Province of the
EASTERN CAPE
EDUCATION

NATIONAL SENIOR CERTIFICATE

GRADE 11

NOVEMBER 2017

AGRICULTURAL SCIENCES P2 MARKING GUIDELINE

MARKS: **150**

This marking guideline consists of 8 pages.

SECTION A

QUESTION 1

1.1	1.1.1	C √√	Xylem	(2)
	1.1.2	B √√	ii, iii and iv	(2)
	1.1.3	B √√	Drip irrigation	(2)
	1.1.4	A √√	eutrophication.	(2)
	1.1.5	D √√	stem cuttings.	(2)
	1.1.6	D √√	Grain and fruit damage before reaching maturity	(2)
	1.1.7	C √√	oxygen.	(2)
	1.1.8	B √√	Tensiometer	(2)
	1.1.9	B √√	nitrogen.	(2)
	1.1.10	C √√	secondary cultivation.	(2)
				(20)
1.2	1.2.1	D √√	Failure of viable seed to germinate	(2)
	1.2.2	F √√	Cutting, turning and shattering of the soil with rotary tillers	(2)
	1.2.3	I √√	Microbial conversion of nitrate to nitrogen gas	(2)
	1.2.4	E √√	Receives pollen during pollination	(2)
	1.2.5	A √√	Required for nitrogen fixation	(2)
				(10)
1.3	1.3.1	Sodicity √√		(2)
	1.3.2	Systemic herbicides √√		(2)
	1.3.3	Mutation √√		(2)
	1.3.4	Hydroponics √√		(2)
	1.3.5	Monoculture √√		(2)
				(10)
1.4	1.4.1	Pipe drains √		(1)
	1.4.2	Vegetative √		(1)
	1.4.3	Osmosis √		(1)
	1.4.4	Necrosis √		(1)
	1.4.5	Compost √		(1)
				(5)

TOTAL SECTION A: 45

SECTION B:

QUESTION 2: PLANT NUTRITION

2.1 2.1.1 (a) Granum/Grana √ (1)

(b) Stroma/Fluid matrix √ (1)

2.1.2
- Oxygen emission √
- Manufacturing of sugars/carbohydrate √
- Stored excess plant parts like fruits are used as food by man √
- Stored plant parts are used as raw materials for manufacturing/production √ (Any 2 x 1) (2)

2.1.3
- Roots √
- Tubers √
- Stems √
- Leaves √
- Fruits √
- Seeds √ (Any 2 x 1) (2)

2.1.4
- Energy is used/stored in photosynthesis. √ (1)
- Energy is produced/released in respiration. √ (1)

2.2 2.2.1 Active ion uptake √ (1)

2.2.2 Active ion uptake √ (1)

2.2.3 Passive ion uptake √ (1)

2.3 2.3.1
- It improves soil structure √
- It improves water retention √
- It is a rich source of nitrogen √ (3)

2.3.2 Calcite/Calcitic agric lime/$CaCO_3$ √
Dolomitic agric lime/$CaCO_3.MgCO_3$ √ (2)

2.3.3
- Storage and handling of the manure √
- The type of animal √
- The age of the animal √
- The type of feed given to the animals √ (Any 3 x 1) (3)

2.4 2.4.1 Compound/Mixed fertiliser √ (1)

