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basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

AGRICULTURAL SCIENCES P2

NOVEMBER 2023

MARKING GUIDELINES

MARKS: 150

These marking guidelines consist of 12 pages.

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SECTION A

QUESTION 1

1.1	1.1.1	B ✓✓		
	1.1.2	B ✓✓		
	1.1.3	C ✓✓		
	1.1.4	B ✓✓		
	1.1.5	A ✓✓		
	1.1.6	C ✓✓		
	1.1.7	D ✓✓		
	1.1.8	C ✓✓		
	1.1.9	A ✓✓		
	1.1.10	D ✓✓	(10 x 2)	(20)
1.2	1.2.1	F ✓✓		
	1.2.2	A ✓✓		
	1.2.3	C ✓✓		
	1.2.4	J ✓✓		
	1.2.5	D ✓✓	(5 x 2)	(10)
1.3	1.3.1	Market research ✓✓		
	1.3.2	Balance sheet ✓✓		
	1.3.3	Meiosis ✓✓		
	1.3.4	Artificial/mass/pedigree/family/progeny selection ✓✓		
	1.3.5	Genetic modification/manipulation/engineering/GM ✓✓	(5 x 2)	(10)
1.4	1.4.1	Broker/agent/intermediary ✓		
	1.4.2	Fixed ✓		
	1.4.3	Bacterial carries/Agrobacterium tumefaciens ✓		
	1.4.4	Heritability ✓		
	1.4.5	Co-dominance ✓	(5 x 1)	(5)

TOTAL SECTION A: 45

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SECTION B

QUESTION 2: AGRICULTURAL MANAGEMENT AND MARKETING

2.1 The different agricultural marketing systems

2.1.1 Identification of agricultural marketing systems

A Co-operative marketing ✓ (1)
B Free marketing ✓ (1)
C Controlled Marketing ✓ (1)

2.1.2 TWO principles of a cooperative marketing system

- Voluntary and open membership ✓
- Democratic member control ✓
- Equal economic participation and contribution ✓
- Autonomy and independence ✓
- Provision of education, training and information to members ✓
- Concern/sustainable development of communities ✓
- A single vote to each member/all members are shareholders ✓
- Marketing is based on a pool system ✓
- Cooperation amongst cooperatives ✓
- Only members may deliver products and benefit ✓
- Members are paid on a commission basis ✓
- Members receive a small interest on their share capital ✓
- After liquidation surplus funds are divided between shareholders ✓
- Products of members are standardized ✓ (Any 2) (2)

2.1.3 ONE disadvantage of a free marketing system

- Too much competition ✓
- Producers may collude (form cartels) to fix prices ✓
- Greater fluctuations in prices ✓
- Market costs are too high ✓
- Producers responsible for marketing the product ✓
- Limited bargaining power ✓
- High risk involved/financial losses ✓
- Farmers may lack necessary skills ✓
- Exploitation by consumers ✓ (Any 1) (1)

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2.1.4 **ONE benefit for cooperative marketing system to the members**

- Involvement of more producers increases potential for growth ✓
- Access to professional expertise ✓
- Better bargaining power than individual farmers ✓
- Economies of scale through pooling system ✓
- Access to better infrastructure ✓
- Elimination of intermediaries ✓
- Bulk purchasing for inputs brings more chances to negotiate better prices ✓
- Branding can make them more visible to buyers ✓
- A number of government programmes make funding available to cooperatives ✓
- Risk is shared by all members ✓
- Extends credit to members ✓
- Meet market requirements for consistent supply ✓
- Potential for growth to members ✓
- Simplifies management ✓
- Dividends are paid/producers receive more stable prices ✓
- The cooperative provides cheaper farming services to members ✓
- Producer is not burdened with marketing and have more time for farming activities ✓ (Any 1) (1)

2.2 **The price and the quantities in a market**

2.2.1 **Identification of curves**

A Demand ✓ (1)
B Supply ✓ (1)

2.2.2 **The economic term for point C**

Market equilibrium ✓ (1)

2.2.3 **Identification of label**

D Surplus ✓ (1)
E Shortage ✓ (1)

2.2.4 **Explanation of the relationship between price, demand and supply**

The higher the price ✓ the higher the supply ✓ and the lower the demand ✓

OR

The lower the price ✓ the lower the supply ✓ and the higher the demand ✓ (Any 1) (3)

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2.3 Legislative and regulatory framework that supports marketing

