education

Department:
Education
PROVINCE OF KWAZULU-NATAL

NATIONAL SENIOR CERTIFICATE

GRADE 11

LIFE SCIENCES

COMMON TEST

MARCH 2019

MARKS: 60

TIME: 1 hour

This question paper consists of 9 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 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. Make 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.

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 1.1.3) in your ANSWER BOOK, **for example 1.1.4 D.**

1.1.1 The seeds conserved in a seed bank will allow for the ...

A protection of plants against diseases.
B re-establishment of endangered species.
C increase in the nutrient content of plants.
D re-introduction of long extinct plants.

1.1.2 Seed production in Gymnosperms occurs as follows:

A Seeds are enclosed within a sorus.
B Seeds are enclosed within a fruit.
C Naked seeds are borne on a flower.
D Naked seeds are borne on a cone.

1.1.3 Pteridophytes are well-adapted for a terrestrial mode of life since they ...

A have true roots, stems and leaves.
B lack xylem and phloem.
C have motile sperm.
D produce seeds.

(3 x 2) **(6)**

1.2 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 (1.2.1 to 1.2.2) in the ANSWER BOOK.

	COLUMN I	COLUMN II
1.2.1	Disease causing fungus	A: Parasitic B: Heterotrophic
1.2.2	Multicellular organisms consisting of branched filaments enclosed by a rigid cell wall.	A: Fungi B: Bacteria

