



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

AGRICULTURAL SCIENCES P2

NOVEMBER 2013

MEMORANDUM

MARKS: 150

This memorandum consists of 10 pages.

SECTION A**QUESTION 1****1.1 Multiple-choice questions**

- 1.1.1 B ✓✓
- 1.1.2 D ✓✓
- 1.1.3 D ✓✓
- 1.1.4 B ✓✓
- 1.1.5 B ✓✓
- 1.1.6 B ✓✓
- 1.1.7 C ✓✓
- 1.1.8 A ✓✓
- 1.1.9 D ✓✓
- 1.1.10 A ✓✓

(10 x 2) (20)

1.2 Column A/Column B

- 1.2.1 E ✓✓
- 1.2.2 F ✓✓
- 1.2.3 C ✓✓
- 1.2.4 H ✓✓
- 1.2.5 A ✓

(5 x 2) (10)

1.3 ONE word/term

- 1.3.1 Business plan ✓✓
- 1.3.2 Whole farm budget/farm budget ✓✓
- 1.3.3 Casual ✓✓
- 1.3.4 Dihybrid ✓✓
- 1.3.5 Polygenes/multiple genes ✓✓

(5 x 2) (10)

1.4 Change the underlined word

- 1.4.1 elasticity ✓
- 1.4.2 land ✓
- 1.4.3 diminishing ✓
- 1.4.4 interest ✓
- 1.4.5 atavism/mutation ✓

(5 x 1) (5)

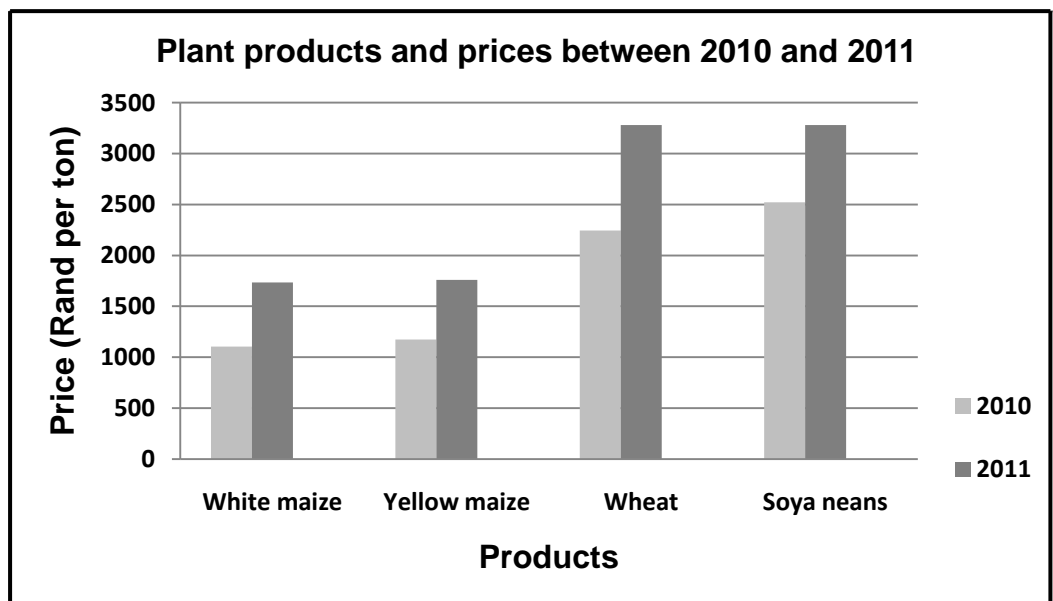
TOTAL SECTION A: 45

SECTION B

QUESTION 2: AGRICULTURAL MANAGEMENT

2.1 Agricultural products

2.1.1 Graph on agricultural products and prices between 2010 and 2011



Marking graph with the following checklist/rubric:

Criteria	Yes:1 Mark	No: 0 Mark
1 Bar graph	1 ✓	
2 X-axis correctly labelled	1 ✓	
3 X-axis sub topics correctly labelled (only these plant products)	1 ✓	
4 Y-axis correctly labelled and unit	1 ✓	
5 Correctly plotted for 2010/11	1 ✓	
6 Correct heading	1 ✓	

(6)

2.1.2 Highest price range:

- White maize ✓

(1)

2.1.3 Trend of crop and animal product prices

- The prices for animal products showed smaller increases/decrease/only lamb with a higher increased ✓
- Prices for plant products showed large increases over this period ✓

(2)

2.1.4 Wheat prices on poor households

- Bread price will go up/food becomes more expensive ✓
- Poor households will not afford to buy/affecting poor households badly due to affordability ✓
- More poverty/hunger/malnutrition ✓

(Any 2) (2)

2.1.5 Measures by the farmer to deal with decreasing pork prices.

- Improve on the quality of pork produced ✓
- Value adding ✓
- Broaden pork product range ✓
- Quota system/controlled marketing/reduce quantity of pork produced ✓
- Set up a business survival strategy ✓
- More control over demand and supply ✓
- More effective promotion/advertising. ✓
- Better financial management/reduce running costs/production costs/use cheaper rations/reduce expenses ✓

