



# basic education

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

## **NATIONAL SENIOR CERTIFICATE**

**GRADE 12**

**AGRICULTURAL SCIENCES P2**

**NOVEMBER 2014**

**MEMORANDUM**

**MARKS: 150**

**This memorandum consists of 11 pages.**

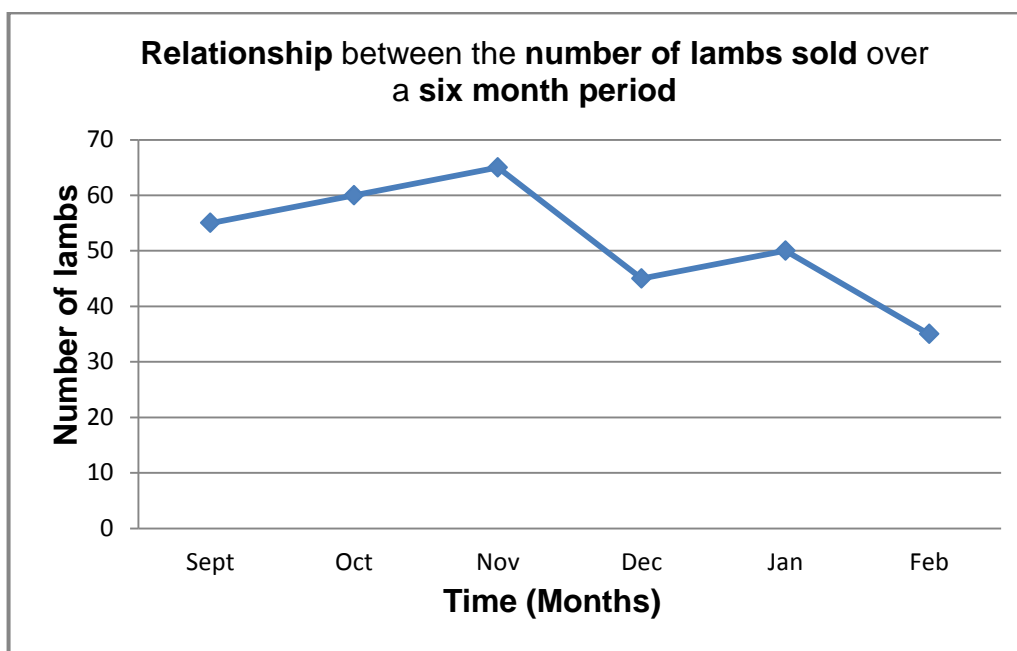
**SECTION A:****QUESTION 1**

1.1	1.1.1	B ✓✓		
	1.1.2	D ✓✓		
	1.1.3	A ✓✓		
	1.1.4	C ✓✓		
	1.1.5	C ✓✓		
	1.1.6	D ✓✓		
	1.1.7	D ✓✓		
	1.1.8	B ✓✓		
	1.1.9	C ✓✓		
	1.1.10	B ✓✓		(10 x 2) (20)
1.2	1.2.1	G ✓✓		
	1.2.2	J ✓✓		
	1.2.3	H ✓✓		
	1.2.4	B ✓✓		
	1.2.5	F ✓✓		(5 x 2) (10)
1.3	1.3.1	Budget ✓✓		
	1.3.2	Collateral/fixed asset ✓✓		
	1.3.3	Risk ✓✓		
	1.3.4	Genetic modification(GM)/engineering/biotechnology ✓✓		
	1.3.5	Quantitative ✓✓		(5 x 2) (10)
1.4	1.4.1	Co-operative/pool ✓		
	1.4.2	Bartering ✓		
	1.4.3	Entrepreneur ✓		
	1.4.4	Depreciation ✓		
	1.4.5	Variation/biometrics/EBV ✓		(5 x 1) (5)
<b>TOTAL SECTION A:</b>				<b>45</b>

**SECTION B****QUESTION 2: AGRICULTURAL MANAGEMENT AND MARKETING**

2.1 **The price and the quantity of lambs sold by a farmer over a period of six months**

2.1.1 **Line graph showing the relationship between the number of lambs sold and the months of the year**

