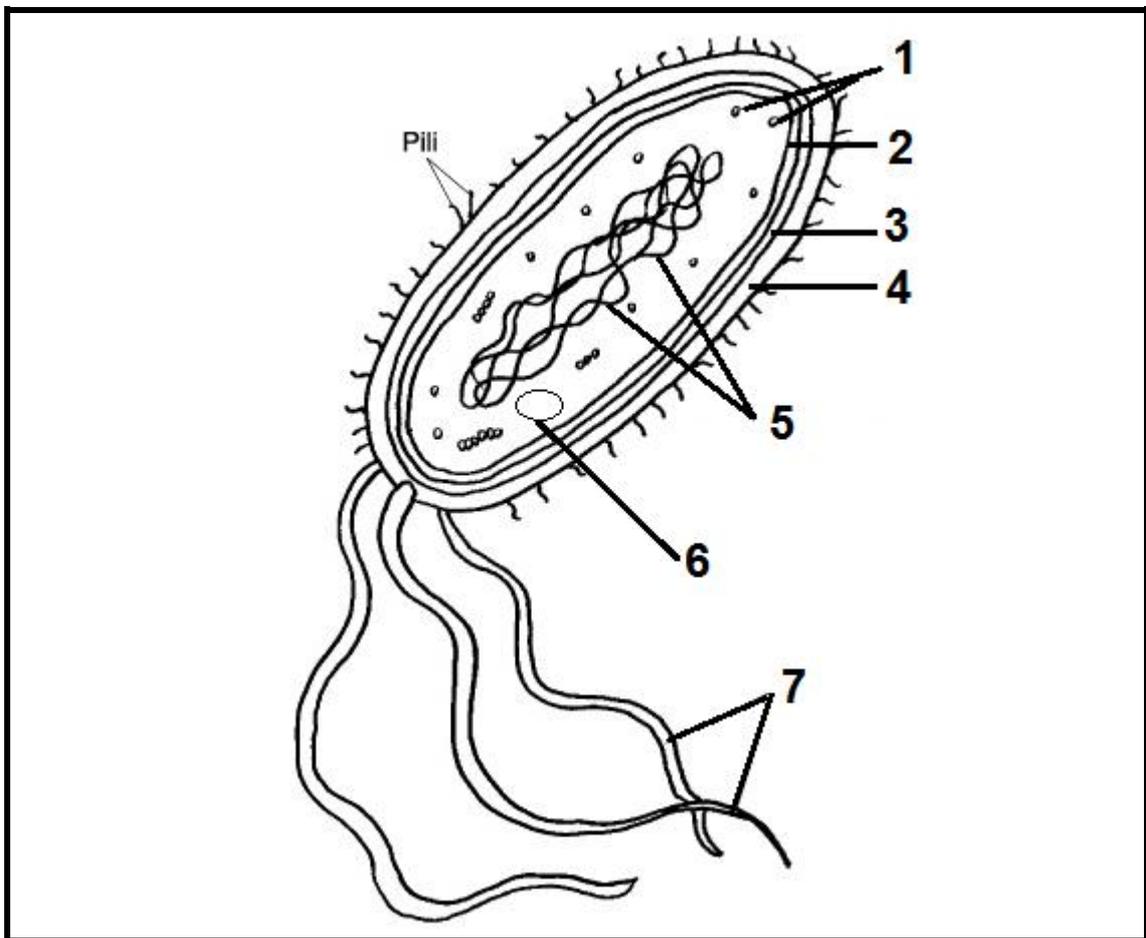
Slice 4: 20 ml sugar water

Each slice of bread was put in a ziploc bag and kept in a dark cupboard at a temperature of about 25 °C for two weeks. She observed the growth of mould on the four slices of bread and worked out the percentage area of the bread covered by mould. The results are shown in the graph below.



