Province of the
EASTERN CAPE
EDUCATION

NATIONAL SENIOR CERTIFICATE

GRADE 11

NOVEMBER 2018

LIFE SCIENCES P2 MARKING GUIDELINE

MARKS: **150**

This marking guideline consists of 12 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 marking guideline 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. Marking guideline 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 appear(s) 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	D	✓✓		
	1.1.2	B	✓✓		
	1.1.3	D	✓✓		
	1.1.4	D	✓✓		
	1.1.5	C	✓✓		
	1.1.6	C	✓✓		
	1.1.7	C	✓✓		
	1.1.8	D	✓✓		
	1.1.9	A	✓✓		
	1.1.10	C	✓✓	(10 x 2)	(20)
1.2	1.2.1	Carbon footprint ✓			
	1.2.2	Eutrophication ✓			
	1.2.3	Food security ✓			
	1.2.4	Afforestation ✓			
	1.2.5	Monoculture ✓			
	1.2.6	Androecium ✓/stamen			
	1.2.7	Sessile ✓/ Sedentary			
	1.2.8	Ectoderm ✓			
	1.2.9	Radial ✓symmetry			
	1.2.10	Moulting ✓/ Ecdysis			(10)
1.3	1.3.1	None ✓✓			
	1.3.2	Both A and B ✓✓			
	1.3.3	A only ✓✓		(3 x 2)	(6)

1.4 1.4.1 **A** – Bryophytes ✓
B – Pteridophytes ✓
C – Gymnosperms ✓
D – Angiosperms ✓ (4)

1.4.2 (a) Vascular ✓/ Water conducting tissue (1)

(b) Flowers ✓/ Seeds enclosed in fruit (1)

1.4.3 Spermatophytes ✓ (1)

1.5 1.5.1 (a) 1994 ✓ (1)

(b) 2014 ✓ (1)

1.5.2 (a) 9 − 10 ✓ (1)

(b) 17 − 18 ✓ (1)

1.5.3
- Monitoring the elimination of CFC's as a propellant in aerosols. ✓
- Increasing public awareness of ozone depletion. ✓
- Investigating new ozone-friendly propellants. ✓
- International agreements e.g. the Montreal Protocol to reduce CFC production . (Any other correct solutions)

(Mark first THREE only) (3)

TOTAL SECTION A: 50

QUESTION 2

2.1 2.1.1 **5** – Ribosome ✓
7 – Flagellum ✓ (2)

2.1.2 Protects the bacterium against dehydration ✓
Protects the bacterium against harmful substances ✓ (Any 1) (1)

2.1.3
- A plasmid (ring-shaped DNA) is removed from the bacterium *E. coli.* ✓
- Special enzymes (restriction enzymes) are used to cut the plasmid DNA of *E.coli.* ✓
- A human gene of insulin is inserted into the plasmid ✓/ *E.coli* DNA.
- The plasmid and human gene of insulin join to form recombinant DNA. ✓
- The *E.coli* bacterium starts to reproduce. ✓
- producing many insulin producing bacteria. ✓
- The insulin is extracted, ✓
- purified and sold to treat diabetes. ✓ (Any 5 x 1) (5)

2.2 2.2.1 China ✓ (1)

2.2.2
- Leads to the enhanced 'greenhouse effect' ✓
- and thus global warming. ✓
- Global warming influences weather patterns ✓
- which can destroy habitats ✓
- leading to a decrease in biodiversity. ✓ (Any 3 x 1) (3)

2.2.3
- It will be expensive ✓ to change to machinery that produce less CO_2. ✓
- Too expensive ✓ to purchase or develop systems that remove excess CO_2 from outlet gases. ✓
- This will reduce profit ✓that will lead to job losses ✓/ have negative effect on the country's economy. (Any 2 x 2)

(Mark first TWO only) (4)

2.3 2.3.1 There has been a rapid increase in the human population ✓ (1)

2.3.2 (a) Pesticides kill the pests which destroy the crops ✓ (1)

(b) Fertilisers increase the nutrient content in the soil ✓ (1)

2.3.3 Secondary consumers such as birds ✓can eat the pests with the poison which can kill the birds, thereby decreasing the population size of the birds. ✓

