higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

ADVANCED PLANT PRODUCTION
NQF LEVEL 4

(1011014)

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09:00–12:00

This question paper consists of 10 pages.

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)
ADVANCED PLANT PRODUCTION
NQF LEVEL 4
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. Use only a black or blue pen.
5. Write neatly and legibly.

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SECTION A

QUESTION 1

1.1 Various options are given as possible 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 the ANSWER BOOK.

1.1.1 The small opening in the seed where water enters during germination.

A Cotyledon
B Hypocotyl
C Integument
D Micropyle

1.1.2 The type of propagation where a single vegetative bud is used.

A Grafting
B Budding
C Pruning
D Layering

1.1.3 Rooted shoots that grow from below the stem of the parent plant.

A Bulbs
B Suckers
C Runners
D Buds

1.1.4 A practice of damaging a seed coat of a seed to enhance germination.

A Soaking
B Stratification
C Scarification
D Chilling seed

1.1.5 A … is a short modified underground stem with a number of fleshy leaves in which food is stored.

A rhizome
B bulb
C tuber
D runner

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1.1.6 A method of vegetative reproduction where the plant forms roots while it is still attached to the parent plant.

A Grafting
B Cutting
C Layering
D Dividing

1.1.7 A method of growing plants in a growth medium other than the soil.

A Horticulture
B Hydroponics
C Aquaculture
D Greenhouse

1.1.8 Vegetative material will be used to graft with, when propagating.

A Bud
B Scion
C Rootstock
D Stolon

1.1.9 A technique of grafting where a scion is fitted into a wedge cut

A Apical wedge grafting
B Whip and tongue wedge grafting
C Tongue wedge grafting
D Whip wedge grafting

1.1.10 A fungal disease that causes plant leaves to become gradually covered with whitish powdery patches.

A Black spot
B Downy mildew
C Powdery mildew
D Soft rot

(10 × 1) (10)

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1.2 Choose a term 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 thickened underground stem that grows more or less parallel to the soil	A	alkaline
		B	acidic
1.2.2	The type of cuttings that are taken from the shoot on the base of certain plants	C	mulching
1.2.3	The plant hormone responsible for root development	D	tunnel
		E	auxins
1.2.4	When a seed is in the resting stage or asleep	F	pathogen
1.2.5	A growing media for seeds or cuttings	G	mound layering
1.2.6	A structure where plants can be grown out of season	H	basal cutting
		I	bulb
1.2.7	An organism that causes disease	J	leaf cutting
1.2.8	The method used to propagate heavy stemmed closely branched shrubs	K	suckers
1.2.9	Covering the soil with a layer of organic or inorganic material	L	runners
		M	rhizome
1.2.10	Soil with a low pH	N	vermiculite
		O	dormant

(10 × 1) (10)

1.3 Give ONE word or term of the following descriptions. Write only the word or words next to the question number (1.3.1–1.3.10) in the ANSWER BOOK.

1.3.1 The type of propagation of which a branch is bent forward into the ground.

1.3.2 The type of cutting where a part of a plant has the ability to produce both roots and shoots from the leaf vein.

1.3.3 The process that occurs when fruit setting takes place without fertilization.

1.3.4 The type of layering used to propagate rootstock for orchards.

1.3.5 The irrigation system where water is provided below the growth medium.

1.3.6 The type of plants that complete their life cycle in two seasons.

1.3.7 The system where plants are fed with nutrients through irrigation water.

1.3.8 The process of fruit setting that takes place after being provided with a stimulus.

1.3.9 The name given to friendly insects known to feed on pests and help to decrease their population on crops.

1.3.10 The rootstock and the … are vegetative materials used for grafting

(10 × 1) (10)
[30]

QUESTION 2

2.1 Many plants rely either on insects or the wind for pollination.

2.1.1 Define the term *self-pollination*. (2)

2.1.2 Give ONE advantage and ONE disadvantage of self-pollination. (2)

2.1.3 Name FOUR characteristics of flowers that are pollinated by;
A Insects
B Wind. (2 x 4) (8)

2.2 Hybridisation and de-hybridisation are two processes that are used to propagate plants.

State FOUR reasons for hybridising plants for propagation. (4)

2.3 Most flowers require growth hormones to grow sufficiently.

Name the plant growth hormone that is mainly responsible for each of these plant parts.

2.3.1 Downward root penetration

2.3.2 Fruit ripening

2.3.3 Cell division

2.3.4 Flower formation

2.3.5 Germination

(5 × 1) (5)

2.4 Name THREE physical factors that need to be considered when growing seeds or seedlings into adult plants. (3)

2.5 Briefly discuss the physical factors named in QUESTION 2.4. (3 × 2) (6)
[30]

QUESTION 3

Flower producers often make use of greenhouses and/or nurseries in order to focus their attention on maximising plant reproduction.

