Province of the
EASTERN CAPE
EDUCATION

NATIONAL SENIOR CERTIFICATE

GRADE 10

NOVEMBER 2019

LIFE SCIENCES P1
MARKING GUIDELINE

MARKS: 150

This marking guideline consists of 10 pages.

PRINCIPLES RELATED TO MARKING LIFE SCIENCES

1. **If more information is given than marks allocated**
   Stop marking when maximum marks are reached and put a wavy line and write '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 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 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.

19. **Changes to the marking guideline**
No changes may be made to the marking guideline without consulting the provincial internal moderator.

SECTION A

QUESTION 1

1.1	1.1.1	B ✓✓		
	1.1.2	D ✓✓		
	1.1.3	B ✓✓		
	1.1.4	C ✓✓		
	1.1.5	B ✓✓		
	1.1.6	C ✓✓		
	1.1.7	D ✓✓		
	1.1.8	D ✓✓		
	1.1.9	B ✓✓		
	1.1.10	B ✓✓	(10 x 2)	(20)

1.2	1.2.1	chlorosis ✓		
	1.2.2	glycerol and fatty acids ✓		
	1.2.3	red blood cells ✓		
	1.2.4	cloning ✓		
	1.2.5	scurvy ✓		
	1.2.6	immunity ✓		
	1.2.7	mitochondria ✓		
	1.2.8	chloroplast ✓		
	1.2.9	nanometres ✓ / micrometres		
	1.2.10	potometre ✓	(10 x 1)	(10)

1.3	1.3.1	A only ✓✓		
	1.3.2	A only ✓✓		
	1.3.3	Both A and B ✓✓	(3 x 2)	(6)

1.4	1.4.1	(a) IV ✓ bone tissue ✓	(2)
		(b) I ✓ motor neuron ✓✓	(2)
		(c) III ✓ striated muscle ✓	(2)
		(d) II ✓ ciliated columnar epithelium ✓	(2)

1.5	1.5.1	Transportation of substances to all cells of the body ✓	(1)
	1.5.2	Red blood cells ✓	(1)
	1.5.3	Forms immune system that defends the body against harmful substances/foreign particles✓	(1)
	1.5.4	Blood platelets ✓	(1)
	1.5.5	Storage tissue ✓	(1)
	1.5.6	Cellular respiration ✓ / photosynthesis / gaseous exchange	(1)

TOTAL SECTION A: 50

SECTION B

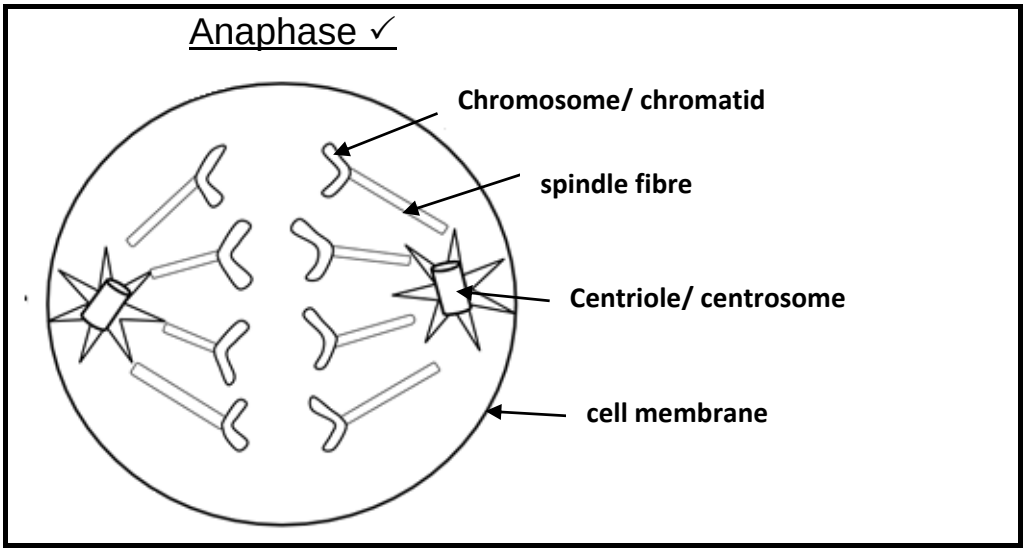
QUESTION 2

2.1 2.1.1 Mitosis ✓ (1)

2.1.2 A – nucleolus ✓ (1)
B – chromatin network ✓ / chromatin (1)
C – cell membrane ✓ (1)

2.1.3 Metaphase ✓ (1)

2.1.4 RUBRIC



Caption/Heading ✓ (1)
Correct structure (S) ✓ (1)
1 correct label ✓ (1)