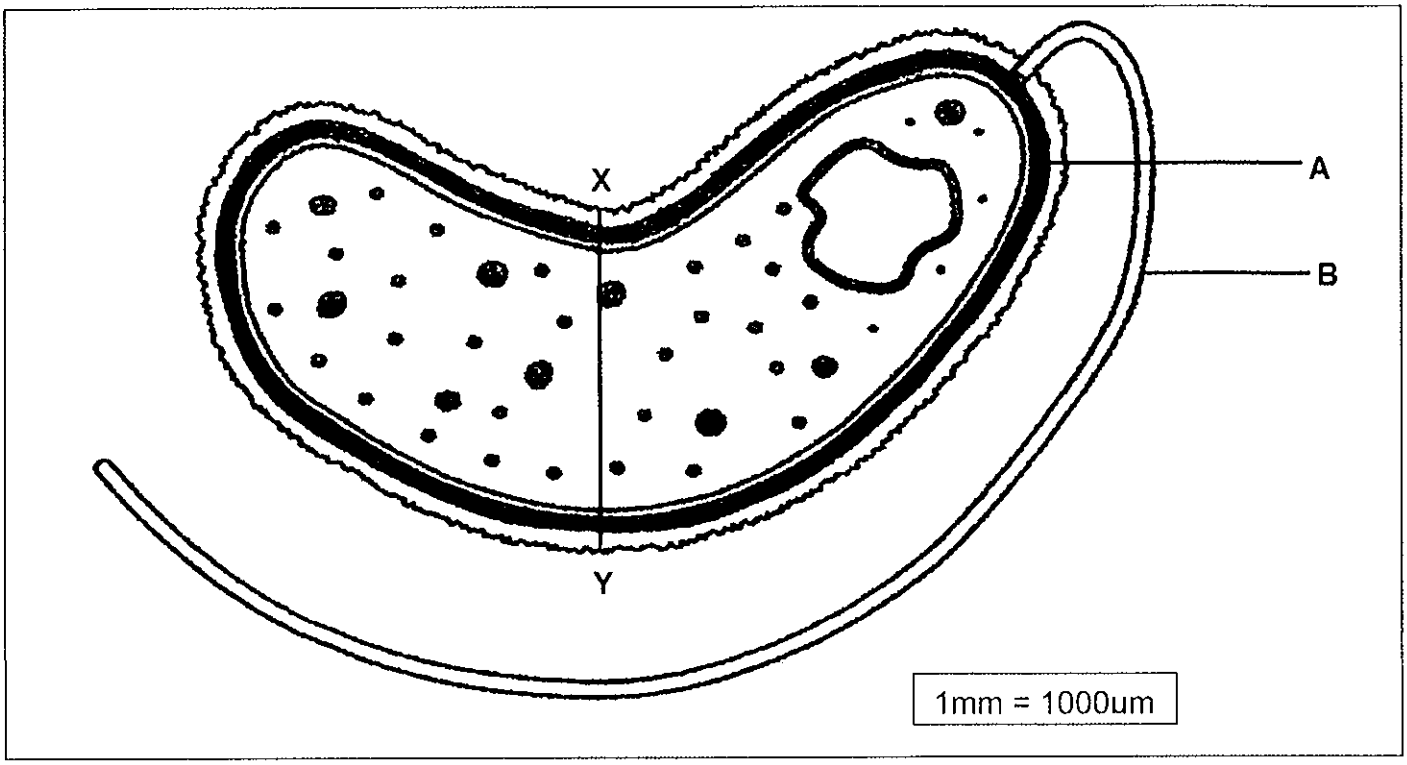
(2 x 2) **(4)**

TOTAL SECTION A: 10

SECTION B

QUESTION 2

2.1 The diagram below shows a cholera bacterium. It has been magnified 50 000 times.



2.1.1 Name structure **A**. (1)

2.1.2 State the function of structure **B**. (1)

2.1.3 The cholera bacterium infects epithelial cells in the human small intestine. Name **ONE** organelle that is present in an epithelial cell in the human small intestine that is NOT present in the cholera bacterium. (1)

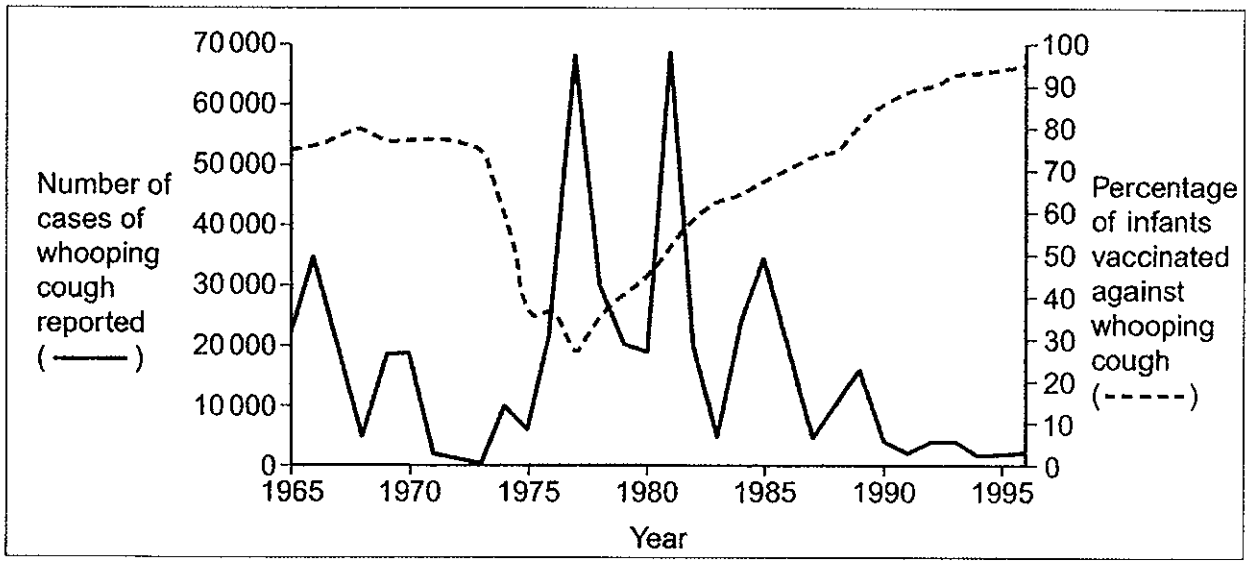
2.1.4 Calculate the actual width of the cholera bacterium between points **X** and **Y**. Give your answer in micrometres (**µm**). Show all working. (2)
(5)

2.2 Whooping cough is a bacterial disease that affects some infants. An investigation was conducted to determine the relationship between vaccinating infants against whooping cough and the number of cases of whooping cough reported. Data relating to whooping cough was collected between 1965 and 1996.

The following data were collected:

- the number of cases of whooping cough reported
- the percentage of infants vaccinated against whooping cough.

The graph below shows the data collected.



