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Department:  
Basic Education  
**REPUBLIC OF SOUTH AFRICA**

## **SENIOR CERTIFICATE EXAMINATIONS**

**AGRICULTURAL SCIENCES P2**

**2016**

**MEMORANDUM**

**MARKS: 150**

**This memorandum consists of 9 pages.**

**SECTION A****QUESTION 1**

1.1	1.1.1	B ✓✓		
	1.1.2	C ✓✓		
	1.1.3	C ✓✓		
	1.1.4	C ✓✓		
	1.1.5	D ✓✓		
	1.1.6	B ✓✓		
	1.1.7	A ✓✓		
	1.1.8	A ✓✓		
	1.1.9	A ✓✓		
	1.1.10	D ✓✓	(10 x 2)	(20)
1.2	1.2.1	C ✓✓		
	1.2.2	G ✓✓		
	1.2.3	F ✓✓		
	1.2.4	J ✓✓		
	1.2.5	A ✓✓	(5 x 2)	(10)
1.3	1.3.1	Entrepreneurs ✓✓		
	1.3.2	Contract ✓✓		
	1.3.3	Heritability ✓✓		
	1.3.4	Mutation ✓✓		
	1.3.5	Genetic modification/engineering ✓✓	(5 x 2)	(10)
1.4	1.4.1	Marketing ✓		
	1.4.2	Public holidays ✓		
	1.4.3	Variation ✓		
	1.4.4	Selection ✓		
	1.4.5	Polygenes ✓	(5 x 1)	(5)

**TOTAL SECTION A: 45**

**SECTION B****QUESTION 2: AGRICULTURAL MANAGEMENT AND MARKETING****2.1 Differences between farmer and consumer price**

- 2.1.1 **Commodity with highest price difference**  
Processed meat ✓ (1)
- 2.1.2 **Reason for the higher price difference**  
More/higher costs/processing/value adding ✓ (1)
- 2.1.3 **Reason for the low price difference in wheat grain**
- Raw material/less capital/labour intensive/unchanged product ✓
  - Demand and supply ✓
  - Marketing cost ✓ (Any 1) (1)
- 2.1.4 **Main problems in marketing the products with regard to:**
- (a) **Value** - Plant products have a low value per mass/animal products have a high value per mass ✓ (1)
- (b) **Transportation** - Animal/plant products need special facilities ✓ (1)
- (c) **Perishability** - Animal/plant products are easily perishable ✓ (1)
- 2.1.5 **THREE factors that resulted in the difference in price**
- Transportation costs ✓
  - Marketing costs ✓
  - Special treatment/cooling facilities/storage ✓
  - Packaging ✓
  - Profit margin/middle man ✓
  - Levies/taxes ✓
  - Demand and supply ✓ (Any 3) (3)

**2.2 Flow diagram illustrating the phases of entrepreneurial process****Illustrating the phases of the entrepreneurial process**

- A** - Identifying/evaluation the opportunity ✓ (1)
- B** - Determine the resources required ✓ (1)
- C** - Develop a business plan ✓ (1)
- D** - Starting/managing the enterprise ✓ (1)

**2.3 Possible markets for their products**

- 2.3.1 **Identification of the market with the highest security risk**  
Local people who buy directly from the farm ✓ (1)
- 2.3.2 **Indication of the best suited market for the marketing of beef**  
Large supermarket chains ✓ (1)
- Reason**  
Large scale sales/assured market/secure market/pay the best prices ✓ (1)

- 2.3.3 **Definition of the concept livestock auction sale**
- Gathering of buyers and sellers of live stock ✓
  - To bid for the highest price ✓
- (2)

- 2.3.4 **THREE advantages of marketing to small butcheries**
- Selling small quantities at regular intervals ✓
  - Selling to many outlets/regular cash flow ✓
  - No middle man ✓
  - Payment on the spot/cash sales ✓
  - Direct interaction between buyers and sellers ✓
- (Any 3) (3)

