



education

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PROVINCIAL ASSESSMENT

GRADE 11

AGRICULTURAL SCIENCES P2

NOVEMBER 2019

MARKS: 150

TIME: 2½ hours

This question paper consists of 14 pages.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of TWO sections, namely SECTION A and SECTION B
2. Answer ALL the questions in the ANSWER BOOK.
3. Start EACH question on a NEW page.
4. Number the answers correctly according to the numbering system used in this question paper.
5. You may use a non-programmable calculator.
6. Show ALL calculations, including formulae, where applicable.
7. Write neatly and legibly.

SECTION A**QUESTION 1**

1.1 Various options are provided as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question number (1.1.1–1.1.10) in the ANSWER BOOK, for example 1.1.11 D.

1.1.1 The interaction between the insect and the flower in the picture below results in ...

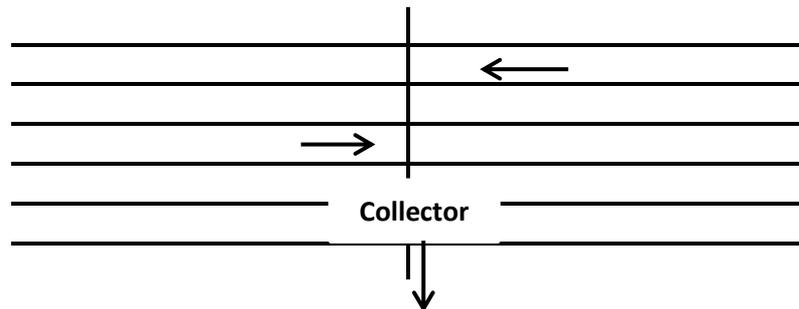


- A self-pollination.
- B cross-pollination.
- C flower formation.
- D nesting behaviour.

1.1.2 ... is a farming management concept based on observing, measuring and responding to inter- and intra-field variability in crops.

- A Aerial farming.
- B Rotational farming.
- C Reenhouse farming.
- D Precision farming.

1.1.3 The diagram below is an example of a drainage system lay-out.



Which of the following descriptions best fit the diagram above?

- A The grid system
- B The parallel system
- C The natural system
- D None of the above

1.1.4 Important requirements for aquaculture farming to achieve high yields are:

- (i) Provide protection against predators
- (ii) Using colder regions which are favourable for all types of fish
- (iii) Using a system which will ensure efficient harvesting
- (iv) Using a system which will optimise feed conversion

Choose the CORRECT combination:

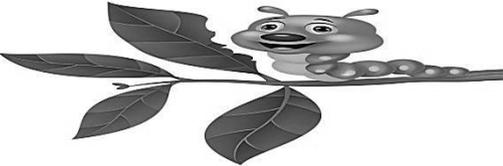
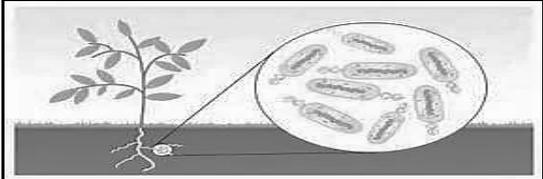
- A (i), (iii) and (iv)
- B (i), (ii) and (iv)
- C (ii), (iii) and (iv)
- D (i), (ii) and (iii)

1.1.5 Fruit develops from the ovary and some other parts of the flower.

- A fleshy, simple fruits.
- B indehiscent, dry fruits.
- C accessory fruits.
- D compound fruits.

- 1.1.6 Soil preparation involving operations which cut and shatter the soil to a fine seedbed, is regarded as ...
- A bare cultivation.
 - B arboriculture.
 - C secondary cultivation.
 - D primary cultivation.
- 1.1.7 The exhalation of water vapour through the stomata.
- A Translocation
 - B Transpiration
 - C Transportation
 - D Transverse movement
- 1.1.8 A gas needed for photosynthesis which adds to the problem of global warming is ...
- A carbon dioxide.
 - B nitrogen.
 - C oxygen.
 - D water molecules.
- 1.1.9 Green leaves turning yellow and appearance of purple spots. This could be attributed to a deficiency of ...
- A nitrogen.
 - B zinc.
 - C potassium.
 - D phosphorous.
- 1.1.10 A scientific test conducted in a certain area of soil, revealed that there were very low nutrient values in the soil.
- The situation could be described as ...
- A eutrophication.
 - B immobilisation.
 - C ammonification.
 - D leaching.
- (10 x 2) (20)