2.2.1 Identify the following variables from the graph:

(a) Dependent variable (1)

(b) Independent variable (1)

2.2.2 State the trend in the number of cases of whooping cough reported between 1971 to 1973. (1)

2.2.3 State a conclusion based on the data shown in the graph. (2)

(5)

2.3 Read the extract below and answer the questions that follow.

Ebola Virus Disease

Ebola is a rare but often deadly disease caused by a virus. Ebola is spread to people by contact with the skin or body fluids of infected animals, like fruit bats and chimpanzees. It then moves from person to person in the same way. Other ways to get Ebola include touching materials or surfaces that have been contaminated by infected body fluids.

Early symptoms of Ebola feel like the flu. As the infection gets worse it causes bleeding from the eyes, ears and nose. Some people will vomit or cough up blood, have bloody diarrhoea and get a rash.

Ebola is treated by managing the symptoms of the disease with: rehydration fluids, oxygen, blood pressure medication and blood transfusions.

Ebola kills up to 90% of people infected. There is as yet no proven cure for Ebola.

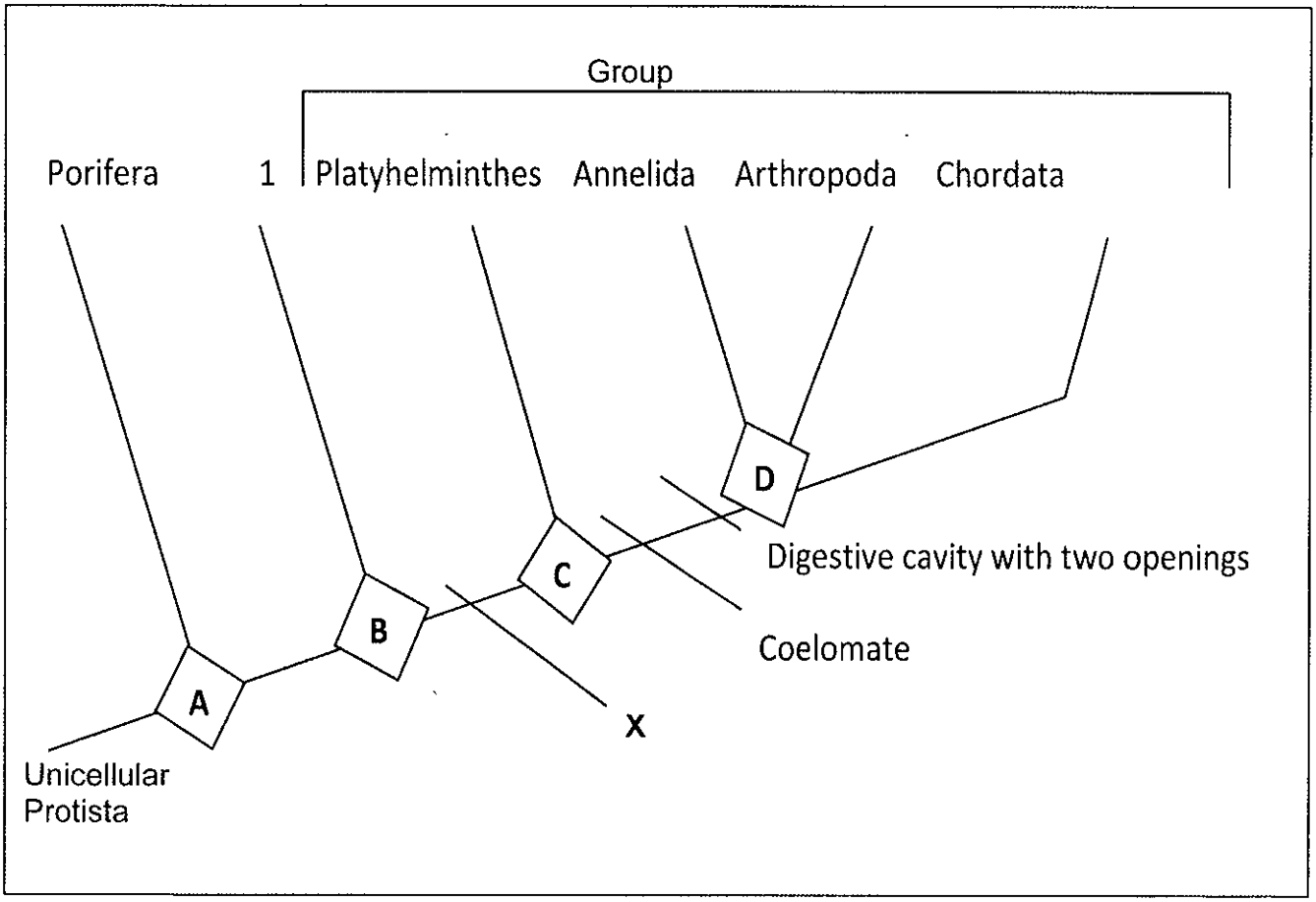
2.3.1 State why Ebola cannot be treated with antibiotics. (1)