**Criteria/rubric/marketing guidelines**

- Correct heading ✓
  - Y - axis –Correct labelled (Number of lambs) ✓
  - X - axis –Correct labelled (Sept. - Feb.) ✓
  - Correct calibrations of X and Y axe ✓
  - Accuracy ✓
  - Line graph ✓
- (6)

2.1.2 **Month with the highest income**

- November ✓✓
- (2)

2.1.3 **Marketing strategy**

- Use of a breeding season/planning for marketing stage ✓
- Supply most of their animals during the festive season/December ✓
- Promotion/advertising/market research ✓
- Market animals when the price is the highest ✓ (Any 1) (1)

2.1.4 **Calculation of the price per lamb for**

**(a) October:**  $27\text{kg} \times \text{R}81/\text{kg}$  ✓  
= R2 187 ✓ (2)

**(b) December:**  $27\text{kg} \times \text{R}110/\text{kg}$  ✓  
= R2 970 ✓ (2)

- 2.1.5 **Economic reason for a decrease in supply**
- Drop in price in January for lambs ✓
  - Biggest demand is over/festive season is over/  
withholding stock/speculating for a higher price ✓
  - Scarcity of money after the festive season ✓
  - The farmer ran out of stock/no stock available ✓ (Any 1) (1)

2.2 **Marketing strategies**

- 2.2.1 **Marketing system for group 2**  
Free marketing/direct system ✓ (1)

- 2.2.2 **TWO reasons to justification the choice in Question 2.2.1**
- Sold vegetables from door to door/sell at any place/  
no middleman ✓
  - Individuals responsible for their own marketing ✓
  - Sell at their own price ✓ (Any 2) (2)

- 2.2.3 **Group's marketing strategy**
- (a) Group 1 ✓ (1)  
(b) Group 2 ✓ (1)

- 2.2.4 **Reason for a pool marketing system**
- Sold at a fixed price/price control ✓
  - Vegetables were combined/stockpile ✓ (Any 1) (1)

2.3 **Diagram of the marketing procedures for an agricultural product.**

- 2.3.1 **Identification of marketing function**
- A: Distribution/transport/delivery ✓  
B: Processing/value adding ✓  
C: Packaging ✓ (3)

- 2.3.2 **Differentiation of the price of Product:**
- A - Raw product with a **lower** price ✓  
D - Processed product with a **higher** price ✓ (2)

- 2.3.3 **TWO aspects of a SWOT analysis**
- Strengths ✓
  - Weaknesses ✓
  - Opportunities ✓
  - Threats ✓ (Any 2) (2)

**2.3.4 TWO aspect to be included in feasibility study**

- Demand for the final product/market research ✓
- Availability of skilled labour ✓
- Capital investment needed/availability of capital ✓
- Support structures needed/resources/storage facilities ✓
- Distance to/from markets/accessibility ✓
- Operation of plant during the off season ✓
- Profitability ✓
- SWOT analysis ✓

(Any 2) (2)

**2.4 Activities related to the production and marketing of agricultural product****2.4.1 THREE activities in the following order:**

- Planning for production ✓
- Soil preparation and planting ✓
- Grading ✓
- Storage ✓
- Distribution ✓
- Sales to consumers ✓ (Any 3 in a CORRECT ORDER) (3)

**2.4.2 TWO problems with the distribution during marketing of agricultural products**

- Poor infrastructure/bad roads ✓
- Transportation/wide distribution and distances to markets ✓
- Accidents/theft can cause losses ✓
- High transportation cost ✓
- Spoilage of products in the market chain/perishability ✓
- Products not properly handled/stored ✓ (Any 2) (2)