1.2 Indicate whether each of the pictures in COLUMN B applies to **A ONLY**, **B ONLY**, **BOTH A AND B** or **NONE** of the items in COLUMN A. Write **A ONLY**, **B ONLY**, **BOTH A AND B OR NONE** next to the question number (1.2.1–1.2.5) in your ANSWER BOOK. e.g. 1.2.6. A ONLY

	COLUMN A	COLUMN B
1.2.1	A: Greenhouse B: Aquaculture	
1.2.2	A: Sucker B: Runner	
1.2.3	A: Irrigation line B: Ploughing disc	
1.2.4	A: Chewing pest B: Creeping pest	
1.2.5	A: Calcium fixation B: Phosphorous fixation	

(5 x 2) (10)

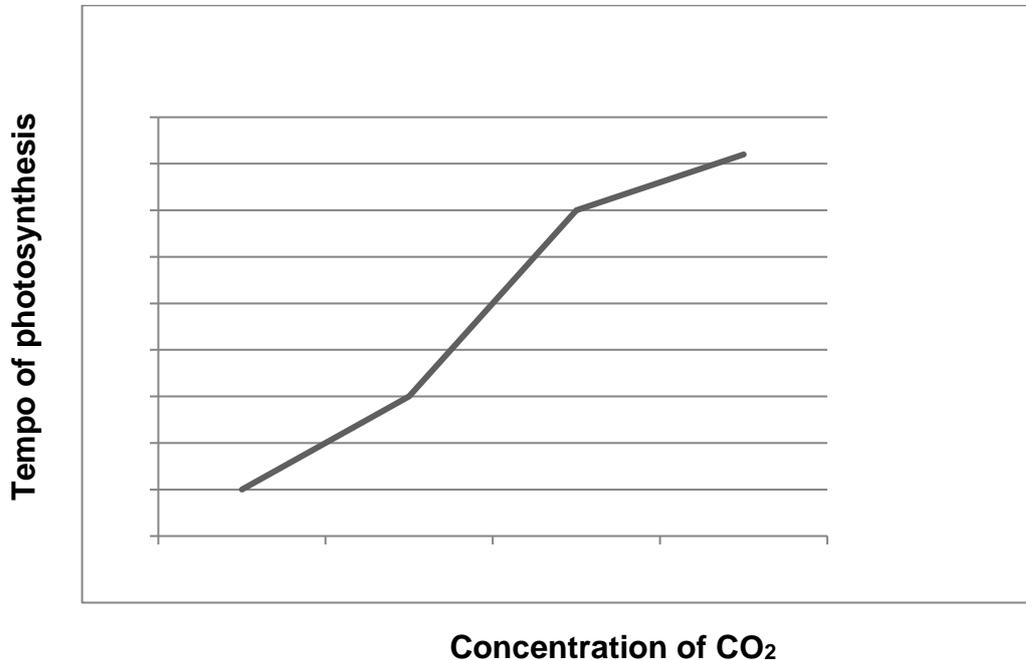
- 1.3 Write ONE agricultural term/phrase for each of the following descriptions next to the question number (1.3.1-1.3.5).
- 1.3.1 Organisms that produce their own food and obtain nutrients.
- 1.3.2 The production of fruit without fertilization of ovules, resulting in seedless fruit.
- 1.3.3 The part of the new plant that grows into the stem and branches in grafting.
- 1.3.4 A special flat water-filled container with a fixed size that is used to measure the rate of water loss.
- 1.3.5 An irrigation system that involves large amounts of water that is brought to the field and flows on the ground among the crops.
- (5 x 2) (10)
- 1.4 Change the UNDERLINED WORD(S) in each of the following statements to make the statements TRUE. Write only the correct word(s) next to the question number (1.4.1-1.4.5) in the ANSWER BOOK.
- 1.4.1 Meiosis involves all the reactions which take place in a living body of an organism.
- 1.4.2 A membrane-bound organelle in each plant cell which contains the genetic material of the cell is termed placenta.
- 1.4.3 An area of concentration of molecules in comparison to another area of concentration of molecules is referred to as divalent.
- 1.4.4 Hydrophilic is the attraction between molecules of the same kind.
- 1.4.5 Spore-forming organisms which are extremely active when fresh organic matter is introduced into the soil.
- (5 x 1) (5)
- TOTAL SECTION A: 45**

SECTION B

QUESTION 2: PLANT NUTRITION

Start this question on a NEW page.