2.3.2 Explain why blood pressure medication may be used as a symptomatic treatment of Ebola. (2)

2.3.3 Although Ebola is not classified as a sexually transmitted infection (STI) it can be transmitted by sexual intercourse. Provide evidence from the passage that supports this statement. (2)
(5)
[15]

QUESTION 3

3.1 Study the phylogenetic tree below showing how six animal groups evolved.



3.1.1 Name the common ancestor of all the animal groups represented. (1)

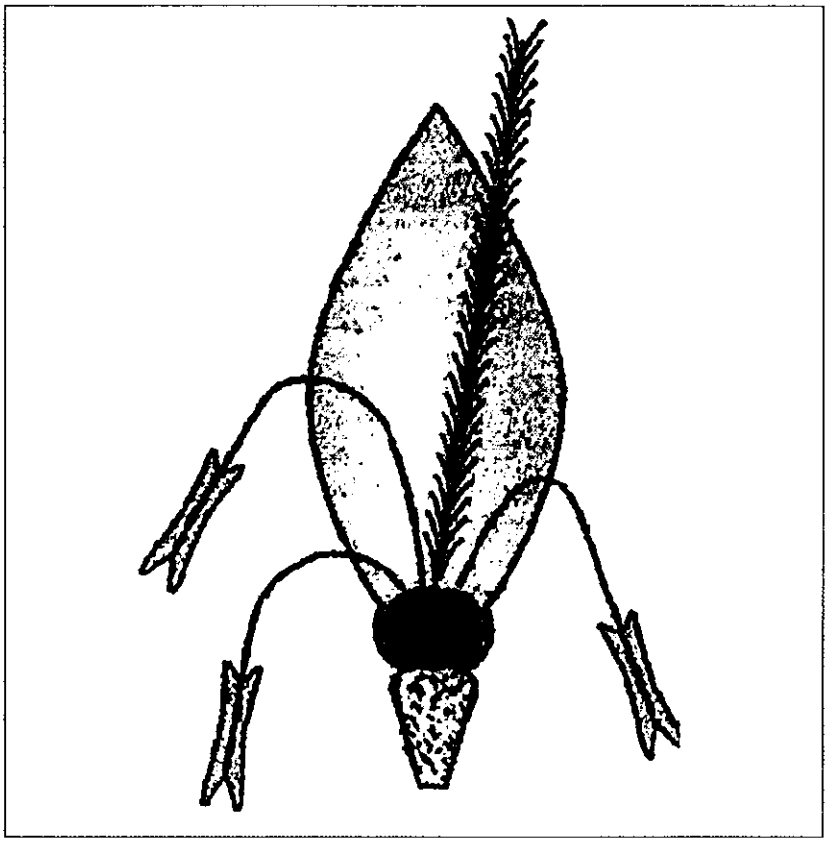
3.1.2 Give ONE characteristic of Arthropods shown on the phylogenetic tree. (1)

3.1.3 Identify the animal group represented by the number 1. (1)

3.1.4 Give the LETTER (**A**, **B**, **C** or **D**) that represents the most recent common ancestor of the bracketed group. (1)

3.1.5 Provide TWO evolutionary features represented by the letter **X**. (2) **(6)**

3.2 The diagram below represents a wind pollinated flower.



3.2.1 Explain TWO observable features that show how the above flower is adapted for wind pollination. (4)

3.2.2 State ONE characteristic of pollen grains produced by the flower shown. (1)
(5)

3.3

3.3.1 State TWO disadvantages of asexual reproduction (2)

3.3.2 State TWO possible consequences of not conserving seeds. (2)
(4)
[15]

TOTAL SECTION B: 30

SECTION C

QUESTION 4

Describe the distinguishing characteristics of Bryophytes and Angiosperms respectively, showing developmental trends. Also discuss the biological importance of Protists and explain the role of Invertebrates in agriculture and ecosystems.

