Province of the
EASTERN CAPE
EDUCATION

NATIONAL SENIOR CERTIFICATE



GRADE 10

05 JUNE 2023

LIFE SCIENCES MARKING GUIDELINES

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MARKS: 150

These marking guidelines consist of 11 pages..

Marking Guidelines

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 memo discussion meeting.

14. **If only the letter is asked for but only the name is given (and vice versa)**
    Do not credit.

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15 **If units are not given in measurements**
Candidates will lose marks. Marking guidelines 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.

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SECTION A

QUESTION 1

1.1	1.1.1	1.1.1 C✓✓ 1.1.2 B✓✓ 1.1.3 A✓✓ 1.1.4 B✓✓ 1.1.5 D✓✓ 1.1.6 B✓✓ 1.1.7 C✓✓ 1.1.8 A✓✓ 1.1.9 D✓✓ 1.1.10 B✓✓	(10 X 2)	(20)
1.2	1.2.1	Iodine✓		
	1.2.2	Amino acids✓		
	1.2.3	Centromere✓		
	1.2.4	Enzyme✓		
	1.2.5	Cellulose✓		
	1.2.6	Independent✓ variable		
	1.2.7	Cranium✓/ skull		
	1.2.8	Sensory✓neuron		
	1.2.9	Chlorophyll✓		
	1.2.10	Micronutrient✓	(10 x 1)	**(10)**
1.3	1.3.1	Both A and B ✓✓		
	1.3.2	1.3.2 B only✓✓		
	1.3.3	1.3.3 B only✓✓		
	1.3.4	1.3.4 None✓✓	(4 x 2)	**(8)**

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1.4 1.4.1 Plant cell✓ (1)

1.4.2
- Presence of cell wall✓
- Presence of chloroplast✓
- Large vacuole✓
- Regular shape✓ Any (2)

(Mark first TWO only)

1.4.3 B- Cell membrane✓
C- Mitochondrion✓
E- Cytoplasm✓ (3)

1.4.4 (a)
- Site for photosynthesis✓
- Chlorophyll traps radiant energy from the sun and uses it to produce for during photosynthesis✓ Any (1)

(Mark first ONE only)

(b) Contains the information/genes that plays a role in heredity✓ (1)

1.4.5
- Water would move out of the cell✓ which is a region of high concentration of water
- to the surrounding salt solution which is a region of low concentration✓
- High amounts of water will be lost from the vacuolar sap✓
- This would reduce the size of the vacuole✓
- The cytoplasm moves away from the cell wall✓
- The cell will become flaccid✓ Any (4)

(12)

TOTAL SECTION A: 50

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SECTION B

QUESTION 2

2.1 2.1.1 Potometer✓ (1)

2.1.2 To determine the effect of temperature on the rate of transpiration✓✓ (2)

2.1.3 - Opening the tap✓ in the burette
- to allow water more water into the jar✓ (2)

2.1.4 - The stomata would be clogged/blocked✓
- There would be water loss✓
- Transpiration would stop✓ (3)

2.1.5 - Cut the shoot from a plant under water✓
- to prevent air from entering the xylem✓

- Make sure the apparatus is airtight, using vaseline to seal any gaps✓
  If air enters the apparatus the readings will be affected✓

- Dry the leaves of the shoot✓
  Any moisture present on the leaves will affect the rate of transpiration✓

- Cut the shoot at a slant ✓
  to increase surface area✓

- Use the apparatus under the same environmental conditions✓
- to ensure validity✓ of the results Any (1 x2) (2)

(Mark first ONE only)

(10)

2.2.1 Telophase✓ (1)

2.2.2 - Chromosomes line up the equator✓
- attached by the centromere to the spindle fibres ✓ (2)

2.2.3 A, C, E, B, D, F✓✓ (2)

2.2.4 (a) Interphase✓ (1)

(b) - in plants the spindle fibres form from centrioles✓ whereas in animals there are no centrioles✓ so the spindle fibres form from cytoplasm
- in plants a cell plate forms to separate the two new daughter cells✓ whereas in animals an invagination occurs that separates the two new daughter cells.✓ Any (1 x 2) (2)

2.2.5 Four✓/ 4 (1)

2.2.6 - For growth✓
- To replace damaged or worn- out cells✓
- Reproduction in unicellular organisms ✓ (3)

(12)

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2.3.1 Epidermis✓ (1)

2.3.2 B- Nucleus✓
D- Cytoplasm✓ (2)

2.3.3 - Finger-like projections✓
increase surface area for absorption of water✓
- Thin, cell wall, without cuticle✓
to absorb water from the soil✓
- Large vacuole with low water concentration in cell sap✓
for absorption of more water✓ (Any 2 x 2) (4)