- 2.1.1 State a hypothesis for this investigation. (2)
- 2.1.2 Name the independent variable. (1)
- 2.1.3 Explain why mould did not grow well on the bread sprinkled with lemon juice? (2)
- 2.1.4 Why was dry bread included in the experiment? (2)
- 2.1.5 Identify and briefly describe the type of nutrition of *Rhizopus* (bread mould). (3)

2.2 The diagram below is that of a bacterial cell. Study it carefully and then answer the questions relating to it.



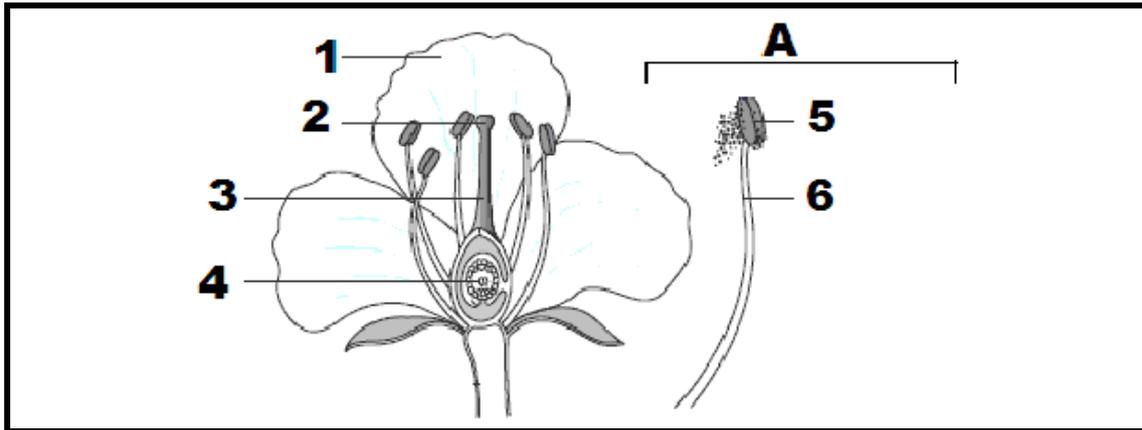
- 2.2.1 Provide labels for parts numbered 3, 5 and 6. (3)
- 2.2.2 State the function of part labelled 4. (1)
- 2.2.3 Briefly explain how bacteria develop resistance to antibiotics and how humans can contribute to the phenomenon. (3)
- 2.2.4 Explain how the structure labelled 6 can be used in the manufacture of insulin for diabetics? (3)

2.3 Answer the questions below on animal diversity.

2.3.1 Name a phylum of animals which is acoelomate and has a triploblastic body plan. (1)

2.3.2 By using examples, briefly discuss TWO ways in which invertebrates play a role in agriculture. (2 × 3) (6)

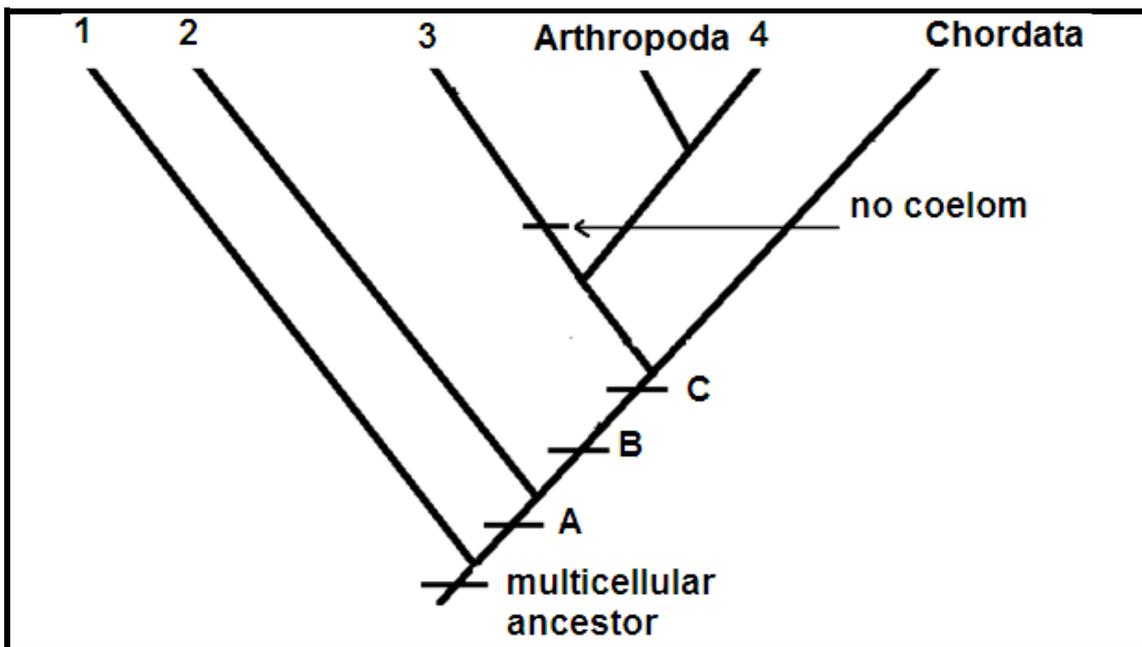
2.4 The diagram below shows the structure of a flower. Answer the questions below using the diagram and your own knowledge.



