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

## **NATIONAL SENIOR CERTIFICATE**

**GRADE 12**

**AGRICULTURAL SCIENCES P2**

**FEBRUARY/MARCH 2017**

**MEMORANDUM**

**MARKS: 150**

**This memorandum consists of 9 pages.**

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

1.1	1.1.1	C ✓✓		
	1.1.2	D ✓✓		
	1.1.3	C ✓✓		
	1.1.4	C ✓✓		
	1.1.5	A ✓✓		
	1.1.6	A ✓✓		
	1.1.7	D ✓✓		
	1.1.8	A ✓✓		
	1.1.9	B ✓✓		
	1.1.10	B ✓✓	(10 x 2)	(20)
1.2	1.2.1	E ✓✓		
	1.2.2	J ✓✓		
	1.2.3	B ✓✓		
	1.2.4	C ✓✓		
	1.2.5	A ✓✓	(5 x 2)	(10)
1.3	1.3.1	Promotion/advertising ✓✓		
	1.3.2	Productivity ✓✓		
	1.3.3	Gene gun ✓✓		
	1.3.4	Genetic modification/engineering/GMO ✓✓		
	1.3.5	Qualitative characteristics ✓✓	(5 x 2)	(10)
1.4	1.4.1	Standardisation ✓		
	1.4.2	Inventory ✓		
	1.4.3	Monohybrid ✓		
	1.4.4	Dominant ✓		
	1.4.5	Segregation ✓	(5 x 1)	(5)

**TOTAL SECTION A: 45**

**SECTION B****QUESTION 2: AGRICULTURAL MANAGEMENT AND MARKETING****2.1 Supply and demand for a particular agricultural product****2.1.1 Identification of curves****A – Demand** ✓

(1)

**B – Supply** ✓

(1)

**2.1.2 Definition of equilibrium price**

- When the price of a product settles at the point where demand ✓
- Is equal to supply ✓

(2)

**2.1.3 Explanation of the relationship between curves A and B with price**

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

**OR**

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

(Any 1) (3)

**2.2 Marketing channels are related to a free market system****2.2.1 Matching of the marketing channels**

A. Farm-gate marketing ✓

(1)

B. Stock sales ✓

(1)

C. Marketing with contract ✓

(1)

D. Fresh produce market ✓

(1)

E. Internet marketing ✓

(1)

**2.2.2 TWO disadvantages of a free marketing system to the farmer**

- Prices fluctuate ✓
- Market costs are high/takes place on a small scale ✓
- Producer is responsible for marketing and producing ✓
- Limited bargaining power ✓
- High risk as many things can go wrong ✓
- Cartels formed and consumers are exploited ✓
- Agents leads to smaller profits ✓

(Any 2) (2)

**2.3 Flow chart of the path of products from the producer to the consumer****2.3.1 Identification of the letters representing the stages marketing**(a) **Demand – E** ✓

(1)

(b) **Supply – D** ✓

(1)

**2.3.2 Factor that can hamper marketing between stages C and D**

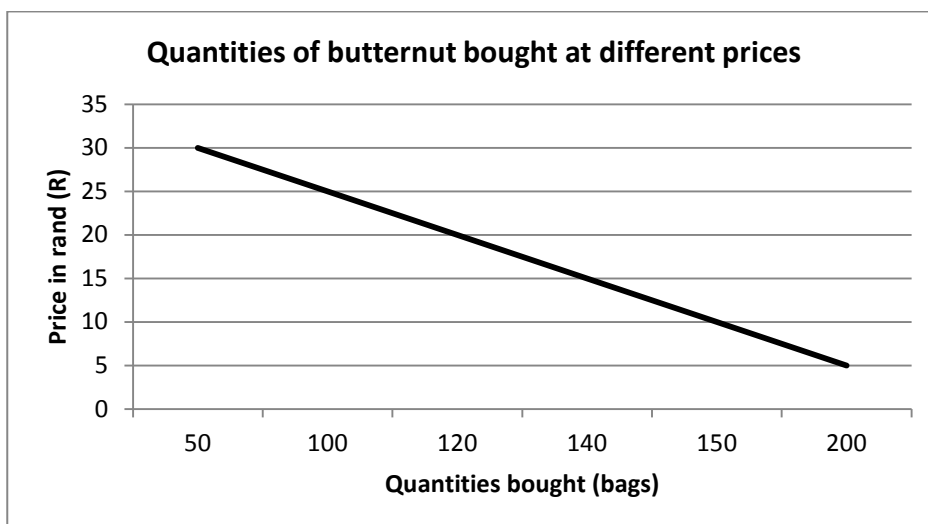
- High marketing costs ✓
- Limited availability of transport/rail/poor access roads/Infrastructure ✓
- Spoilage/perishability/accidents/theft/risk ✓ (Any 1) (1)

