



# higher education & training

Department:  
Higher Education and Training  
**REPUBLIC OF SOUTH AFRICA**

## **NATIONAL CERTIFICATE (VOCATIONAL)**

### **ADVANCED PLANT PRODUCTION**

**NQF LEVEL 4**

**(1011014)**

**1 March 2018 (Y-Paper)**

**13:00–16:00**

**This question paper consists of 10 pages.**

**TIME: 3 HOURS**  
**MARKS: 150**

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**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. Start each question on a NEW page.
  5. Write neatly and legibly.
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**SECTION A****QUESTION 1**

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

- 1.1.1 ... is done with a single vegetative bud.
- A Grafting
  - B Pruning
  - C Budding
  - D Cutting
- 1.1.2 ONE of the following is an example of a compound fruit:
- A Pineapples
  - B Strawberries
  - C Plums
  - D Apples
- 1.1.3 A short underground stem with a number of flesh leaves in which food is stored:
- A Tuber
  - B Rhizome
  - C Runner
  - D Bulb
- 1.1.4 The part of a stem from which leaves or branches grow is a/an ...
- A node.
  - B internode.
  - C micropyle.
  - D integument.
- 1.1.5 In this type of layering the part of the branch touches the soil surface and develops roots:
- A Mound layering
  - B Tip layering
  - C Air layering
  - D Trench layering

- 1.1.6 A biotic agent of pollination that forces pollen to move from one flower to another:
- A Wind
  - B Weed
  - C Insect
  - D Water
- 1.1.7 An opening in the seed where water enters during germination:
- A Intergument
  - B Hypocotyle
  - C Micropyle
  - D Cotyledon
- 1.1.8 A plant disease that results in dead shoot tips and discolored flowers:
- A Black spot
  - B Powdery mildew
  - C Soft rot
  - D Downy mildew
- 1.1.9 A characteristic of a wind pollinated flower:
- A Has colorful petals
  - B Produce large amount of pollen
  - C Has sweet smell
  - D Have exposed anthers
- 1.1.10 Fruits whose ovary walls harden to form a woody or leathery skin and its seeds are part of the fruit.
- A Grapes
  - B Peaches
  - C Apples
  - D Nuts

(10 × 1) (10)

- 1.2 Choose a word from COLUMN B that matches a description in COLUMN A. Write only the letter (A–O) next to the question number (1.2.1–1.2.10), in the ANSWER BOOK.

COLUMN A		COLUMN B	
1.2.1	A necessity for a nursery site	A	endosperm
1.2.2	Hydroponics uses	B	greenwood cuttings
1.2.3	Water reservoir with nutritious solution	C	water culture
1.2.4	Side shoots with long internodes	D	zygote
1.2.5	Artificial pollination	E	rhizomes
1.2.6	Bulbs produced above the ground.	F	fleece
1.2.7	An inorganic rooting medium	G	soft wood cutting
1.2.8	Breaks at a sharp snap sound	H	hybridisation
1.2.9	Underground stem that grows parallel to soil surface	I	internodes
1.2.10	A tissue that surrounds and feeds the embryo	J	vermiculture
		K	nodal
		L	bulbils
		M	sub-irrigation
		N	water supply
		O	runners

(10 × 1) (10)

- 1.3 Differentiate between the following terms:

- 1.3.1 Stimulative parthenocarpy and vegetative parthenocarpy
- 1.3.2 Layering and grafting
- 1.3.3 Node and internode
- 1.3.4 Sexual and vegetative reproduction
- 1.3.5 A tuber and a bulb