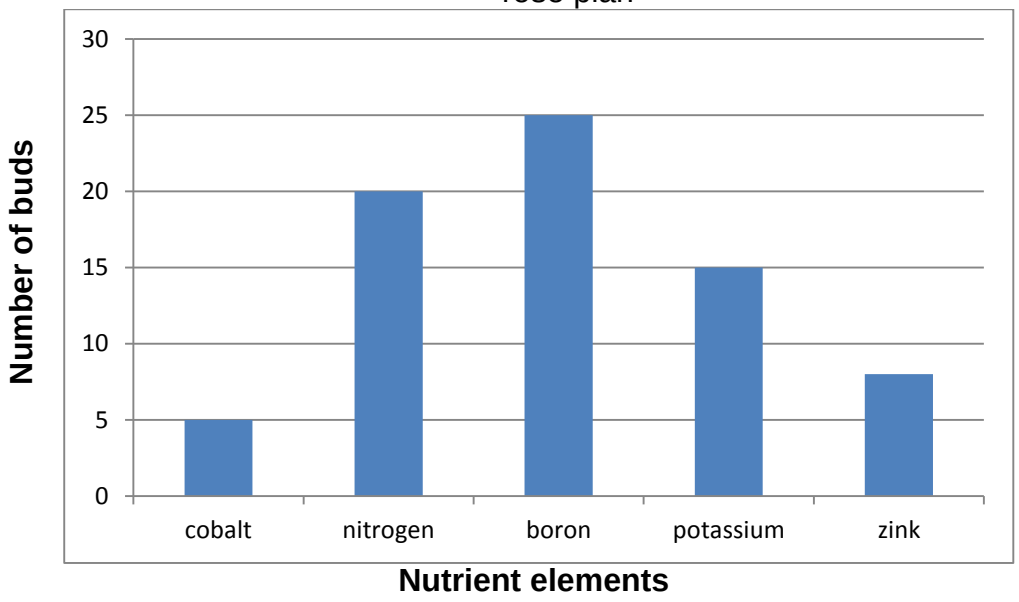
2.4.2
- The picture indicates a mixture ratio of 2:3:2 √
- The bag contains more than one type of fertiliser √ (Any 1 x 1) (1)

2.4.3 N = **3** P = **2** K = **1**

Total: 3+2+1=6 √

% nitrogen = $\frac{3}{6}$ x30 = 15% (4)

2.5 2.5.1 The effect of different nutrient elements on the formation of buds in rose plan



Bar graph √ (1)
Correct heading √ (1)
Correct plotting/proportional plotting √ (1)
Labelling and units on y-axis √ (1)
Labelling and units on x-axis √ (1) (5)

2.5.2

Macro elements	Micro elements
Nitrogen √	Cobalt √
Potassium √	Zinc √
	Boron √

(5)

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QUESTION 3: PLANT REPRODUCTION

3.1 3.1.1 FIGURE 3.1(a) Hypogeal germination √
FIGURE 3.1(b) Epigeal germination √ (2)

3.1.2
- Scarification √
- Priming √ (2)

3.1.3
- Enough soil moisture √
- Favourable temperature √
- Enough oxygen √
- Ideal growth medium √ (Any 3 x 1) (3)

3.2 3.2.1 FIGURE 3.2(a) Grafting √
FIGURE 3.2(b) Budding √ (2)

3.2.2
- They produce plants that are true to type √
- Grafted plants and budded plants produce fruits earlier than seed grown plants. √
- They require no pollination √
- To impart disease resistance or hardiness, contributed by the root √
- To reduce the occurrence of seed borne diseases √ (Any 3 x 1) (3)

3.3 3.3.1 Cross pollination √ (1)

3.3.2
- Plants produce large amounts of dry pollen grains √
- Flowers are small and dull in appearance √
- The corolla is either absent or very small √
- Flowers have large styles and anthers √
- Flowers are not scented √ (Any 3 x 1) (3)

3.3.3
- Insects √
- Mammals √
- Birds √
- Water √
- Mice √ (Any 3 x 1) (3)

3.4 3.4.1
- They only affect the part of the plant they are applied √
- They are suitable for annual plants √
- They do not affect root crops √
- Leaves can resurrect after a period of time without total destruction √ (Any 3 x 1) (3)

3.4.2
- Weeds grow easily in disturbed environments √
- Weeds produce large quantities of seeds √
- Weeds seeds have a long life span √
- Weeds have many seed dispersal methods √
- Most weeds are native/adaptable to the environment within which they compete with cultivated crops √ (Any 3 x 1) (3)

3.4.3
- Weeds compete with crops for moisture/space/nutrients/light √
- Weeds interfere with the harvesting of crops √
- Weeds serve as host plants for insects and pests √
- Weeds that are thorny pose health hazards to plants √ (Any 3 x 1) (3)

