



Province of the  
**EASTERN CAPE**  
EDUCATION

Iphondo leMpuma Kapa: Isebe leMfundo  
Provinsie van die Oos Kaap: Departement van Onderwys  
Porafensie Ya Kapa Botjhabela: Lefapha la Thuto

# **NATIONAL SENIOR CERTIFICATE**

**GRADE 11**

**NOVEMBER 2025**

## **LIFE SCIENCES P1 MARKING GUIDELINE**

**MARKS: 150**

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This marking guideline consists of 10 pages.

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**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 a 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. 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 A ✓✓  
 1.1.2 C ✓✓  
 1.1.3 D ✓✓  
 1.1.4 D ✓✓  
 1.1.5 C ✓✓  
 1.1.6 C ✓✓  
 1.1.7 D ✓✓  
 1.1.8 B ✓✓  
 1.1.9 A ✓✓  
 1.1.10 C ✓✓ (10 x 2) (20)
- 1.2 1.2.1 Breathing ✓/ Ventilation  
 1.2.2 Aldosterone ✓  
 1.2.3 Pre-molars/Molars ✓  
 1.2.4 Pharynx ✓  
 1.2.5 Secretion ✓  
 1.2.6 Chyme ✓  
 1.2.7 Distal convoluted tubule ✓  
 1.2.8 Osmosis ✓ (8)
- 1.3 1.3.1 A ONLY ✓✓  
 1.3.2 B ONLY ✓✓  
 1.3.3 NONE ✓✓  
 1.3.4 NONE ✓✓ (8)
- 1.4 1.4.1 (a) F ✓ – Renal calyx ✓ (2)  
 (b) B ✓ – Renal capsule ✓ (2)  
 (c) C ✓ – Renal pelvis ✓ (2)
- 1.4.2 Part D is darker because it contains more blood vessels.  
**OR**  
 Part A is lighter because it has fewer blood vessels. (1)
- 1.5 1.5.1 - The body's ability to maintain a stable internal environment ✓  
 - despite changes in the external environment ✓ (2)
- 1.5.2 (a) Chemoreceptors of the carotid artery ✓ (1)  
 (b) Intercostal muscles, ✓ diaphragm ✓ (respiratory muscles ✓),  
 heart ✓ (Any 2 x 1) (2)
- 1.5.3 - The blood becomes increasingly acidic ✓ /cell death  
 - Less aerobic respiration can take place ✓ /no ATP created (2)

**[50]****TOTAL SECTION A: 50**

**QUESTION 2**

2.1 2.1.1 Chloroplast ✓ (1)

- 2.1.2 - Presence of thylakoid/grana/inter-grana disks/lamellae ✓  
 - Stroma present ✓  
 - Starch granules present ✓

**(FIRST TWO ONLY) (MAX 2)**

(Do not accept double membrane as it is not a distinct identifying characteristic as many organelles have this.) (2)

2.1.3

<b>Light (dependent) Phase/B</b>	<b>Dark (light-independent) Phase/A</b>
Requires light	Does not require light
Photolysis occurs	No photolysis occurs
CO <sub>2</sub> is not absorbed	CO <sub>2</sub> is absorbed
No glucose is produced	Glucose is produced

**(FIRST TWO ONLY) ✓ per correct difference (MAX 4) + Table ✓**

**NOTE:** Differences must match correctly to be awarded marks. (5)

- 2.1.4 - Produces food for heterotrophic organisms/Forms basis of food chains ✓  
 - Production of oxygen ✓  
 - Absorption and storage of carbon dioxide ✓  
 - Maintaining/balancing a constant level of oxygen in the environment (aquatic/terrestrial) ✓

**(MARK FIRST TWO ONLY)**

(2)

- 2.1.5 - Presence of many grana/thylakoids/lamella ✓  
 It holds a significant amount of chlorophyll (pigment) to maximise that rate of photosynthesis ✓  
 - Large surface area ✓  
 To maximise the amount of radiant energy which can enter it ✓  
 - It has a (fluid)stroma ✓  
 Allowing for chemical reactions to take place/products of the light phase can move into the dark phase ✓

**(MARK FIRST ONE ONLY)**

(1 x 2)

(2)