2.3.1 TWO roles of legislation in the marketing of agricultural products

- Promotes a fair, accessible and sustainable market place ✓
- Prevents unfair marketing and business practices ✓
- Ensures that product information is given in simple language ✓
- Enhances viability of the agricultural sector/increase market access to participants ✓
- Authorises establishment of regulations for marketing agricultural products ✓
- Controls the sales of certain agricultural products ✓
- Ensures that products comply with set standards in terms of produce itself and packaging ✓
- Sets and maintains national standards at processing sites ✓
- Promotes agricultural products safety ✓
- Regulates market agents and improve their functioning ✓ (Any 2) (2)

2.3.2 TWO factors that hamper the marketing chain

- Perishability/spoilage ✓
- Seasonal fluctuation ✓
- Lack of control over production ✓
- Wide distribution of production areas/high transportation costs ✓
- Bulkiness in relation to the value/low value in relation to volume ✓
- Intermediaries/agents ✓
- Poor/insufficient infrastructure ✓
- Risks/accidents/theft/strikes ✓
- Lack of capital ✓
- Standardisation/variation in the quality of products ✓ (Any 2) (2)

2.4 The main function of agricultural marketing

2.4.1 Identification of the main function of agricultural marketing

Processing/value adding ✓ (1)

2.4.2 TWO advantages of processing

- Avoids over supply/spoilage/reduce wastage of excess produce ✓
- Improves food safety ✓
- Increases shelf life ✓
- Provides job opportunities ✓
- Enables easy packaging/handling ✓
- Ensures food security/availability of products all year round ✓
- Adds value to the product ✓
- Product can be transported over longer distances ✓
- Increases the demand of the product ✓
- Increases profitability/revenue ✓ (Any 2) (2)

2.4.3 TWO other main functions of agricultural marketing

- Transportation ✓
- Storage ✓
- Packaging ✓ (Any 2) (2)

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2.5 **Entrepreneurship**

2.5.1 **Distinction between an**
Entrepreneur: A person who exercise initiative by taking advantage of a business opportunity ✓ (1)
Entrepreneurship: The process of discovering, evaluating and exploiting new business opportunities ✓ (1)

2.5.2 **Identification of the success factors**
(a) Leadership ✓ (1)
(b) Punctuality ✓ (1)

2.6 **Components of the SWOT analysis**

2.6.1 Threat ✓ (1)

2.6.2 Weakness ✓ (1)

2.6.3 Strength ✓ (1)

2.6.4 Opportunity ✓ (1)

2.7 **Business plan**

2.7.1 **TWO components to be included in a good business plan**
- Title page ✓
- Table of content/index ✓
- An executive business profile/general overview of the business ✓
- A marketing plan ✓
- Production/operational plan ✓
- Human resource plan ✓
- Financial plan ✓
- SWOT analysis ✓
- Supporting documentation ✓ (Any 2) (2)

2.7.2 **ONE reason for drawing up a business plan**
- Determine financial needs of the business ✓
- To test the feasibility/economic viability of the business ✓
- Secure funding/attract investors or partners ✓
- Ensure effective business management ✓
- Repositioning of the business ✓
- To foresee problems ✓
- Gain knowledge about market opportunities/competitors ✓
- To guide daily operations/provision of time frames ✓
- Outlining the roles and responsibilities of individual involvement ✓
- Mapping out objectives or goals ✓
- Provides guidelines for decision making ✓ (Any 1) (1)

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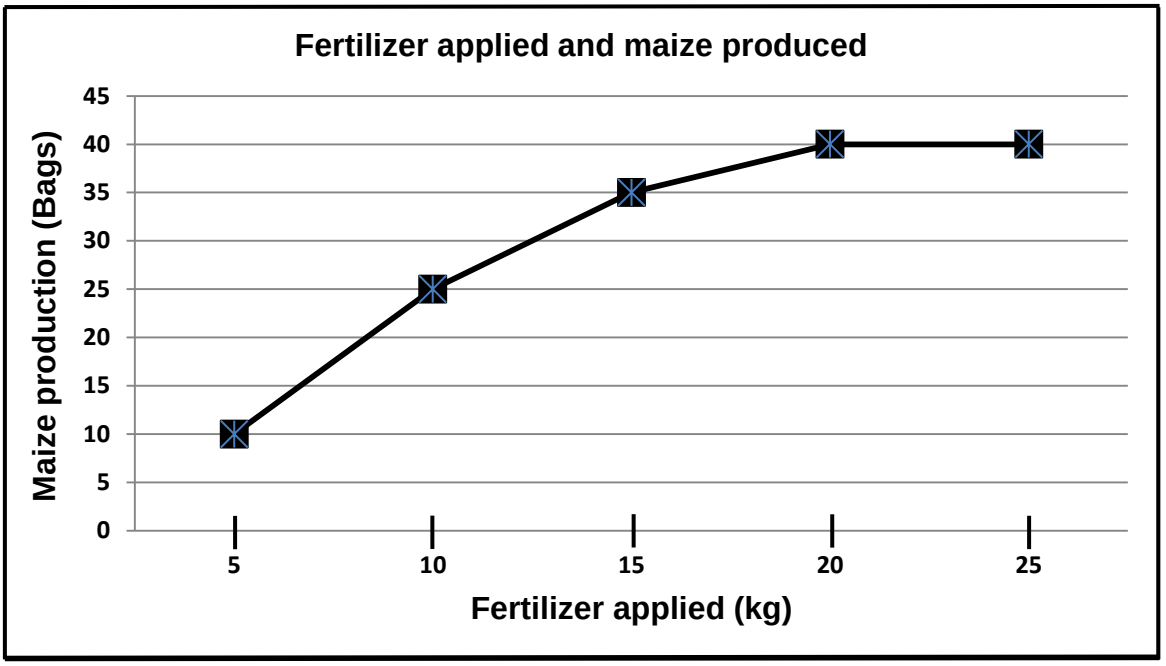
QUESTION 3: PRODUCTION FACTORS