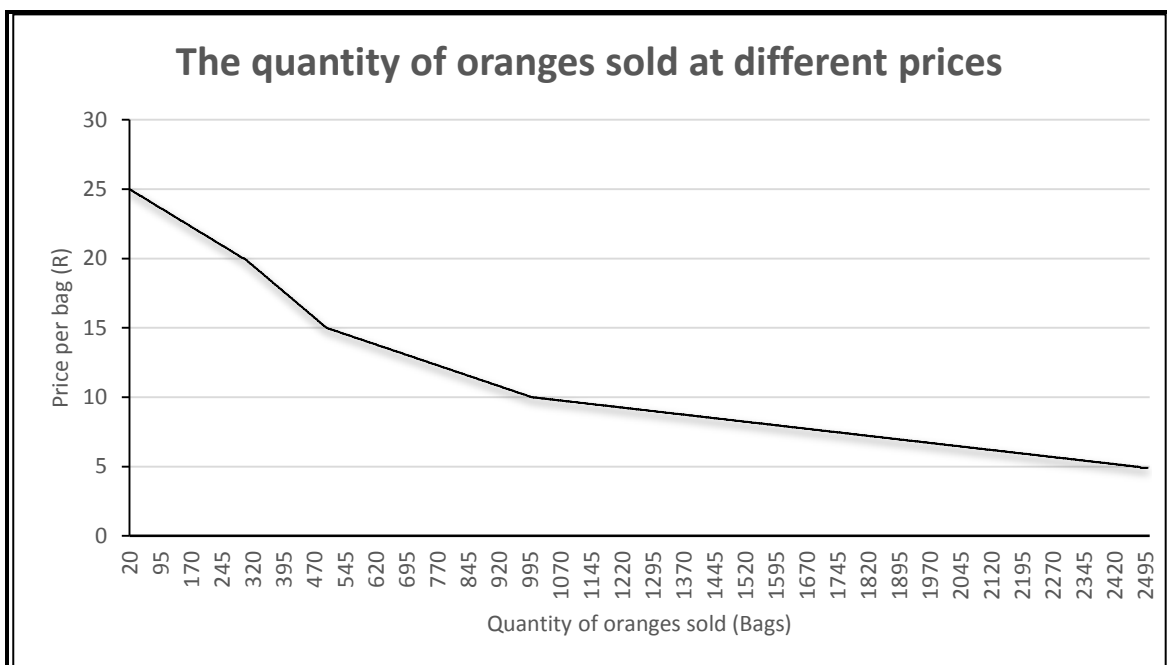
## 2.4 Case study on dairy farmers

**Appropriate marketing term associated with the following:**

- 2.4.1 Entrepreneurship ✓ (1)
- 2.4.2 Niche market ✓ (1)
- 2.4.3 Innovation/entrepreneurship ✓ (1)
- 2.4.4 Diversification ✓ (1)
- 2.4.5 Risk management ✓ (1)

## 2.5 The quantities of oranges that were sold at different prices per week

### 2.5.1 Line graph to indicate oranges sold per week



### Criteria/rubric/marketing guidelines

- Correct heading ✓
  - X-axis: Correct calibrations and labelled (Quantity of oranges sold) ✓
  - Y-axis: Correct calibrations and labelled (Price per bag) ✓
  - Correct unit (Rand and bags) ✓
  - Accuracy ✓
  - Line graph ✓
- (6)

**2.5.2 Comparing the demand to the supply with reference to price**

- The higher the price ✓ the higher the supply ✓  
the lesser the demand ✓

**OR**

- The lower the price ✓ the lower the supply ✓  
the higher the demand ✓

(3)  
[35]**QUESTION 3: PRODUCTION FACTORS****3.1 A budget for a rose producer in a greenhouse for the year 2015/16**

**3.1.1 The management principle that this budget addresses**  
Planning ✓

(1)

**3.1.2 Calculate the profitability of this enterprise**

- Profit/loss = Estimated returns – Estimated costs ✓
- = R477 500 – R143 564 ✓
- Profit = R333 936 ✓

(3)

**3.1.3 Reasons for rose production**

- It is recommended ✓
- Show a profit ✓

(1)

(1)

**3.1.4 TWO measures to be more environmentally friendly**

- Use green energy ✓
- Use more manure/organic farming systems ✓
- Use less chemicals ✓

(Any 2)

(2)

**3.2 Absenteeism, social and financial problems**

**3.2.1 TWO labour challenges**

- Low wages ✓
- Lack of training/unskilled labour ✓
- Low productivity ✓
- Long working hours ✓

(Any 2)

(2)

**3.2.2 Statements associated with legislation**

- (a) Wages/working hours ✓
- (b) Provided a training centre to address training/educational needs ✓

(1)

(1)

**3.2.3 THREE conditions to motivate employees**

- Higher wages/payment of employees ✓
- Full time nurse/primary health care ✓
- Social worker ✓
- Provision of housing ✓
- Education/training ✓

(Any 3)

(3)

**3.3 Management in a farming enterprise**

- 3.3.1 **Indication of management skill in picture B**  
Communication/interpersonal skill/problem solving ✓ (1)
- 3.3.2 **Justification**  
There is communication between the farming personnel ✓ (1)
- 3.3.3 **Identification of a risk management strategy in picture A**  
Diversification ✓ (1)
- 3.3.4 **TWO reasons visible in the picture**
- Pasture production ✓
  - Horticulture ✓
  - Field crop ✓
  - Fodder production ✓
  - Timber production/orchard ✓ (Any 2) (2)
- 3.3.5 **TWO principles enabling the manager to farm successfully**
- Planning ✓
  - Implementation ✓
  - Control ✓
  - Organisation ✓
  - Leadership
  - Decision making ✓ (Any 2) (2)

