



basic education

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)

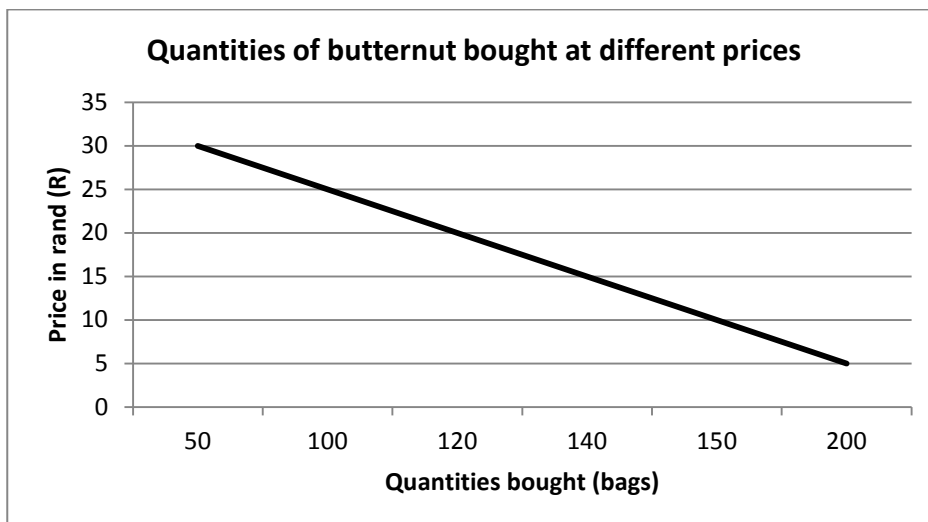
2.3 Flow chart of the path of products from the producer to the consumer**2.3.1 Identification of the letters representing the stages marketing**

- (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/marking 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)
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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 refer 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 F₂**

	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 F₂-generation**

1:2:1 ✓

(1)

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TOTAL SECTION B: 105
GRAND TOTAL: 150