2.4.1 Identify the structure labelled A on the diagram. (1)

2.4.2 Plants have to spend a lot of energy to produce flowers. Explain why it is still an evolutionary advantage to produce flowers in plants. (5)

2.5 The diagram below shows a cladogram of animal phyla. Study it and answer the questions that follow.

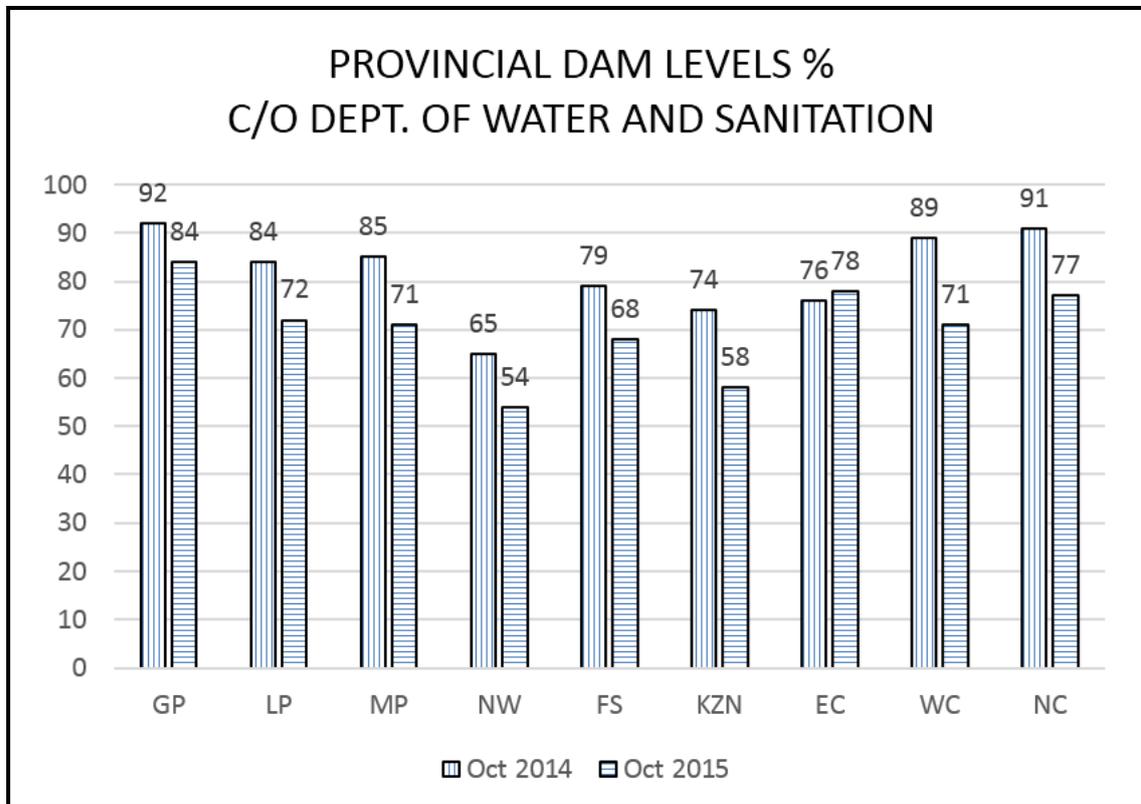


- 2.5.1 What is a cladogram? (1)
- 2.5.2 Name the feature labelled C common to animal phyla labelled 3 and 4 as well as the Arthropoda and Chordata. (1)
- 2.5.3 Provide labels for animal phylum numbered 1, 2 and 3. (3)
- 2.5.4 State ONE disadvantage of an exoskeleton in Arthropoda and explain how they overcome that disadvantage. (1 × 2) (2)

