



# basic education

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

## **NATIONAL SENIOR CERTIFICATE**

**GRADE 12**

**AGRICULTURAL SCIENCES P2**

**FEBRUARY/MARCH 2016**

**MEMORANDUM**

**MARKS: 150**

**This memorandum consists of 9 pages.**

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

1.1	1.1.1	B ✓✓		
	1.1.2	C ✓✓		
	1.1.3	A ✓✓		
	1.1.4	C ✓✓		
	1.1.5	B ✓✓		
	1.1.6	C ✓✓		
	1.1.7	A ✓✓		
	1.1.8	D ✓✓		
	1.1.9	D ✓✓		
	1.1.10	C ✓✓		(10 x 2) (20)
1.2	1.2.1	D ✓✓		
	1.2.2	C ✓✓		
	1.2.3	E ✓✓		
	1.2.4	A ✓✓		
	1.2.5	G ✓✓		(5 x 2) (10)
1.3	1.3.1	Budget ✓✓		
	1.3.2	Equilibrium price ✓✓		
	1.3.3	Capital ✓✓		
	1.3.4	Biometrics ✓✓		
	1.3.5	Epistasis ✓✓		(5 x 2) (10)
1.4	1.4.1	Marketing ✓		
	1.4.2	Technical ✓		
	1.4.3	Net Farm Income ✓		
	1.4.4	Skilled ✓		
	1.4.5	Breeding value ✓		(5 x 1) (5)
			<b>TOTAL SECTION A:</b>	<b>45</b>

**SECTION B****QUESTION 2: AGRICULTURAL MANAGEMENT AND MARKETING****2.1 The illustration representing marketing strategy****2.1.1 Marketing strategies**

- A A - Product ✓
- B B - Price ✓
- C C - Place ✓
- D D - Promotion ✓

(4)

**2.1.2 TWO factors to consider when planning a product**

- Quality ✓
- Design ✓
- Branding ✓
- Packaging ✓
- Size ✓
- Warranty ✓

(Any 2) (2)

**2.1.3 TWO ways to implement the strategy**

- Advertising ✓
- In-store promotion ✓
- Direct mailing ✓
- Trade fairs and exhibition ✓
- Sponsorship ✓
- Personal selling ✓

(Any 2) (2)

**2.1.4 TWO aspects to consider when deciding on pricing**

- Cost ✓
- Demand ✓
- Competition ✓

(Any 2) (2)

**2.2 Marketing system****2.2.1 Identification of the marketing system**

Co-operative marketing system ✓

(1)

**2.2.2 THREE advantages of co-operative marketing**

- Farmers (producers) will have a better chance to negotiate a good price for their produce ✓
- They will have an access to professional expertise ✓
- They can afford better infrastructure as a group than as individuals ✓
- They can buy fertiliser or packaging material cheaper ✓
- They can develop a brand for their produce which makes them more visible to the potential buyers ✓
- They can access funding from the government as a cooperative ✓

(Any 3) (3)

**2.2.3 TWO principles of co-operative marketing**

- Voluntary membership ✓
- Democratic member control ✓
- Member's economic participation ✓
- Autonomy and independency ✓

(Any 2) (2)

**2.3 Quantities of product 1 and 2 supplied****2.3.1 Formulation of hypothesis**

Producers may not increase the supply of agricultural product ✓  
even when the price has increased in a short period of time ✓

**OR**

If the price of an agricultural product increases, ✓ the supply may  
not increase within a short period of time ✓

(2)

**2.3.2 Calculation of price elasticity of supply for product 1 and 2**

- Product 1 =  $\frac{13\%}{20\%}$  ✓  
= 0,65 ✓

(2)

- Product 2 =  $\frac{39\%}{20\%}$  ✓  
= 1,95 ✓

(2)

**2.3.3 Interpretation of price elasticity of supply for the two products**

- Supply for product 1 is inelastic ✓
- Supply for product 2 is elastic ✓

(2)

**2.3.4 TWO factors affecting supply of the products**

- Price ✓
- Possibilities of increasing the supply of goods/time ✓
- Technology ✓
- Production costs ✓
- Expectations of the future price ✓
- Environmental conditions ✓
- Subsidies ✓

(Any 2) (2)

**2.4 SWOT analysis****2.4.1 Use of SWOT analysis to identify the following****(a) TWO strengths**

- Availability of land ✓
- Services by an extension officer ✓
- Human resource ✓

(Any 2) (2)

**(b) ONE weakness**

- Lack of capital ✓
- Lack of skills ✓

(Any 1) (1)

**(c) ONE opportunity**

- Identified market ✓
- Services of the extension officer ✓

(Any 1) (1)

**(d) TWO threats**

- Unreliable weather ✓
- Competition from another project/Flourishing project in a nearby village ✓
- Lack of funds ✓
- Lack of skills ✓