2.3.4 Part **A**/the cell wall of a root hair is freely permeable✓
and allows both salt and water to pass through✓ whereas
Part **C**/the cell membrane of a root hair is semi-permeable
and does not allow large dissolved salt molecules to pass through✓ (4)
(Mark first ONE only)

2.3.5 Root pressure✓
Transpiration pull✓
Capillarity✓ (3)
(14)

2.4 2.4.1 - A disease✓
- caused by abnormal and uncontrolled cell division✓ in the body (2)

2.4.2 It is caused by abnormal stem cells in the bone marrow producing defective/immature blood cells✓ (1)

2.4.3 To replace the diseased and damaged bone marrow✓ (1)

2.4.4 Radiotherapy✓
Surgery✓ (2)
(6)

2.5 2.5.1 It represents the reaction between an enzyme and its substrate✓ (1)

2.5.2 **B** – product✓
D - enzyme-substrate complex✓ (2)

2.5.3 - the enzyme✓/ A remains the same
- promotes the chemical change✓
- without being used up✓ in a reaction (3)

2.5.4 - structure A/ enzyme become denatured✓/ shape is altered
- reaction rate slows down or stops altogether✓ (2)
(8)
[50]

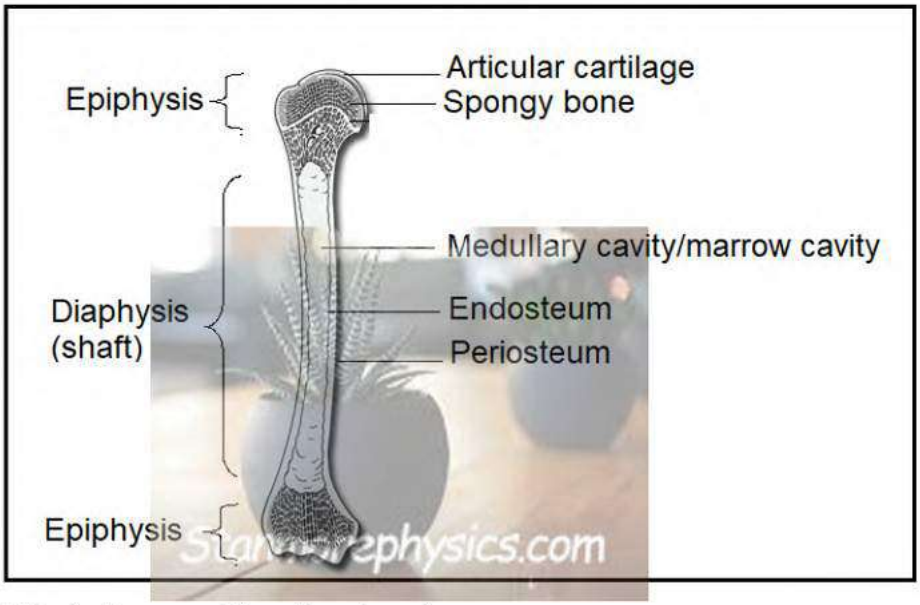
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QUESTION 3

3.1 3.1.1 B- Femur✓
C- Patella ✓
D- Fibula✓ (3)

3.1.2 Appendicular✓ (1)

3.1.3 **Structure of a long**



Criteria for marking the drawing:
Caption (**C**) ✓
Drawing (**D**) ✓
Any 3 correct labels **(L)** ✓✓✓ (5)

3.1.4 - Support✓
- Movement✓/ locomotion
- Mineral storage✓
- Hearing✓
- Production of blood corpuscles and blood cells✓ Any (2)

(Mark first TWO only) **(11)**

3.2 3.2.1 **A** – Squamous epithelium✓
C - Columnar epithelium✓ (2)

3.2.2 Tissue A
- protects underlying tissues✓
- allows certain substances to pass through✓ Any 1

Tissue C
- supports other cell types✓
- secretion of mucus✓
- absorption of food, water and minerals✓ Any 1 (2)

3.2.3 Tissue B/Cuboidal tissue is damaged:
- useful substances will not be secreted ✓
- the functioning of cells in the body will be affected✓ (2)
(6)

3.3 3.3.1 Phloem✓ (1)

3.3.2 A – Palisade mesophyll✓
B – Xylem✓ (2)

3.3.3 - Guard cells are bean shaped✓
epidermal cells have fixed shapes✓
- Guard cells have thick inner walls✓,
epidermal cells have thin walls✓
- Guard cells have chloroplasts✓
epidermal cells have no chloroplasts✓ Any (1 x 2) (2)

Mark first ONE only)