3.1 Land as a production factor

3.1.1 Line graph



CRITERIA/RUBRIC/MARKING GUIDELINES

- Correct heading ✓
- X-axis: Correctly calibrated and labelled (Fertilizer) ✓
- Y-axis: Correctly calibrated and labelled (Maize production) ✓
- Correct units (Bags and kg) ✓
- Line graph ✓
- Accuracy (80% + correct plotting) ✓ (6)

3.1.2 Economic characteristic of land

Land is subject to the law of diminishing returns ✓ (1)

3.1.3 Deduction of the function of land

- Land provides food ✓
- Land provides space ✓ (Any 1) (1)

3.1.4 TWO methods of increasing land productivity other than fertilisers

- The use of scientific methods/technology/precision farming ✓
- Improving water management ✓
- Changing cropping practices/intercropping ✓
- Restoring land potential/avoid erosion ✓
- Farming land more efficiently/consolidating small uneconomical land units ✓ (Any 2) (2)

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3.2 **Labour**

3.2.1 **Tasks performed by labourers**

(a) **Feeding stud rams -** Permanent ✓ (1)
(b) **Sheep shearing -** Seasonal ✓ (1)
(c) **Installation of water troughs -** Casual ✓ (1)

3.2.2 **TWO ways to improve living conditions of farm labourers**

- Better housing that is safe and secure/sanitation ✓
- Supply of water/food/electricity ✓
- Recreational facilities to relax and socialise ✓ (Any 2) (2)

3.3 **Labour contract and legislation**

3.3.1 **Letters associated with the condition addressed by legislation**

(a) **Labour Relations Act -** B ✓ (1)
(b) **Occupational Health and Safety Act -** C ✓ (1)
(c) **Basic Conditions of Employment Act -** A ✓ (1)

3.3.2 **Name of the document**

Labour/employment contract ✓ (1)

3.4 **Capital**

3.4.1 **Identification of the type of capital**

A Movable ✓ (1)
B Fixed ✓ (1)
C Working/floating/production ✓ (1)

3.4.2 **TWO methods of creating capital**

- Savings ✓
- Production ✓
- Credit/loan ✓
- Inheritance ✓
- Grants/donations ✓ (Any 2) (2)

3.5 **Financial records of a farm**

3.5.1 **Identification of the financial record**

Cash flow statement ✓ (1)

3.5.2 **ONE reason**

Because it shows

- All income and expenditure for a specific period ✓
- Income/receipts ✓
- Expenditure/payments ✓
- Opening/closing balances for each month ✓
- Profit/loss for each month ✓
- Cash items only ✓ (Any 1) (1)

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3.5.3 **Calculation of the profit/loss for December represented by A**
- Profit/loss = Total income – Total expenditure ✓
- = R4 200 – R8 774 ✓
- = **–** R4 574/R4 574 loss ✓ (3)

3.5.4 **Closing balance represented by B**
- R500+R9 650 ✓
- R10 150 ✓ (2)

3.6 **Management**

3.6.1 **TWO principles of management**
(a) Implementation ✓ (1)
(b) Planning ✓ (1)

3.6.2 **ONE example for each of the following**
(a) Internal force
- Available resources ✓
- Available management capacity and competencies ✓
- Organisational structure ✓
- Culture of the business ✓
- Financial position of the farm business ✓
- Management systems available ✓
- Products produced ✓
- Investment in research and development ✓
- The use of outdated equipment ✓ (Any 1) (1)

