



Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

**PLANT PRODUCTION
NQF LEVEL 2**

(1011012)

**1 March 2018 (X-Paper)
09:00–12:00**

This question paper consists of 8 pages.

TIME: 3 HOURS
MARKS: 150

INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions.
 2. Read ALL the questions carefully.
 3. Number the answers according to the numbering system used in this question paper.
 4. Write neatly and legibly.
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QUESTION 1

1.1 Give one word or a term for each of the following descriptions. Write only the word or term next to the question number (1.1.1–1.1.10) in the ANSWER BOOK.

- 1.1.1 Small openings on the underside of a leaf
- 1.1.2 Plants that love the sun and do not tolerate shade
- 1.1.3 The device used to estimate the amount of water loss by transpiration
- 1.1.4 Control of pests by using an organism that is their natural enemy or predator
- 1.1.5 An irrigation method that resembles rainfall
- 1.1.6 Plants that do not die off after a year but live for many years
- 1.1.7 The length of time food can be stored before its quality deteriorates.
- 1.1.8 An organism that spreads diseases from one plant or animal to another
- 1.1.9 The unit for measuring pressure
- 1.1.10 An outer layer of an ovule that forms the seed coat

(10 ×1) (10)

1.2 Give ONE word or a term for each of the following descriptions by choosing a word or term from the list below. Write only the word or term next to the question number (1.2.1–1.2.10) in the ANSWER BOOK.

water-holding capacity; subtropical; blackjack; fleshy fruits; pumpkin;
lettuce; dandelion; soil veld capacity; maize; gymnosperm;
summer rainfall; chloroplast; beans; wheat; infiltration rate; tomatoes;
simple fruits; chlorophyll; angiosperm

- 1.2.1 The part of a plant on which photosynthesis happens
- 1.2.2 Is harvested after 100 days of planting
- 1.2.3 An example of an annual weed
- 1.2.4 Maximum amount of water that the soil can hold in that area
- 1.2.5 Crop that grows best in soil with a pH of 5,5 and higher

- 1.2.6 The pace at which water sinks into the soil
- 1.2.7 A minimum of 440 mm rain is required for this during the growth season
- 1.2.8 The ovary wall becomes fleshy when the seed ripens
- 1.2.9 Produces seeds that are enclosed inside the ovule of the flower
- 1.2.10 A climatic region with hot and humid summers with a high rainfall, and dry winters that are quite warm and mostly frost free

(10 × 1) (10)

1.3 Indicate whether the following plant conditions or diseases are due to METABOLISM, BACTERIA, FUNGI or a VIRUS. Write only 'metabolism', 'bacteria', 'fungi' or 'virus' next to the question number (1.3.1 – 1.3.5) in the ANSWER BOOK.

- 1.3.1 Early blight
- 1.3.2 Leaves turn yellow and fall off, stems are black inside
- 1.3.3 Leaf edges turn brown and fold downwards, the stem becomes short and flowers do not form properly
- 1.3.4 Mosaic
- 1.3.5 Leaves turn pale yellow-green and plant becomes small and looks very weak

(5 × 1) (5)

1.4 State how each of the plant conditions or diseases named in QUESTIONS 1.3.1 – 1.3.5 above can be controlled. Write only the answer next to the question number (1.4.1–1.4.5) in the ANSWER BOOK.

(5)
[30]

QUESTION 2

2.1 Study the diagram in FIGURE 1 below and answer the questions.

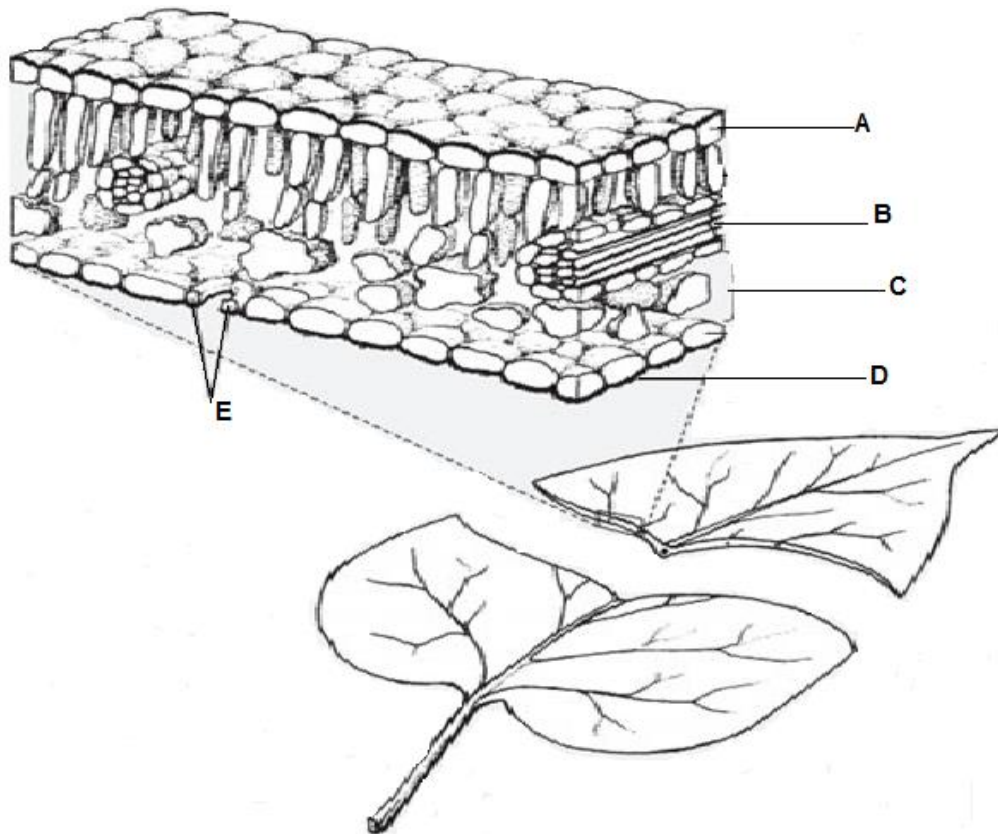


FIGURE 1

- 2.1.1 Label the parts marked A - E. Write only the answer next to the letter (A-E) in the ANSWER BOOK. (5)
- 2.1.2 State the main function of the parts identified as C, D and E. (3)
- 2.1.3 What is main role of leaves during the process of photosynthesis? (1)
- 2.1.4 Name the type of leaf arrangement for the plant illustrated above. (1)