OR

Pests can become extinct ✓ and the secondary consumers feeding on them would decrease in numbers due to a shortage of food. ✓ (2)

2.3.4
- Loss of flora and fauna biodiversity ✓by inbreeding of GMOs.
- Entire species could be wiped out if exposed to disease ✓ (2)

2.4 2.4.1 It is a close association between two organisms where they both benefit. ✓ (1)

2.4.2
- The hyphae of the fungus increase the absorptive surface of the plant's roots ✓/ allow the plant to absorb water, phosphorus and other minerals from the soil.
- The plant provides the fungus with carbohydrates. ✓ (2)

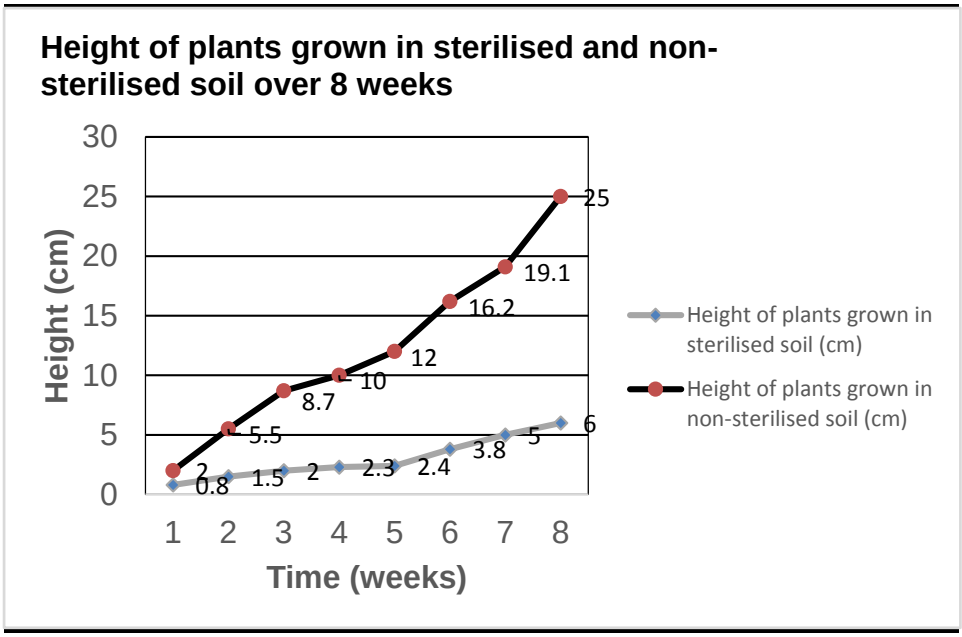
2.4.3 (a) (Presence / Absence of) Mycorrhiza ✓ (1)

(b) Plant growth ✓ (1)

2.4.4
- same type of soil was used ✓
- all other factors were kept the same

(Mark first ONE only) (Any 1 x 1) (1)

2.4.5



CRITERIA FOR ASSESSING THE GRAPH:

Line graphs drawn	1 mark
Caption	1 mark
Label and units of x-axis and y-axis	1 mark
Scale on x-axis and y-axis	1 mark
Plotting: 6 points correctly plotted	1 mark
All points plotted correctly	1 mark

(6)

2.4.6
- Sterilising the soil killed the fungi ✓ meaning that
- there were no mycorrhizal hyphae ✓
- to increase the absorptive surface of plant's roots. ✓
- The plant could not get sufficient water, phosphorus and other mineral ions from the soil, ✓ resulting in slow growth. (Any 3 x 1) (3)

2.4.7 Mycorrhizal fungi encourage plant growth as can be seen in plants grown in non-sterilised soil. ✓✓ (2)

[40]

QUESTION 3

3.1 3.1.1 **A → B** ✓ (1)

3.1.2 Arthropoda ✓
Chordata ✓
Annelida ✓ (Any 2 x 1) (2)

3.1.3 **X** − Mesoderm ✓
Y − Coelom ✓ (2)

3.1.4
- Provides space for the development of internal organs. ✓
- Separates the gut wall from the body wall enabling them to function independently of each other. ✓.
- The fluid within the body cavity acts as hydrostatic skeleton ✓ assisting the animals with locomotion. (Any 2 x 1) (2)

3.1.5 **A** ✓ (1)