(Any 2) (2)

2.2 Agribusiness chain

2.2.1 Chain store ✓ (1)

2.2.2 Miller ✓ (1)

2.2.3 Consumer ✓ (1)

2.2.4 Maize producer ✓ (1)

2.2.5 Miller/chain store ✓ (1)

2.3 Demand of meat during the Orange Africa Cup of Nations**2.3.1 Reaction of farmers**

- Farmers increased their supply as the prices increased ✓
- Continued to supply at high levels ✓

(2)

2.3.2 TWO factors influencing increased demand

- Number of consumers/tourists ✓
- Festive period/large sporting event ✓
- Income/buying power of consumers ✓
- Taste and preference of consumers/quality of the meat ✓

(Any 2) (2)

2.3.3 THREE measures to overcome surplus

- Processing/value-adding ✓
- Preservation with no value-adding ✓
- Direct marketing ✓
- Lowering of price/special promotions ✓
- Lowering the supply/control the supply ✓
- Dumping ✓
- Exporting ✓

(Any 3) (3)

2.4 Marketing system**2.4.1 Product for free marketing system**

- Product A ✓
- Product A shows price fluctuation as a feature of free marketing system ✓

(2)

2.4.2 TWO outlets of a free market system

- Consumers/public/farm gate sales/farm stall sales ✓
- Wholesalers ✓
- Retailers ✓
- Factories ✓
- Municipal markets/auctions ✓
- Internet sales ✓
- Export sales ✓

(Any 2)

(2)

2.5 Steps in decision making**2.5.1 Steps in correct order**

- Identify the problem with regard to its importance ✓
- Analyse possible alternatives ✓
- Evaluate alternatives ✓
- Choose and follow the best solution ✓

(4)

2.5.2 TWO factors influencing effective decision making

- Speed with which decisions are taken/timing of the decisions ✓
- The degree of accuracy with which decisions are taken ✓
- The acceptability of the decision ✓
- Business sense ✓
- Social views/ethics ✓
- Economics ✓
- Profitability ✓
- Environmental sustainability ✓

(Any 2)

(2)

[35]**QUESTION 3: PRODUCTION FACTORS AND MANAGEMENT****3.1 Implementation of land reform policy****3.1.1 TWO challenges of land reform implementation**

- Delays in finalizing claims ✓
- Inappropriate principle of willing buyer willing seller ✓
- Land claim beneficiaries opted for money instead of land ✓
- Lack of support to new beneficiaries on how to farm ✓

(Any 2)

(2)

3.1.2 TWO most appropriate land reform programmes

- Redistribution ✓
- Restitution ✓

(2)

3.1.3 THREE reasons for implementing land reform programme

- To correct injustices of the past apartheid era ✓
- To compensate/return land to the rightful owners ✓
- The need for land ownership to also reflect more the composition of the population ✓
- It forms part of the need for Black Economic Empowerment/BEE ✓
- It is part of the transformation initiatives for South African society ✓
- To alleviate poverty in rural communities ✓
- It is a driving force for rural development ✓

(Any 3) (3)

3.1.4 TWO aims of equity scheme

- To improve the working and living conditions of participants ✓
- To improve financial returns of participants ✓
- To increase job security ✓
- To improve tenure security ✓

(Any 2) (2)

3.2 Different farming enterprises**3.2.1 TWO risk management strategies and justification**

- **Diversification** ✓ - the farmer has a number of different enterprises that is, crop, livestock and fodder production in order to spread the risk ✓
- **Hedging** ✓ - the farmer made future contracts/agreement with supermarket ✓
- **Insurance** ✓ - the farmer will insure the produce against unforeseen circumstances ✓
- **Flexibility/contingency planning** ✓ - the farmer will adapt to a crisis in an orderly way ✓
- **Effective control and safety measures** ✓ - the farmer will ensure that the product is appropriately prepared for the market place ✓
- **Value adding/processing** ✓ - the farmer can process/value add for a more stable market price ✓

(Any 2) (4)

3.2.2 FOUR management principles

- Planning ✓
- Organisation ✓
- Co-ordination ✓
- Motivation ✓
- Decision making ✓
- Control ✓
- Leadership ✓
- Implementation ✓

(Any 4) (4)

3.3 Family farming enterprise**3.3.1 THREE forms of capital**

Fixed capital ✓	Movable capital ✓	Working/floating capital ✓
Land ✓	Tractors/irrigation system ✓	Pesticides/fertilisers/seeds/grants/pension package ✓

(6)

3.3.2 TWO sources of capital for family farming enterprise

- Grant ✓
- Pension pay-out/government pay-out ✓
- Own savings ✓

(Any 2) (2)

