



# LIMPOPO

**PROVINCIAL GOVERNMENT**  
REPUBLIC OF SOUTH AFRICA

**DEPARTMENT OF EDUCATION**

**GRADE 11**

**TERM 3**

**AGRICULTURAL SCIENCES**  
**MEMORANDUM**

**Date: 12 September 2024**

**MARKS: 100**

**This Marking guideline consists of 5 pages**

**SECTION A****QUESTION 1**

1.1. Multiple choice questions:

- 1.1.1. C✓✓
- 1.1.2. D✓✓
- 1.1.3. A✓✓
- 1.1.4. D✓✓
- 1.1.5. B✓✓

**(5 x 2 = 10)**

1.2. Match column B with column A:

- 1.2.1. F✓✓
- 1.2.2. A✓✓
- 1.2.3. G✓✓
- 1.2.4. H✓✓
- 1.2.5. B✓✓

**(5 x 2 = 10)**

1.3. Agricultural term:

- 1.3.1. Stamen✓✓
- 1.3.2. Petals / Corolla✓✓
- 1.3.3. Tape placement / Strip application✓✓
- 1.3.4. Pollination✓✓
- 1.3.5. Transpiration suction✓✓

**(5 x 2 = 10)**

1.4. Replace the underlined word:

- 1.4.1. Green manure✓
- 1.4.2. Alkaline soil✓
- 1.4.3. Dicotyl✓
- 1.4.4. Single house✓
- 1.4.5. Germination✓

**(5)****2. QUESTION 2****2.1. PHOTOSYNTHESIS**

- 2.1.1. A - Photosynthesis✓  
B - Respiration✓
- 2.1.2. Chloroplast✓
- 2.1.3. - Sunlight  
- Water (H<sub>2</sub>O)  
- Carbon dioxide (CO<sub>2</sub>)  
- Chlorophyll

**(2)****(1)**

- Temperature

(any 4) (4)

2.1.4.

| Photosynthesis                                                                                                                                                   | Respiration                                                                                                                                                                                  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>This is an anabolic process.</u><br>Energy from the sun is used to build energy-rich organic compounds such as carbohydrates from simple inorganic compounds. | <u>This is a catabolic process.</u><br>Energy is released and energy-rich compounds, such as carbohydrates and fats, are broken down into simpler substances, e.g. carbon dioxide and water. |
| Occurs during the day in sunlight.                                                                                                                               | Occurs during the day and night.                                                                                                                                                             |
| Energy from the sun is used.                                                                                                                                     | Chemical potential energy is released.                                                                                                                                                       |
| The rate of photosynthesis is about 30 times that of respiration.                                                                                                | The rate is much slower than that of photosynthesis.                                                                                                                                         |
| The oxygen that is released is used by animals for respiration and the carbon dioxide that is released is used by plants for photosynthesis.                     | <u>Oxygen from the atmosphere is used</u> to convert the carbohydrates back to carbon dioxide and water.                                                                                     |
| Water is absorbed from the soil                                                                                                                                  | Water is released into the atmosphere                                                                                                                                                        |

✓✓

✓✓

(any 2 differences) (4)

2.1.5. Storage organs

- a) Stems / Roots / Leaves / Seeds / Fruits ✓✓ (any 2) (2)  
 b) See list below ✓✓ (any 2 under the correct heading) (2)

- **Stems**

Potatoes (fleshy, thickened underground stem) ✓

Ginger (underground horizontal stem / rhizome) ✓

Onions (short, underground stem) ✓

Sugarcane / Figs (aerial stem) ✓

- **Carrots**

Sweet potatoes (fleshy, lateral root tubers) ✓

Carrot and beetroot (stored in taproot) ✓

- **Leaves**

Onions (modified leaf bases) ✓

Cabbage, spinach, lettuce ✓

Celery (stalks) ✓

- **Seed**

Sunflower seed ✓

Bean seeds ✓

Corn kernels ✓

- **Fruits**

Soft fruits and citrus fruits ✓ (fleshy fruits) Nuts (Dry fruits) ✓

## 2.2. Temperature affects photosynthesis

- 2.2.1. If temperature is too high, the photosynthesis enzymes will ✓ be destroyed and photosynthesis will not be able to take place/ plant will die. ✓ (2)
- 2.2.2. Carbon dioxide ✓ light intensity ✓ availability of water ✓  
presence of chlorophyll ✓ (any 2) (2)
- 2.2.3 - Training of crops ✓  
- Pruning of plants ✓  
- Plant spacing ✓  
- Use of greenhouses ✓ (4)

## 3. QUESTION 3

- 3.1.1 Root pressure ✓  
Osmotic flow ✓  
Transpiration suction ✓ (any 2) (2)
- 3.1.2 **Osmotic flow** is the movement of water through cells by means of osmosis caused by an osmotic gradient. ✓✓  
**Transpiration suction** is the upward suction force acting on the water column exerted when water is lost during transpiration. ✓✓ (4)
- 3.1.3 The stoma / stoma ✓ (1)
- 3.1.4 -Water transports nutrients from the soil to the roots and to the leaves. ✓  
- Water transports the products of photosynthesis from the leaves to the plant organs for storage. ✓  
- Water provides structural support to plants. ✓  
- Water regulates plant temperature. ✓  
- Water provides the medium for metabolic processes such as photosynthesis and breathing. ✓ (Any 3) (3)

- 3.1.5 a) A – Passive recording✓  
B – Active recording✓ (2)  
b) A does not require energy in the form of ATP✓, while B energy need✓  
OR  
In A, the movement is along the concentration gradient✓where the movement at B is against the concentration gradient✓ (2)
- 3.1.6 a) A – Phosphorus✓  
B – Potassium✓  
C – Micro✓  
D – Leaf chlorosis✓ (4)  
b) -Soil analysis✓  
-Plant analysis✓ (2)
- 3.1.7 -Soil texture ✓  
-Soil pH ✓ (2)
- 3.2.1 Nitrogen (N)✓phosphorus(P)✓and potassium (K)✓ (3)  
3.2.2 17%✓ (1)  
3.2.3 Phosphorus / P✓ (1)  
3.2.4 Bag A:  $\%P = 1 / 11 \times 15 = 1.36\%P$ ✓✓  
Bag B:  $\%P = 1 / 14 \times 17 = 1.21\%P$ ✓✓  
Bag A has the most phosphorus/P✓ (5)
- 3.3.1 Green manure✓compost✓farm manure✓sewage waste✓ (any 2) (2)  
3.3.2 There are bacteria✓on the roots of soybeans (legumes) that the nitrogen gas in the soil converts to a usable form (nitrates)✓and therefore it is not necessary to add extra fertilizer to the fields.✓ (3)

#### 4. QUESTION 4

- 4.1.1. 1 - Anther✓  
2 – Stigma✓  
3 – Petal✓  
4 – Ovary✓  
5 – Flower stalk✓ (5)

**TOTAL 100**