KWAZULU-NATAL PROVINCE

EDUCATION

REPUBLIC OF SOUTH AFRICA

GRADE 11

LIFE SCIENCES

MARCH CONTROLLED TEST- EXEMPLAR

MARKS: 75

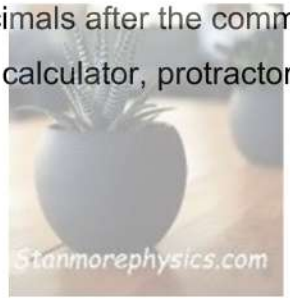
TIME: 1Hr & 15 Min

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 on your **FOLIO PAPER** provided.
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. **ALL** drawings should be done in pencil and labelled in blue or black ink.
7. Draw diagrams 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. Round off ALL calculations to two decimals after the comma.
11. You should use a non-programmable calculator, protractor, and a compass.
12. 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 1.1.4) in your **ANSWER BOOK**, for example 1.1.5 D.

1.1.1 Bryophytes are terrestrial plants that have NO...

A cellulose.
B rhizoids.
C vascular tissue.
D sporophyte phase.

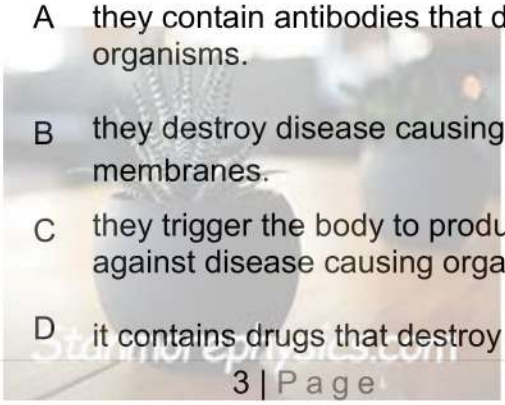
1.1.2 Viruses have a ...

A nucleic acid core and a protein coat.
B DNA-containing nucleus and a lipid envelope.
C nucleic acid core and a plasma membrane.
D DNA core and a protein coat.

1.1.3 Viruses are considered non – living because …

A they do not locomote.
B their nucleic acid does not code for protein.
C they cannot reproduce independently .
D they do not mutate and therefore do not adapt.

1.1.4 Vaccines work because ...



A they contain antibodies that destroy disease causing organisms.
B they destroy disease causing organisms by dissolving their cell membranes.
C they trigger the body to produce antibodies to protect the body against disease causing organisms.
D it contains drugs that destroy disease causing organisms.

(8)

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 A micro-organism used in the manufacturing of beer and bread.

1.2.2 The group of sporangia in a fern plant

1.2.3 Plants without true roots, stems and leaves.

1.2.4 Symbiotic relationship where one species benefits whilst the other does not benefit, nor is it harmed

1.2.5 The dominant generation in a moss plant

1.2.6 A disease-causing organism

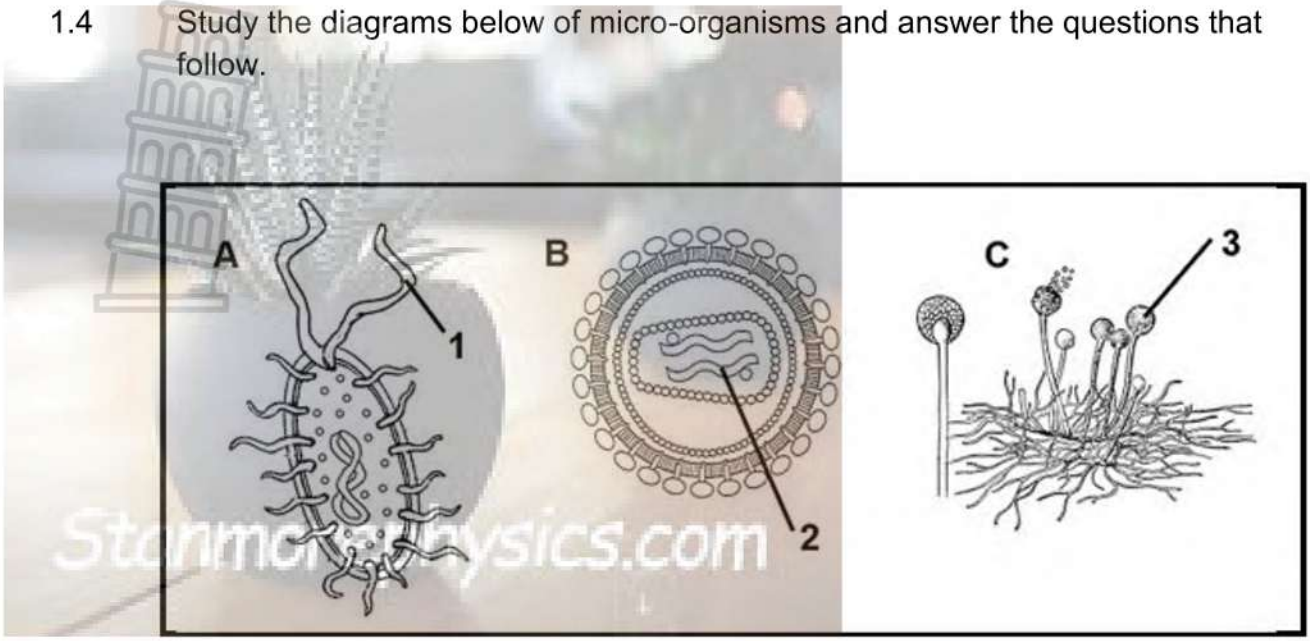
(6)

