



# basic education

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

**NATIONAL  
SENIOR CERTIFICATE**

**GRADE 12**

**AGRICULTURAL SCIENCES P2  
FEBRUARY/MARCH 2017  
MEMORANDUM**

**MARKS: 150**

*Approved*  
*Selwane MA*  
*Internal moderator*  
*27/03/2017*

*Geumani-Mokhaniso*  
*T.N.*  
*Chief Examiner*  
*27/03/2017*

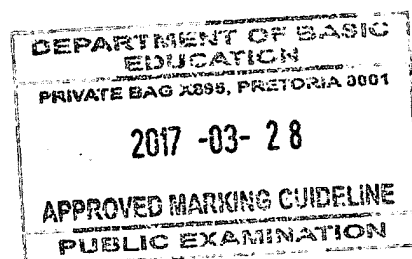
**This memorandum consists of 9 pages.**

*Approved*  
*SM Gcwensa*  
*Umalusi*  
*29-03-2017*

DEPARTMENT OF BASIC  
EDUCATION  
PRIVATE BAG X895, PRETORIA 0001  
2017 -03- 28  
APPROVED MARKING GUIDELINE  
PUBLIC EXAMINATION

**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/marketing ✓✓		
	1.3.2	Productivity ✓✓		
	1.3.3	Gene gun/syringe/gene pulsar ✓✓		
	1.3.4	Genetic modification/engineering/manipulation ✓✓		
	1.3.5	Qualitative characteristics ✓✓	(5 x 2)	(10)
1.4	1.4.1	Standardisation ✓		
	1.4.2	Inventory ✓ o		
	1.4.3	Monohybrid ✓		
	1.4.4	Dominant ✓		
	1.4.5	Segregation ✓	(5 x 1)	(5)
			<b>TOTAL SECTION A:</b>	<b>45</b>



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CA  
FIN

**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 ✓

**OR**

- Is when the demand for a product at a specific price ✓ is equals to the supply of that product at the same price ✓

(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 ✓

**OR**

- The interaction between A and B ✓ determining the price of the product ✓ and quantity demanded ✓

(3)

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

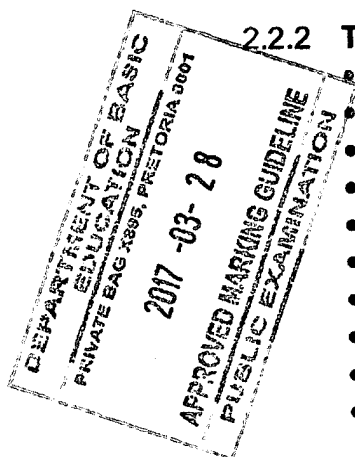
- A. Farm-gate marketing/fresh produce market ✓ (1)
- B. Stock sales ✓ (1)
- C. Marketing with contract ✓ (1)
- D. Fresh produce market ✓ (1)
- E. Internet marketing ✓ (1)

**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 ✓
- Agents leads to smaller profits ✓
- Competing producers with more resources will produce more ✓
- Overproduction can lead to surplus ✓
- Necessary inputs can be too expensive if the price is not fixed ✓
- No barriers to dumping by foreign markets ✓

(Any 2)

(2)



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## 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

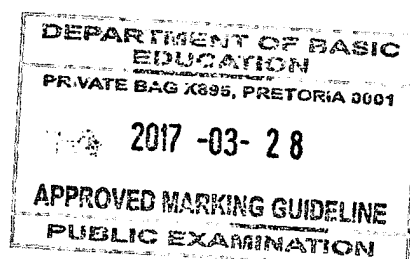
- High marketing costs ✓
- Limited availability of transport/rail/poor access roads/ Infrastructure ✓
- Spoilage/perishability/accidents/theft/risk/ lack of storage facilities ✓
- Poor handling ✓
- Poor packaging ✓
- Bulkiness in relation to value ✓
- Export regulations ✓
- Seasonal character of production ✓ (Any 1) (1)

### 2.3.3 TWO guidelines for packaging at stage C

- Identify and provide useful information about the produce/ warning of harmful products ✓
- 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 ✓
- Packaging must be protected from fungal growth ✓ (Any 2) (2)