2.1 Study the following graph and then answer the questions that follow:



- 2.1.1 Suggest FOUR methods of manipulating plants to increase the photosynthetic rate. (4)
- 2.1.2 Describe the relationship indicated in the graph. (3)
- 2.1.3 Name FOUR factors that affect the rate of photosynthesis. (4)
- 2.1.4 Explain THREE reasons why photosynthesis is so important to all living organisms. (3)
- 2.2 Farm manure is the manure from farm animals and is mostly prepared and sold as kraal or stable manure. The most common types of manure used for fertiliser are manure from pigs, horses, cattle, sheep, goats and chickens.
- 2.2.1 Identify THREE physical effects of organic matter on a garden bed. (3)
- 2.2.2 State THREE factors that influence the composition of farm manure. (3)

2.3 Study the calculations below and answer the questions that follow:

$$\text{The \% (N) is therefore: } \frac{2}{7} \times \frac{30}{1} = 8,6\%$$

$$\text{The \% (P) is therefore: } \frac{3}{7} \times \frac{30}{1} = 12,8\%$$

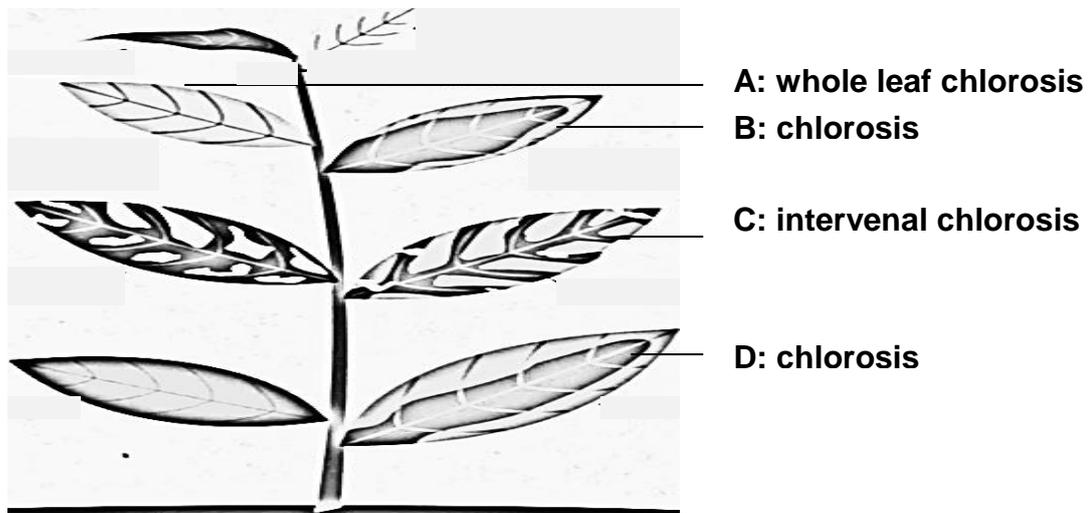
$$\text{The \% (K) is therefore: } \frac{2}{7} \times \frac{30}{1} = 8,6\%$$

2.3.1 Indicate what is represented by the figure **(30)** on a bag with fertilizer. (1)

2.3.2 Provide names for the following symbols: **N**, **P** and **K** as seen above: (3)

2.3.3 Give ONE word to describe the following relationship: **2:3:2** (1)

2.4 Study the picture below and answer the questions that follow:



2.4.1 Identify the minerals which will cause the above deficiency symptoms at:

- A
 - B
 - C
 - D
- (4)

2.4.2 Name ONE function of molybdenum in plants. (1)

2.4.3 State TWO ways in which mineral nutrients are absorbed in plants. (2)

- 2.5 Two processes have been indicated in the block below. Match the processes in the block to the descriptions that follow.

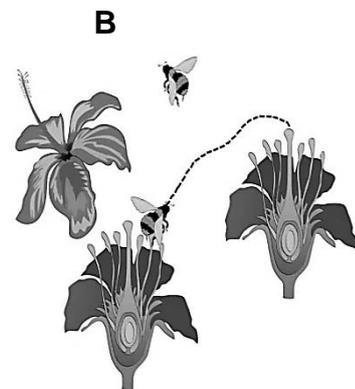
osmosis; diffusion

- 2.5.1 Movement of molecules from an area of low concentration to an area of high concentration (1)
- 2.5.2 Requires a solution. (1)
- 2.5.3 Passage of water through semi-permeable membrane (1)
- [35]**

QUESTION 3: PLANT REPRODUCTION

Start this question on a NEW page.