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 the **ANSWER BOOK.**

	COLUMN I	COLUMN II
1.3.1	The purpose of flowers	A: Attract pollinators B: Form fruit
1.3.2	Root-like structures in moss plants	A: thallus B: rhizoids

2x2 (4)

1.4 Study the diagrams below of micro-organisms and answer the questions that follow.



1.4.1 Name the group of organisms to which B and C belong respectively. (2)

1.4.2 Provide labels for:

(a) 1 (1)

(b) 2 (1)

(c) 3 (1)

1.4.3 Give the LETTER of the organism that:

(a) Is not considered to be living (1)

(b) Is eukaryotic (1)

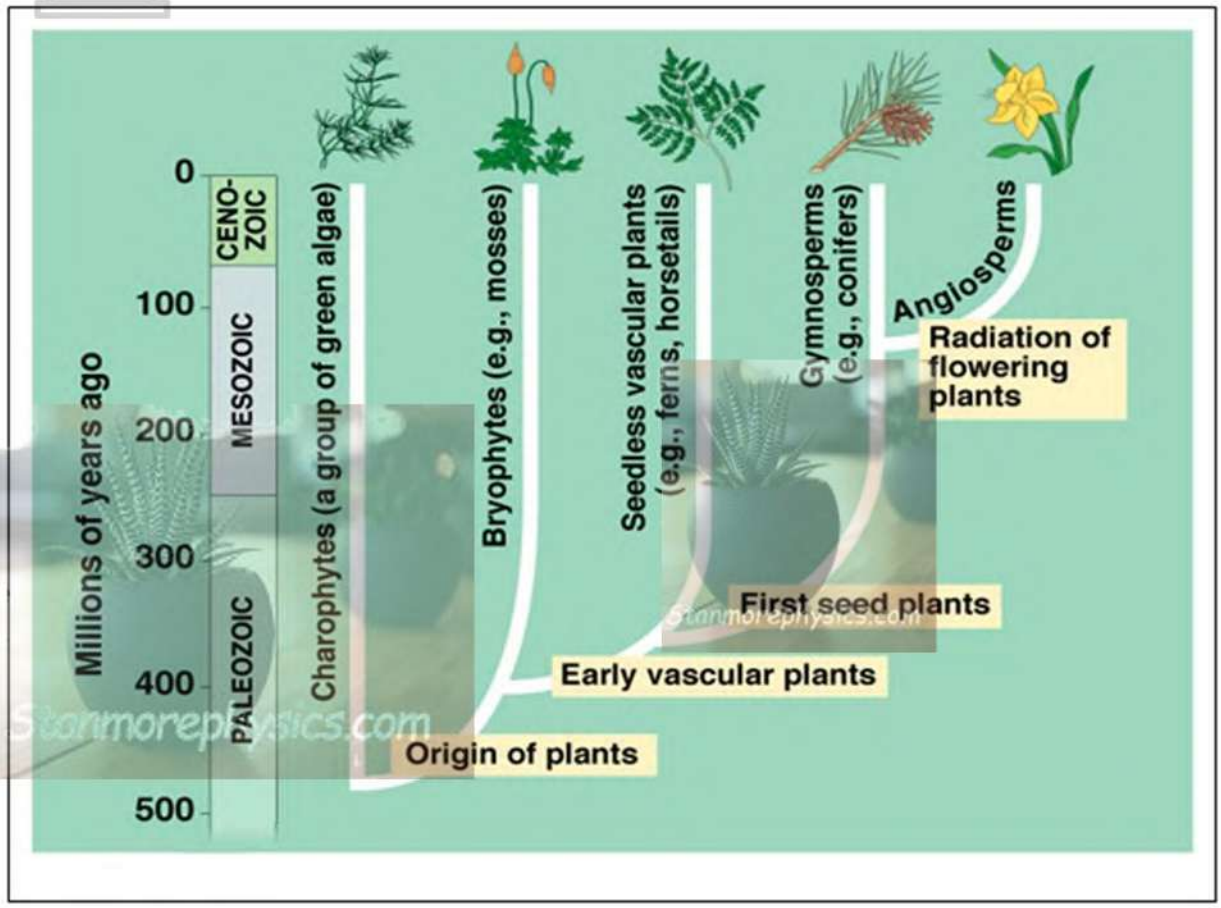
(7)

