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## **NATIONAL SENIOR CERTIFICATE**

**GRADE 12**

**SEPTEMBER 2023**

### **AGRICULTURAL SCIENCES P2 MARKING GUIDELINE**

**MARKS: 150**

This marking guideline consist of 9 pages.

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## SECTION A

## QUESTION 1

- |     |        |                            |          |      |
|-----|--------|----------------------------|----------|------|
| 1.1 | 1.1.1  | B ✓✓                       |          |      |
|     | 1.1.2  | C ✓✓                       |          |      |
|     | 1.1.3  | C ✓✓                       |          |      |
|     | 1.1.4  | A ✓✓                       |          |      |
|     | 1.1.5  | B ✓✓                       |          |      |
|     | 1.1.6  | D ✓✓                       |          |      |
|     | 1.1.7  | C ✓✓                       |          |      |
|     | 1.1.8  | D ✓✓                       |          |      |
|     | 1.1.9  | B ✓✓                       |          |      |
|     | 1.1.10 | A ✓✓                       | (10 x 2) | (20) |
| 1.2 | 1.2.1  | G ✓✓                       |          |      |
|     | 1.2.2  | D ✓✓                       |          |      |
|     | 1.2.3  | E ✓✓                       |          |      |
|     | 1.2.4  | C ✓✓                       |          |      |
|     | 1.2.5  | F ✓✓                       | (5 x 2)  | (10) |
| 1.3 | 1.3.1  | Marketing chain ✓✓         |          |      |
|     | 1.3.2  | Elasticity ✓✓              |          |      |
|     | 1.3.3  | Labour ✓✓                  |          |      |
|     | 1.3.4  | Management ✓✓              |          |      |
|     | 1.3.5  | Heritability ✓✓            | (5 x 2)  | (10) |
| 1.4 | 1.4.1  | Entrepreneur ✓             |          |      |
|     | 1.4.2  | SWOT ✓                     |          |      |
|     | 1.4.3  | Biometrics ✓               |          |      |
|     | 1.4.4  | Aneuploidy ✓               |          |      |
|     | 1.4.5  | Estimated Breeding Value ✓ | (5 x 1)  | (5)  |

**TOTAL SECTION A: 45**

## SECTION B

## QUESTION 2: AGRICULTURAL MANAGEMENT AND MARKETING

## 2.1 2.1.1 Identification of marketing function

Packaging ✓

(1)

## 2.1.2 Guidelines that govern the marketing function in QUESTION 2.1.1.

- Packaging must not contaminate the produce ✓
- Packaging must protect produce from physical damage ✓
- Packaging must be recyclable ✓
- Packaging should provide useful information about the product ✓

(Any 2 x 1)

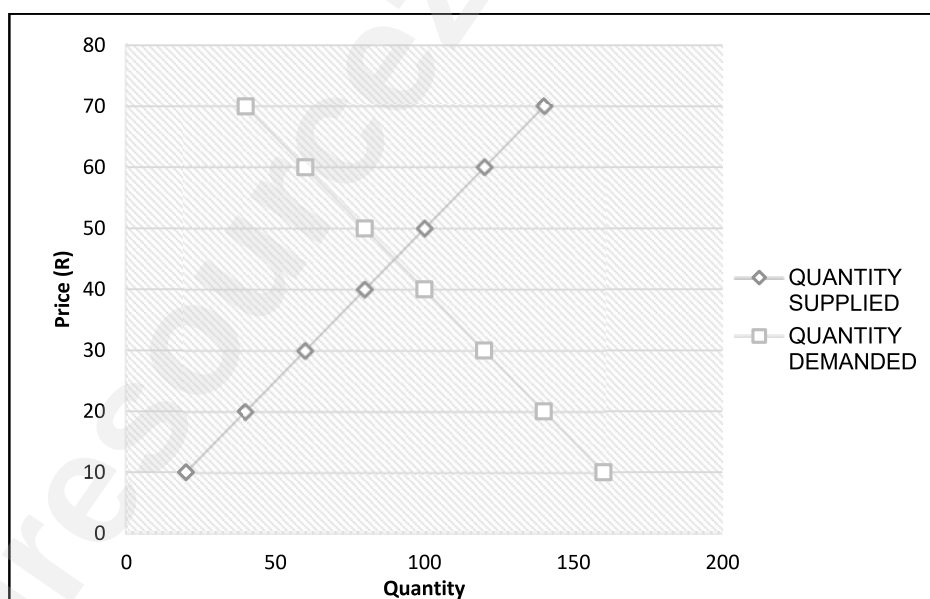
(2)

2.1.3 Definition of *marketing*.

Marketing is the activity or business ✓ of promoting and selling products or services, including market research and advertising. ✓

(2)