2.1.5 No growth will occur in living organisms, ✓ no repair of worn out tissues or damaged tissues, ✓ no asexual reproduction in unicellular organisms ✓ (Any 2) (2)

2.2 2.2.1 Rickets ✓ (1)

2.2.2 As the person becomes older ✓ / as the age increases the bone becomes less dense ✓/weak (2)

2.2.3 Accept range between 24–27 ✓✓ (2)

2.2.4 Weight bearing exercises strengthen bone mass and makes it stronger and denser ✓ while calcium-rich food provide minerals which build strong bones, causing bones to have high density ✓ (2)

2.2.5 Brain ✓ (1)

2.2.6 Movement ✓/ Support ✓/ Hearing ✓/ Storage of minerals ✓ (Any 3) (3)

2.3 Hydrostatic skeleton ✓ – common in aquatic animals ✓/ fluid filled to maintain hydrostatic pressure for an organism prevent an organism from drying out / prevent from predation (2)

Exoskeleton ✓ – located outside the body of an animal ✓/ made up of chitin moults as the animal grows to allow larger body structures / common in insects / in some animals it is made up of a shell (2)

Endoskeleton ✓ – located on the inside of an animal, ✓/ usually consists of bones, cartilage / supports various body sizes / covered by skin / present in larger animals like mammals (2)

2.4 2.4.1 Diagram I – plant cell ✓
Diagram II – animal cell ✓ (2)

2.4.2 D ✓ – vacuole ✓ (2)

2.4.3 A – cell membrane✓
B – nucleus ✓
C – cell wall ✓ (3)

2.4.4 Selective membrane, ✓ it allows water and mineral salts to pass through ✓ and prevent larger molecules such as cell organelles to enter ✓ (3)

2.4.5 Magnification = 15 mm ✓/ 0,015 mm ✓= x 1 000 ✓ (3)
[40]

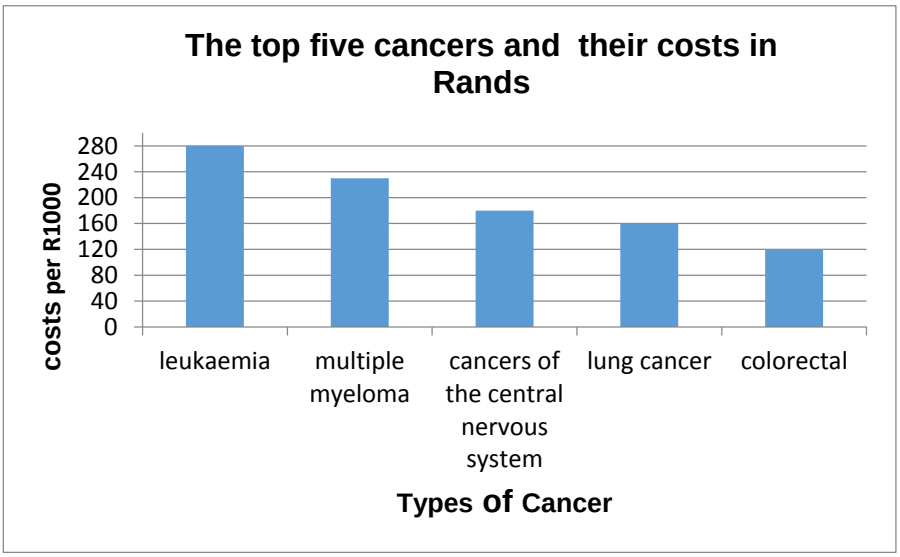
QUESTION 3

3.1 3.1.1 Uncontrolled cell division and growth ✓ (1)

3.1.2 Lung cancer ✓ (1)

3.1.3 Radiotherapy, ✓ chemotherapy, ✓ surgery ✓ (Any 2) (2)

3.1.4



Bar graph rubric

Type of graph	**1**
Heading for graph	**1**
Correct label and scale of X-axis	**1**
Correct label and scale of Y-axis	**1**
Plotting of points	1–4 bars correctly plotted: **1** 5 bars correctly plotted: **2**
TOTAL	**6**

(6)

3.2 3.2.1 A – epidermis ✓/ epidermal tissue (1)
B – parenchyma cortex ✓ (1)
C – xylem ✓ (1)
D – root hair ✓ cell (1)

3.2.2
- Thin walls ✓ that are permeable to water ✓
- No cuticle on the walls ✓ making it more permeable to water molecule ✓
- Large vacuole ✓ providing large surface area for absorption of water ✓ (Any TWO) (2 x 2) (4)

