



Province of the
EASTERN CAPE
EDUCATION

**NATIONAL
SENIOR CERTIFICATE**

GRADE 11

NOVEMBER 2019

**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 are 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. 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 C ✓✓
- 1.1.2 A ✓✓
- 1.1.3 C ✓✓
- 1.1.4 D ✓✓
- 1.1.5 B ✓✓
- 1.1.6 C ✓✓
- 1.1.7 C ✓✓
- 1.1.8 B ✓✓
- 1.1.9 D ✓✓
- 1.1.10 A ✓✓ (10 x 2) (20)
- 1.2 1.2.1 lymphocytes / white blood cells ✓
- 1.2.2 pathogens ✓
- 1.2.3 Porifera ✓
- 1.2.4 antibiotics ✓
- 1.2.5 plankton ✓
- 1.2.6 yeast / fungi ✓
- 1.2.7 herbicide ✓/pesticides
- 1.2.8 greenhouse effect ✓ (8 x 1) (8)
- 1.3 1.3.1 Both A and B ✓✓
- 1.3.2 Both A and B ✓✓
- 1.3.3 A only ✓✓ (3 x 2) (6)

1.4	1.4.1	Multicellular ✓	(1)
	1.4.2	(a) C ✓	(1)
		(b) A ✓	(1)
		(c) B ✓	(1)
		(d) D ✓	(1)
		(e) A ✓	(1)
	1.4.3	Gymnosperms ✓ Angiosperms ✓	(2)
		(mark first TWO only)	
1.5	1.5.1	B – Viruses ✓	
		C – Fungi ✓	(2)
	1.5.2	1 – flagellum ✓	
		2 – Nucleic acid ✓ / RNA / DNA	
		3 – Sporangium ✓	(3)
	1.5.3	(a) B ✓	(1)
		(b) C ✓	(1)
	1.5.4	bacillus ✓	(1)

TOTAL SECTION A: 50

SECTION B

QUESTION 2

- 2.1 2.1.1 Protista ✓ (1)
- 2.1.2 Liver ✓/ red blood cells (1)
- 2.1.3 (a) 40,3 °C ✓ (accept 40,2 – 40,4) (1)
- (b) 3 ✓ (1)
- 2.1.4 day 17 ✓ (1)
- 2.1.5
- Take preventative medication ✓/ prophylactics before entering a malaria area
 - Prevent mosquitoes biting you ✓ / wearing long sleeved clothing / using repellent sprays and lotions / sleeping under a mosquito net / closing doors and windows at night
 - Getting rid of mosquitoes ✓ / draining swampy areas / spraying insecticide / DDT (3)
- 2.2
- They act as pollinators. ✓ Honeybees and butterflies pollinate various flowers ✓
 - They are decomposing dead organic material. ✓ Bacteria and fungi decompose invertebrates such as termites, beetles, flies and worms. ✓
 - They enrich the soil. ✓ Faeces of earthworms are rich in nutrients for plants. ✓
 - They aerate the soil ✓/ earthworms, ants, termites, etc. create underground tunnels. This helps to infiltrate the soil with water ✓/ and helps the plants to grow their roots deeper. ✓
- (mark first TWO only) (Any 2 x 2) (4)
- 2.3 2.3.1 A – Ectoderm ✓
B – Mesoderm ✓
C – Endoderm ✓ (3)
- 2.3.2
- Platyhelminthes are **dorso-ventrally differentiated**, ✓ since most free-living flatworms live at the bottom of muddy waters and so have their “eyes” on their upper surface ✓
 - Free-living flatworms have **cephalization** ✓ as they come into contact with new environments with new dangers and food sources regularly so there needs to be an accumulation of sense organs at the part that enters these new environments first. ✓
 - **Dorso-ventral differentiation and cephalization** ✓ leads to bilateral symmetry ✓
 - The development of the **mesoderm** ✓/ **triploblastic** allows the development of muscles ✓ / which allows free-living flatworms to actively move from place to place. (mark first TWO only)
- (Any 2 x 2) (4)

- 2.3.3 • Due to the flattened body structure ✓there is no need for a blood system to transport gases, nutrients and waste products as all cells are in direct contact with the environment ✓ (2)

2.3.4 ✓ Table

Platyhelminthes	Cnidaria
triploblastic ✓	diploblastic ✓
cephalisation ✓	no cephalisation ✓
bilateral symmetry ✓	radial symmetry ✓
dorso-ventral differentiation ✓	no dorso-ventral differentiation ✓