3.1 Distinguish between a *greenhouse* and a *nursery.* (4)

3.2 Name TWO ways in which plants in the nursery can be fed with soluble nutrients. (2)

3.3 Why is it important to have vents in a nursery? (3)

3.4 Why should the soil, which makes up part of a potting mixture, be sterilized? (2)

3.5 Explain why flowers are mostly propagated in a controlled environment. (3)

3.6 Give reasons why each of the following environmental conditions is to be considered when choosing a site for a nursery.

3.6.1 Drainage

3.6.2 Pollution

3.6.3 Light

3.6.4 Water supply (4 × 2) (8)

3.7 Different types of containers are used by flower producers to grow flowers.

State why growers mostly use the following containers in the nursery.

3.7.1 Potting bags

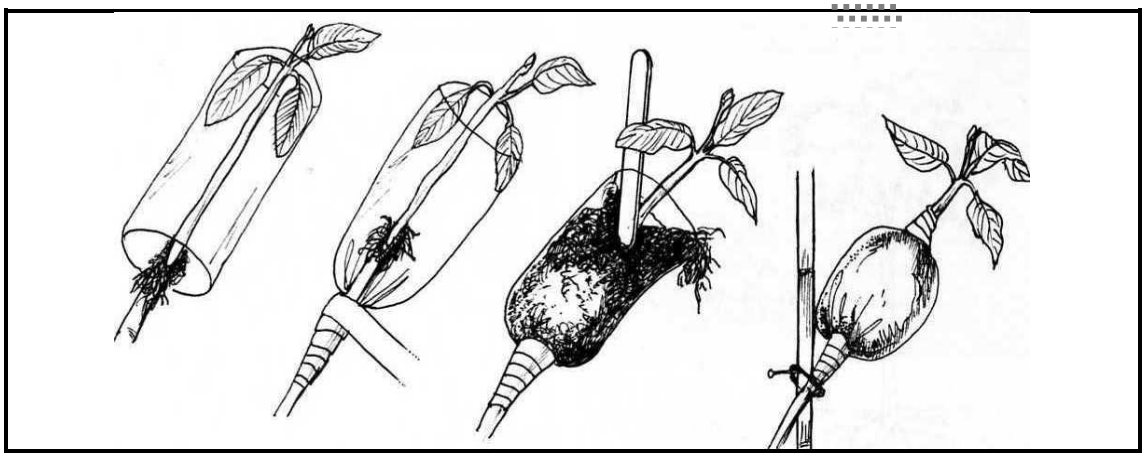
3.7.2 Plant stands with shelves (2 × 2) (4)

3.8 Plants require both macro and micro nutrients for optimum growth and development.

Briefly distinguish between micro and macro elements with examples (2 × 2) (4)
[30]

QUESTION 4

4.1 Study the diagram below and answer the questions.



[Source:www.ces.ncsu.edu/depts/hort/hil/hil-8701.html]

4.1.1 Name the method of vegetative reproduction illustrated above. (1)

4.1.2 Briefly describe this process of plant propagation. (8 × 1) (8)

4.1.3 Identify the material that is used to cover the rooting medium. (1)

4.2 State FIVE guidelines for successfully propagating the vegetative method named in QUESTION 4.1 above. (5)

4.3 Name FIVE aspects of cut flowers that makes trading profitable for growers. (5)

4.4 Explain how the following cut flowers are reproduced commercially:

4.4.1 Roses

4.4.2 Barberton daisy

4.4.3 Irises

4.4.4 Carnation

4.4.5 Chrysanthemums

(5 × 2) (10)

[30]

QUESTION 5

In recent years floriculture has become more popular than ever, as farmers realised the variety of available opportunities.

5.1 5.1.1 What is a *cut flower*? (1)

5.1.2 What is the leading cut flower in South Africa? (1)

5.1.3 Name TWO uses of cut flowers. (2)

5.1.4 Harvesting flowers is the first stage of marketing the product.

List FOUR important characteristics of cut flowers that are ready for the market. (4)

5.2 When watering container plants one must always be careful not to over or under water, as this can cause more stress on plants.

List THREE factors that determine the water needs of plants in containers. (3)

5.3 Flower production has to be managed by growers.

Briefly explain why each of these management practices are important.

5.3.1 Thinning

5.3.2 Fertigation

(2 × 2) (4)

[15]

QUESTION 6

6.1 Flower producers are well aware of the different organisms that can affect their products

6.1.1 Define the term *Integrated Pest Management*. (2)

6.1.2 Name THREE ways in which Integrated Pest Management can be approached. (3)

6.2 Insects and pests attack plants and cause widespread damage.

Identify the organism that causes the following damage:

6.2.1 Leaves are curling. Spotty yellow discoloration usually on the underside of the plant leaves.

6.2.2 Missing edges on leaves. Gaping holes or whole leaves are missing.

6.2.3 Mottled appearance, with leaf loss and plant death in severe cases. (3 × 1) (3)

6.3 Briefly describe the common symptoms that indicate the presence of bacterial disease in plants. (3)

6.4 Flowering plants can be affected by many diseases during growth and even after harvest. Botrytis blight is but one of these diseases.

Explain how Botrytis can be controlled other than the use of chemicals. (4 × 1) (4)

[15]

TOTAL: 150

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