3.2.3 Stele ✓/ vascular cylinder (1)

3.2.4 Storage tissue ✓ for water, food and mineral salts (1)

3.2.5

Cross-section of root	Cross-section of stem
Contains both epidermis and endodermis ✓	Contains epidermis only ✓
Vascular cylinder is arranged to form a stele ✓	Vascular cylinder forms stacks called vascular bundles ✓
Xylem is star shaped ✓	Xylem forms bundles ✓
Phloem is on the outside of the vascular cylinder ✓	Phloem is on the inside of the vascular tissue ✓

(Any 2 x 2) + T ✓ (5)

3.3 3.3.1 Test 1 – To determine whether protein is present or not ✓ (1)
Test 2 – To test for the presence of reducing sugars ✓ (1)

3.3.2 (a) egg white ✓ (1)
(b) sucrose solution ✓ (1)

3.3.3 1. Brick red ✓/deep purple (1)
2. Orange brown ✓ (1)

3.3.4
- Do not heat the solution directly in the flame ✓/ heat the solution in a water bath
- Ensure that the test tube faces away from the face ✓
- When adding spirit in the Bunsen burner ensure that the flame is off ✓

(Any 2) (2)

3.3.5
- Ask the teacher permission to conduct experiment ✓
- Collect all the required apparatus to conduct the test. ✓
- Seek a trained/professional person to be present when doing test. ✓
- Check all safety measures such as first aid kit ✓
- Read and follow instructions carefully prior to conducting an experiment ✓ (Any 3) (3)

3.3.6 Increase sample size of food ✓/ use more groups of disaccharides/ or proteins
Repeat/do more tests ✓ (1)

3.3.7 Test 1 – cell membrane ✓/ chromosomes / blood as haemoglobin / skin (Any 1) (1)

3.3.8 Test 1 – growth ✓/ repair worn-out tissue / forms part of cell membranes / transport oxygen to the lungs (Any 1) (1)

Test 2 – source of required energy ✓/ form parts of many parts of a cell e.g. cell walls / serve as stored energy (Any 1) (1)

TOTAL SECTION B: 80

SECTION C

QUESTION 4

4.1 **Adaptation of a leaf for photosynthesis**

- Consists of tightly packed palisade mesophyll tissue ✓(s) containing large number of chloroplasts ✓(s) which is the product of photosynthesis
- Contains starch grains that store starch ✓(f).
- Contains pigment chlorophyll ✓(s) that traps light energy from the sun ✓(f) for the process of photosynthesis.
- Phloem ✓(s) for food conduction ✓(f) to all parts of a plant.
- The spongy parenchyma cells also contain chloroplasts ✓(s) to assist in photosynthesis. ✓ (f)
- Xylem tissue ✓(s) transports water and mineral salts from the roots to the leaves ✓(f)

(5 x f)
(2 x s) (7)

Adaptation of a leaf for transpiration

- Has modified epidermal cells called guard cells ✓(s) that control the opening and closing ✓(f) of stomatal pores ✓(s)
- that allow the loss of water in the form of vapour ✓(f)

(2 x f)
(1 x s) (3)

Adaptation of a leaf for gaseous exchange

- Stoma ✓(s) allows for the incoming of oxygen ✓ (f) and the release of carbon dioxide ✓(f)
- spongy mesophyll tissue with loosely packed parenchyma cells ✓(s)
- that contain large intercellular air spaces ✓(s)
- for easy movement of gases ✓(f)

(3 x f)
(1 x s) (4)

Adaptation of a leaf for guttation

- At the margins there are special structures called hydathodes ✓(s) which exude excess water in the form of droplets ✓(f) when there's too much water vapour in the air, ✓ (f) This occurs in the early hours of the day. ✓(f)

(2 x f)
(1 x s) (3)

Content: 17
Synthesis (3)

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

ASSESSMENT OF THE PRESENTATION OF THE ESSAY

Criterion	Relevance (R)	Logical sequence (L)	Comprehensive (C)
In general	All information provided is relevant to the topic.	Ideas arranged in a logical/cause-effect sequence	Answered all aspects required by the essay.
In this essay	Only information relating to the leaf structural (S) adaptations, processes and functions (f) (There is no irrelevant information.)	Logical sequence of events in description of structure and function of the leaf	Includes sufficient information on all aspects of the leaf structure, different parts, their functions and associated processes in question, as **(12 marks functions); (5 marks structure)**
Mark	1	1	1

(3)

TOTAL SECTION C: 20
GRAND TOTAL: 150