TOTAL QUESTION 1: [25]

TOTAL SECTION A: [25]

QUESTION 2

2.1 Below is a common phylogenetic tree showing the evolutionary development of plants.



2.1.1 What is a phylogenetic tree? (2)

2.1.2 Which are the …

(a) youngest vascular plants? (1)

(b) oldest vascular plants? (1)

2.1.3 In which era, did most of the plant groups evolve? (1)

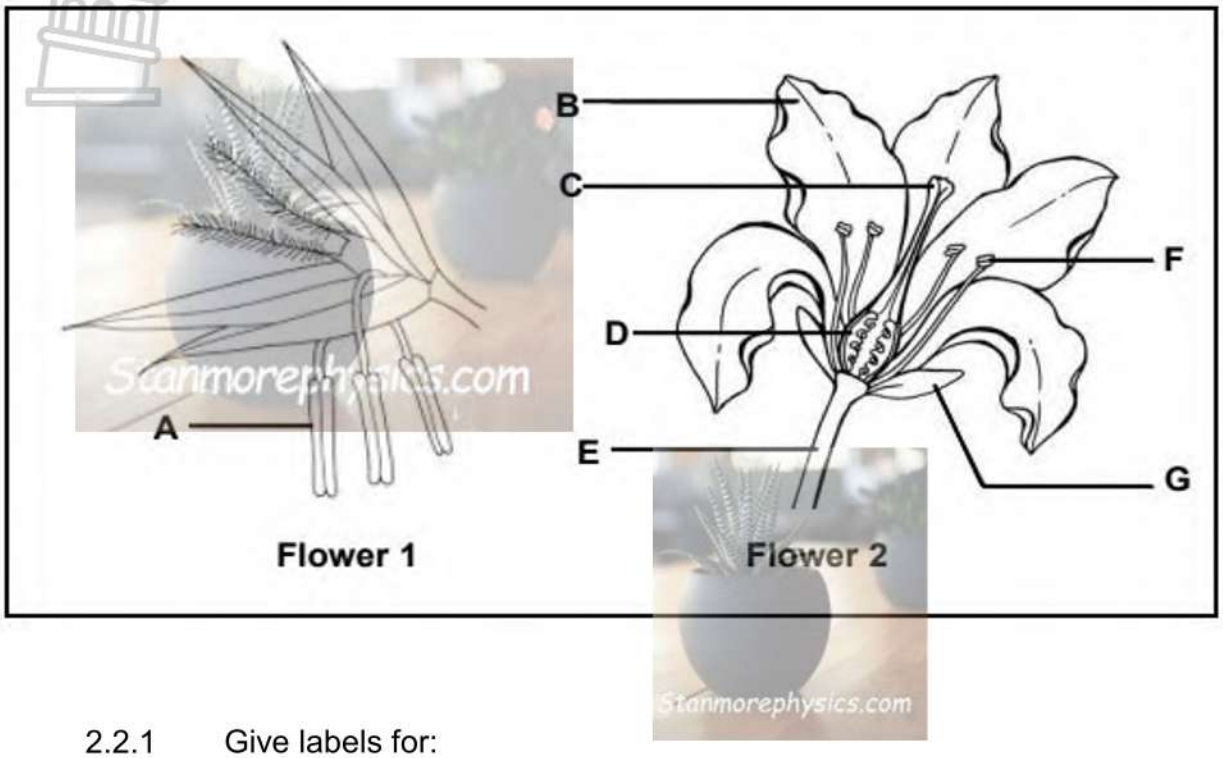
2.1.4 Which characteristic gave gymnosperms and angiosperms an evolutionary advantage over other land plants? (1)

