



# basic education

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

## SENIOR CERTIFICATE EXAMINATIONS

**AGRICULTURAL SCIENCES P2**

**JUNE 2017**

**MARKING GUIDELINES**

**MARKS: 150**

**These marking guidelines consist of 9 pages.**

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

1.1	1.1.1	D ✓✓		
	1.1.2	C ✓✓		
	1.1.3	B ✓✓		
	1.1.4	D ✓✓		
	1.1.5	A ✓✓		
	1.1.6	C ✓✓		
	1.1.7	A ✓✓		
	1.1.8	D ✓✓		
	1.1.9	D ✓✓		
	1.1.10	B/C/D ✓✓	(10 x 2)	(20)
1.2	1.2.1	E ✓✓		
	1.2.2	J ✓✓		
	1.2.3	C ✓✓		
	1.2.4	D ✓✓		
	1.2.5	B ✓✓	(5 x 2)	(10)
1.3	1.3.1	Fixed price/cost/price fixing/hedging ✓✓		
	1.3.2	Management ✓✓		
	1.3.3	Inversion ✓✓		
	1.3.4	Polygenic ✓✓		
	1.3.5	Cross breeding/out crossing ✓✓	(5 x 2)	(10)
1.4	1.4.1	Market segment ✓		
	1.4.2	Closing balance ✓		
	1.4.3	Continuous ✓		
	1.4.4	Biometrics ✓		
	1.4.5	Heterosis/hybrid vigour ✓	(5 x 1)	(5)
<b>TOTAL SECTION A:</b>			<b>45</b>	

**SECTION B****QUESTION 2: AGRICULTURAL MANAGEMENT AND MARKETING****2.1 Market functions****2.1.1 The letter representing the functions of marketing**

- (a) C ✓ (1)
- (b) B/D ✓ (1)
- (c) D ✓ (1)
- (d) A ✓ (1)

**2.1.2 THREE advantages of processing agricultural products**

- Prevents spoilage/perishability/increases shelf life/increases storage period ✓
- The product is available throughout the year ✓
- Improves food safety ✓
- Easy to transport ✓
- Adds/increases value/quality/usefulness of product ✓
- It provides job/business opportunities ✓
- Reduces wastage of excess produce ✓
- It is a way of overcoming over-supply of products ✓
- It allows for easier packing and handling of products ✓
- Higher price of products/higher income/profit ✓ (Any 3) (3)

**2.2 Marketing channels**

- 2.2.1 Farm gate marketing ✓ (1)
- 2.2.2 Stock auction ✓ (1)
- 2.2.3 Contract market ✓ (1)
- 2.2.4 Fresh produce market ✓ (1)
- 2.2.5 Internet marketing ✓ (1)

**2.3 Graph on price equilibrium****2.3.1 Identification of curves**

- **A** Demand ✓ (1)
- **B** Supply ✓ (1)

**2.3.2 THREE factors affecting demand**

- Price of the product ✓
- Quality of products/usefulness of product ✓
- Consumer preferences/fashion/taste of consumers ✓
- Range of products available/substitute/complimentary products ✓
- Season/time/period of production ✓
- Income/status of consumers/buying power of consumers ✓
- Number of consumers ✓ (Any 3) (3)

**2.3.3 Definition of equilibrium**

The price where the supply ✓ is equal to the demand ✓

(2)

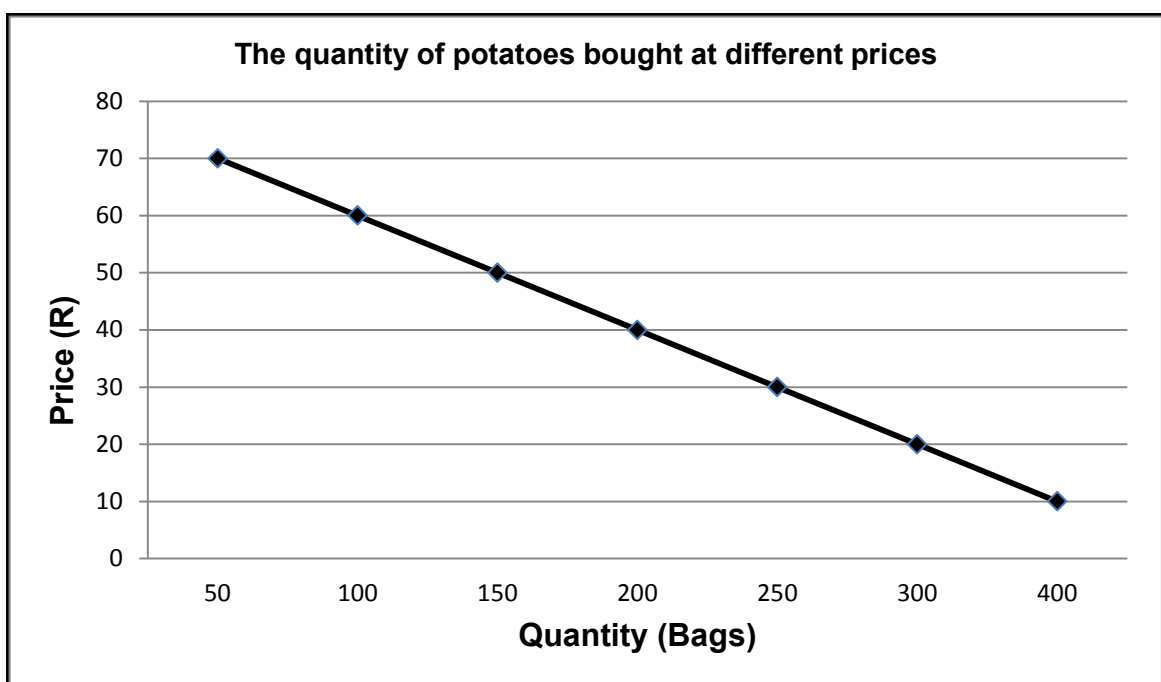
**2.3.4 Relationship between the price and the quantity demanded**