3.1.6
- Allows animals that are sessile / attached to collect food coming from any direction ✓ since they cannot move. ✓

OR

- Allows animals that are sessile to react to danger from any direction ✓since they cannot turn to face the danger. ✓ (2)

3.2 3.2.1
- Reddish-brown colour of water ✓
- Smell of rotten eggs ✓
- Dead fish ✓ (Any 2 x 1) (2)

3.2.2 Yes ✓ (1)

3.2.3
- The number of faecal coliforms are higher ✓ from sample **B** than from sample **A** ✓

(Mark first ONE only) (Any ONE of the 7 comparisons) (2)

3.2.4 (a) Drop in pH, ✓ sulphates ✓ (Any 1 x 1) (1)
(b) Chlorides, ✓ sodium ✓ (Any 1 x 1) (1)
(c) Faecal coliforms, ✓ nitrates, ✓ phosphates ✓ (Any 1 x 1) (1)

3.2.5 (a) Spread of waterborne diseases by polluted water used for irrigation. ✓✓ (2)
(b) Spread of waterborne diseases from drinking polluted water. ✓✓ (2)

3.2.6 Better management ✓ and regular maintenance of waste water treatment plant. ✓ (2)

3.3 3.3.1 Poaching ✓ (1)

3.3.2 Increase in urban demand ✓/ big cities and towns are growing. Easy access to wild animals due to road networks expanding to forests. ✓ (2)

3.3.3
- Disturbs the ecosystem ✓
- because food chains are affected ✓
- leading to the extinction of some species ✓ in the ecosystem
- and will eventually lead to the loss of biodiversity. ✓

(Any 3 x 1) (3)

3.3.4 (a)
- Regulating hunting ✓
- working with local communities to manage and protect their resources from outsiders. ✓
- Promoting sustainable sources of food ✓ (Any 2 x 1) (2)

(b) Better management of the numbers of people visiting protected areas. ✓
Better management of the activities of people visiting the protected areas. ✓ (2)

3.4 3.4.1
- Reducing of waste ✓
- Re-using of waste products ✓ (2)

3.4.2 **Advantage**
- No chemicals involved ✓
- so no pollution of the environment ✓ (2)

Disadvantage
- The introduced organism could become so successful ✓ that it could eliminate other species. ✓ (2)

[40]

TOTAL SECTION B: 80

SECTION C

QUESTION 4

WIND POLLINATED FLOWERS

- Are usually small ✓
- green / dull ✓
- without showy petals ✓ and
- reduced nectar. ✓
- They produce large amounts of pollen ✓
- to increase the chances of pollination. ✓
- The pollen grains are light ✓/ smooth and dry
- to allow them to float in the air ✓ over long distances.
- They have long and thin filaments ✓
- to sway in the wind. ✓
- The anthers are attached to the filaments ✓
- such that they can move easily. ✓
- The stigma is large and sticky ✓
- to trap as much pollen as possible. Max. 9

INSECT POLLINATED FLOWERS

- are usually large ✓and
- brightly coloured.✓
- Some give off pleasant smells ✓
- to attract insects such as bees ✓/butterflies and moths.
- Some give off unpleasant smells ✓
- to attract insects such as flies. ✓
- Some flowers have hairs ✓/ special markings / nectar guides
- leading the insects to the nectaries ✓which produce nectar.
- Some have special structural adaptations ✓/
- to transfer pollen onto the insects ✓
- to accept pollen from the insect's back on the flower ✓ Max. 8 (8)

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

ASSESSING THE PRESENTATION OF THE ESSAY

Criterion	Relevance (R)	Logical sequence (L)	Comprehensive (C)
Generally	All information provided is relevant to the question.	Ideas are arranged in a logical sequence.	All aspects of the essay have been sufficiently addressed.
In this essay in Q4	Only information relevant to the association with the discussion of the adaptations of flowers to pollination by wind and insects. No irrelevant information included.	The discussion of the adaptations of flowers to pollination by wind and insects is presented in a logical and sequential manner.	At least **the following marks should be obtained:** - **6/9** for the discussion of adaptations of flowers to pollination by wind - **5/8** for the discussion of adaptations of flowers to pollination by insects
Mark	1	1	1

TOTAL SECTION C: 20
GRAND TOTAL: 150