2.1.5 Which of these groups require water for reproduction? (2)

2.1.6 Explain why the groups mentioned in QUESTION 2.1.5 need water for reproduction (4)

(12)

2.2 Study the diagrams of the two flowers below.



2.2.1 Give labels for:

(a) Structure A (1)

(b) Whorl B (1)

(c) Structure C (1)

2.2.2 Give the letter of the structure where the seed is formed. (1)

2.2.3 Which flower (1 or 2) above, is wind pollinated? (1)

2.2.4 Give TWO visible reasons for your answer in QUESTION 2.1.3 (2)

2.2.5 Name TWO unique features of flowering plants that have allowed them to become the dominant plant species on Earth. (2)

2.2.6 Explain TWO disadvantages of asexual reproduction in plants . (4)

(13)

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TOTAL QUESTION 2: [25]

QUESTION 3

3.1 Scientists conducted an investigation to determine the effects of antibiotic on bacteria causing pneumonia in children from 2000 to 2006.

The procedure for the investigation:

- The bacteria were cultured in the same type of agar medium in petri dishes of the same size.
- Petri dishes were divided into two groups.
- Petri dish **A** was treated with an antibiotic.
- Petri dish **B** was not treated with antibiotic.
- An antibiotic was introduced in years 2000 in petri dish **A**.
- Both petri dishes were the incubated under the same conditions and bacterial growth was examined.
- The investigation was repeated over a period of 5 years.

The table below shows the results of the investigation.

	GROWTH OF BACTERIA PER 100 000	
YEARS	**PETRI DISH A**	**PETRI DISH B**
1999	85	23
2000	60	28
2001	20	30
2002	9	40
2003	5	45
2004	2	50
2005	0.2	55
2006	0	60

3.1.1 Identify the independent variable of the investigation. (1)

3.1.2 What was the growth of bacteria in petri dish **A** in 2004? (1)

3.1.3 Describe the growth of pneumonia causing bacteria from 2001 to 2006 in petri dish **A.** (2)

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

3.1.5 Draw a line graph to show the growth of bacteria in petri dish **B** from 1999 to 2006 (6)

3.1.6 State what was done by the scientists to improve the reliability of the investigation. (1)

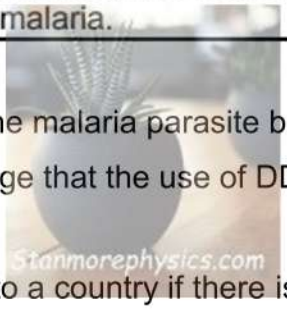
3.1.7 Calculate the percentage decrease in the growth of bacteria in petri dish **A** from 2002 to 2003. (3)

3.1.8 Explain why petri dish B was included in the investigation. (2)

(18)

3.2 Read the extract below.

> Malaria is a deadly disease caused by *Plasmodium sp*. and transmitted through the female Anopheles mosquito. In 2020, 627 000 people around the world died from malaria.
>
> DDT is a pesticide used to control mosquito populations in malaria areas. In the early 1990s there was a worldwide ban on the use of DDT. DDT is non-biodegradable. It affects animals at the top of the food chain. It caused the decline of many birds of prey as it made the shells of their eggs very thin.
>
> The number of deaths due to malaria rose from 19 in 1991 to 450 in 2000. The South African government decided to lift the ban and started using DDT again. By 2020 there were only 38 deaths due to malaria.



