



Province of the
EASTERN CAPE
EDUCATION

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

SEPTEMBER 2019

**LIFE SCIENCES P1
MARKING GUIDELINE**

MARKS: 150

This marking guideline consists of 11 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. 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 appear(s) in any official language other than the learner's 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 | A ✓✓ | | |
| | 1.1.2 | B ✓✓ | | |
| | 1.1.3 | C ✓✓ | | |
| | 1.1.4 | C ✓✓ | | |
| | 1.1.5 | B ✓✓ | | |
| | 1.1.6 | D ✓✓ | | |
| | 1.1.7 | A ✓✓ | | |
| | 1.1.8 | B ✓✓ | | |
| | 1.1.9 | A ✓✓ | | |
| | 1.1.10 | D ✓✓ | (20 x 1) | (20) |
| 1.2 | 1.2.1 | Sustainability ✓ | | |
| | 1.2.2 | Aldosterone ✓ | | |
| | 1.2.3 | Yolk sac ✓/yolk | | |
| | 1.2.4 | Karyotype ✓ | | |
| | 1.2.5 | Cytokinesis ✓ | | |
| | 1.2.6 | Internal fertilisation ✓ | | |
| | 1.2.7 | Ovary ✓ | | |
| | 1.2.8 | Pesticides ✓ | | |
| | 1.2.9 | Chiasmata ✓/ Chiasma | | |
| | 1.2.10 | Acrosome ✓ | (10 x 1) | (10) |
| 1.3 | 1.3.1 | B only ✓✓ | | |
| | 1.3.2 | A only ✓✓ | | |
| | 1.3.3 | None ✓✓ | | (6) |
| 1.4 | 1.4.1 | (a) Vas deferens ✓ | | (1) |
| | | (b) Urethra ✓ | | (1) |
| | 1.4.2 | C ✓ Epididymis ✓ | | (2) |
| | | D ✓ Scrotum ✓ | | (2) |
| | 1.4.3 | - Secrete a fluid ✓ | | |
| | | - that stimulates the male gametes to be more mobile ✓ | | (2) |
| 1.5 | 1.5.1 | 3 ✓ | | (1) |
| | 1.5.2 | 4 ✓ | | (1) |
| | 1.5.3 | 2 ✓ | | (1) |
| | 1.5.4 | 3 ✓ | | (1) |
| | 1.5.5 | 2 ✓ | | (1) |
| | 1.5.6 | 1 ✓ | | (1) |

TOTAL SECTION A: 50

SECTION B**QUESTION 2**

- 2.1 2.1.1 - Type of pollution that occurs when some industries release large quantities of hot water ✓
 - into water bodies ✓ (rivers and oceans) (2)
- 2.1.2 - As a source of water ✓ for the informal settlement
 - for household purposes/farming ✓ (2)
- 2.1.3 - Hot water contains less oxygen ✓
 which will negatively affect other living organisms ✓
 - Heating may lead to increased metabolic rate ✓
 which cause organisms to need more food and oxygen ✓
 - Higher temperatures may encourage algal bloom ✓
 which may prevent sunlight from reaching photosynthesizing plants
 and they may die ✓
 - Dead plants and animals will be decomposed ✓
 and decomposers will use up more oxygen ✓
 - The decrease of oxygen and increase in decomposers ✓
 will reduce the quality of the water ✓
(Mark first TWO only) (Any 2 x 2) (4)
- 2.2 2.2.1 - Burning of fossil fuels ✓
 - Deforestation ✓ (2)
- 2.2.2 (a) The heat rays from the sun that enter the Earth's atmosphere are reflected back to space ✓ (1)
- (b) Most of the heat rays from the sun are trapped in the Earth's atmosphere ✓ by greenhouse gases (1)
- 2.2.3 - More evaporation of water ✓ which can lead to
 - increased potential of flooding ✓ due to increased precipitation
OR
 - Rising sea levels due to melting ice in the glaciers ✓/thermal expansion can lead to
 - increased potential of flooding ✓
OR
 - Increased wildfires ✓ increasing the chances of soil erosion and
 - eventually desertification ✓
OR
 - Increased droughts ✓ leading to
 - food insecurity ✓/ desertification
(Mark first TWO only) (Any 2 x 2) (4)