**2.4.3 Activities related to the standardisation of agricultural products**

Grading ✓

(1)  
**[35]**

**QUESTION 3: PRODUCTION FACTORS****3.1 Contract between an employer and an employee**

- 3.1.1 Type of worker signing a contract**
- Permanent/fixed/full time worker ✓ (1)
- Justification with reason**
- Long term employment/1 February 2011 - retirement ✓✓
  - Entitled to some benefits, e.g. annual leave ✓✓ (Any 1) (2)
- 3.1.2 Labour legislation**
- (a) Basic Conditions of Employment Act.  
(Act Number 75 of 1997)**
- Duration of contract: 01 February 2011 - retirement or till the contract ends ✓
  - Remuneration/Amount ✓
  - Terms of employment/leave/working hours: ✓ (Any 1) (1)
- (b) Occupational, Health and Safety Act.  
(Act 85 of 1993)**
- Protective clothing: ✓ (1)
- 3.1.3 Aspect that contributes to scarcity of labour:**
- Remuneration of R2 500 ✓
  - The industry pay more for skilled labour ✓
- Or**
- Working hours from 06h00 to 17h00 ✓
  - Industry is shorter working hours ✓
- Or**
- Leave: One week paid leave per annum ✓
  - Longer/paid leave period is given to workers in industry ✓
- Or**
- Protective clothing: None ✓
  - Dangerous working conditions ✓ (2)
- 3.1.4 HIV impact on the productivity of a farming business**
- Worker would be sick and absent from work ✓
  - Lower productivity/worker will work slowly/shorter hours ✓
  - Labour shortages/difficult to complete tasks ✓
  - Extra financial/cost burden/support on the farmer ✓
  - Planning/running the farm becomes more difficult ✓
  - Loss of skills/experience ✓ (Any 2) (2)

**3.2 Diagram representing capital forms**

**3.2.1 Types of capital represented by:**

- A - movable capital ✓
- C - fixed/immovable/movable capital ✓ (2)

**3.2.2 TWO examples of floating capital in the farming operation**

- Feeds ✓
- Medication/chemicals ✓
- Cleaning/sanitation substances ✓
- Electricity ✓
- Fuel ✓
- Wages/salaries/cash ✓
- Fertilisers/manure ✓
- Stationery ✓
- Seeds ✓ (Any 2) (2)

**3.3 Information on assets and liabilities on a farm**

**3.3.1 Table and calculation of the net worth of the farm**

✓ Assets	Rand	Liabilities	Rand
Farm	3 500 000	Tractor loan	365 000
Vehicles	275 000	Overdraft	150 000
Cash	50 000	Bond	4 200 000
Buildings	650 000		
<b>Total</b>	<b>4 475 000 ✓</b>	<b>Total</b>	<b>4 715 000 ✓</b>
<b>Net worth</b>	<b>R 4 475 000 – R 4 715 000 = R – 240 000 or (R240 000 deficit) ✓✓</b>		

**Mark allocation/marking guidelines/rubric:**

- Redrawing the table with the correct headings
- Assets sorted correctly
- Total of assets
- Liabilities sorted correctly
- Total of liabilities
- Net worth (7)

**3.3.2 Viability of the farming business**

- Not viable ✓ (1)
- Justification with reason**
- Loss/deficit of – R240 000/insolvent/bankrupt/liabilities are greater than the assets ✓ (1)

**3.4 Fertilizer applied and the quantity of potato produced on piece of land****3.4.1 Economic characteristic shown by the data in the table**

- The law of diminishing returns ✓ (1)

**3.4.2 Relationship between fertilizer input and yield**

- Potato yield will increase with an increase in fertiliser input until optimum production is reached ✓
- A further increase in fertiliser input result in a decreasing increase of potato yield ✓
- After that production of potatoes will stabilise/remain constant ✓ (Any 2) (2)

**3.4.3 TWO measures a farmer can employ to the land in order to be more productive**

- Scientific/precision farming methods/fertiliser/manure/correct cultivation methods/crop rotation ✓
- Consolidation of small/uneconomic units ✓
- Restoring land potential/resting the land/correct land utilisation ✓
- Responsible application chemicals/pesticides/herbicides ✓
- Irrigation/permanent water supply ✓ (Any 2) (2)

**3.5 Passage on managerial principles****3.5.1 TWO managerial principles**

- Planning ✓
- Organization/co-ordination ✓
- Decision making ✓
- Control ✓
- Motivation ✓
- Communication ✓
- Leading and direction ✓
- Monitoring ✓
- Implementation ✓ (Any 2) (2)

**3.5.2 TWO external forces**

- Legal/legislation/politics ✓
- Economic/marketing environment ✓
- Capital /funding ✓ (Any 2) (2)

**3.5.3 Types of essential farm records**

- (a) List/record ✓ of assets/all the machinery/equipment/livestock/other moveable items on the farm ✓ (2)
- (b) A record of all the breeding stock ✓ that is used in a particular breeding program and their activities ✓ (2)