### 2.3.4 Factors determining the demand of peaches

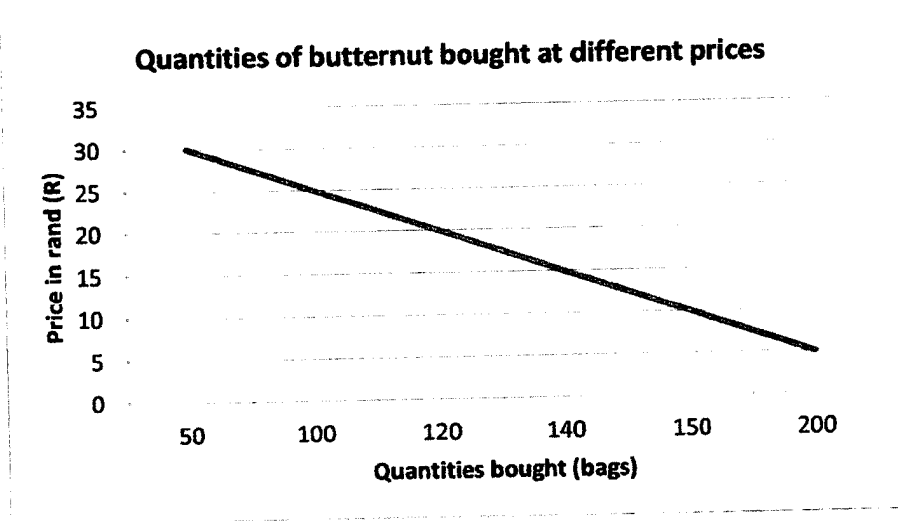
- Price of the product ✓
- Consumer income/ buying power of consumers ✓
- Number of consumers ✓
- Taste/preference of consumers ✓
- Price of competing/complimentary commodities/substitutes ✓
- Range/use of the products ✓
- Price expectations ✓
- Quality of the product ✓
- Research ✓
- Advertising/ fashion ✓
- Socio- economic factors ✓
- Legislation ✓
- Festive season ✓ (Any 2) (2)



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**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 (quantities bought) ✓
  - Correct units (Rand and bags) ✓
  - Line graph ✓
  - Accuracy ✓
- (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**

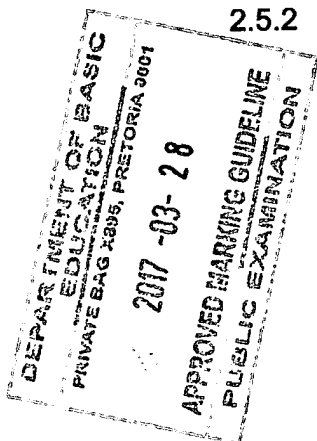
- 2.5.1 Re-arrangement the entrepreneurial phases**
- C ✓
  - B/D ✓
  - D/B ✓
  - A ✓
- (1)  
(1)  
(1)  
(1)

**(Statements should also be considered)**

**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 ✓
- Incomplete financial ✓

(Any 3) (3)  
**[35]**



*SM*  
*MA*  
*J.N.*

**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%) ✓ (2)
- R23 750 ✓

**3.1.2 The profitability of the farming enterprise**

- Income – expenditure ✓
- R212 500 – R213 750 ✓ (3)
- = – R1 250 ✓

**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**

- Promotes/ provides and regulates ✓ health and 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/ safety gear ✓
- Training on operating equipment/handling chemicals/apparatus ✓
- Noise/ear protection ✓
- Warning signs for dangerous areas ✓
- Emergency exit/ assembly points ✓
- Hanging of legislation posters ✓ (Any 3) (3)

**3.3 Co-ordination of production factors****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 in the picture**

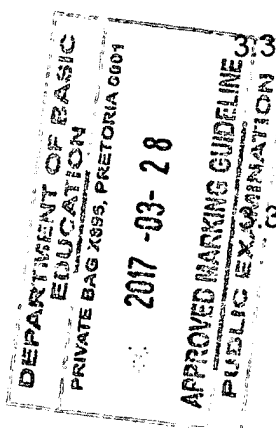
- Supervision/Control/Coordination ✓ (1)