3.5
- Use the right product for the pest to be controlled √
- Use the right quantity of the pesticide √
- Apply the product at the correct stage √
- Ensure the correct interval for the application of the product √
- Follow the safety directions such as wearing cloths √
- Do not dispose chemicals into water source √ (Any 4 x 1) (4)

3.6
- Fertilisers – Farm seeds, Agricultural Remedies and Stock Remedies Act,1947 √
- Agricultural Pest Act, 1983 √
- Agricultural Products Standards Act, 1990 √
- Conservation of Agricultural Resources Act, 1983 √
- The Plant Breeders' Right Act, 1976 √
- Genetically Modified Organisms Act, 1997 √ (Any 3 x 1) (3)

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QUESTION 4: OPTIMAL RESOURCES

4.1 4.1.1
- Farmers move away from blanket fertiliser application √
- Farmers apply fertiliser to specific poor area √
- It allows farmers to compare harvest information √
- Farmers identify non fertile spots in their fields √ (Any 3 x 1) (3)

4.1.2
- Global position systems/GPS/Satellites √
- Computers √
- Maps √
- Data cards √ (Any 2 x 1) (2)

4.1.3
- Capital/it's expensive/loan/financial assistant √
- Lack of knowledge/technical know-how maintenance skill √
- Lack of support/equipment like combine harvester and tractors √ (Any 2 x 1) (3)

4.2 4.2.1 **Flood irrigation**
Flood irrigation is an irrigation system where the whole surface of the soil √ is flooded. √

Sprinkler irrigation
With sprinkler irrigation, water is forced under pressure through a rotating spray to reach the soil's surface √ in the form of separate drops. √ (4)

4.2.2
- Where the slope is level/flat √
- When the water is plentiful and cheap √
- When a strong stream of water is available √
- Where the soil is not sandy √ (Any 2 x 1) (2)

4.2.3
- Not much labour is required √
- There is no loss of water through seepage √
- Water is measured accurately √
- It is possible to irrigate uneven soils √
- Water is applied uniformly √ (Any 2 x 1) (2)

4.3 4.3.1

Bare cultivation	Mulching
B/Compaction occurs √	D/No compaction √
C/Weak aeration √	A/Better air movement √

(4)

4.3.2 Mulching refers to the spreading of any loose material such as saw dust, leaves on the soil surface √ to protect the soils ant roots from the effects of rain drops, crusting and evaporation. √ (2)

4.3.3
- Mulching prevents soil surface evaporation √
- It retain soil moisture √
- It controls weeds √
- It prevents erosion √
- Prevents incidence of rain drops √
- It protects plant roots √
- It decomposes to increase organic fertiliser to the soil √ (Any 2 x 1) (2)

4.4 4.4.1 Hydroponics √ (1)

4.4.2
- The pH of the medium should be neutral √
- It should provide support to the plant √
- It should retain moisture and allow space for good moisture exchange √
- It should have sufficient pores to allow circulation of air around the root system √
- It should provide protection to the roots against temperature fluctuations √ (Any 3 x 1) (3)

4.4.3
- No soil is needed, plants can be grown anywhere as long as there is light √
- Lower water cost as the same water can be reused √
- It is easier to control nutritional levels √
- There is no need for tilling, watering, fumigation and weed eradication √
- It is easier to control plant pests and diseases as plant containers can be moved easily √
- Hydroponics uses less fertiliser √
- The growing season is extended √ (Any 2 x 1) (2)

4.5
- To provide aeration for roots to breath √
- To enhance oxygen flow in the soil for microbial activities √
- To reduce accumulation of brack salts in the top soil √
- To reduce production risk √
- For field operation such as ploughing √ (Any 2 x 1) (2)

4.6
- They grow better and faster √
- Some people prefer eating the exotic breeds √
- They are more fertile, breed easily and produce many young ones √
- They are more in demand and provide a large market √ (Any 3 x 1) (3)

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TOTAL SECTION B: 105

GRAND TOTAL: 150