[40]

QUESTION 3

3.1 The graph below shows a comparison of the percentage of water stored in dams in each province in South Africa between October 2014 and October 2015. Answer the questions below based on the data shown in the graph and from your own knowledge.

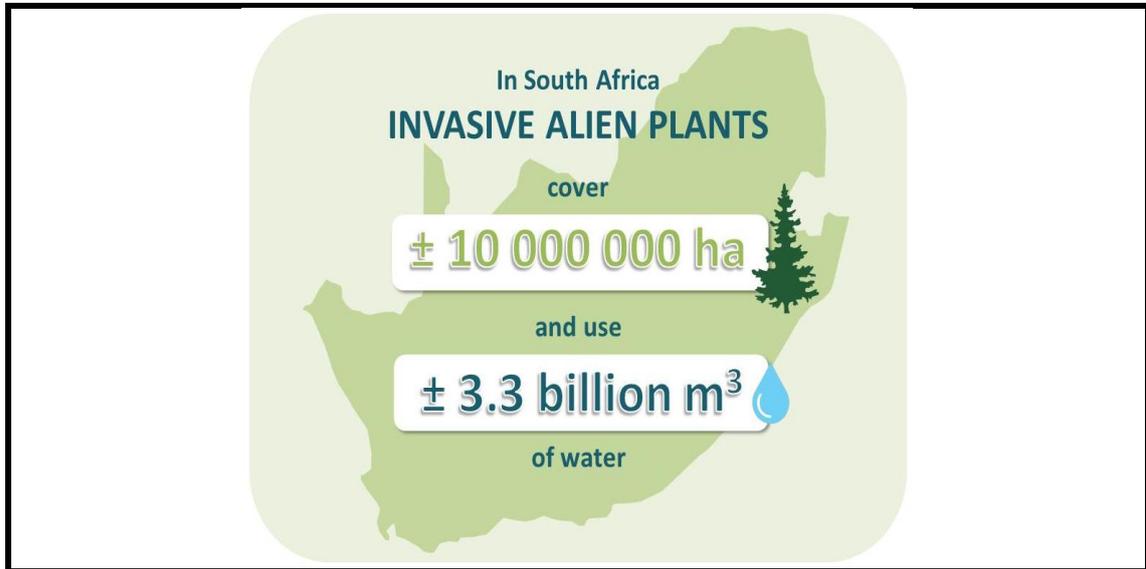


Key: GP – Gauteng LP – Limpopo MP – Mpumalanga
NW – North West FS – Free State KZN – KwaZulu-Natal
EC – Eastern Cape WC – Western Cape NC – Northern Cape

- 3.1.1 Comment on the comparison of water stored in the country's dams between October 2014 and October 2015 in general. (2)
- 3.1.2 Which province experienced the sharpest decrease in water storage over the year? (1)
- 3.1.3 Account for this notable decrease in water storage in the Province mentioned in QUESTION 3.1.2. (2)

3.1.4 Briefly discuss TWO ways in which the construction of dams can be disadvantageous. (4)

3.2 Study the diagram below about invasive alien plants in South Africa. It is estimated that they cover 10 million hectares (**ha**) in South Africa. Every year they use approximately 3,3 billion cubic metres (**m³**) of water more than the amount of water used by indigenous plants.