- 3.1 Draw a clear sketch of a flower and label the following parts: (6)
- stigma
 - style
 - ovary
 - anther
- 3.2 Study the pictures below and answer the questions that follow:



- 3.2.1 Identify the type of pollination above: (2)
- A
 - B
- 3.2.2 Which type of pollination tends to increase genetic variability in plants? (1)

3.3 Weeds are unwanted or undesirable plants that usually have a negative impact on agricultural land, in gardens, parks and even in protected areas.

3.3.1 Give TWO reasons to support the suitability of contact herbicides to control weeds. (2)

3.3.2 Name TWO reasons why weeds easily overgrow cultivated crops. (2)

3.3.3 List TWO negative effects of weeds on the growth of food crops. (2)

3.4 Suggest THREE safety measures to consider when applying chemicals on crops. (3)

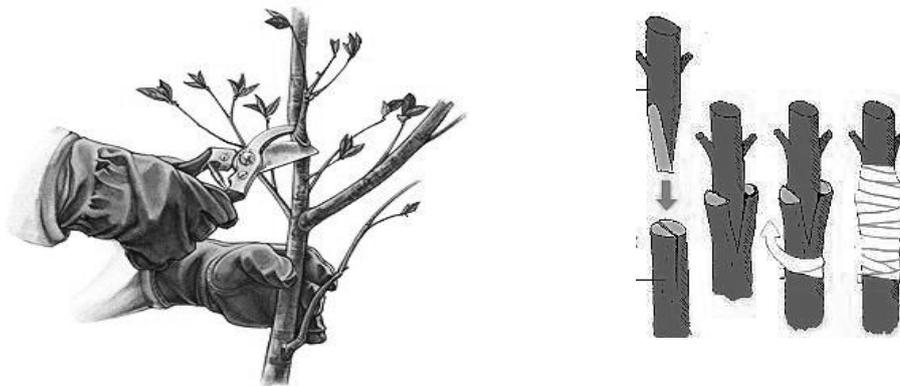
3.5 State TWO important legislative initiatives by the National Department of Agriculture towards plant protection in South Africa. (2)

3.6 **GMO** - Genetically modified organisms are a result of DNA transfer in laboratory conditions

3.6.1 Discuss TWO arguments against GMO foods. (2)

3.6.2 Give THREE advantages of genetic modification. (3)

3.7 Study the pictures below and answer the questions that follow:



3.7.1 Differentiate between *cutting* and *grafting*. (4)

3.7.2 Give TWO advantages of asexual reproduction. (2)

3.7.3 Name TWO methods of asexual reproduction. (2)

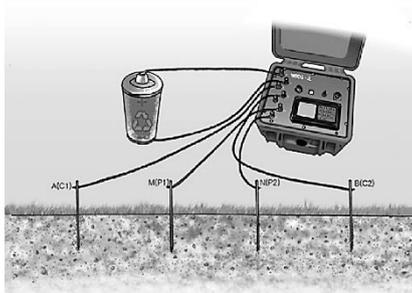
3.8 Give ONE plant disease of fungal origin and ONE plant disease of bacterial origin. (2)

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QUESTION 4: OPTIMAL RESOURCE UTILISATION

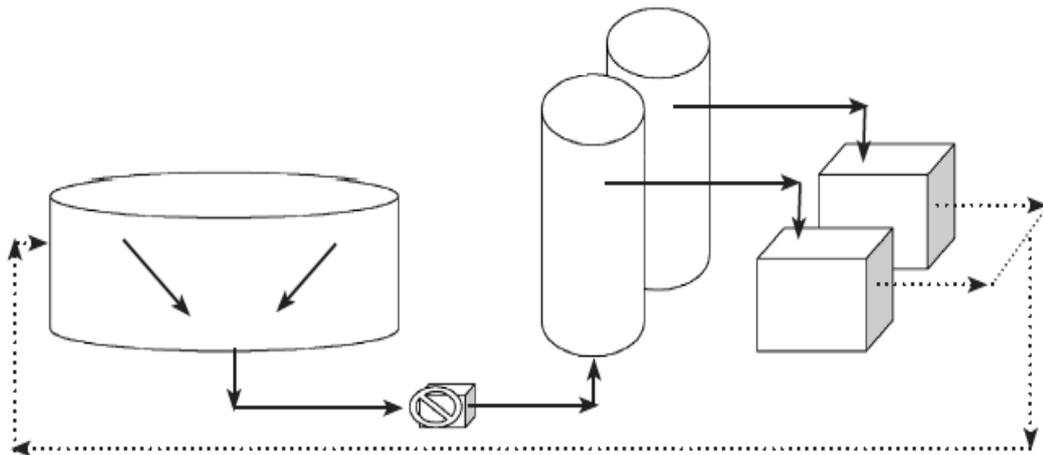
Start this question on a NEW page.