The higher the price, the lower the quantity demanded ✓✓

**OR**

The lower the price the higher the quantity demanded ✓✓

(2)

**2.4 The number of potatoes bought at different prices per week****2.4.1 Line graph showing the quantities of potatoes bought at different prices****Criteria/rubric/memorandum**

- Correct heading ✓
- X axis: Correctly calibrated and labelled (Quantity) ✓
- Y axis: Correctly calibrated and labelled (Price) ✓
- Correct units (R and bags) ✓
- Line graph ✓
- Accuracy ✓

(6)

**2.4.2 The price when most potatoes were bought**

R10 ✓

(1)

**2.4.3 Reason**

400 bags of potatoes were bought when the price was R10/the highest quantity was bought at R10/lowest price/highest quantity bought at the lowest price ✓

(1)

- 2.5 **THREE problems encountered when drawing up a business plan**
- Insufficient research done ✓
  - Vague business plan ✓
  - Insufficient cash flow allocated ✓
  - Unrealistic assumption and projections ✓
  - Hiding weaknesses and risks ✓
  - Not highlighting potential competition ✓
  - Using the incorrect format ✓
  - Inconsistent information on supplies ✓
- (Any 3) (3)
- 2.6 **THREE elements of the SWOT analysis**
- Strengths ✓
  - Weaknesses ✓
  - Opportunities ✓
  - Threats ✓
- (Any 3) (3)  
**[35]**

### QUESTION 3: PRODUCTION FACTORS

- 3.1 **The budget of a small-scale farmer for a year**
- 3.1.1 **ONE cost item that can be repaid over a period of five years**  
Loan (tractor) ✓ (1)
- 3.1.2 **Reason for the answer**  
A tractor is a medium term asset ✓ (1)
- 3.1.3 **Calculation of the highest income generated**
- R200 000 + R120 000 ✓
  - = R320 000 ✓
- (2)
- 3.1.4 **TWO problems associated with a medium term asset**
- Interest rate on loan ✓
  - Depreciation ✓
- (2)
- 3.1.5 **The profit of the enterprise**
- Profit = income – expenditure ✓
  - R320 000 – R252 500 ✓
  - Profit = R67 500 ✓
- (3)
- 3.2 **Labour legislation**
- 3.2.1 Basic Conditions of Employment Act, 1997 (Act 75 of 1997) ✓ (1)
- 3.2.2 Skills Development Act, 1998 (Act 97 of 1998) ✓ (1)
- 3.2.3 Occupational Health and Safety Act, 1993 (Act 85 of 1993) ✓ (1)

**3.3 Scenario on labour as a production factor****3.3.1 Identification of the type of labourers**

Seasonal labourers ✓

(1)

**3.3.2 Distinction between a permanent and a seasonal labourer**  
**Seasonal labourer**

- Employed only for harvesting/specific time/peak period of the year/season ✓

**Permanent labourer**

- Permanently employed throughout the year ✓

(2)

**3.4 THREE challenges of labour as a production factor**

- Shortages/scarcity of labour ✓
- High cost of labour ✓
- Lack of skills/training ✓
- Competition from other industries/economic migrants ✓
- Poor labour management/working conditions ✓
- Social problems/HIV and AIDS ✓
- Industrial action/strikes ✓

(Any 3)

(3)

**3.5 Calculation of the wage of the labourer working on a public holiday**

- $R150 \times 2/R150 + R150$  ✓
- $= R300$  ✓

(2)

**3.6 Management principles****3.6.1 Association of the statement with the management principles**

- **A** Control/supervision ✓
- **B** Organization/coordination ✓
- **C** Planning ✓

(3)

**3.6.2 THREE business managerial skills of a manager to perform duties at C**

- Conceptual ✓
- Analytical ✓
- Planning ✓
- Problem solving ✓
- Application skills
- Financial management skills ✓
- Implementation ✓
- Decision making ✓