- 2.2 A general worker at the college is retiring the following year and intends to start a vegetable production project to generate income. He observes all the projects that are undertaken to gather information about vegetable production. Your lecturer has nominated you to assist and advise him, and provide him with the background information and skills required for vegetable production. The worker explains that the vegetables that are in high demand in his area include beetroot, potatoes, spinach, cabbages, onions, madumbe and carrots.
- 2.2.1 Name FIVE growing conditions that the worker should take into consideration before deciding on the types of vegetables to grow. (5)

- 2.2.2 Copy and complete the table below in the ANSWER BOOK. The information in the table will guide the worker when he starts growing his own vegetables.

NAME OF VEGETABLE	TYPE/GROUP OF VEGETABLE	INTRA-SPACING	TIME OF HARVEST
Spinach			
Tomatoes			
Onions			
Potatoes			
Beetroot			

(5 × 3)

(15)
[30]

QUESTION 3

- 3.1 With the unpredictable weather due to climate change, hydroponics may offer the farmer an effective solution.
- 3.1.1 Define the term *hydroponics*. (2)
- 3.1.2 State FIVE major advantages of a hydroponic system. (5)
- 3.1.3 If the general worker were to consider planting vegetables in a hydroponic system, which irrigation system would you advise him to use? (1)
- 3.1.4 Justify your answer in QUESTION 3.1.3 by stating TWO advantages of the recommended irrigation system. (2 × 2) (4)
- 3.1.5 Give FIVE characteristics of good seeds. (5)
- 3.1.6 Name the appropriate fertiliser application method that can be used in hydroponics. (1)
- 3.1.7 Describe the fertiliser application method named in QUESTION 3.1.6. (2)
- 3.2 For plants to grow they require water which is absorbed from the soil through the process of osmosis.
- 3.2.1 Define the term *osmosis*. (2)
- 3.2.2 Explain how root hairs are adapted to absorb water. (5)
- 3.2.3 What is the importance of the vascular bundle in the roots? (3)

[30]

QUESTION 4

- 4.1 Briefly explain how temperature directly affects plant growth during transpiration. (3)
- 4.2 4.2.1 Name THREE factors that reduce the effectiveness of photosynthesis. (3)
- 4.2.2 Briefly describe how each factor named in QUESTION 4.2.1 limits the process of photosynthesis. (3)
- 4.2.3 Explain the relationship between *photosynthesis* and *respiration*. (4)
- 4.3 Weeds are detrimental to plant growth and they must be effectively controlled.
- 4.3.1 List the THREE categories of weeds as classified according to their leaf types. (3)
- 4.3.2 Give ONE example of each type of weed named in QUESTION 4.3.1. (3)
- 4.3.3 Briefly describe how systemic herbicides work in controlling weeds. (3)
- 4.4 4.4.1 Describe the damage that will be caused by aphids on leafy vegetables. (4)
- 4.4.2 How can aphids be effectively controlled on vegetable crops? (4)
- [30]**

QUESTION 5

- 5.1 Harvesting crops must be done with care, as the crop quality may be affected during this process.
- 5.1.1 Name THREE methods of harvesting crops. (3)
- 5.1.2 Tabulate ONE advantage and ONE disadvantage of each method of harvesting named in QUESTION 5.1.1. (3 × 2) (6)
- 5.2 Knowing the evaporation rate of an area helps the farmer to estimate the irrigation requirements and even schedule irrigation.
- 5.2.1 Explain the term *irrigation schedule*. (2)
- 5.2.2 Name TWO apparatus items used in irrigation scheduling. (2)
- 5.2.3 Briefly explain the procedure for determining the water requirements of plants when using an evaporation pan. (5)

5.3 Study the diagram in FIGURE 2 below and answer the questions.

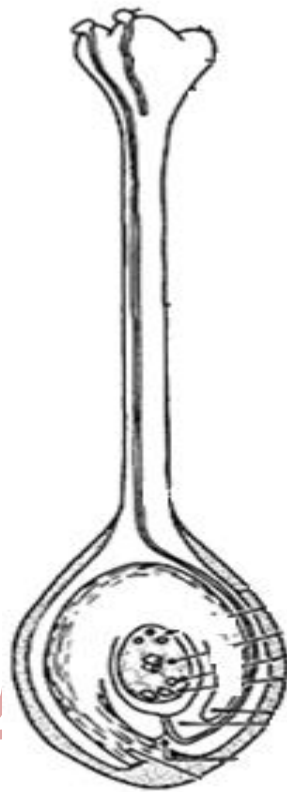


FIGURE 2

5.3.1 Describe the path followed by pollen from the stigma till fertilisation takes place. (4)

5.3.2 Discuss post-fertilisation changes that will occur in a plant. (4)

5.4 Explain the following methods of plant improvement:

5.4.1 Hybridisation (2)

5.4.2 Mutation (2)

[30]

TOTAL: 150