

**NATIONAL
SENIOR CERTIFICATE**

GRADE 10

NOVEMBER 2018

**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 provincial 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. The 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.
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 B ✓✓
1.1.3 B ✓✓
1.1.4 C ✓✓
1.1.5 D ✓✓
1.1.6 B ✓✓
1.1.7 B ✓✓
1.1.8 D ✓✓ (8 x 2) (16)
- 1.2 1.2.1 chromoplasts ✓✓
1.2.2 lysosome ✓✓
1.2.3 catabolism ✓✓
1.2.4 parenchyma ✓✓
1.2.5 genes ✓✓
1.2.6 phloem ✓✓
1.2.7 enzyme ✓✓ (7 x 2) (14)
- 1.3 1.3.1 B only ✓✓
1.3.2 A only ✓✓
1.3.3 A only ✓✓
1.3.4 B only ✓✓
1.3.5 B only ✓✓
1.3.6 Both A and B ✓✓
1.3.7 B only ✓✓ (7 x 2) (14)
- 1.4 1.4.1 (a) starch ✓✓
(b) fats and oils ✓ (2)
1.4.2 Benedict's solution / Fehling's A and Fehling's B ✓ (1)
1.4.3 (a) blue black ✓
(b) blue-green-orange ✓
(c) violet/rose pink ✓ (3)

TOTAL SECTION A: 50

SECTION B**QUESTION 2**

- 2.1 2.1.1 **A:** motor neuron ✓
B: Blood tissue ✓ (2)
- 2.1.2 **3** – axon ✓ (1)
4 – myeline sheath ✓ (1)
8 – white blood cell/white blood corpuscle/leucoplasts ✓ (1)
10 – red blood cell/ red blood corpuscle/erythrocyte ✓ (1)
- 2.1.3 Carries impulses from the brain to the effector organ ✓ (1)
- 2.1.4 (a) 10 ✓ (1)
(b) 8 ✓ (1)
- 2.1.5 Organism will be able to detect stimuli ✓ (sound, smell, etc.) in the environment, but will not be able to quickly respond to it ✓ to protect itself against possible injury ✓ (3)
- 2.2 2.2.1 **1** – root hair ✓
2 – epidermis ✓ (2)
- 2.2.2 (a) 5 ✓
(b) 6 ✓
(c) 7 ✓
(d) 4 ✓ (4)
- 2.2.3 • Large surface area ✓ speed up osmosis ✓
• Thin walled cells easy ✓diffusion across membrane ✓ (Any 1 x 2) (2)
- 2.2.4 No. ✓ Function of cuticle is to reduce water loss. ✓ Root required to absorb water, therefore it will not allow this function. ✓ (3)
- 2.2.5 Since root hair increases surface area for maximum absorption, less water and minerals will be absorbed ✓ by the root and thus growth and functioning ✓ of the plant will be affected. (2)
- 2.3 2.3.1 Seeds will germinate better in sunlight than in the darkness ✓
OR
Seeds will germinate better in darkness than in sunlight ✓
OR
Seeds will germinate well whether in sunlight or darkness ✓ (2)

- 2.3.2 (a) independent variable: sunlight ✓
(b) dependent variable: amount of seeds that germinated ✓ (2)
- 2.3.3 Amount of soil, size of pots, number of seeds ✓✓
Amount of water ✓ (Any 2) (2)
- 2.3.4 Repeat the experiment ✓
Increase the sample size ✓
Put more seeds in each pot ✓ (Any 2) (2)
- 2.4 2.4.1 Transpiration is the loss of water in the form of water vapour from the
aerial parts of a plant ✓ (2)
- 2.4.2 As temperature increases, ✓ transpiration rate increases ✓ when it
reaches an optimal temperature, ✓ transpiration rate stays the same,
(the graph levels off) ✓ (Any 2) (2)
- 2.4.3 Humidity is very high (lots of water vapour in the air) ✓
Water potential gradient between inside of leaf stomata and
atmosphere is very low ✓
Transpiration rate decreases ✓/greatly decreased to the minimal
level (3)
- [40]**

QUESTION 3

3.1 3.1.1 (a) Interphase ✓ (1)

(b) Metaphase ✓ (1)

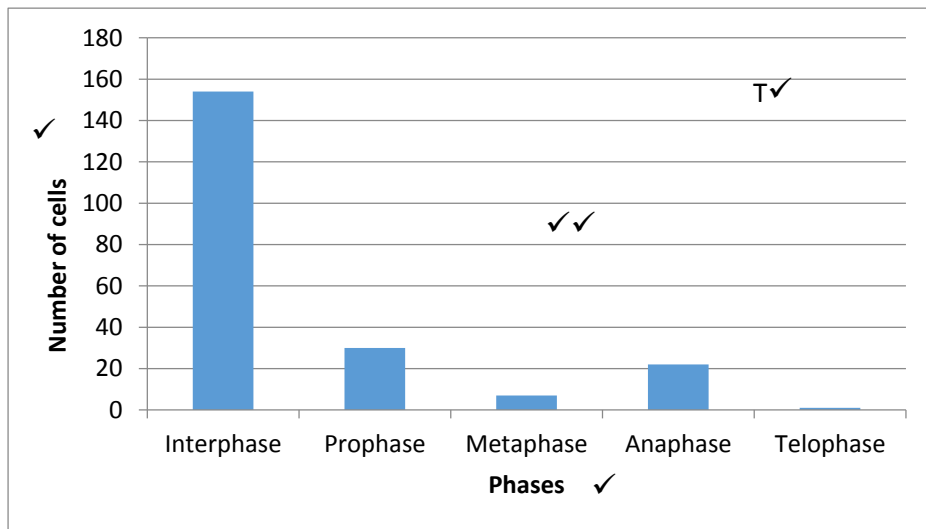
3.1.2 $30/225 \checkmark \times 100 \checkmark = 13,3\% \checkmark$ (3)