4.1 Study the following soil surveying equipment and answer the questions that follow:



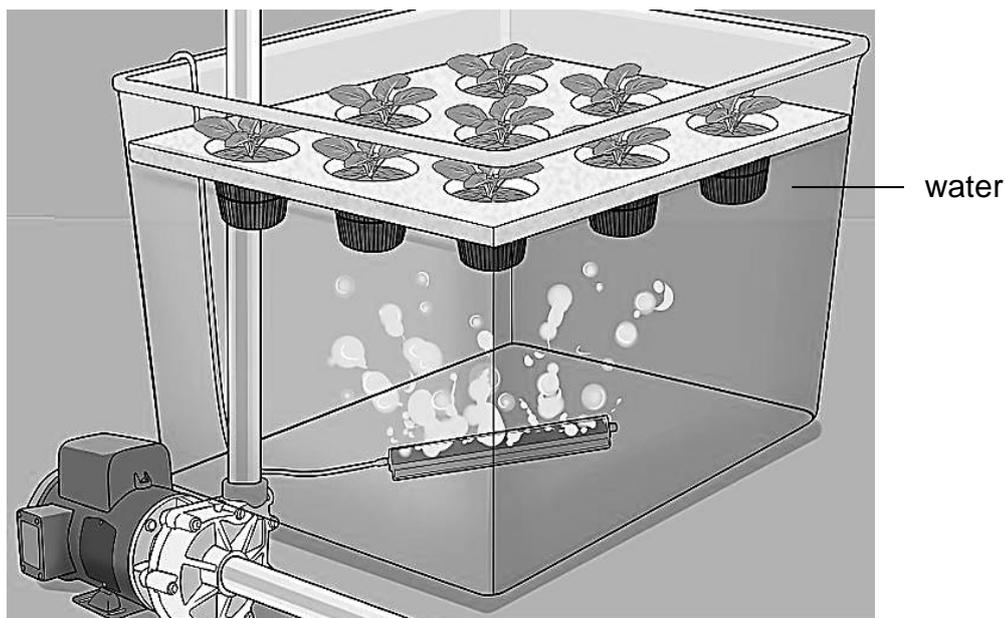
- 4.1.1 Define *soil survey*. (2)
- 4.1.2 Justify its importance by giving TWO aims of a soil survey. (2)
- 4.1.3 Indicate THREE steps to follow in the physical analysis of soil. (3)

4.2 Study the picture below and answer the questions that follow:



- 4.2.1 Identify the structure above. (1)
- 4.2.2 Give FOUR requirements that need to be considered for production when erecting the structure in QUESTION 4.2.1. (4)

- 4.2.3 Suggest TWO methods that can be used for disease control in this type of farming. (2)
- 4.3 Differentiate between *flood irrigation* and *sprinkler irrigation* . (4)
- 4.4 Precision farming aims to optimize field-level management through the use of modern technologies and agronomic principles.
- 4.4.1 The above statement is one example of the use of modern technology in agriculture. Give ONE other example of the use of modern technology in agriculture. (1)
- 4.4.2 Formulate TWO reasons why modern technology may be unpopular in some communities. (2)
- 4.4.3 Give TWO advantages of modern technology in farming practices. (2)
- 4.5 Study the picture below and answer the questions that follow:



- 4.5.1 Identify the farming method above. (1)
- 4.5.2 State TWO advantages of this system of farming. (2)
- 4.5.3 List TWO basic requirements to achieve higher yields in this type of farming. (2)
- 4.5.4 Deduce from the picture above, TWO reasons why this method of farming is advantageous to the farmer. (2)

- 4.6 Five trials were done to determine the effect of temperature on evapotranspiration. The following data was the result of the trials.

Temperature (°C)	Evapotranspiration (mm per unit time)
12	5
17	5
22	11
27	14
32	23

Draw the findings of the trials, using a bar graph. Give an appropriate heading to your graph.

(5)
[35]

TOTAL SECTION B: 105
GRAND TOTAL: 150