**Reason**

- Entrepreneur is supervising workers according to the plan ✓ (1)

**3.3 Entrepreneurial skills that are visible in the picture**

- Communication skills ✓
- Interpersonal skills ✓
- Planning/interpretation ✓
- Management skills/ monitoring/ leading and directing/ controlling ✓
- Organisational skills ✓



- Decision making ✓
  - Operational skills ✓
- (Any 3) (3)

### 3.4 Ways of improving 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/better care of water resources ✓ (1)
- (d) Scientific method/research/ precision farming/ modern technology ✓ (1)

#### 3.4.2 THREE economic functions of land

- Source of wealth /minerals ✓
  - Enables production of food ✓
  - Physical space for settlement/industry/recreation/transport
  - Provision of raw materials/fibre/fuel/ ✓
  - Used as a collateral ✓
- (Any 3) (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 ✓
  - Closing balance ✓
  - Receipts/income ✓
  - Payments/expenses ✓
  - Net cash ✓
- (Any 2) (2)

#### 3.5.3 Document to determine the net worth of the farming business

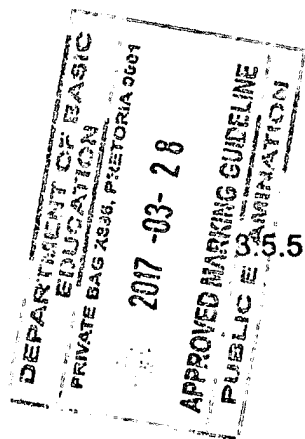
Income statement/balance sheet ✓ (1)

#### 3.5.4 TWO benefits for the farmer to have a record

- Shows the need for borrowing ✓
  - Money available for investment/money invested/ budgeting ✓
  - Money available to make purchases ✓
  - Enough cash to meet the needs of the enterprise/determines liquidity ✓
  - For future reference ✓
  - Gives an idea of what is owned and owed ✓
- (Any 2) (2)

#### The implication of negative net cash in March

- Restricted cash flow ✓
  - Need for borrowing money to meet the needs ✓
  - Poor financial management ✓
- (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/line breeding ✓
  - (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**

- Requires expert knowledge /close monitoring/ experience ✓
  - Progeny cannot be used for further breeding ✓
  - Destroys characteristics/more heterozygotic ✓
- (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/ lower production costs ✓
  - Health benefits/healthier/tastier/more nutritious foods ✓
  - Longer shelf life ✓
  - Crops maybe grown in a previously non arable land ✓
- (Any 2) (2)

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

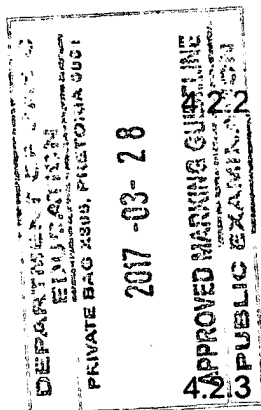
- Bt is only specific on certain classes of insects and still impacts on the environment ✓
  - Indiscriminate use of weed killers can destroy useful plants/ reduced biodiversity ✓
  - Production of super weeds/ reduced effectiveness of pesticides ✓
  - Insect resistant plants also kill beneficial insects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

**Explanation of the technique 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/ omission of chromosomes ✓
- Meiosis/ crossing over ✓
- Fertilisation ✓

(Any 2) (2)

**4.3.3 Difference between variation and selection**

**Variation** – is the phenomenon that refer to differences✓ in the characteristics of individuals of the same species✓

(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/both are recessive ✓

(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)

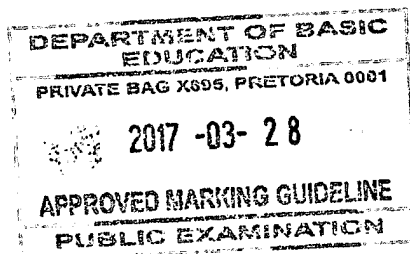
**4.5.3 Reason for the answer in QUESTION 4.5.2 Intermediate colour/all the offspring are pink/no dominance ✓**

(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**