3.2.1 Name the kingdom to which the malaria parasite belongs. (1)

3.2.2 Give evidence from the passage that the use of DDT has a negative effect on the environment. (1)

3.2.3 Explain the economic impact to a country if there is a high percentage of people suffering from malaria. (2)

3.2.4 Explain how the Anopheles mosquito transmits malaria. (2)

3.2.5 Give ONE precaution besides killing mosquitoes that people can take to prevent getting malaria. (1)

(7)

TOTAL QUESTION 3 : [25]
TOTAL SECTION B : [50]
GRAND TOTAL : [75]

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EDUCATION

REPUBLIC OF SOUTH AFRICA

GRADE 11

LIFE SCIENCES

MARKING GUIDELINE

EXEMPLAR

MARKS: 75

TIME: 2½ hours

This marking guideline consists of 9 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 part of it is required**
Read all and credit relevant part.

4. **If comparisons are asked for and descriptions are given**
Accept if 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 is incorrect, do not credit. If sequence and links becomes correct again, resume credit.

9. **Non-recognised abbreviations**
Accept if first defined in answer. If not defined, do not credit the unrecognized abbreviation but credit the rest of 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 recognizable accept provided it does not mean something else in Life Sciences or if it is out of context.

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

14. **If only letter is asked for and only name is given (and vice versa)**
No 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

18. **Code switching of official languages (terms and concepts)**

A single word or two that appears in any official language other than the learners' assessment language used to the greatest extent in his/her answers should be credited, if it is correct. A marker that is proficient in the relevant official language should be consulted. This is applicable to all official languages.

SECTION A

QUESTION 1

1.1	1.1.1	C✓✓		
	1.1.2	A✓✓		
	1.1.3	C✓✓		
	1.1.4	C✓✓		
			(4 x 2)	**(8)**
1.2	1.2.1	Fungus✓/Yeast		
	1.2.2	Sorus ✓ / Sori		
	1.2.3	Thallus ✓		
	1.2.4	commensalism✓		
	1.2.5	Gametophyte ✓		
	1.2.6	Pathogen ✓		
				(6)
1.3	1.3.1	A only ✓✓		
	1.3.2	B only ✓✓		
			(2 x 2)	**(4)**
1.4	1.4.1	B – Viruses ✓		(1)
		C – Fungi ✓		(1)
	1.4.2	1 – flagellum ✓/ flagella		(1)
		2 – Nucleic acid ✓/ RNA / DNA		(1)
		3 – Sporangium ✓		(1)
	1.4.3	(a) B ✓		(1)
		(b) C ✓		(1)
				(7)

TOTAL SECTION A: [25]

SECTION B

QUESTION 2

2.1 2.1.1 A branching diagram/tree showing the evolutionary relationships among various species✓✓/organisms. (2)

2.1.2 (a) Angiosperms✓ (1)
(b) Ferns✓/horsetails (1)

2.1.3 Palaeozoic✓ era (1)

2.1.4 Development of seeds✓ (1)

2.1.5 Bryophytes ✓/mosses
Pteridophytes✓/ferns/horsetails (2)

2.1.6
- Mosses/ferns/both are small plants/a prothallus ✓
- that need to be covered in water✓
- So that the male gametes✓/sperm cells
- can swim to the female reproductive organ /archegonium/ ovum✓
- using their flagella✓
- in order for fertilization to take place✓ (Any 4) (4)

(12)

2.2 2.2.1 (a) Anther ✓ (1)

(b) Corolla ✓ (1)

(c) Stigma ✓ (1)

2.2.2 D ✓ (1)

2.2.3 1✓ (1)

2.2.4
- Their stigmas are large✓/feathery
- The stamens are long ✓/protrude out of the flower
- Anthers are large ✓ to produce lots of pollen

(Mark First TWO only) (2)

2.2.5 Fruit ✓
Flowers ✓ (2)

2.2.6 All the offsprings are identical ✓
If conditions become unfavourable, they will die ✓

Bad characteristics / Traits present in parents ✓
Will be passed to offsprings increasing the number of plants with this characteristics. ✓ (4)

(13)

Rapid multiplication ✓by asexual reproduction may lead to overcrowding. ✓

(Mark first TWO only) (Any 2 x 2)