- 2.2 2.2.1 - Greenhouses create jobs in rural areas and support the local economy. ✓  
 - Greenhouses help grow local vegetables, so people don't have to import food. ✓  
 - Greenhouses allow farmers to grow crops all year, even when it's cold. ✓  
**(MARK FIRST ONE ONLY)** (1)
- 2.2.2 - Greenhouses use geothermal and solar energy, ✓ which reduces the need to use electricity from the local power grid and helps save costs. ✓ (2)
- 2.2.3 (a) - Use of heaters ✓ powered by geothermal energy.  
 - Insulated material ✓ (like double walls or plastic layers) to keep the heat inside the greenhouse  
**(MARK FIRST TWO ONLY)** (2)
- (b)  $\frac{-25-28}{-25} \checkmark \times 100 \checkmark = 212 \checkmark \% \text{ change}$
- OR**
- $\frac{28-(-25)}{25} \checkmark \times 100 \checkmark = 212 \checkmark \% \text{ change}$  (3)
- 2.2.4 (a) - As light intensity increases, the rate of photosynthesis increases/light intensity is directly proportional to rate of photosynthesis ✓  
 - Up to a point ✓  
 - Beyond this point, further increases to light intensity do not affect the rate of photosynthesis ✓ (3)
- (b) - Chlorophyll is saturated/insufficient ✓  
 - Not enough enzymes/transfer chains to assist with photosynthesis ✓  
**(MARK FIRST ONE ONLY)** (2)
- 2.3 2.3.1 (a) Glycolysis (1)  
 (b) Oxygen (1)  
 (c) Carbon dioxide (1)
- 2.3.2 - Catabolic ✓\*  
 Glucose is broken down into pyruvic acid ✓  
**OR**  
 A six-carbon glucose molecule is broken to form two three-carbon chain pyruvic acid molecules ✓  
**(Compulsory ✓\* + ANY OTHER ✓)** (2)

- 2.3.3 - B ✓\*  
Because oxygen is used ✓ as the final electron acceptor, allowing the chain to function continuously **OR**  
The process drives the production of about 36 ATP molecules, while glycolysis only produces 2 ATPs ✓ (2)
- 2.3.4 - Can only take place if oxygen is present ✓  
- Occurs inside of the mitochondrion ✓  
- Releases carbon dioxide and high energy hydrogen ions (H+) ✓  
- Transports hydrogen atoms to the third stage ✓ (4)
- 2.3.5 - Not enough oxygen was available ✓ to his muscles to undergo aerobic respiration  
- Pyruvic acid was converted into lactic acid/Lactic acid fermentation occurred ✓  
- Lactic acid caused his muscles to cramp ✓ (3)
- 2.4 2.4.1 Carbon dioxide concentration ✓ (in arbitrary units) (1)
- 2.4.2 - Duplicating the experiment with all variables kept the same ✓  
- Not including the pondweed and pond snail/independent variables ✓ (2)
- 2.4.3 - The amount of CO<sub>2</sub> released during cellular respiration ✓  
- is utilised by the pondweed during photosynthesis ✓ (2)
- 2.4.4 - Photosynthesis could no longer take place ✓  
- as no light was available ✓ (2)
- 2.4.5 - The environment was anoxic/lacked sufficient O<sub>2</sub> ✓\*  
- For cellular respiration to occur ✓  
- The water became too acidic to support aquatic life ✓  
(✓\* plus any other ✓) (2)
- 2.4.6 Photosynthesis and cellular respiration are complementary processes ✓ regulating CO<sub>2</sub> concentration in the environment. ✓  
**OR**  
Photosynthesis removes carbon dioxide ✓ and produces oxygen. ✓  
**OR**  
When there is no light, photosynthesis stops ✓ and carbon dioxide increases due to respiration. ✓ (2)