(mark first TWO only) (1 table + Any 2 x 2) (5)

- 2.4 2.4.1 Cold temperatures / -18 °C and minimum access to oxygen. ✓ (Must have both factors) (1)

2.4.2 Global warming ✓ (1)

- 2.4.3 • Provide staple foods ✓ e.g. beans, maize, wheat, rice and nuts
- To make beverages ✓e.g. cocoa
- To make spices ✓ e.g. vanilla, black pepper, mustard and cumin (3)

- 2.4.4 • Seed banks may store variations of crops that may be hardier to the disease and can replace those wiped out. ✓
- A seed bank stores unusual or rare varieties that are not commercially farmed to maintain biodiversity ✓
- A seed bank keeps cultures of plants that are not usually grown from seed in case they are needed to replace plants that go extinct in the wild ✓
- Endemic species need to be preserved as they do not occur elsewhere in the world ✓
- Endangered species may be preserved in case they go extinct in the wild ✓
- Species may have the potential to provide us with substance of medicinal value ✓
- They must be preserved so that they can be studied before they go extinct. ✓ (Any 2 x 1) (2)

2.4.5 Variety C is viable for a longer period of time ✓ and is therefore better to store than variety A and B. ✓

OR

Variety A is not suitable for long term storage ✓ as it will not germinate after 50 years ✓

OR

Different species cannot all be stored for the same period of time ✓ as they all differ in the time that they are still viable (able to germinate) ✓

(Any 1 x 2) (2)

2.5 2.5.1 $\frac{1\ 028 - 1\ 215}{1\ 215} \checkmark \times 100 = 15,39 \checkmark \% \text{ decrease } \checkmark$ (3)

2.5.2 There was an increase in rhino poaching from 2007 until 2014 ✓ after which rhino poaching decreased. ✓ (2)

[40]

QUESTION 3

3.1 3.1.1 A – Style ✓
B – Anther ✓
C – Ovary ✓
D – Sepal ✓ / Calyx (4)

3.1.2 C ✓ (1)

3.1.3

- Petals are small, green and not showy ✓
- Long filaments and anthers (stamens) that hang outside the flower ✓
- Large amount of pollen produced ✓
- Small, light pollen granules ✓
- Stigma may be large and feathery ✓
- Do not produce scent or nectar ✓

(mark first TWO only) (Any 2 x 1) (2)

3.1.4

- Offspring genetically different from one another and their parents which allows species to adapt to new environments. ✓
- It is a way of leaving behind parasites or diseases that the parent might have. ✓
- The zygote is surrounded by a thick protective coat which increases chance of survival. ✓
- Genetic variation may lead to new species developing. ✓
- Allows for selection of favourable characteristics ✓

(mark first TWO only) (Any 2 x 1) (2)

3.1.5

- They have vascular tissue ✓
- They have a cuticle ✓
- They do not rely on water for reproduction ✓
- They produce seeds instead of spores which are resistant to desiccation ✓

(mark first TWO only) (Any 2 x 1) (2)

- 3.2 3.2.1 Biological control ✓ / Biocontrol (1)
- 3.2.2 • Mechanical control ✓ / physical removal of plants / example
• Chemical control ✓ / use of herbicides / example (2)
- 3.2.3 16 ✓ (1)
- 3.2.4 • 16 weevils controls the Water Hyacinth in the least number of days (20) ✓ / fastest
• If you add more weevils the number of days will not decrease ✓ / 16 weevils is the least number of weevils to use to do the job the fastest (Any 2 x 1) (2)
- 3.2.5 • Repeat the experiment ✓
• Increase the size of the tank ✓ / increase the sample size / increase the number of plants / increase the number of tanks.
(mark first ONE only) (Any 1 x 1) (1)
- 3.2.6 (a) Days taken to control water hyacinth ✓ (1)
(b) Number of weevils per plant ✓ (1)
- 3.2.7 • number of plants in each tank ✓
• size of plants used ✓
• size of tank used ✓
• environmental conditions ✓ / amount of light / temperature / amount of water
(mark first TWO only) (Any 2 x 1) (2)
- 3.2.8 (a) The Water Hyacinth would block irrigation channels ✓ preventing crops getting sufficient water ✓ (2)
(b) The Water Hyacinth would cover the water making it impossible to swim through and very difficult to paddle in ✓ so they could not use the dam or river ✓ (2)
- 3.3 3.3.1 • The amount of carbon dioxide released ✓
• As a result of activities that cause greenhouse gas emissions. ✓ (2)
- 3.3.2 oxygen ✓ (1)
- 3.3.3 They are heavily taxed on high carbon emissions. ✓ (1)
- 3.3.4 • Less travelling in motor vehicles using petrol and diesel as fuel / walk / cycle ✓
• Reduce the use of electrical appliances / switch off unnecessary appliances ✓
• Reduce the use of fuels such as propane, liquid gas and kerosene ✓
• Reducing burning of wood and coal ✓
(mark first THREE only) (Any 3 x 1) (3)