**2.3.3 TWO guidelines for packaging at stage C**

- Identify and provide useful information about the produce ✓
- Enclose the produce in convenient units for handling ✓
- Ensure that the produce is protected from mechanical damage ✓
- Packaging should not contain chemicals that could be toxic to the produce ✓
- Packaging must be recyclable ✓ (Any 2) (2)

**2.3.4 Factors determining the demand of peaches**

- Price of the product ✓
- Consumer income ✓
- Number of consumers ✓
- Taste/preference of consumers ✓
- Price of competing/complimentary commodities ✓
- Range/use of the products ✓
- Price expectations ✓ (Any 2) (2)

**2.4 The quantity of butternuts bought at different prices****2.4.1 Line graph to indicate the quantity and the price of butternuts****Criteria/rubric/marketing guidelines**

- Correct heading ✓
- Y-axis: correctly calibrated with label (price per bag) ✓
- X-axis: correctly calibrated with label (number sold) ✓
- Correct units (Rand and bags) ✓
- Accuracy ✓
- Line graph ✓ (6)

- 2.4.2 **The tendency in the price as the quantity of butternuts declines**  
The price increases/higher/more ✓ (1)

2.5 **Different phases in the process of entrepreneurship**

- 2.5.1 **Re-arrangement the entrepreneurial phases**
- C ✓ (1)
  - B ✓ (1)
  - D ✓ (1)
  - A ✓ (1)
- 2.5.2 **THREE problems that can be encountered with the phase of planning**
- Insufficient research ✓
  - Leaving gaps/being vague/providing too much information ✓
  - Insufficient technical details ✓
  - Unrealistic assumptions and projections ✓
  - Not highlighting potential competition ✓
  - Hiding weaknesses and risks ✓
  - Using the incorrect format ✓
- (Any 3) (3)  
[35]

**QUESTION 3: PRODUCTION FACTORS**

3.1 **Farming enterprise**

- 3.1.1 **The interest the farmer will pay back**
- R190 000 x 0,125 (12,5%) ✓
  - R23 750 ✓ (2)
- 3.1.2 **The profitability of the farming enterprise**
- Income – expenditure ✓
  - R212 500 – R213 750 ✓
  - = – R1 250 ✓ (3)
- 3.1.3 **Recommendation for farmer to continue with a reason**
- Should not continue/not recommended ✓ (1)
- Reason**
- Not profitable/runs at a loss/deficit of R1 250/ – R1 250 ✓ (1)

3.2 **The Occupational Health and Safety Act, 1993 (Act 85 of 1993)**

- 3.2.1 **Brief explanation of the intention of this Act**
- Aims to provide and regulate ✓
  - Health/safety in the work place ✓ (2)

**3.2.2 THREE guidelines for the farmer to comply with this legislation**

- Protective clothing ✓
  - Gloves ✓
  - Footwear/gumboots ✓
  - Goggles/eye protection ✓
  - Dust masks ✓
  - Training on operating equipment/handling chemicals/apparatus ✓
  - Noise/ear protection ✓
- (Any 3) (3)

**3.3 Production factors are coordinated for effective agricultural production****3.3.1 Identification of each of the following**

- (a) **Farm manager** – A ✓ (1)
- (b) **Farm labourer** – C ✓ (1)
- (c) **Movable capital** – D/E ✓ (1)
- (d) **Fixed capital** – B/F ✓ (1)

**3.3.2 Management principle reflected with a reason**

- Supervision/Control/Coordination ✓ (1)
- REASON**
- Entrepreneur is supervising workers according to the plan ✓ (1)

**3.3.3 Entrepreneurial skills that are visible in the illustration above**

- Planning/interpretation ✓
  - Management skills ✓
  - Organisational skills ✓
- (3)

**3.4 Different ways in which the farmer can improve land productivity****3.4.1 Measures of improving land productivity**

- (a) Improving soil fertility ✓ (1)
- (b) Consolidation of uneconomical farm units ✓ (1)
- (c) Water management ✓ (1)
- (d) Scientific method ✓ (1)

**3.4.2 THREE economic functions of land**

- Source of wealth ✓
  - Enables production of food/fibre/fuel/biotic materials ✓
  - Physical space for settlement/industry/recreation/transport ✓
- (3)

