SENIOR CERTIFICATE EXAMINATIONS/
NATIONAL SENIOR CERTIFICATE EXAMINATIONS

AGRICULTURAL SCIENCES P2

2021

MARKING GUIDELINES

MARKS: 150

These marking guidelines consist of 10 pages.
### SECTION A

#### QUESTION 1

<p>| | | | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>1.1.1</td>
<td>D ✓✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.1.2</td>
<td>B ✓✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.1.3</td>
<td>C ✓✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.1.4</td>
<td>C ✓✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.1.5</td>
<td>D ✓✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.1.6</td>
<td>C ✓✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.1.7</td>
<td>A ✓✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.1.8</td>
<td>B ✓✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.1.9</td>
<td>D ✓✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.1.10</td>
<td>B ✓✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(10 x 2)  (20)

| 1.2 | 1.2.1 | D ✓✓ |
|     | 1.2.2 | F ✓✓ |
|     | 1.2.3 | H ✓✓ |
|     | 1.2.4 | C ✓✓ |
|     | 1.2.5 | B ✓✓ |

(5 x 2)  (10)

| 1.3 | 1.3.1 | Shortage ✓✓ |
|     | 1.3.2 | Contract ✓✓ |
|     | 1.3.3 | Dominant ✓✓ |
|     | 1.3.4 | Epistasis ✓✓ |
|     | 1.3.5 | Heredity ✓✓ |

(5 x 2)  (10)

| 1.4 | 1.4.1 | Green marketing/eco-labelling ✓ |
|     | 1.4.2 | Motivation ✓ |
|     | 1.4.3 | Pedigree ✓ |
|     | 1.4.4 | Haemophilia ✓ |
|     | 1.4.5 | Polygenic inheritance ✓ |

(5 x 1)  (5)

**TOTAL SECTION A:**  45
SECTION B

QUESTION 2: AGRICULTURAL MANAGEMENT AND MARKETING

2.1 Marketing

2.1.1 Definition of the concept marketing
The process of planning and executing the conception, pricing, promotion ✓ and distribution of ideas, goods and services to consumers ✓ (2)

2.1.2 The differences between marketing and selling
   (a) Marketing ✓
   (b) Selling ✓
   (c) Selling ✓ (1)

2.2 Inelasticity of demand

2.2.1 Deduction of the marketing concept
Price inelasticity of demand ✓ (1)

2.2.2 A reason for the answer
The demand changed slightly despite the huge change in price ✓ (1)

2.2.3 Explanation of the reason why consumers responded in this way
Maize meal is a necessity/staple food ✓ people will therefore buy maize meal even with a price increase ✓ (2)

2.2.4 Identification of the factor leading to the differences in the number bags demanded
Price ✓ (1)

2.3 Cooperative marketing of avocados

2.3.1 Identification of the agricultural marketing system
Cooperative marketing ✓ (1)

2.3.2 Indication of the role of agricultural marketing system
Production/selling/marketing ✓ (1)
2.3.3 **TWO benefits for the marketing system to farmers**
- Lower marketing costs/cost distribution ✓
- Requirements/services are supplied cheaper/bulk purchasing ✓
- More bargaining power ✓
- Access to funding/credit to producers ✓
- Higher prices are obtained ✓
- Elimination of the intermediaries ✓
- Potential for growth ✓
- Access to better infrastructure ✓
- Branding ✓
- Risk sharing ✓
- Farmer spend more time on producing than on marketing ✓
- Access to professional expertise ✓

(Any 2) (2)

2.3.4 **TWO factors that may hamper the marketing of avocados**
- Perishability/spoilage ✓
- Seasonal fluctuations in production ✓
- Lack of capital ✓
- Poor infrastructure ✓
- Wide distribution of production areas ✓
- Ineffective control over production ✓
- Risk/theft/accidents ✓
- Standardization ✓
- Large volume in relation to value/bulkiness ✓

(Any 2) (2)

2.4 **Marketing function**

2.4.1 **Identification of the marketing function**
Packaging ✓

(1)

2.4.2 **THREE characteristics of the cardboard boxes which make them suitable**
- Clean/dry/undamaged/suitable for the product ✓
- No foreign tastes/odours ✓
- Free of visible signs of fungal growth ✓
- Strong/rigid/solid ✓
- Recyclable/biodegradable ✓
- Easy to handle ✓
- Identification ✓