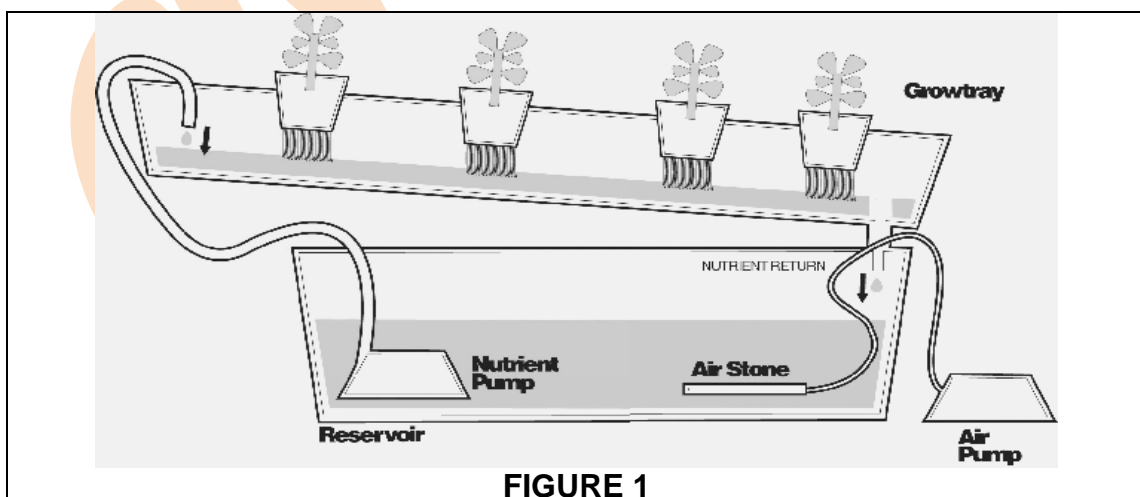
(5 × 2) (10)  
[30]

**QUESTION 2**

- 2.1 Budding is the most common propagation technique used to propagate fruit trees and flowers. It is recommended that the original stem above the bud must be cut away.
- 2.1.1 Define *budding*. (2)
- 2.1.2 Why must the original stem be removed? (2)
- 2.1.3 Briefly explain the procedure used for budding. (8)
- 2.1.4 Newly propagated plants or seedlings must be healthy and adhere to specified standards.  
Name FOUR environmental factors to be closely monitored in order to achieve the required standards. (4)
- 2.1.5 Name the equipment that can be used in the propagation method described above. (2)
- 2.1.6 Why is it important to sterilize the tools? (1)
- 2.2 What type of layering technique is mostly used by commercial growers to propagate rootstock for orchards? (1)
- [20]**

**QUESTION 3**

- 3.1 Study FIGURE 1 below and answer the questions.



- 3.1.1 What type of crop production system is illustrated in FIGURE 1? (1)
- 3.1.2 What method of fertilisation is used in this production system? (1)

- 3.2 Name TWO types of growth medium that can be used in the production system. (2)
- 3.3 Why do farmers often prefer this type of production system? (4)
- 3.4 Name TWO leaf crops that can successfully be grown in this type of system. (2)
- 3.5 Identify the plant hormone that is associated with the following growth and development of a plant:
- 3.5.1 Fruit ripening and leaf drop
- 3.5.2 Greater growth and budding from the apex
- 3.5.3 Delay plant aging and death (3 × 1) (3)
- 3.6 A nursery is a facility for the propagation, growing and holding of plants for later use. Briefly explain why the following environmental factors should be considered when erecting a nursery.
- 3.6.1 Light
- 3.6.2 Moisture (2 × 4) (8)
- 3.7 When planting seedlings it is recommended to always press the soil close to its stem.
- What is the main reason for doing that? (1)
- 3.8 Give THREE reasons why plastic potting bags are the most commonly used in a nursery. (3)
- [25]**

**QUESTION 4**

- 4.1 Due to changes in international demand, the economic importance of flower production has increased in recent years.
- Briefly discuss the economic importance of cut flowers and flowers produced for the cosmetic industry. (5)

- 4.2 Grafting is a horticultural technique that can only be done between reasonably closely related plants.

Study the illustration below and answer the questions.