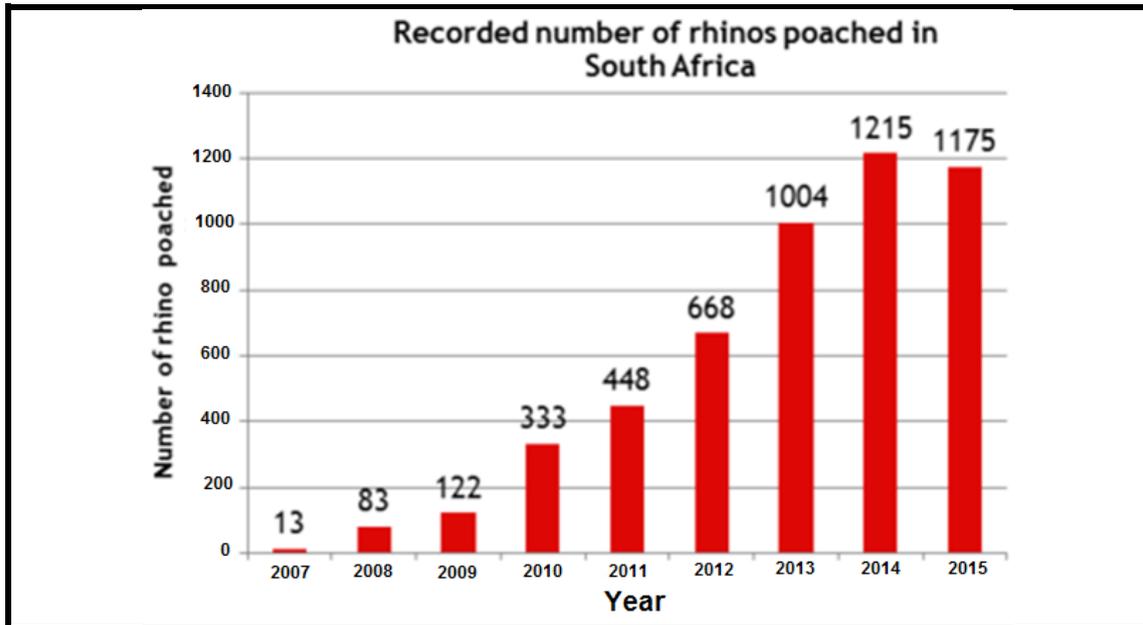
[SOURCE: <http://www.capenature.co.za/conserving-water-factories-western-cape/>]

3.2.1 Differentiate between *alien plants* and *indigenous plants*. (2)

3.2.2 Describe the impact on **water quality** if alien plants cover such a large area of South Africa as shown in the picture above. (5)

3.2.3 Define and differentiate between *biological control* and *chemical control* of invasive alien plants. (4)

3.3 The graph below shows South African Rhino poaching statistics using data published by the South African Department of Environmental Affairs (2016). Study the graph and then answer the questions which follow.



- 3.3.1 Define the term *poaching*. (1)
 - 3.3.2 Give THREE reasons why animals such as the rhino are poached. (3)
 - 3.3.3 Calculate the percentage increase in the number of rhino poached between 2013 and 2015. Show all your calculations. (3)
 - 3.3.4 Suggest THREE ways in which the poaching of rhino can be reduced. (3)
- 3.4 **SA to face severe food crisis, high staple food prices by September**

The Famine Early Warning System Network (FEWSNET) has warned of severe food insecurity across the Southern Africa region in 2016-2017 after two years of consecutive drought which have limited crop production.

FEWSNET estimates that nearly four million people currently face a crisis (IPC Phase 3) or worse across the region. This total includes nearly one million people in Malawi and 500,000 people each in Zimbabwe, Mozambique and Madagascar,” the alert said.

[SOURCE: <http://www.sabc.co.za/news>]

- 3.4.1 Distinguish between *food security* and *food insecurity*. (2)
- 3.4.2 According to the article above, what has led to food insecurity in Southern African regions? (1)
- 3.4.3 Which region has the most people affected by food insecurity? (1)
- 3.4.4 Briefly describe THREE ways in which pest control can threaten food security. (6)

[40]

TOTAL SECTION B: 80

SECTION C**QUESTION 4**

Climate change is a global problem with South Africa ranked amongst the worst twenty greenhouse gas emitters in the world. As a result of the increase in the emission of greenhouse gases we are faced with the problem of global warming.

Write an essay in which you discuss the causes and effects of global warming and explain what can be done to control the problem of global warming.

Content (17)
Synthesis (3)
[20]

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

TOTAL SECTION C: 20
GRAND TOTAL: 150