- 2.3 2.3.1 Pituitary gland ✓ /Hypophysis (1)
- 2.3.2 - Gonadotropin-releasing hormone stimulates the pituitary gland ✓
- to release reproductive hormones ✓/FSH/ LH (2)
- 2.3.3 - FSH stimulates the development of a primary follicle ✓
- into a Graafian follicle ✓ (2)
- 2.3.4 - The level of LH increases just before ovulation takes place ✓/High LH levels in the blood/urine indicate that ovulation is going to take place/an ovum will be released
- This indicates the period of highest fertility in females ✓ (2)
- 2.3.5 - The endometrium will not thicken enough ✓ and therefore causing the fertilised ovum not to implant ✓
- The endometrium will not be maintained ✓ and this could lead to a miscarriage ✓

(Mark first ONE only) (Any 1 x 2) (2)

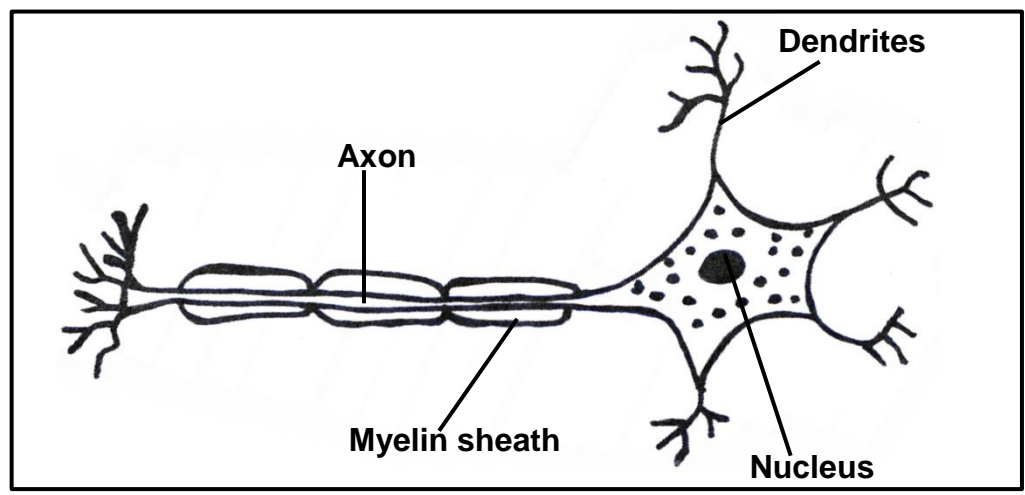
2.4 2.4.1 A group of conditions that cause the motor neurons in the nerves in the spine and brain to progressively lose function ✓ (1)

- 2.4.2 - Genetic issues ✓
- Viruses ✓
- Environmental issues ✓

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

- 2.4.3 - The person would feel the pain ✓
- but would not be able to react ✓
- The motor neuron is not functioning, therefore the muscles would not be stimulated ✓ (3)

2.4.4



Criteria	Mark allocation
Correct neuron drawn	1
Any THREE correct labels	3

(4)

- 2.5 2.5.1 - It is caused by an irregular curvature ✓
- of the front surface of the cornea ✓ (2)
- 2.5.2 - Prescription lenses ✓ will be needed for clear vision (1)
- 2.5.3 - Short-sightedness/Myopia ✓
- Long-sightedness/Hypermetropia ✓
- Cataracts ✓
(Mark first TWO only) (Any 2) (2)
- [40]**

QUESTION 3

- 3.1 3.1.1 - To establish a baseline/starting point for the investigation from where the glucose levels will increase ✓✓
OR
 - To compare the change in the blood glucose levels to what it was before breakfast was eaten ✓✓ (2)
- 3.1.2 The type of breakfast ✓ /Low or high GI food (1)
- 3.1.3 8,0 ✓ – 8,2 mmol/l (1)
- 3.1.4 - Low GI food causes a smaller increase in the blood glucose levels than high GI food ✓✓/ High GI food causes a larger increase in the blood glucose levels than low GI food
OR
 - Eating Low GI food causes the blood glucose levels to increase closer to normal after 120 minutes (4 mmol/l to 5,2 mmol/l) than high GI food (4 mmol/l to 5,8 mmol/l) ✓✓ (2)
- 3.1.5 Insulin ✓ (1)
- 3.1.6 - A high GI breakfast causes a sharp increase in the blood glucose level ✓
 - This will cause a large ✓/rapid increase in the blood insulin levels (2)
- 3.1.7 (a) - To improve reliability ✓ of the investigation (1)
 (b) - To ensure the results were caused by the breakfast only ✓✓/ low and high GI food and not any other factor (2)
- 3.1.8 - Only females were used ✓/same sex
 - Females of the same age ✓/28–30 years old were used
 - Same time intervals for measuring blood glucose concentration ✓
(Mark first TWO only) (Any 2) (2)
- 3.2 3.2.1 Geotropism ✓ (1)
- 3.2.2 (a) - As the plant was constantly rotating, there was an equal distribution of auxins throughout the stem ✓
 - therefore, there was no unequal growth of the stem ✓
 - And the stem continued to grow straight ✓ (3)
- (b) - As the plant was placed on its side, auxins accumulated at the lower side of the stem ✓
 - because of the gravitational force ✓
 - A high concentration of auxins on the lower side of the stem stimulated the growth of the stem ✓
 - Thus, unequal distribution of auxins caused unequal growth of the stem on the lower side ✓/the stem grew more on the lower side
 - causing the stem to bend/grow upwards ✓ (Any 4) (4)