3.3.3 The total value of assets:

R189 000,00 – pension/land
 +R80 000,00 ✓ – grant/tractor + irrigation + production items
 R269 000,00 ✓ (R58 000) (R7 000) (R15 000)

(2)

3.3.4 Net value of enterprise

- the difference between the total value of assets ✓
- and total value of liabilities ✓

(2)

3.4 Labour in farming**3.4.1 TWO characteristics of a permanent farm labourer**

- Employed on a long term basis ✓
- Has an employment contract with the farmer ✓
- All the basic conditions of employment are known to the labourer ✓
- Lives mostly on the farm/accommodation on the farm ✓
- Performs daily routine duties/work on the farm ✓
- Shareholders/profit sharing ✓
- Special benefits ✓

(Any 2) (2)

3.4.2 TWO causes of loss of farm labour to industries

- Working conditions/working hours ✓
- Wages/incentives ✓
- Exposure to weather conditions ✓
- Career opportunities for workers ✓

(Any 2) (2)

3.4.3 TWO ways of retaining farm labour

- Better working conditions/reasonable working hours/replacement of part of manual labour by machinery ✓
- Adequate living conditions ✓
- Better wages/incentives ✓
- Motivation/appreciation ✓
- Better education/training/career opportunities ✓

(Any 2) (2)

[35]

QUESTION 4: BASIC AGRICULTURAL GENETICS**4.1 Flower****4.1.1 Type of dominance**

Incomplete/partial dominance ✓

Motivation - The heterozygous phenotype offspring is an intermediate between the two homozygous parents ✓ (2)**4.1.2 Genotype and phenotype of flower B**

Flower B: Genotype – RW(WR) ✓

Phenotype – Pink ✓ (2)

4.2 Dark and white piglets**4.2.1 Phenotype percentage of pair 1 offspring**Pair 1: $\frac{2}{4} \times 100 \checkmark = 50\% \checkmark$ (2)**4.2.2 Punnet square for genotype of the offspring**

	D	d ✓
D	DD	Dd ✓
✓ d	Dd	dd ✓

(4)

4.2.3 Phenotypic ratio25% white:75% dark **Or** 1 white:3 dark **Or** white:dark = 1:3 ✓
Or (vice versa) (1)**4.2.4 Higher demand for white piglets**

Pair 1 ✓

Motivation - 50% **Or** 2 of the offspring will be white ✓ (2)**4.3 Heritability characteristics****4.3.1 Characteristic to select**

- Post weaning weight ✓

Motivation - 60% **Or** the highest heritability, meaning that the characteristic is more likely to be transferred to its offspring/more genetically influenced than environmentally ✓ (2)**4.3.2 Selection for fleece quality to improve the flock**

- Not very effective ✓
- It has 17% **Or** the lowest heritability meaning it is more influenced by the environment/other factors than by genes ✓

(2)

4.3.3 Calculation of estimated breeding value

WA = wool production of the animal is 4 kg
WH = wool production of the flock is 3,5 kg

$$EBV = (WA - WH) \times \text{heritability of wool production}$$

- $EBV = (4 \text{ kg} - 3,5 \text{ kg}) \times 0,65 \checkmark$

Or

- $EBV = 0,5 \text{ kg} \times 0,65 \checkmark$

- $= 0,325 \checkmark \text{ kg} \checkmark$

(3)

4.4 Horse, donkey and the mule.

4.4.1 Breeding system

Species crossing \checkmark

(1)

4.4.2 Type of animal

Mule/hinny \checkmark

(1)

4.4.3 TWO uses of the mule in farming

- Used as draught animals for pulling implements/ploughing/working \checkmark
- To carry loads/transport \checkmark

(2)

4.5 Genetically modified organisms

4.5.1 Difference in yield

- $17 \text{ t/ha} - 11 \text{ t/ha} \checkmark$
- $= 6 \text{ t/ha} \checkmark$

(2)

4.5.2 The year GMO was introduced

2012 \checkmark

Motivation

Visible /significant change in production/higher production \checkmark

(2)

4.5.3 TWO techniques used to develop genetically modified plant

- Electroporation \checkmark
- Micro-injection \checkmark
- Agrobacterium tumefaciens/Agro bacterial transfer \checkmark
- Gene gun/biolistics \checkmark
- Recombinant DNA \checkmark
- Viral carriers \checkmark

(Any 2)

(2)

4.5.4 Difference between conventional hybrid seed and GMO seed

Hybrid seed	GMO seed
DNA not altered/Crossing of two in-bred lines (cultivars) \checkmark	Altered DNA/Genes from another organism are inserted into a cell \checkmark

(2)

4.5.5 THREE advantages of genetic engineering

- Faster/rapid results (yield) ✓
- More precise ✓
- Genes used are not limited to the same species ✓
- Increases genetic diversity ✓
- Improves control/management over diseases/pests ✓
- Saves/protects endangered species ✓
- Produces pharmaceuticals/medicines/vaccines ✓
- Food security ✓
- Reduces environmental pollution ✓

(Any 3) (3)

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