(Any 3)

(3)

**3.7 Scenario on the increasing of land productivity**

3.7.1 Consolidation/consolidating uneconomic units/mechanisation ✓

(1)

3.7.2 Scientific methods/improve soil fertility/crop rotation/inter cropping ✓

(1)

- 3.7.3 Restoring land potential ✓ (1)
- 3.7.4 Improving water management ✓ (1)
- 3.8 **Explanation with an example the law of diminishing return**
- As the quantity of an input is increased, the yield (output) will increase ✓
  - until a specific point, thereafter it will increase at a decreasing rate ✓
  - **Example** (fertilizer application and maize yield) ✓ (3)
- 3.9 **TWO functions of land as a production factor**
- Source of minerals ✓
  - Used as a collateral ✓
  - Provides physical space for production ✓
  - Provides raw materials ✓
  - Food production ✓ (Any 2) (2)
- [35]**

#### QUESTION 4: BASIC AGRICULTURAL GENETICS

- 4.1 **Crossing of yellow and white flowers**
- 4.1.1 **Provision of the labels (a) - (e)**
- (a) Yy ✓
- (b) Yellow ✓
- (c) Yy ✓
- (d) 3:1 (Yellow to white) ✓
- (e) 1:2:1 ✓ (5)
- 4.1.2 **Type of dominance**  
Complete dominance ✓ (1)
- 4.1.3 **Justification**
- Yellow colour (Y) is dominant over white colour (y) ✓
  - No intermediate/new colour in the offspring ✓ (Any 1) (1)
- 4.2 **TWO crosses in F<sub>1</sub> generation**
- 4.2.1 **Indication of the type of crossing**  
Monohybrid ✓ (1)
- 4.2.2 **Reason**  
Crossing involving only one characteristic/trait ✓ (1)
- 4.2.3 **Prediction of the genotype of parents in the first crossing**
- **Parent 1** Bb ✓
  - **Parent 2** bb ✓
  - OR**
  - Bb ✓ x bb ✓ (2)

4.2.4 **Punnet square determining the genotypic percentage of the offspring in the second crossing**

♂ ♀	B	B ✓
b	Bb	Bb ✓
b	Bb	Bb

Punnet square with gametes and offspring ✓

Genotypic percentage of the offspring is 100% ✓

**Marking guidelines**

Complete Punnet square with gametes and offspring ✓

Correct gametes ✓

Correct offspring ✓

Correct percentage ✓

(4)

4.2.5 **Calculation of the phenotypic percentage of the offspring in the second crossing**

$$\text{Phenotypic \%} = \frac{4}{4} \times 100 \checkmark$$

$$= 100\% \text{ black } \checkmark$$

(2)

4.3 **Scenario on Genetic Modification**

4.3.1 **Identification of the advantage of GM seed over the traditional seed**

- Yield doubled during the first harvest ✓
- Spraying against bollworm is reduced/less costs ✓ (Any 1) (1)

4.3.2 **TWO possible techniques used to modify the cotton seed**

- Bacterial carriers/*Agrobacterium tumefaciens* ✓
- Gene gun/ biolistic ✓
- Electroporation ✓
- Micro - injection ✓
- Lipofection ✓
- Viral carriers ✓
- Gene silencing ✓
- Gene slicing ✓
- Gene recombination ✓
- Calcium-phosphate precipitation ✓ (Any 2) (2)

4.3.3 **TWO economic benefits of using genetically modified seed to the farmer**

- Reduced cost for pesticides ✓
- Higher yield/ more income ✓ (2)



4.3.4 **TWO impacts of using the GM cotton seed****(a) Environment**

- Less spraying leads to reduced pollution of environment ✓
- Leads to herbicide resistant crops/super weeds ✓
- Beneficial insects/pests are killed when feeding on insect resistant crops ✓
- Biodiversity is reduced ✓

(Any 2) (2)

**(b) Economic**

- Seeds are expensive/farmers have to buy new seed yearly/ farmers may not retain seeds for breeding purposes ✓
- High input costs as farmers must pay a technology fee ✓

(2)

4.4 **Breeding systems**

4.4.1 Cross breeding/upgrading ✓

(1)

4.4.2 Inbreeding ✓

(1)

4.4.3 Upgrading ✓

(1)

4.4.4 Species crossing ✓

(1)

4.5 **Breeding Value (BV)**4.5.1 **Calculation of the weaning weight of the progeny in kilograms**

$$16 + 6 = 22 \checkmark$$

$$\frac{22}{2} \checkmark$$

$$= 11 \text{ kg } \checkmark$$

**OR**

$$(16 \div 2) + (6 \div 2) \checkmark$$

$$8 + 3 \checkmark$$

$$= 11 \text{ kg } \checkmark$$

(3)

4.5.2 **Interpretation of the figure**

The offspring of these parents will be 11 kg heavier ✓ than the average of the herd ✓

(2)

**[35]**

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