(Any 2) (2)

**2.4.2 THREE actions to correct threats**

- Application of scientific methods/ use of modern technology ✓
- Establishment of sound market chain ✓
- Consider processing and value adding ✓
- Source interest free funding and subsidies ✓
- Consider training; internships and voluntary hands on experience ✓

(Any 3) (3)

**[35]****QUESTION 3: PRODUCTION FACTORS****3.1 Land as a production factor****3.1.1 TWO characteristics of land**

- Land is subject to the law of diminishing return ✓
- Land is durable ✓

(2)

**3.1.2 Explanation of the law of diminishing return**

- More units of fertiliser ✓
- Did not result to proportional further increase the yield ✓

(2)

**3.1.3 TWO functions of land from the case study**

- It enables the production of food ✓
- It provides physical space for industry ✓

(2)

- 3.1.4 **TWO ways to increase productivity of land**
- Changing cropping systems/intercropping/adaptation to scientific methods ✓
  - Restoring land potential/halting erosion ✓
  - Consolidate small uneconomic land units ✓
  - Improving water management/provision ✓
- (Any 2) (2)

3.2 **Capital as a production factor**

- 3.2.1 **Explanation of the assistance of using a cash flow budget**
- It shows the flow of cash into and out of the farming operation ✓
  - To determine the profit and loss ✓
- (2)

- 3.2.2 **Monthly income**
- Sale of eggs = R8 000 per week x 4 = R32 000 ✓
  - Sale of broilers = R12 500 per week x 4 = R50 000 ✓  
= R32 000 + R50 000 = R82 000 ✓
- (3)

- 3.2.3 **Decision to continue with the business**  
Farmer must continue with the business ✓
- (1)

- 3.2.4 **Reason**
- Income is more than the expenditure ✓
  - The business is run at a profit. (Profit is R43 000) ✓
- (2)

- 3.2.5 **TWO forms of capital**
- Floating/working capital ✓
  - Movable capital ✓
- (2)

3.3 **Ability levels of farmers and farm workers**

- 3.3.1 **TWO skills of farm manager based on graph**
- Planning ✓
  - Entrepreneurial ✓
- (2)

- 3.3.2 **One important skill needed by the farm worker**  
Technical skill ✓
- (1)

- 3.3.3 **Justification of skill needed by the farm worker**
- Worker needs to perform practical activities ✓
  - using hands ✓
- (2)

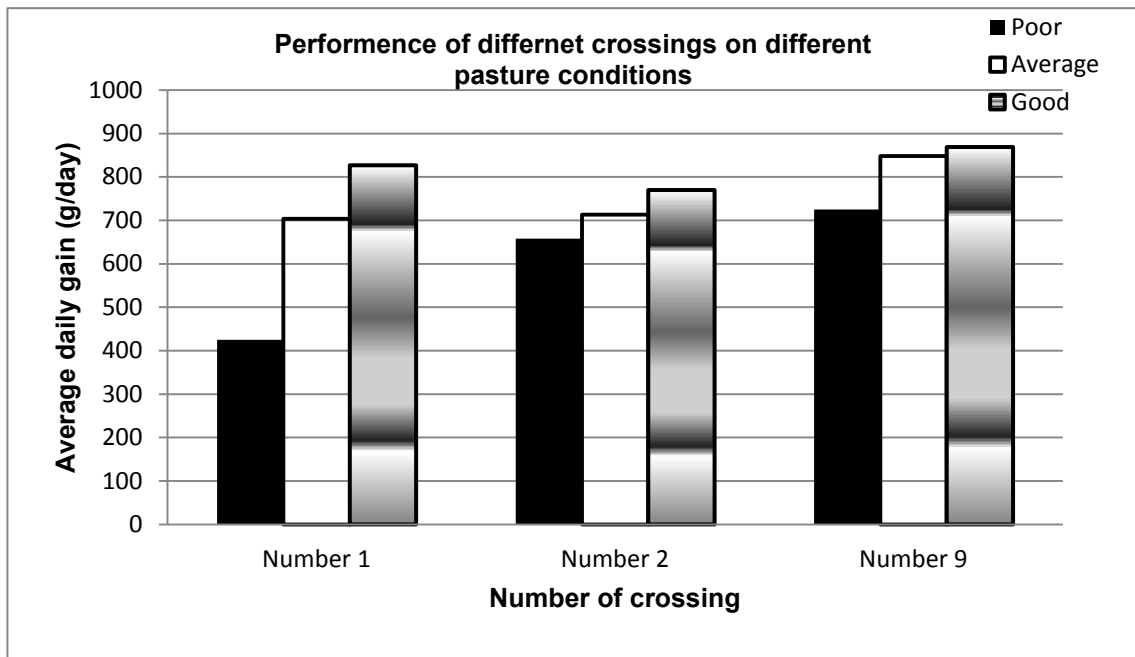
- 3.3.4 **TWO management skills important to the farmer other than the skills in the graph**
- Financial ✓
  - Communication and interpersonal ✓
  - Problem-solving ✓
  - Decision-making ✓
- (Any 2) (2)

