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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.



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

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)

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)

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)

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)

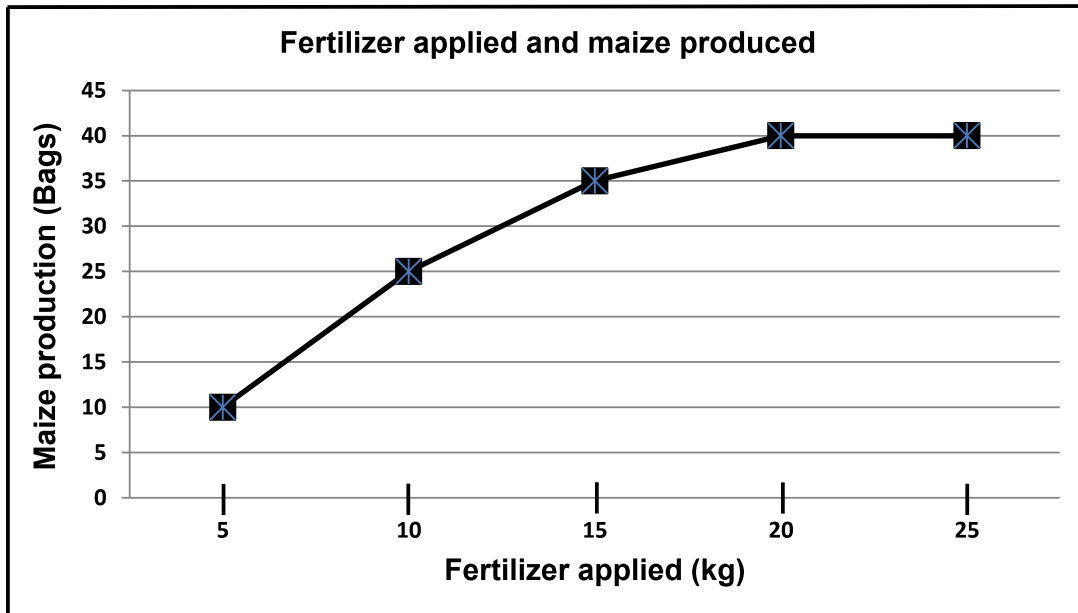
2.7 Business plan**2.7.1 TWO components to be included in a good business plan**

- 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)

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)

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

MARKING RUBRIC

- 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

- $\frac{0}{4} \times 100$ ✓
- = 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)

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)

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)

[35]

TOTAL SECTION B: 105
GRAND TOTAL: 150