TOTAL SECTION 2: 25

Question 3

3.1 3.1.1 Time (years) ✓ (1)

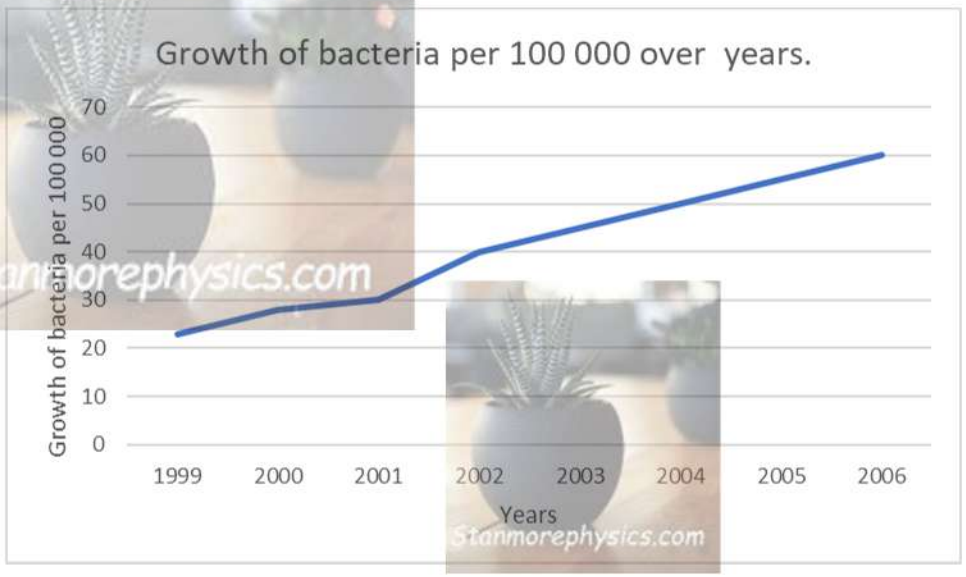
3.1.2 200 000✓ (1)

3.1.3 As the years increases, the growth rate of bacteria decreases. ✓✓ (2)

3.1.4
- Type of agar medium ✓
- Size of petri dishes✓
- Environmental conditions where petri dishes were incubated✓ . (2)

(Mark First TWO only)

3.1.5



Criteria		Elaboration	Mark(s)
Correct type of the graph	T	Line graph drawn	1
Correct caption of the graph	C	Both variables included	1
Correct labels on the y and X- axis with units	L	Both labels correct	1
Correct scale	S	Equal spacing between intervals for each axis	1
Plotting	P	1 – 7 correct All 8 correct	1 2

(6)

3.1.6 (1)

Repeated over a period of 5yrs

3.1.7

$\frac{9-5}{9}$ ✓ X 100✓ = 44.44✓ %

OR

$\frac{5-9}{9}$ ✓X 100✓ = - 44.44

Therefore 44.44% decrease ✓ (3)

3.1.8 To serve as control✓
So that it can be compared with group A ✓
And show that antibiotic is the only factor that affects the results✓/ improve validity of the investigation.

(2)

(18)

3.2 3.2.1 Protozoa✓ / Protista (1)

3.2.2 • It is non-biodegradable✓
• It builds up in the food chain and affects animals at the top of the food chain✓
• It caused the decline of many birds of prey as it made the shells of their eggs very thin (1)
(Mark first ONE only)

3.2.3 • It will have a negative impact on the economy ✓
• Because there will be less people working ✓/ earning money/ more money spent on medical care (2)

3.2.4 • The mosquito sucks up blood containing plasmodium from infected person✓
• When it bites another person the mosquito spits some of it's saliva containing plasmodium into it's victim's blood✓ (2)

3.2.5

- Take medication before entering the malaria area ✓
- staying indoors between sunset and sunrise
- covering doors and windows with gauze to stop mosquitoes from entering rooms.
- sleeping under mosquito nets.
- applying insect repellents to exposed skin.
- wearing long sleeves and pants if you need to be outdoors at night.
- drain places where there is standing water e.g. drains, ponds, gutters, old tyres etc., as mosquitoes breed in standing water. (1) **(7)**

(Mark first ONE only

TOTAL QUESTION 3 : 25
TOTAL SECTION B: 50
GRAND TOTAL: 75