



Province of the  
**EASTERN CAPE**  
EDUCATION

**NATIONAL  
SENIOR CERTIFICATE**

**GRADE 11**

**NOVEMBER 2011**

**AGRICULTURAL SCIENCES P2  
(MEMORANDUM)**

**MARKS: 150**

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This memorandum consists of 8 pages.

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**ANSWER SHEET****SECTION A****QUESTION 1.1**

1.1.1	A	<b>B</b> ✓✓	C	D
1.1.2	A	<b>B</b> ✓✓	C	D
1.1.3	A	B	<b>C</b> ✓✓	D
1.1.4	A	B	C	<b>D</b> ✓✓
1.1.5	<b>A</b> ✓✓	B	C	D
1.1.6	A	<b>B</b> ✓✓	C	D
1.1.7	<b>A</b> ✓✓	B	C	D
1.1.8	<b>A</b> ✓✓	B	C	D
1.1.9	A	B	<b>C</b> ✓✓	D
1.1.10	A	<b>B</b> ✓✓	C	D

(10 x 2) (20)

**QUESTION 1.3**

- 1.3.1 Pistil/Gynaecium ✓✓
- 1.3.2 Transpiration ✓✓
- 1.3.3 Traditional/Indigenous knowledge ✓✓
- 1.3.4 Genetic Engineering /Genetic modification ✓✓
- 1.3.5 Tensiometer ✓✓

(5 x 2) (10)

**QUESTION 1.2**

1.2.1 C ✓✓

1.2.2 F ✓✓

1.2.3 E ✓✓

1.2.4 G ✓✓

1.2.5 A ✓✓

(5 x 2) (10)

**QUESTION 1.4**

- 1.4.1 Dormancy ✓
- 1.4.2 Biotechnology/biological pest control ✓
- 1.4.3 Mulching ✓
- 1.4.4 Root hairs ✓
- 1.4.5 Permaculture ✓

(5 x 1) (5)

**TOTAL SECTION A: 45**

**SECTION B****QUESTION 2**2.1 2.1.1 **Stomata**

Carbon dioxide is taken in through the stomata. ✓

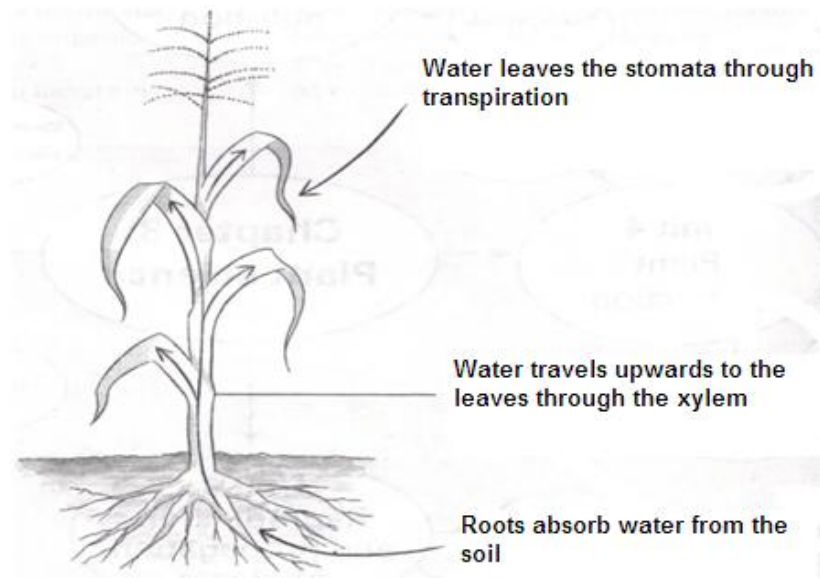
Oxygen gas is given out through the stomata. ✓ (2)

**Chlorophyll pigment**

Contains green molecules ✓ which absorb energy from sunlight. ✓ (2)