**3.4 A flow diagram illustrating properties of land as a production factor**

- 3.4.1 **Functions of land represented by**
- A** - Provision of mineral resources ✓ (1)
  - B** - Food production/raw materials ✓ (1)
  - C** - Space/area for production ✓ (1)
  - D** - Space/area for capital wealth/human settlement/industry ✓ (1)
- 3.4.2 **Provisions a farmer can employ to improve land productivity**
- The use of scientific methods/technology/precision farming ✓
  - Provision of water ✓
  - Consolidating uneconomical farming units ✓
  - Suitable crops/use for the land ✓ (Any 2) (2)

**3.5 List of activities on a farm****Task that need to be done by each labourer**

- 3.5.1 **Casual labourer** - Construction of tunnels ✓ (1)
- 3.5.2 **Permanent labourer** - Cultivation of fields with a tractor ✓ (1)
- 3.5.3 **Seasonal labourer** - Wool shearing ✓ (1)

3.6 **TWO forms of credit and the purpose for usage**

FORMS OF CREDIT	PURPOSE FOR USAGE
Short term ✓	Production capital ✓
Medium term ✓	Equipment/livestock ✓
Long term ✓ (Any 2)	Fixed assets/land ✓ (Any 2)

Table with the correct information ✓

(5)  
[35]**QUESTION 4: BASIC AGRICULTURAL GENETICS**4.1 **Representation of a cross between a black cow and a white bull**4.1.1 **Identification of the genotype**

- (a) Parent black cow - Bb ✓  
(b) Parent white bull - bb ✓

(1)  
(1)4.1.2 **Determination of the F<sub>2</sub> offspring**

- Phenotype - white ✓

(1)

4.1.3 **Punnet square**

♀ ♂	B	b ✓
b	Bb	bb
b ✓	Bb	bb ✓

1 mark for Punnett square with information ✓

(4)

4.2 **Crossing of plants with red (R) flowers and plants with white (W) flowers**4.2.1 **Indication of the parent with red flowers**

- Female ✓
- Reason**
- RR is for red flowers/genotype is RR ✓

(1)  
(1)4.2.2 **Determination of the phenotype as percentages in the F<sub>2</sub>**

- 25% white ✓
- 50% pink/white and red ✓
- 25% red ✓

(1)  
(1)  
(1)4.2.3 **Identification the type of dominance indicated by this crossing**  
Incomplete dominance/co-dominance ✓

(1)

4.2.4 **Justification of the answer in QUESTION 4.2.3**

The offspring is neither white nor red/pink/intermediate colour  
/white and red ✓

(1)



**4.3 Crossing parents with TWO characteristics**

- 4.3.1 **Identification of the crossing**  
Dihybrid cross ✓ (1)
- 4.3.2 **Determination of characteristics received by each offspring**
- Offspring 1 - Colour ✓ (1)
  - Offspring 2 - Shape ✓ (1)
  - Offspring 3 - Shape ✓ (1)
- 4.3.3 **Indication of the dominant characteristics**
- Square shape ✓
  - White colour ✓ (2)
- 4.3.4 **Indication of the percentage of genes received**  
50%/each received 50% genes from both parents ✓ (1)

**4.4 A passage on GM's**

- 4.4.1 **Identification of the year Farmer B changed to GM crops**
- 2012 ✓ (1)
- Reason**
- Increase in production/from 10,6 - 12 started in 2012 ✓ (1)
- 4.4.2 **ONE advantage that Farmer B got from using GM maize**  
Yields improved for 2012/improved progressively more from 2012 - 2015 ✓ (1)
- 4.4.3 **THREE characteristics of GMO maize to Farmer B**
- Resistance to herbicides ✓
  - Not affected by insecticides ✓
  - Crops have lower water requirements ✓
  - Better adapted to the region ✓ (Any 3) (3)
- 4.4.4 **Main reason for the resistance against the use GM's**
- Health risks ✓
  - Environmental risks ✓ (Any 1) (1)

**4.5 Scenario on breeding system**

- 4.5.1 **Identification of the animal breeding system applied by Farmer B**
- Crossbreeding ✓ (1)
- Reason**
- Crossing of two different breeds ✓ (1)
- 4.5.2 **TWO advantages of out crossing**
- The least likely system to produce any problems ✓
  - Offspring will carry the traits characteristics of both parents ✓
  - Improve genetic diversity/new blood line is introduced ✓ (Any 2) (2)

**4.5.3 TWO reasons why the old and non-fertile cows are sold**

- Reached the end of their production cycle/not productive ✓
- Efficiency by saving on nutrition ✓
- Improve the fertility of the herd ✓
- More economical for the farmer ✓

(Any 2) (2)

**4.5.4 Breeding system used by Farmer B with his own bulls**

Line/in breeding ✓

(1)

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