## 2.2 2.2.1 Quantities of a product supplied and demanded at different prices

Checklist

- Correct heading ✓
- $x$ -axis correctly calibrated with label (Quantity) ✓
- $y$ -axis correctly calibrated with label (Price) ✓
- Graph type (Line graph) ✓
- Correct units (R) ✓
- Accuracy (80 % + correct plotting) ✓

(6)

2.2.2 **Deduction of equilibrium price**  
R45 ✓ (1)

2.2.3 **The law of supply**  
The higher the price ✓ the higher the supply ✓

OR

The lower the price ✓ the lower the supply ✓ (2)

2.2.4 **Factors that affect the supply of a product**

- Technology ✓
- Production costs ✓
- Government subsidies ✓
- Environmental conditions ✓
- Competitive products ✓
- Political instability ✓

(Any 2 x 1) (2)

2.3 2.3.1 **Identification of marketing approaches**  
A – Mass marketing ✓  
B – Niche Marketing ✓  
C – Multi-segment marketing ✓ (3)

2.3.2 **Identification of a marketing approach that would suit small businesses**  
Marketing approach B ✓ (1)

2.3.3 **Motivation of answer to QUESTION 2.3.2**

- It has cheaper marketing costs ✓
- Less competition from big businesses ✓
- Producers enjoy a monopoly ✓

(Any 2 x 1) (2)

2.4 2.4.1 **Naming the process**  
Eco labelling ✓ (1)

2.4.2 **Definition of *sustainable marketing***  
It is the adoption of farm activities that are ecologically friendly and socially healthy ✓ (1)

2.4.3 **Requirements for green product pack**

- Recyclable ✓
- Biodegradable ✓

(2 x 1) (2)



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- 2.5 2.5.1 **Identification of main problem faced by farmers**  
Farmers have no control over pricing ✓ (1)
- 2.5.2 **Identification of solution**  
Farmers working together ✓ (1)
- 2.5.3 **Identification of marketing system**  
Co-operative marketing ✓ (1)
- 2.5.4 **Advantages of marketing system identified in QUESTION 2.5.3**
- Ability to meet market requirements for volume and consistent supply ✓
  - Economies of scale ✓
  - Bargaining power ✓
  - Access to better infrastructure ✓
  - Access to professional expertise ✓
  - Access to funding ✓ (Any 2 x 1) (2)
- 2.6 2.6.1 **Justification for the use of business plans**
- They are used to secure funding ✓
  - Guide daily operations ✓
  - Determine financial needs ✓
  - Gain knowledge about marketing opportunities ✓
  - To foresee problems, which reduce risk ✓ (Any 2 x 1) (2)
- 2.6.2 **How electronic resources are used in drafting business plans**
- Business plan templates can be obtained online ✓
  - Online business planning experts who provide advice and guidance ✓
  - Financial formulae that do calculations automatically to get accurate numbers and figures ✓
  - Design tools for a professional-looking business plan ✓
  - Measurement tools to measure the impact of your business plan ✓ (Any 2 x 1) (2)
- [35]



**QUESTION 3: PRODUCTION FACTORS**

- 3.1 3.1.1 **Explanation of economic characteristics of land**  
Land is subject to the law of diminishing returns ✓ (1)
- 3.1.2 **Methods that can be used to improve the productivity of land**
- Water management/irrigation/rainwater harvesting ✓
  - Restoring the land's potential ✓
  - Consolidation of uneconomic land units ✓
  - Use of scientific farming methods ✓
  - Improving soil fertility ✓ (Any 2 x 1) (2)
- 3.1.3 **Economic functions of land**
- Enables production of food ✓
  - Provides physical space for human settlements ✓
  - Provides physical space for agricultural activities ✓
  - It is an asset that can be used as collateral ✓
  - It is a source of minerals ✓ (Any 2 x 1) (2)
- 3.2 3.2.1 **Piece of legislation that empowers workers to carry out strikes**  
Labour Relations Act / Act 66 of 1995 ✓ (1)
- 3.2.2 **Other issues addressed by Act in QUESTION 3.2.1**
- Involvement of employees in decision making ✓
  - Prevents unfair labour practices ✓
  - Gives employees /employers right to form trade unions / associations ✓
  - Provides procedures for the resolution of labour disputes ✓ (Any 2 x 1) (2)
- 3.2.3 **Possible causes of strike action**
- Poor remuneration / Low wages ✓
  - Poor working conditions ✓
  - Unfair labour practices ✓ (Any 2 x 1) (2)
- 3.2.4 **TWO strategies to increase labour productivity**
- Having the right type and number of workers ✓
  - Giving clear instructions to workers ✓
  - Providing the right type and number of tools or equipment ✓
  - Motivating workers ✓ (Any 2 x 1) (2)
- 3.3 3.3.1 **Identification of financial record**  
Income statement ✓ (1)
- 3.3.2 **Calculation of net income**  
Net income = Income – Expenses ✓  
= R740 000 ✓ – R138 500 ✓  
= R601 500 ✓ (4)