- 2.1.2
- Root pressure ✓
  - Transpiration pull ✓
  - Cohesion-tension of water molecules /adhesion forces ✓
  - Capillarity ✓ (Any 2) (2)

## 2.1.3



Root hairs absorb water from soil. ✓

Water travels to leaves through xylem. ✓

Water leaves the stomata through transpiration. ✓ (3)

- 2.1.4
- It helps farmers to identify deficiencies of certain nutrients in their crops. ✓
  - It helps farmers to correct deficiencies by adding appropriate fertilizers. ✓
  - It determines levels of plant nutrients in a soil type accurately ✓
  - It saves time and money by helping the farmer to apply the correct fertiliser in the correct amounts. ✓ (Any 2) (2)

- 2.2 2.2.1 It refers to the transfer of pollen from the anther of a flower ✓ to the stigma of a flower on another plant ✓ of the same species. ✓ (3)
- 2.2.2
- Wind pollinated plants produce large quantities of pollen grain. ✓
  - The pollen grains are very small, light and dry so it is easily blown by the wind. ✓
  - Some pollen grains have air sacs that help them to float through air. ✓
  - They have large feathery stigmas that stick out of the flower to catch pollen floating by on the wind. ✓
  - The female flowers are very simple and bare, so pollen can enter the flower easily. ✓ (Any 4) (4)
- 2.2.3
- Wind ✓
  - Insects/bees/wasps/beetles/butterflies/moths ✓
  - Animals ✓
  - Birds/bats/sunbirds/sugarbirds ✓
  - Water ✓ (Any 2) (2)
- 2.3 2.3.1 Plants cannot absorb nitrogen released from organic matter decomposition directly. ✓ Plants absorb nitrogen only when it is in the form of nitrate ions ✓ and ammonium ions. ✓ (3)
- 2.3.2 Blood = nitrogen ✓  
Bones = phosphorus ✓ (2)
- 2.3.3
- Slashing/cutting ✓
  - Hand pulling ✓
  - Mulching ✓
  - Cultivation/tilling ✓
  - Cover cropping ✓
  - Plant early ✓
  - Only put fertilizer where the crops are growing. ✓
  - Genetic engineering ✓ (Any 3) (3)
- 2.4 2.4.1 Biotechnology/bio-control/biological control ✓ (1)
- 2.4.2 For the lady birds to predate on the aphids ✓ as a pest control measure. ✓ (2)
- 2.4.3
- They can poison/kill people if they swallow/inhale large amounts. ✓
  - They can pollute the soil and water resources. ✓
  - Non target organisms such as helpful insects can be killed. ✓
  - Repeated use of pesticides can result in resistance of pests to the pesticide. ✓ (4)

**QUESTION 3**

- 3.1 3.1.1
- The layout of the area such as fields, roads, cultivated area, water-places, contour banks. ✓
  - Topography/relief/aspect/scenery such as rivers, mountains, steepness of slopes, hills ✓
  - Natural vegetation ✓
  - Eroded areas ✓
  - Land use practices ✓
  - Drainage patterns ✓
  - Possible soil differences ✓ (Any 3) (3)
- 3.1.2 The land-use that will give the best return. ✓  
The way the land must be used to protect it. ✓ (2)
- 3.1.3
- Contouring ✓
  - Planting ley crops ✓
  - Establishing buffers or vegetative strips ✓
  - Mulching ✓
  - Cover cropping ✓ (Any 3) (3)
- 3.1.4 (A) Yes ✓ / No ✓ (Any 1) (1)
- (B) **Reasons for Yes**
- Crops can be cultivated out of season. ✓
  - Crops that would normally not thrive in that area can be grown ✓
  - Crops can be produced for specific market dates when that product is scarce and prices high. ✓
  - High-quality products can be produced by controlling the greenhouse according to the crop requirements. ✓
  - Damage due to wind or rain is eliminated. ✓ (Any 3) (3)