Content: (17)
Synthesis: (3)
(20)

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

TOTAL OF SECTION C: 20

GRAND TOTAL: 60

Education

KwaZulu-Natal Department of Education
REPUBLIC OF SOUTH AFRICA

LIFE SCIENCES

PROVINCIAL COMMON TEST

MEMORANDUM - MARCH 2019

NATIONAL
SENIOR CERTIFICATE

GRADE 11

MARKS: 60

This memorandum consists of 6 pages.

PRINCIPLES RELATED TO MARKING LIFE SCIENCES

1. **If more information than marks allocated is given**
   Stop marking when maximum marks is reached and put a wavy line and 'max' in the right-hand margin.

2. **If, for example, three reasons are required and five are given**
   Mark the first three irrespective of whether all or some are correct/incorrect.

3. **If whole process is given when only a part of it is required**
   Read all and credit the relevant part.

4. **If comparisons are asked for, but descriptions are given**
   Accept if the differences/similarities are clear.

5. **If tabulation is required, but paragraphs are given**
   Candidates will lose marks for not tabulating.

6. **If diagrams are given with annotations when descriptions are required**
   Candidates will lose marks.

7. **If flow charts are given instead of descriptions**
   Candidates will lose marks.

8. **If sequence is muddled and links do not make sense**
   Where sequence and links are correct, credit. Where sequence and links are incorrect, do not credit. If sequence and links become correct again, resume credit.

9. **Non-recognised abbreviations**
   Accept if first defined in answer. If not defined, do not credit the unrecognised abbreviation, but credit the rest of the answer if correct.

10. **Wrong numbering**
    If answer fits into the correct sequence of questions, but the wrong number is given, it is acceptable.

11. **If language used changes the intended meaning**
    Do not accept.

12. **Spelling errors**
    If recognisable, accept the answer, provided it does not mean something else in Life Sciences or if it is out of context.

13. **If common names are given in terminology**
    Accept, provided it was accepted at the national memo discussion meeting.

14. **If only the letter is asked for, but only the name is given (and vice versa)**
    Do not credit.

15. **If units are not given in measurements**
    Candidates will lose marks. Memorandum will allocate marks for units separately.

16. **Be sensitive to the sense of an answer, which may be stated in a different way.**

17. **Caption**
    All illustrations (diagrams, graphs, tables, etc.) must have a caption.

SECTION A

QUESTION 1

1.1	1.1.1	B✓✓		
	1.1.2	D✓✓		
	1.1.3	A✓✓	(3 x 2)	**(6)**
1.2	1.2.1	Both A and B✓✓		
	1.2.2	A only✓✓	(2×2)	**(4)**
				(10)
			TOTAL SECTION A:	**10**

SECTION B
QUESTION 2

2.1	2.1.1	Cell wall✓	(1)
	2.1.2	For movement✓	(1)
	2.1.3	Mitochondrion✓/Nucleus/Vacuole/Endoplasmic reticulum/ Golgi apparatus/ Lysosome **Mark first one only** **Any 1**	(1)
	2.1.4	Actual size = Image size ÷ Magnification = 45 mm ÷ 50 000✓ = 0,0009 x 1000 = 0.9µm✓	(2) **(5)**
2.2	2.2.1	(a) Number of cases of whooping cough reported✓	(1)
		(b) Percentage of infants vaccinated against whooping cough✓	(1)
	2.2.2	Decreased✓ / low	(1)
	2.2.3	Vaccinating infants against whooping cough prevents the infection occurring.✓✓ OR As the percentage of infants vaccinated against whooping cough increased the number of cases of whooping cough reported decreased.✓✓	(2) **(5)**
2.3	2.3.1	Antibiotics are ineffective against viruses/cannot kill viruses.✓ OR Viruses are not living organisms✓	(1)
	2.3.2	- Bleeding/Blood loss occurs✓ with Ebola - This lowers/changes/affects blood pressure✓ - Blood pressure medication will return blood pressure to normal✓ **Mark first two only** **Any 2**	(2)