**3.5 Record of a farming enterprise for a period of three months****3.5.1 Identification of the farming records**

- Cash flow budget ✓ (1)

- 3.5.2 **Items on the record to support the answer**
- Opening balance ✓
  - Receipts/income/ ✓
  - Payments/expenses ✓ (Any 2) (2)
- 3.5.3 **Document to determine the net worth of the farming business**  
Income statement ✓ (1)
- 3.5.4 **TWO benefits for the farmer to have a record**
- Shows the need for borrowing ✓
  - Money available for investment ✓
  - Money available to make purchases ✓
  - Enough cash to meet the needs of the enterprise ✓ (Any 2) (2)
- 3.5.5 **The implication of negative net cash in March**
- Restricted cash flow ✓
  - Need for borrowing money to meet the needs ✓ (Any 1) (1)
- [35]**

#### QUESTION 4: BASIC AGRICULTURAL GENETICS

- 4.1 **Different breeding methods and technologies**
- 4.1.1 **Identification of the breeding method**
- (a) Upgrading ✓
  - (b) Inbreeding ✓
  - (c) Crossbreeding ✓ (3)
- 4.1.2 **Methods to change the enterprise from commercial to stud**  
Upgrading ✓ (1)
- 4.1.3 **Breeding method that heterosis or hybrid vigour derives from**  
Crossbreeding ✓ (1)
- 4.1.4 **TWO disadvantages of crossbreeding**
- Required expert knowledge ✓
  - Progeny is of poor quality ✓
  - Destroys characteristics/more heterozygote's ✓ (Any 2) (2)
- 4.2 **The improvement of maize with *Bacillus thuringiensis* (Bt)**
- 4.2.1 **TWO potential benefits of this GM crop**
- Environmental benefits/pest/insect resistance/use less chemicals/less susceptible to diseases ✓
  - Economic benefits/higher yields/production/mature quicker ✓
  - Health benefits/healthier/tastier/more nutritious foods ✓ (Any 2) (2)



**4.2.2 TWO negative effects of GM crops on the environment**

- Bt is only specific on certain classes of insects and still impacts on the environment ✓
- Indiscriminate use of weed killers can destroy useful plants ✓
- Insect resistant plants also kill beneficial insects ✓
- Production of super weeds ✓ (Any 2) (2)

**4.2.3 The technique using this bacterium to modify maize**

- The gene is incorporated into the maize plant where it produces toxins ✓
- To protect the plant against the maize stalk borer ✓ (2)

**4.3 The phenomenon of variation****4.3.1 TWO benefits of variation in a breeding programme**

- Improving existing breeds/cultivars ✓
- Producing new breeds/cultivars ✓ (2)

**4.3.2 Two internal/genetic causes of variation**

- Mutations/recombination of genes/abnormalities ✓
- Translocation/duplication/inversion/ deletion/ crossing over/ omission of chromosomes ✓
- Meiosis ✓ (Any 2) (2)

**4.3.3 Difference between variation and selection**

**Variation** – is the phenomenon that refers to differences ✓ in the characteristics of individuals ✓ (2)

**Selection** – is the process of choosing individuals ✓ with desirable characteristics to be used as parents ✓ (2)

**4.4 Brown coat colour in goats is dominant over that for white coat colour****4.4.1 Genotypes of the individuals**

- 1 – Bb ✓ (1)
- 2 – Bb ✓ (1)

**4.4.2 Phenotypes of the offspring in the F1 generation labelled**

- 3 – Brown ✓ (1)
- 5 – Brown ✓ (1)

**4.4.3 The percentage of the F1 heterozygous for a brown coat colour**

50% ✓ (1)

**4.4.4 Coat colour of progeny if 6 is crossed with individual of similar genetic compound with reason**

- White ✓ (1)

**Reason**

- Both are homozygous white/bb ✓ (1)

**4.5 White flowers (W) are crossed with red flowers (R)****4.5.1 Punnett square method to illustrate the offspring of the F<sub>2</sub>**

	W	R ✓
W	WW	WR
R ✓	WR	RR ✓

Punnett square ✓ (4)

**4.5.2 The type of dominance in QUESTION 4.5.1**

Incomplete dominance ✓

(1)

**4.5.3 Reason for the answer in QUESTION 4.5.2**

Intermediate colour/all the offspring are pink ✓

(1)

**4.5.4 The phenotypic ratio of the F<sub>2</sub> -generation**

1:2:1 ✓

(1)

**[35]**

**TOTAL SECTION B: 105**  
**GRAND TOTAL: 150**