- 3.3.5 **TWO management principles**
- Planning ✓
  - Motivation ✓
  - Control ✓
  - Implementation ✓
  - Control ✓
- (Any 2) (2)
- 3.4 **Labour Legislation**
- 3.4.1 **21 days leave of absence farm employees entitled to Annual leave ✓** (1)
- 3.4.2 **4 months leave of absence female employees entitled to Maternity leave ✓** (1)
- 3.4.3 **Leave of absence for flu Sick leave ✓** (1)
- 3.5 **Labour**
- 3.5.1 **Calculation of worker payment during public holiday**
- $R111.72 \times 2 = R223.44$  ✓ **OR**  $R111.72 \times 2 \times 3 = R670.32$  ✓
  - $R223.44 \times 3 = R670.32$  ✓
- (2)
- 3.5.2 **Deduction of a labour practice Unfair labour practice ✓** (1)
- 3.5.3 **Justification of answer in QUESTION 3.5.2**
- Worker underpaid/worker received R270.32 less ✓
  - Public holidays are double paid according to Public Holiday Act/ allowance on public holidays is double the allowance of normal working days ✓
- (2)  
**[35]**

**QUESTION 4: BASIC AGRICULTURAL GENETICS**

- 4.1 **Growth rates between cattle breeds**
- 4.1.1 **Type of breeding system Cross breeding ✓** (1)
- 4.1.2 **Parents that produced calves with highest average daily gain Hereford bulls and Brahman cows ✓** (1)
- 4.1.3 **TWO reasons for better performance of these calves**
- Offspring have hybrid vigour/heterosis ✓
  - Are better adapted to poor veld conditions/more hardy ✓
  - Have a better feed conversion rate ✓
- (Any 2) (2)

4.1.4



**Criteria/rubric/marking guidelines**

- Correct heading ✓
- X axis - correctly calibrated and labelled (number crossing) ✓
- Y axis - correctly calibrated and labelled (ADG) ✓
- Correct units (g/day) ✓
- Accuracy ✓
- Bar graph ✓

(6)

4.2 **Inheritance**

4.2.1 **Type of inheritance controlling milk yield**

Polygenic inheritance ✓

(1)

4.2.2 **Milk yield of a Jersey cow with genotype AA<sub>bb</sub>**

AA = 20 + 20 = 40 litres ✓

AA<sub>bb</sub> = 200 + 40 litres ✓

= 240 litres ✓

(3)

4.2.3 **Phenotypic and genotypic ratio of F<sub>1</sub>-generation**

AABB x aabb

AB x ab ✓

Genotype : 4 AaBb ✓

Phenotype : all producing 240 litres ✓

(3)

4.3 **Inheritance**

4.3.1 **The phenomenon in QUESTION 4.3**

Atavism ✓

(1)



- 4.3.2 **Reason**
- A recessive gene for red which was switched off and not expressed ✓
  - In the phenotype in the past is now switched on and expressed ✓
- (2)
- 4.3.3 **Alternative term for atavism**  
Throwback ✓
- (1)
- 4.4 **Selection and breeding**
- 4.4.1 **Differentiation between selection and heritability**
- Selection**
- is choosing of individuals for breeding purposes ✓
  - due to superior characteristics ✓
- (2)
- Heritability**
- is the degree to which the characteristics are
  - determined ✓ by genetic factors ✓
- (2)
- 4.4.2 **TWO advantages of a species crossing**
- They are hardy animals ✓
  - They are drought animals ✓
  - They are highly durable ✓
- (Any 2) (2)
- 4.4.3 **TWO related breeding systems**
- Line breeding ✓
  - Inbreeding ✓
- (2)
- 4.4.4 **Importance of using EBV**  
It indicates the heritability of a particular characteristic ✓  
to predict the success of a breeding programme ✓
- (2)
- 4.5 **Effects of mutagenic agents**
- 4.5.1 **Gamma and X-rays**  
Damages DNA molecule and causes it to break ✓
- (1)
- 4.5.2 **Metals**  
Change the chemical structure of a DNA molecule ✓
- (1)
- 4.5.3 **Alkaloids**  
They prevent chromosome segregation ✓
- (1)
- 4.5.4 **Viruses**  
They insert their own DNA ✓
- (1)
- [35]**
- TOTAL SECTION B: 105**  
**GRAND TOTAL: 150**