2.3.3 - Ebola is transmitted by contact with skin or body fluids✓ of infected people
- Semen/Vaginal fluids/Skin contact during sexual intercourse will transmit the virus/Ebola✓ (2)
(5)
[15]

QUESTION 3

3.1.1 Protista ✓/Unicellular Protista (1)

3.1.2 - Digestive cavity with two openings✓
- Coelomate✓
Any 1 (1)

3.1.3 Cnidaria✓ (1)

3.1.4 C✓ (1)

3.1.5 - Triploblastic✓
- Bilateral symmetry✓
- Cephalisation✓
Mark first two only **Any 2** (2)
(6)

3.2 3.2.1 - Feathery stigma✓ - to trap pollen carried by wind✓/increases surface area to trap pollen
- Stamens/Anthers hang out of flower✓ – to expose anthers to wind✓
- Petals are reduced/absent✓ - to expose anthers/stigma to wind✓
- Anthers are large✓ - to produce large amounts of pollen✓
Mark first two only **Any (2×2)** (4)

3.2.2 - light✓/airborne/air sacs
- smooth✓
- dry✓ (1)
Mark first one only **Any 1** **(5)**

3.3 3.3.1 - A weak parent plant will produce weak offspring✓
- If the environment changes, the new plants may not survive since all offspring are genetically identical✓
Mark first two only (2)

3.3.2 - Loss of nutritious food sources✓
- Loss of biodiversity✓ if current endangered species become extinct in the wild
- Loss of original wild types of food✓ that can safeguard our food supply/Loss of food security
Mark first two only **Any 2** (2)
(4)
[15]

SECTION C

QUESTION 4

Characteristics of Bryophytes

- No vascular tissue✓/No xylem and phloem
- Thallus plant✓/No true roots, stems and leaves
- Produce spores✓for reproduction
- Dependent on water for fertilization✓
- Gametophyte generation dominant✓ **4**

Characteristics of Angiosperms

- Vascular tissue present✓/Has xylem and phloem
- True roots , stems and leaves✓ present
- Produce seeds✓ for reproduction
- Produce fruit✓/flowers
- Water not needed for fertilization✓
- Pollen grains transfer male gametes✓
- Sporophyte generation dominant✓ **4**

Biological importance of Protists

- Phytoplankton protists are producers✓ in aquatic food chains
- Photosynthetic protists maintain the balance between oxygen and carbon dioxide✓ in the aquatic environment
- Seaweeds used in foods ✓, e.g. sushi, jellies, ice-cream
- Saprophytic protists/slime moulds are decomposers✓/nutrient recyclers
- Parasitic protists cause diseases, e.g. *Plasmodium* causes malaria
- Diatoms have silica that is used to make glass✓ **3**

Role of Invertebrates in agriculture and ecosystems

- Insects are pollinating agents✓ resulting in reproduction of plants✓
- Earthworms and insects are decomposers✓ and recycle nutrients✓
- Earthworms and insects aerate soil✓ and make oxygen available✓ to plant roots and animals/helps drainage✓ of soil for plant growth
- Insects act as pathogen vectors✓ spreading disease✓
- Insects act as pests✓ destroying plants✓/crops
- Insects are used as biological control agents✓ preventing pests destroying crops✓
- Bees produce honey✓ which humans use as a food source✓ (**3×2) = 6**

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
All information is relevant to: • Characteristics of Bryophyta; • Characteristics of Angiosperms; • Biological importance of Protists; • Role of Invertebrates in agriculture and ecosystems	Ideas are arranged in a logical sequence with regards to: • Characteristics of Bryophyta; • Characteristics of Angiosperms; • Biological importance of Protists; • Role of Invertebrates in agriculture and ecosystems	Minimum marks required: Characteristics of Bryophyta (3/4) Characteristics of Angiosperms (3/4) Biological importance of Protists (2/3) Role of Invertebrates in agriculture and ecosystems (3/6)
1 mark	1 mark	1 mark

TOTAL SECTION C: 20
GRAND TOTAL: 150