3.3.4 Guard cells are responsible for the opening and closing of stomata✓ (1)

3.3.5 - The presence of a waxy cuticle layer✓
does not allow water to pass through it easily, this prevent water loss✓.
- Guard cells on the ventral side✓/underside
allow stomata to open and close to prevent more water from being released✓ Any (2 x 2) (4)
(10)

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3.4 3.4.1 1- Eye Piece✓
3 – (High Power) objective lens✓ (2)

3.4.2 Stage -Responsible for the placement of slide for examination✓
OR
Stage clips – Hold the slide in place✓ Any (1)

3.4.3 Actual size = $\frac{\text{Measured length of the cell X length of the scale in micrometers}}{\text{Measured length of eh scale in mm}}$✓

$= \frac{6.3cm \ X \ 2\mu m}{1.5 \text{ cm}}$ ✓✓OR $= \frac{63 \ mm \ X \ 2\mu m}{15 \text{ mm}}$ ✓✓

$= 8.4 \ \mu m$✓ $= 8.4 \ \mu m$✓

(4)
(7)

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3.5 3.5.1 Salt solution✓ (1)

3.5.2 Same:
- type of plant✓
- size of onion rings✓
- weighing scale used✓
- beaker size✓
- number of onion rings in each group✓ Any (2)

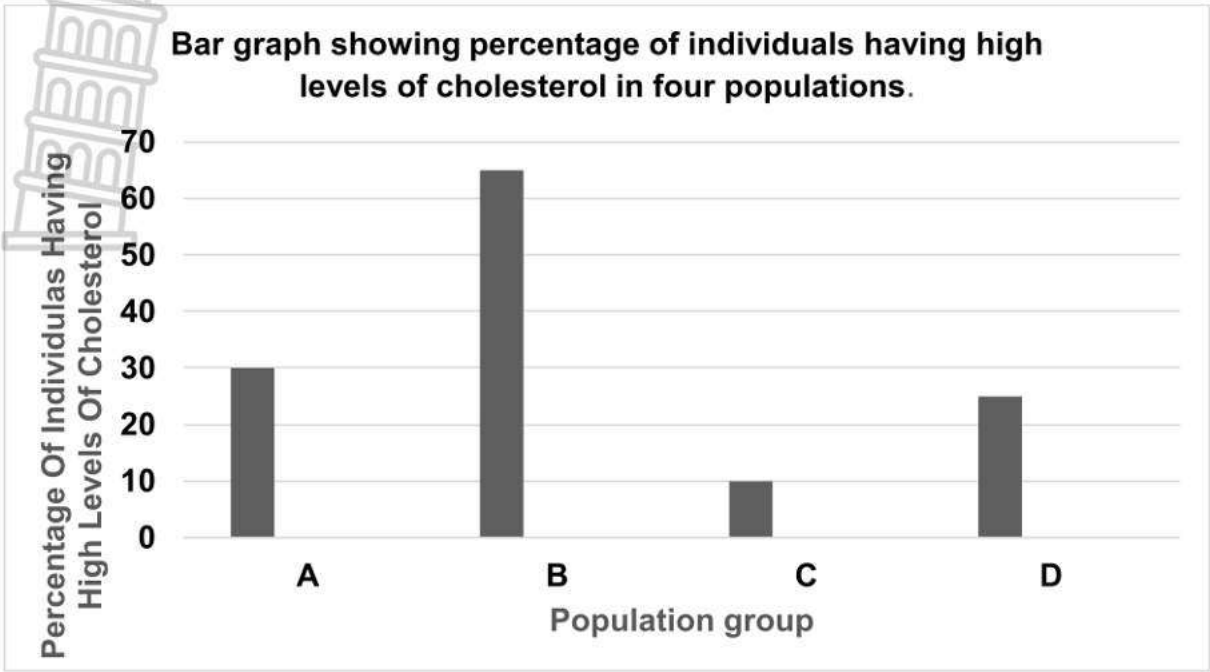
(Mark first TWO only)

3.5.3 100✓ onion rings were used

3.5.4 15-2/15 ✓X 100✓ **OR** 15-2=13
= 86.67%✓ 13/15✓X100✓
=86.67%✓ (3)

3.5.5 The higher the concentration of salt in a solution, the smaller the size of the onion rings✓✓ (2)
(9)

3.6.1 (6)



Criteria for marking the graph

Criteria	Mark allocation
Bar graph is drawn **(T)**	1
Captionof the graph includes both variables **(C)**	1
Correct labels on X-axis and Y-axis **(L)**	1
Correct scale for Y-axis Equal spaces between bars and equal width of bars for X-axis **(S)**	1
Plotting **(P)** 1-3 co-ordinates plotted correctly All 4 co-ordinates plotted correctly	 1 2

(6)

3.6.2 Population C✓ (1)

(7)

[50]

TOTAL SECTION B: 100

GRAND TOTAL: 150

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