- 3.3.3 **Comment on the farm's profitability**  
The farm is profitable ✓ because the net income is positive ✓ (2)
- 3.3.4 **Identification of fixed costs**
- Depreciation ✓
  - Insurance ✓ (2)
- 3.3.5 **Uses of financial records on farm**
- Manage the capital of the farm ✓
  - Analyse past and current performance of the farm business ✓
  - Plan the future of the business ✓
  - Apply for loans ✓
  - Provide information for tax purposes ✓ (Any 2 x 1) (2)
- 3.4 3.4.1 **Definition of an asset**  
An item of property ✓ owned by a person or company, regarded as having value. ✓ (2)
- 3.4.2 **Identification of type of capital**  
Movable capital ✓ (1)
- 3.4.3 **Type of credit used to finance capital shown above**  
Medium term credit ✓ (1)
- 3.4.4 **Sources of finance that can be used to purchase the capital item**
- Commercial banks ✓
  - The land bank ✓
  - Trust companies ✓
  - Potential investors ✓ (Any 2 x 1) (2)
- 3.4.5 **Identification of farm record**  
Inventory (1)
- 3.5 3.5.1 **Internal forces that affect businesses**
- Cash flow ✓
  - Workforce competence ✓ (2)
- 3.5.2 **A force that can be improved through in-service training**  
Workforce competence ✓ (1)
- 3.6 **Identification of appropriate management skill**
- 3.6.1 Interpersonal and communication skills ✓ (1)
- 3.6.2 Financial management skills ✓ (1)

**[35]**

**QUESTION 4: BASIC AGRICULTURAL GENETICS**

4.1 4.1.1 **Identification of cross**  
Dihybrid cross ✓ (1)

4.1.2 **Identification of dominant traits**  
 • Black ✓  
 • Solid ✓ (2)

4.1.3 **Genotype A**  
AaBb ✓ (1)

4.1.4 **Mendelian law that is unique to a dihybrid cross**  
Law of independent assortment (1)

4.1.5 **Punnet square to determine F<sub>s</sub> generation genotype**

|      |      |        |
|------|------|--------|
|      | aB   | ab ✓   |
| aB   | aaBB | aaBb   |
| ab ✓ | aaBb | aabb ✓ |

✓

Rubric

Punnet square with gametes and offspring genotypes ✓

Correct male gametes ✓

Correct female gametes ✓

Correct offspring genotype ✓ (4)

4.1.6 **F<sub>2</sub> phenotypic ratio**  
9 Black and solid : 3 Black and brown : 3 Spotted and brown: 1  
Spotted and brown ✓✓ (2)

4.2 4.2.1 **Contribution of each additive allele**  
 $60 \text{ cm} \div 6 \checkmark = 10 \text{ cm} \checkmark$  (2)

4.2.2 **Genotype of F<sub>1</sub> generation**  
AaBbCc ✓ (1)

4.2.3 **Calculation of the plant's height**  
 $AaBBCc = 40 \text{ cm} + (10 \text{ cm} \times 4) \checkmark$   
 $= 40 \text{ cm} + 40 \text{ cm} \checkmark$   
 $= 80 \text{ cm} \checkmark$  (3)

4.2.4 **Characteristics associated with polygenic inheritance**  
Quantitative characteristics (1)



**4.3 Identification of mechanism of inheritance**

- 4.3.1 Epistasis ✓ (1)
- 4.3.2 Co-dominance ✓ (1)
- 4.3.3 Incomplete dominance ✓ (1)
- 4.3.4 Multiple alleles ✓ (1)

**4.4 4.4.1 Selection method described in the passage**

Mass selection ✓ (1)

**4.4.2 Possible causes of the differences in performance**

- Recombination of genes / Crossing over of chromosomes (Meiosis) ✓
- Mutations ✓
- Fertilisation ✓ (Any 2 x 1) (2)

**4.4.3 TWO uses of selection in animal improvement**

- Create new breeds ✓
- Improve existing breeds ✓
- Foundation for selection ✓ (Any 2 x 1) (2)

**4.5 Identification of breeding method**

- 4.5.1 Outcrossing ✓ (1)
- 4.5.2 Inbreeding ✓ (1)
- 4.5.3 Cross breeding ✓ (1)
- 4.5.4 Line breeding ✓ (1)

**4.6 Explanation of how use of GMOs will result in the specified risks**

- 4.6.1 Herbicide resistant genes in GMOs ✓ might be transferred to wild plants thereby making them herbicide resistant. ✓ (2)
- 4.6.2 Farmers may use excessive amounts of herbicides in fields where they grow herbicide resistant crops ✓ leading to water and soil pollution. (2)

**[35]**

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