**[35]**



**QUESTION4: BASIC AGRICULTURAL GENETICS****4.1 Dihybrid crossing on horns and hair colour****4.1.1 The genotype of individual number 11 and 14**

(a) 11 - aaBB ✓ (1)

(b) 14 - Aabb ✓ (1)

**4.1.2 The phenotype of individual number 6 and 12**

(a) 6 - Red and polled/no horns ✓ (1)

(b) 12 - Black and horned ✓ (1)

**4.1.3 Phenotype of the offspring between number 6 and 16:**

✓	<b>Ab</b>	<b>Ab</b> ✓
<b>ab</b>	Aabb	Aabb ✓
✓ <b>ab</b>	Aabb	Aabb

**Mark allocation/marketing guidelines/rubric**

- Punnet square
- Parent 1 gametes
- Parent 2 gametes
- Genotype of offspring (4)

**4.1.4 Phenotype of the crossing in QUESTION 4.1.3**

- Red and polled/no horns ✓ (1)

**4.2 Breeding systems and technologies****4.2.1 The breeding methods:**

- A.** Upgrading ✓
- B.** Inbreeding ✓
- C.** Crossbreeding ✓ (3)

**4.2.2 Breeding method for heterosis**

C/A ✓ (1)

**4.2.3 TWO disadvantages of inbreeding**

- Loss of vigour/performance/inbreed depression ✓
- Loss of fertility ✓
- Smaller genetic variation ✓
- Increase of lethal genes which can result in death ✓
- Reduced vitality ✓
- Fixation of undesired genes ✓
- Expert knowledge required ✓
- Less resistance to diseases ✓
- Poorly adapted to the environment ✓
- Deformed animals ✓ (Any 2) (2)

**4.2.4 Change the enterprise from Brahman to a Bonsmara**

Upgrading/A ✓ (1)

**Nguni cattle with a distinct colour pattern**

- 4.3.1 **Identify this type/mechanism of heredity**  
 • Co-dominance ✓ (1)

- 4.3.2 **Explanation of colour combination**  
 • Both white and red hair fibres are present ✓  
 • The offspring has the phenotype of both parents ✓  
 • No intermediate/mixture of colour is formed ✓ (Any 2) (2)

- 4.3.3 **Difference between incomplete and co-dominance**  
 • **Incomplete dominance**  
 Offspring has a phenotype that is in-between those of the parents ✓  
 • **Co-dominance**  
 Offspring has the phenotype/colour of both parents ✓ (2)

4.4 **Techniques to change DNA of tomato plant**

- 4.4.1 **TWO other methods**  
 • Micro-injection ✓  
 • Gene gun/biolistic ✓  
 • Agro-bacterium tumefaciens ✓  
 • Electroporation ✓  
 • Recombination DNA ✓  
 • Calcium phosphate precipitation ✓  
 • Gene silencing ✓  
 • Gene splicing ✓  
 • Lipofection ✓ (Any 2) (2)

- 4.4.2 **TWO disadvantages of DNA modified tomatoes**  
 • Health concerns/allergies ✓  
 • Not enough research has been done ✓  
 • Expensive ✓  
 • Super weeds develop from tomato pollen ✓  
 • Religious beliefs ✓ (Any 2) (2)

4.5 **Differences between continuous and discontinuous variation****Continuous variation**

- There is a complete range of characteristics from one extreme to another ✓

**Discontinuous variation**

- Characteristics have a few clear-cut forms/no intermediate forms in between ✓ (2)

**4.6 Traditional selection method****4.6.1 Define selection**

- Process of choosing/identifying specific individuals ✓
- For their desired characteristics/traits ✓
- To be used in the production of quality offspring ✓ (Any 2) (2)

**4.6.2 Method of selection in the scenario.**

- Mass selection ✓ (1)

**4.6.3 THREE characteristic considered for selection**

- Growth ✓
- Health ✓
- Fertility ✓ (3)

**4.6.4 Aspects to improve phenotype of animals**

**(a) Best** bulls for growth/health/fertility were shared ✓ (1)

**(b) Utilizing** the best available pastures/keeping them away from wet/muddy areas ✓ (1)

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