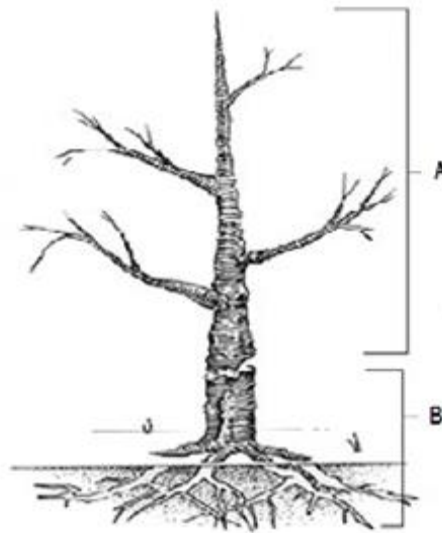


FIGURE 2 Source: [www.waldeneffect.org/blog](http://www.waldeneffect.org/blog)

- 4.2.1 Clearly state the role that plant parts in A and B can play during the grafting process. (2)
- 4.2.2 Identify FOUR specific parts of the plant which can act in the role of A as indicated in 4.2.1. (4)
- 4.2.3 Identify the specific part of the plant which will perform the role of B as indicated in 4.2.1. (1)
- 4.2.4 Name THREE sanitary precautions that should be carried out when preparing a graft. (3)
- 4.3 What likely effect will damaged cuttings or open wounds have on plant growth? (2)
- 4.4 Name THREE reasons why grafting is used to propagate fruit trees. (3)
- 4.5 Name TWO other grafting techniques that can be used to propagate nursery crops and ornamentals. (2)
- 4.6 Failure to propagate plants that meet set standards is a potential source of financial loss.
- What are the indicators of an unsuccessful propagation? (3)

[25]



**QUESTION 5**

Flowers are threatened by slugs, snails, mites, other insects and diseases. Pest control can be achieved through agricultural practices that are cheap and environmentally friendly.

5.1 List FOUR agricultural practices that can be used to control pests and insects. (4)

5.2 Early detection of pests is crucial but some are very small and cannot easily be seen with the naked eye. Which pests are responsible for the following tell-tale signs?

5.2.1 Yellowing leaves which turns to a sickly shade of green

5.2.2 Curled leaves with a sticky residue, can later cause severe stunting.

5.2.3 Visible slime trails and holes in lower leaves.

5.2.4 Patches of white fluff with sticky residue.

5.2.5 Total collapse of young seedlings (5 × 1) (5)

5.3 Chemical pest control is the application of pesticides. They are classified according to their mode of action.

How does each of the following chemicals primarily enter the insect?

5.3.1 Contact insecticides

5.3.2 Systemic insecticides

5.3.3 Stomach poisons

5.3.4 Fumigants (4 × 1) (4)

- 5.4 Complete COLUMN B and C by matching the description in COLUMN A. Write only the answer next to the question number (5.4.1–5.4.6) in the ANSWER BOOK.

<b>COLUMN A</b> Description of disease	<b>COLUMN B</b> Type of disease	<b>COLUMN C</b> Type of pathogen
Leaves are covered with white powdery patches	5.4.1 _____	5.4.2 _____
A grey mould or fur on plants or fruit trees	5.4.3 _____	5.4.4 _____
Leaf has spot and leaf margins are dark	5.4.5 _____	5.4.6 _____

(6)

- 5.5 Define the term *plant disease*.

(2)

- 5.6 Name FOUR precautions that should be taken into account when using chemical sprays.

(4)  
[25]

### QUESTION 6

- 6.1 Identify FIVE types of daily management practices that should be carried out in a nursery.

(5)

- 6.2 List the type of data that should be kept when producing flowers.

(5)

- 6.3 Metabolic processes continue for some time after harvesting of flowers.

List FIVE factors that affect post-harvest quality negatively and decrease the shelf life of flowers.

(5)

- 6.4 Briefly explain the effect of each of the following on improving the post-harvest life and quality of cut flowers:

6.4.1 Precooling

6.4.2 Impregnation

6.4.3 Pulsing

6.4.4 Cold storage

6.4.5 Holding

(5 × 2) (10)  
[25]**TOTAL: 150**