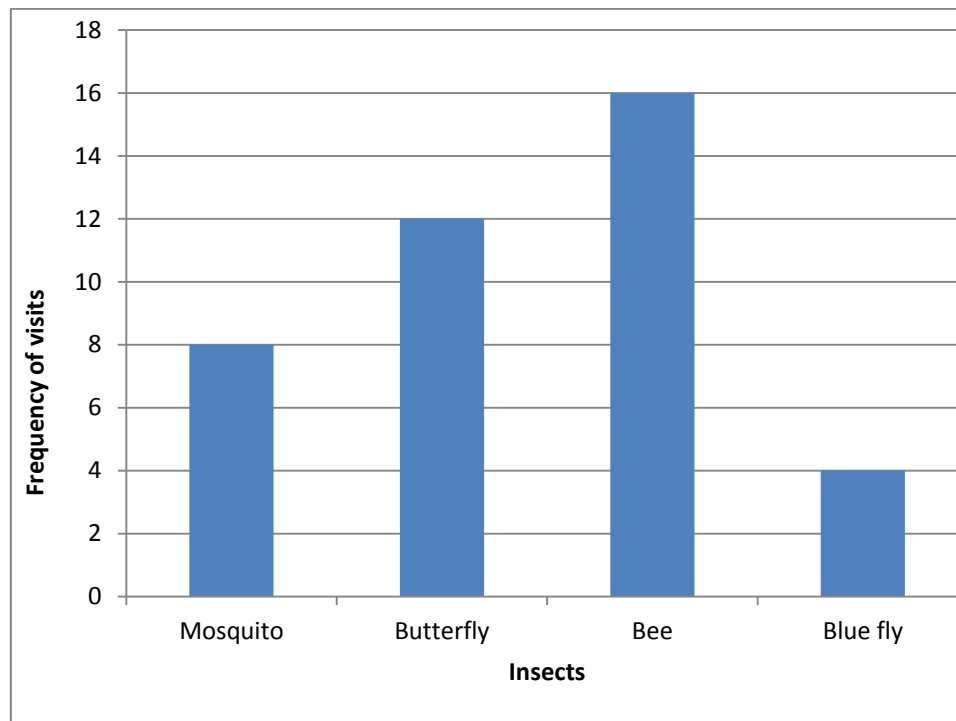
**OR****Reasons for No**

- Building costs of greenhouses are high. ✓
  - Competent management is absolutely essential. ✓
  - Pests and diseases thrive in greenhouses. ✓
  - Maintenance is expensive. ✓
  - Intensive spray program to control these is necessary. ✓
  - It is intensive and requires skilled labour which is expensive. ✓
  - Hail and strong winds can cause a lot of damage to greenhouses. ✓ (Any 3) (3)
- 3.2 3.2.1 Rainwater ✓ (1)
- 3.2.2 It is clean/not muddy/neutral in pH/ does not contain salts/not contaminated. ✓ (1)