**[50]**

**QUESTION 3**

- 3.1 3.1.1 (a) Oesophagus ✓ (1)
- (b) Hepatic portal vein ✓ (1)
- 3.1.2 - The small intestine is long ✓\*  
Increasing surface area for absorption ✓  
- It has circular folds ✓\*  
Increasing surface area for absorption ✓  
- It is lined with millions of villi ✓\*  
Increasing surface area for absorption ✓  
- It is richly supplied with blood vessels ✓\*  
Allowing for an efficient transport system of nutrients from the gut to the body ✓  
- It has smooth muscle tissue (circular and longitudinal) ✓\*  
To efficiently move food and indigestible matter through the gut ✓  
- Has a mucus rich layer on its surface ✓\*  
To allow for nutrients to dissolve into and to be absorbed into the body  
✓ / to lubricate / act as a medium for chemical reactions  
**(MARK FIRST THREE ONLY) (✓\* compulsory mark) (3 x 2) (6)**
- 3.1.3 **Physical digestion**  
- Occurs due to the churning movements ✓ of the stomach.  
- Smooth muscle layers involuntarily contract, mixing the bolus of food with gastric juices ✓
- Chemical digestion**  
- occurs as gastric juices/enzymes react with exposed surface ✓ of bolus/chyme  
- Breaking insoluble macroscopic molecules into their soluble forms ✓ / (accept suitable example). (4)
- 3.1.4 - Bile is produced by the liver ✓  
- Bile will still enter the duodenum and fat emulsification will take place ✓ (2)
- 3.2 3.2.1 - Digestion ✓\*  
- Proteases ✓ (2)
- 3.2.2 Stomach ✓ (1)
- 3.2.3 Assimilation ✓ (1)
- 3.2.4 - Egestion ✓\*  
- Undigested materials and waste products are transported through the colon ✓ where most water and mineral salts are absorbed ✓  
- Undigested material is temporarily stored in the rectum ✓ until it is excreted through the anus ✓  
**(✓\* COMPULSORY + ANY OTHER TWO) (3)**



- 3.3 3.3.1 Breaking of larger food pieces into smaller pieces ✓ making it easier to swallow increases the surface area of the food so that digestive enzymes can work more effectively. ✓ (2)
- 3.3.2 - Bread contains starch.  
- During chewing, an enzyme in saliva called amylase breaks down starch ✓ into sugar (maltose), ✓ which tastes sweet. (2)
- 3.4 3.4.1 Diffusion ✓ (1)
- 3.4.2 - Mucus layer present inside the alveolus ✓\*  
Allowing for O<sub>2</sub> and CO<sub>2</sub> to be dissolved as diffusion occurs ✓  
- Alveolus is only one squamous epithelium layer thick ✓\*  
Promoting easy diffusion into/out of the wall of the alveolus ✓  
- Blood capillary is only one cell layer thick ✓\*  
Promoting easy diffusion into/out the wall of the alveolus ✓  
- Richly supplied with blood vessel(s) ✓\*  
Allowing for efficient gaseous exchange (of CO<sub>2</sub> and O<sub>2</sub>) to occur ✓  
**(ANY TWO ✓\* with corresponding reasoning ✓)** (2 x 2) (4)
- 3.4.3 - As oxyhaemoglobin ✓  
- Dissolved within blood plasma ✓ (2)
- 3.4.4 - Blood would move into the lung/alveoli ✓  
Limiting/preventing efficient gaseous exchange ✓  
- Pressure would no longer be effectively regulated/ Lung will collapse ✓  
Impeding the processes of inhalation and exhalation as pressure is required to pull air into the lung/force air out ✓  
- Lung tissue/alveoli/ bronchioles would be damaged ✓  
Limiting/preventing gas pathways through the lung ✓  
**(MAX. 5)** (5)
- 3.5 3.5.1 - A ✓ B ✓ C ✓  
**(MARK FIRST TWO ONLY)** (2)
- 3.5.2 - Tubular reabsorption ✓\*  
(Useful) solutes and water are moved from the renal tubule back into the peritubular capillary network/F  
- Tubular secretion ✓\*  
Waste products and toxins are moved from F into the renal tubule ✓  
**(✓\* with its corresponding ✓)** (4)

- 3.5.3 (a) D ✓ - Ascending limb of Henle/loop of Henle ✓ (2)
- (b) - The renal medulla will no longer be hypertonic in its sodium concentration ✓  
- No osmotic water potential gradient would be created ✓  
- Between the filtrate/medulla tissue fluid/blood ✓  
- Less/no water will be drawn in the renal medulla ✓  
- Less water would be reabsorbed back into the blood ✓ (5)
- [50]**

**TOTAL SECTION B: 100**  
**GRAND TOTAL: 150**