- 3.2.3 To eliminate the effect of light ✓ on the growth movement of the stems / To prevent phototropism from influencing the results (1)
- 3.3 3.3.1 - Physical removal of the plants ✓/mechanical methods/
example
- The use of herbicides ✓/chemical methods/example
- Using the natural enemies of the alien invasive species ✓/biological control/example
(Mark first THREE only) (3)
- 3.3.2 - Since alien plant invaders do not have natural enemies ✓
- they grow rapidly and outcompete the indigenous plants ✓leading to loss of biodiversity (2)
- 3.3.3 - Habitat destruction ✓ / any example
- Poaching ✓
(Mark first TWO only) (2)
- 3.4 3.4.1 (a) Auditory canal ✓/Meatus (1)
(b) Semi-circular canals ✓ (1)
(c) Cochlea ✓ (1)
- 3.4.2 E ✓ (1)
- 3.4.3 Sensory neuron ✓ (1)
- 3.4.4 - A change in speed or direction of movement ✓
- in any plane can be detected ✓
- in order to maintain balance ✓ (Any 2) (2)
- 3.4.5 - The tympanic membrane may rupture ✓
- The membrane will therefore not vibrate properly ✓
- and less vibrations will be transferred to the ossicles/oval window ✓
- The cochlea will be stimulated less ✓
- leading to hearing loss ✓ (Any 3) (3)
- [40]**

TOTAL SECTION B: 80

SECTION C**QUESTION 4****Regulation of body temperature during the race**

- The body temperature increases ✓
- because of the increased cellular respiration ✓
- The hypothalamus ✓ is stimulated and sends impulses to the blood vessels in the skin causing them to dilate ✓/vasodilation takes place
- More blood flows through the surface of the skin ✓
- More heat is lost through the skin ✓/radiation
- More blood is sent to the sweat glands ✓
- More sweat is produced ✓/the sweat glands become more active/more sweat is released
- Evaporation of sweat cools the body ✓/more heat to be lost

Regulation of water balance during the race

- Because of sweating the blood has less water than normal ✓
 - The hypothalamus is stimulated ✓
 - and sends impulses to the pituitary gland to secrete more ADH ✓
 - ADH travels in the blood to the kidneys ✓
 - ADH increases the permeability of the collecting ducts ✓/ the distal convoluted tubules
 - More water is reabsorbed and passed to the surrounding blood vessels ✓
 - The water level in the blood returns to normal ✓
- (Any 12) (12)

Pupillary reflex mechanism

- In bright light ✓
 - the circular muscles ✓
 - of the iris ✓
 - contract ✓
 - and the radial muscles relax ✓
 - the pupil constricts ✓
 - allowing less light to enter the eye ✓
- (Any 5) (5)

ASSESSING THE PRESENTATION OF THE ESSAY

Criterion	Relevance (R)	Logical sequence (L)	Comprehensive (C)
Generally	All information provided is relevant to the topic	Ideas are arranged in a logical sequence	All aspects required by the essay have been sufficiently addressed
In this essay Q4	Only provided information relevant to: - thermoregulation and osmoregulation during the race - the pupillary reflex mechanism There is no irrelevant information	Information on: - thermoregulation and osmoregulation during the race - the pupillary reflex mechanism is presented in a logical sequence	At least the following marks should be obtained: - thermoregulation and osmoregulation during the race (7/12) - pupillary reflex mechanism (4/5)
MARKS	1	1	1

Content: (17)**Synthesis:** (3)**TOTAL SECTION C:** 20**GRAND TOTAL:** 150