(b) External forces
- Economic forces ✓
- Political forces ✓
- Ethical forces ✓
- Legal forces ✓
- Socio-cultural forces/population demographics ✓
- Education levels in the area ✓
- Competition ✓
- Technology ✓
- Environmental forces/nature ✓ (Any 1) (1)

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QUESTION 4: BASIC AGRICULTURAL GENETICS

4.1 Mendel's laws

4.1.1 A term for genetic make-up
Genotype ✓ (1)

4.1.2 Mendel's law of inheritance
Mendel's law of segregation ✓ (1)

4.1.3 Mendel's law of independent assortment
Different pairs of genes separate independently of the members of other pairs ✓ when two or more characteristics are involved ✓ (2)

4.2 Monohybrid crossing

4.2.1

Gametes	r	r
R	Rr	Rr
R	Rr	Rr

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- Correct gametes of male parent ✓ (1)
- Correct gametes of female parent ✓ (1)
- Correct genotype of the offspring ✓ (1)
- Punnett square populated with gametes and offspring ✓ (1)

4.2.2 Percentage of red piglets
- $\frac{0}{4}$ x 100 ✓
- = 0% ✓ (2)

4.3 Polygenic inheritance

4.3.1 Calculation of the height
- AaBbCcDD plant = 40cm + 4cm + 4cm + 4cm + 4cm + 4cm ✓
- = 60cm ✓ (2)

4.3.2 (a) Genotype of 68 cm tall plant
AABBCCDd/AABBCcDD/AABbCCDD/AaBBCCDD ✓ (1)

(b) Phenotype of the shortest plant
40 cm ✓ (1)

4.4 Sex-linked characteristics

4.4.1 Indicating whether a trait is X-linked or Y-linked inheritance
X-linked inheritance ✓ (1)

4.4.2 Terminology
Sex-linked characteristics ✓ (1)

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4.5 **Pedigree diagram**

4.5.1 **Indication of a dominant characteristic**
Long fleece ✓ (1)

4.5.2 **Genotypes of individual number 5**
ll ✓ (1)

4.5.3 **Phenotype of individual number 9**
Short fleece ✓ (1)

4.5.4 **Indicating whether individual 8 is homozygous or heterozygous**
Heterozygous ✓ (1)

4.5.5 **The number of female animals in the pedigree**
Two/females 1 and 9 ✓ (1)

4.6 **Variation**

4.6.1 **Definition of the term variation**
The differences ✓ amongst individual of the same species ✓ (2)

4.6.2 **TWO causes of variation**
- Genetic/internal ✓
- Environmental/external ✓ (2)

4.6.3 **ONE type of mutagen**
- Biological ✓
- Physical ✓
- Chemical ✓ (Any 1) (1)

4.7 **Breeding systems in cattle**

4.7.1 **Identification of**
(a) Breeding system 1 - Crossbreeding ✓ (1)
(b) Crossing Holstein (bull 1) with Holstein (heifer 2)
Line breeding ✓ (1)

4.7.2 **The breeding system that promotes heterosis**
Crossbreeding/Breeding system 1 ✓ (1)

4.7.3 **TWO disadvantages of inbreeding**
- Variation decreases ✓
- Undesirable characteristics can be bred into the progeny ✓
- Reduction in vitality ✓
- Animals are less resistant to diseases ✓
- Poorer adaptability to the environment ✓
- Undesirable genes are made homozygous ✓
- Inbreeding depression occurs ✓
- Increases the expression of lethal genes/deformities ✓
- Expensive ✓ (Any 2) (2)

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4.8 **Genetic modified organisms**

4.8.1 **TWO health benefits of genetically modified crops**

- Food low in pesticide residues/farmers use less pesticides ✓
- High nutritional value ✓
- Food with a better flavour/colour/texture ✓
- Production of medication ✓ (Any 2) (2)

4.8.2 **TWO aims of genetic modification in animals**

- To develop new vaccines and medication for animals/people ✓
- Develop animal models to study animal/human diseases ✓
- To increase the nutritional quality of animal products ✓
- To increase the health quality of animal products ✓
- To increase the yield of animal products ✓
- To reduce animal consumption by developing non-animal sources for important oils and industrial enzymes ✓
- Breed more fertile animals ✓
- Produces industrial and consumer products/fibres
- Improves production characteristics/growth rate/milk production ✓
- Produces products for therapeutic use ✓
- Improves the resistance to pests/diseases/harsh environmental conditions ✓
- Development/manipulation for desirable characteristics in an organism ✓ (Any 2) (2)

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TOTAL SECTION B: 105
GRAND TOTAL: 150

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