3.1.3 - Growth ✓
- Replaces dead cells ✓
- Repairs damaged cells ✓ (Any 2) (2)

3.1.4 No. of cells in interphase = 154
Total cells = 225 (24 hours)
Time for interphase = $154 \times 24 \checkmark / 225 \checkmark$
= 16,4 hours ✓ (3)

3.1.5 Sister chromatids ✓ pulled towards opposite poles ✓ of a cell by the spindle fibres. (2)

3.1.6 Graph to represent total number of cells in each phase ✓



Rubric: graph

Type of graph	1
Heading for graph	1
Correct label and scale <i>x</i> -axis	1
Correct label and scale of <i>y</i> -axis	1
Plotting of points	1–4 points plotted: 1 5 points plotted: 2
TOTAL	6

(6)

3.2	3.2.1	Ball and socket joint ✓ Bears weight of the body/supports lower limbs ✓	(2)
	3.2.2	Red marrow produces red blood cells ✓ and white blood cells ✓	(2)
	3.2.3	<ul style="list-style-type: none"> • Pelvic girdle supports entire body mass ✓ • Two hip bones are joined ✓ • Attached to vertebral column ✓ 	(Any 2) (2)
	3.2.4	Female hip bones wider ✓ to accommodate childbirth ✓	(2)
3.3	3.3.1	Ligament ✓	(1)
	3.3.2	<ul style="list-style-type: none"> • immovable ✓ joints • slightly movable ✓ joints • freely movable ✓ joints 	(3)
	3.3.3	Articular cartilage ✓ of joint wears away ✓ Bones of joint grind against each other ✓ Small outgrowths of bone ✓ produced	(4)
	3.3.4	Middle-aged people: more years of wear and tear ✓ on cartilage due to physical activity ✓ or past injuries	(2)
	3.3.5	<ul style="list-style-type: none"> • limited ability ✓ to withstand corrosion ✓ in the long term • May cause iron poisoning ✓ leading to possible liver failure ✓ • May erode ✓ in body when mixed with body fluids ✓ (suitable logical answer) 	(Any 2 x 2) (4)
			[40]

TOTAL SECTION B: 80

SECTION C

QUESTION 4

4.1 Cell membrane

- According to **fluid mosaic model**: ✓ Cell membrane has **double layer of phospholipid** ✓ molecules
- Protein molecules **go through** the layers (some) ✓
- Protein molecules **go partly through** (others)
- Phospholipid molecule has a **head** ✓(**hydrophilic** layer that attracts water)
- Has a **tail** ✓(**hydrophobic** layer that repels water) (Any 4)

- Membrane is **selectively permeable**, ✓ therefore controls the movement
- of substances into and out of the cell ✓
- **Encloses** and **protects** ✓ cell contents of animal cells (3) (7)

Nucleus:

- **Round or oval** ✓ body in plant and animal cells
- Consists of **nucleoplasm**, ✓ liquid that lies inside the **nuclear membrane**. ✓
- Contains sugars, enzymes, nucleotides and other substances.
- **Nuclear membrane** surrounds the nucleus and is a double membrane with **nuclear pores**. ✓
- **Chromatin network** consists of mass of threads that become the Chromosomes (Any 3)

Production of enzymes ✓**Chromosomes carry hereditary characteristics** ✓**Controls entry and exit of substances into nucleus** ✓ (Any 2) (5)Mitochondria:

- Found in plant and animal cells ✓
- **rod shaped**, ✓ **hollow** ✓ on the inside
- **double membrane** ✓ surrounding the organelle
- inner membranes folded called **crisetae** ✓
- filled with fluid called the **matrix** ✓ (Any 3)

- **Cellular respiration** ✓ takes place in the mitochondria
- **Powerhouse** ✓ of the cell
- Energy released during cellular respiration carried by **ATP** ✓ (Any 2) (5)

Content: (17)

ASSESSING THE PRESENTATION OF ESSAY (SYNTHESIS)

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 cell membrane, nucleus and mitochondria (There is no irrelevant information.)	Logical sequence of events in description of structure and function of cell membrane, nucleus and mitochondria	Includes sufficient information on all aspects of the cell structure in question, as 4/7 : cell membrane; 3/5 : nucleus; and 3/5 : mitochondria
Mark	1	1	1

(3)

TOTAL SECTION C: 20
GRAND TOTAL: 150