- 3.2.3
- Clean the gutters often. ✓
  - Put wire mesh over openings to prevent insects from entering. ✓
  - Drain excess water from tank pipes to prevent mud. ✓ (Any 2) (2)
- 3.2.4
- Make a soil basin around every fruit tree. ✓
  - Make the basin as wide as the outer branches of the tree. ✓
  - Widen the basin once a year before the rainy season. ✓
  - Water fruit trees when they begin to flower until they begin to ripe. ✓
  - After planting fruit tree, water each tree with at least 20 litres once a week. ✓ (Any 3) (3)
- 3.2.5
- Spacing of drainage pipes ✓
  - Pipe diameter ✓
  - Drainage slope ✓
  - Layout of a drain ✓
  - Dept of a drain. ✓ (Any 2) (2)
- 3.3 3.3.1
- To prepare the soil for planting. ✓
  - To make the soil loose. ✓
  - To kill weeds. ✓
  - To bury or mix the remains of the previous crop into the soil. ✓
  - To mix fertilizers in the soil. ✓ (Any 3) (3)
- 3.3.2
- No fuel cost because animals are used for the ploughing ✓
  - Cheaper to buy 'beast of burden'(animals) than heavy machinery. ✓
  - The droppings of animals fertilise the soil. ✓
  - Animals reduce the risk of soil compaction. ✓
  - No need to employ skilled operators. ✓ (Any 3) (3)
- 3.3.3
- Soil ✓
  - Natural vegetation – indigenous or veld plants ✓
  - Water – streams, rivers and underground water ✓ (3)
- 3.3.4
- Pastures replace natural vegetation ✓
  - The use of agro-chemicals to maintain pastures can have negative impact on natural pastures. ✓
  - Many pastures rely on irrigation. Too much irrigation water from a river can have a negative impact on the ecosystem. ✓ (3)
- 3.3.5
- Hard options – making use of concrete/gabions/stone packing/reshaping the donga to make it less prone to soil erosion. ✓
- Soft option – involving the use of vegetation planted across the donga to slow to slow the water and allow sedimentation. ✓ (4)

**QUESTION 4**

4.1 4.1.1 Frequency of visits of pollinating insects onto a cocoa tree.



Correct heading/title ✓

Correct labelling of Y and X axis ✓

Correct scaling, using ruler ✓

Bar graph ✓

(4)

4.1.2  $8 + 12 + 16 + 4 = 40$  times. ✓

(2)

- 4.2 4.2.1
- There is high capital outlay as specialised equipment is needed. ✓
  - The grower must have access to information about the nutrient requirements of the particular crops to be grown. ✓
  - Diseases can be spread easily through the water system. ✓
  - High management level required. ✓ (Any 3) (3)

- 4.2.2
- Water ✓
  - Air ✓
  - Suitable temperature ✓
  - Light ✓
  - Growing medium/soil ✓ (Any 4) (4)

- 4.3 4.3.1
- | Renewable resources | Non-renewable resources |
|---------------------|-------------------------|
| Air ✓               | Gold ✓                  |
| Plants ✓            | Sandy soil ✓            |
| Animals ✓           | Fossil fuels ✓          |
- (6)
- 4.3.2
- For food. ✓
  - Feed for livestock ✓
  - Fuel. ✓
  - Cultural purposes. ✓
  - Medicinal purposes. ✓
  - Sports and recreation ✓
  - Building materials ✓
- (Any 3) (3)
- 4.3.3
- Preventing areas from being invaded by alien plants and – controlling such plants where necessary. ✓
  - Harvesting firewood or wood for other uses at a sustainable rate so that the resource is not depleted. ✓
  - Harvesting medicinal plants sustainably. ✓
  - Controlling bush encroachment ✓
  - Preserve the vegetation along rivers. ✓
- (Any 4) (4)
- 4.3.4 **Wetlands**
- Wetlands are areas where water tends to collect ✓ and the soil stays wet for long periods of time. ✓
- (2)
- 4.3.5
- Wetlands can store a lot of water and release it slowly. ✓
  - Wetlands purify water by trapping pollutants. ✓
  - Wetlands absorb lots of nitrogen and phosphorus and can prevent eutrophication. ✓
  - Wetlands support a wide variety of plants and animals. ✓
  - Reduces flooding during storms. ✓
- (Any 3) (3)
- 4.4 4.4.1
- Crops of the same family are not grown on the same plot for two years or seasons. ✓
  - A legume crop is included in the rotation to fix nitrogen in the soil. ✓
  - Heavy feeders are followed by light feeder. ✓
  - Nitrogen consuming crops are followed by nitrogen fixing crops. ✓
  - Each plot on the rotation is allocated one crop. ✓
- (Any 4) (4)

**[35]****TOTAL SECTION B: 105****GRAND TOTAL: 150**