- 3.3.5
- The money earned ✓
 - Could be used to conserve the natural environment ✓
- (2)
- 3.3.6
- High levels of carbon dioxide trap more heat in the Earth's atmosphere ✓
 - Causing the enhanced greenhouse effect ✓
 - leading to global warming / an increase in the average temperature on earth ✓
 - This will in turn cause climate change / change in the Earth's weather patterns ✓
 - Which will change rainfall patterns ✓
 - Could lead to loss of biodiversity ✓
- (Any 5 x 1) (5)

[40]**TOTAL SECTION B: 80**

SECTION C**QUESTION 4****AGRICULTURE AFFECTS WATER QUALITY**

- **Pesticides and herbicides** (fertilisers) if washed into rivers and wetlands ✓
may harm / kill aquatic animals ✓
- And affect the people who drink the water ✓ (alter fat metabolism / affect nerve transmissions / reduce resistance to infection / cause breast cancer)
- When there is **over-use of fertilisers** and heavy rainfall, fertilisers get washed into rivers, streams and lakes ✓
- High concentrations of nitrogen and phosphorus / nutrients in the water
- cause increased growth of algae ✓ / algal bloom
- the thick algal growth prevents light from reaching the lower levels of the water ✓
- photosynthesis in lower levels stops and plants die and rot ✓
- the number of bacteria causing decomposition increases ✓
- using up large amounts of oxygen ✓
- lack of oxygen causes other organism (like fish) to die ✓
- This is called **eutrophication** ✓

Max. (6)**MINING ON WATER QUALITY**

- Mining exposes rock containing pyrite which contains sulphur ✓
- **Acid mine drainage** ✓ results when
- water released from mines runs over pyrite it reacts with sulphur forming sulphuric acid ✓

- The water also contains **toxic heavy metals** ✓
- Which can cause severe health problems in people consuming the water. ✓
- This will lead to the death of many amphibians and other aquatic life ✓ / other organisms higher in the food chain may also be affected if they eat these animals

- The release of hot water leads to **thermal pollution** ✓
- warm water reduces the amount of oxygen in the water ✓
- it also increases the metabolism of organisms, causing them to require more food ✓

- **Increased salinity** ✓
- May be toxic to plants, animals and humans ✓
- The salts may also clog up machines like pumps and irrigation pipes ✓

- **Increased sediment** ✓
- Blocks out sunlight for aquatic plants and algae to grow ✓
- Particles may settle to the bottom of rivers and wetlands and reduce the amount of water they can hold ✓

Max. (6)

AGRICULTURE ON WATER AVAILABILITY

- The **construction of dams** for irrigation purposes affects people and their livestock ✓/ natural balance upstream and downstream
- When floodgates are opened, they flood land and displace those living there. ✓
- Dams also increase the amount of water lost by evaporation ✓ and thereby reduce the availability of water.
- **Poor farming practice** (uphill ploughing and overgrazing) leads to loss of topsoil which increases runoff ✓ and reduced groundwater recharge.
- It also leads to soil being washed into rivers and wetlands, which decreases the amount of water they can use. ✓
- **Inefficient irrigation methods (open ditch and overhead sprinklers)** which causes loss of water through evaporation and seepage. ✓
- Irrigation upstream reduces water flow downstream ✓
- Growing crops that require lots of irrigation instead of crops that are adapted to the rainfall conditions reduce water availability ✓

Max. (5)

Content: (17)
Synthesis: (3)

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 required by the essay have been sufficiently addressed.
In this essay in Q4	Only information relevant to effect of agriculture and mining on water quality and availability No irrelevant information included	The discussion on the effect of agriculture and mining on water quality and availability is given in a logical and sequential manner.	At least the following marks should be obtained: – 4/6 for effects of agriculture on water quality – 4/6 for effects of mining on water quality – 3/5 for the discussion of the effect of agriculture on water availability
Mark	1	1	1

TOTAL SECTION C: 20
GRAND TOTAL: 150