(Any 3) (3)

2.4.3 **Reason for using cardboard boxes with holes**
Allow air flow/reduce spoilage/health reasons ✓

(Any 1) (1)
2.5 Drawing up a business plan

2.5.1 ONE aspect that should be included in
(a) The title page
- Name of the business/person ✔
- Logo ✔
- Address ✔
- Contact details of the business/person ✔ (Any 1) (1)

(b) Human resource plan
- Number and type of employees ✔
- Competencies and skills needed ✔ (Any 1) (1)

2.5.2 Indication of an electronic resource
Computer software programmes ✔ (1)

2.5.3 TWO reasons for drawing up a business plan
- To test the feasibility/economic viability of the business idea ✔
- To secure funding ✔
- To determine financial needs/budget ✔
- To guide daily operations/outlines roles and responsibilities ✔
- To allow the entrepreneur to foresee problems ✔
- To reposition/analyse the business ✔
- To gain knowledge about marketing opportunities and competitors ✔
- To ensure effective business management ✔
- Mapping out the objectives/goals of the enterprise ✔
- Provides information on the internal/external business environment ✔
- Provision of time frames ✔ (Any 2) (2)

2.5.4 ONE problem encountered when drawing up a business plan
- Incomplete/with gaps ✔
- Vague ✔
- Unrealistic assumptions/over ambitious ✔
- Hiding weaknesses and risks ✔
- Not taking the competition into account ✔
- Using the incorrect format ✔
- Insufficient research ✔
- Insufficient technical details ✔ (Any 1) (1)

2.6 Entrepreneurship

2.6.1 Rearrangement of the phases of the entrepreneurial process
- D ✔ (1)
- A ✔ (1)
- C ✔ (1)
- B ✔ (1)
2.6.2 TWO aspects of the SWOT analysis

(a) Internal - Strength ✓ weaknesses ✓
(b) External - Opportunities ✓ threats ✓

QUESTION 3: PRODUCTION FACTORS

3.1 Land

3.1.1 The life of soil is unlimited if used correctly - Durability ✓

3.1.2 12% of the soil in South Africa can be cultivated - Availability ✓

3.1.3 Soil may be damaged but cannot be destroyed - Indestructibility ✓

3.2 TWO economic functions of land

- Land provides space/area ✓
- Provides raw materials ✓
- Provides minerals ✓
- Food security ✓
- Serves as collateral/security ✓

(Any 2)

3.3 Labour

3.3.1 Labour legislation

Basic Conditions of Employment Act (Act 75 of 1997)/BCEA ✓

3.3.2 TWO problems experienced by farm workers

- Long working hours ✓
- HIV/AIDS infections ✓

3.3.3 TWO ways to address the impact of HIV/AIDS infections on farms

- HIV/AIDS awareness campaigns/education/workshops ✓
- Provisions of condoms ✓
- Nutritional schemes ✓
- Provision of ARV's ✓
- Avoid multiple partners ✓
- Support groups ✓
- Treatment of STI's ✓

(Any 2)

3.3.4 TWO types of temporary farm workers

- Casual worker ✓
- Seasonal worker ✓

3.4 Income and expense record of a farm

3.4.1 Calculation of the profit or loss of the cattle enterprise

- Profit/loss = total income – total expenditure ✓
- = R455 000 – R13 041 ✓
- Profit = R441 959 ✓
3.4.2 Comparing the profit of the tomato and maize enterprises
- The profit of tomatoes is higher ✓ than that of maize ✓ (Any 1) (2)
- The profit of maize is lower ✓ than that of tomatoes ✓

3.4.3 TWO overhead expense items
- Fuel ✓
- Truck licence ✓ (2)

3.5 Capital

3.5.1 Indication of the types of capital
- Fixed ✓
- Movable ✓
- Floating/working/production ✓ (Any 2) (2)

3.5.2 Total value of the assets
R20 300 000 ✓ (1)

3.5.3 Deduction of the type of credit obtained by the farmer
Medium term credit ✓ (1)

3.5.4 Justification of the answer
It is used to purchase movable capital/truck ✓ (1)

3.5.5 Capital item regarded as a liability
Truck ✓ (1)

3.6 Graph

Bar graph showing the prices of animal products in 2010 and 2020

![Bar graph showing the prices of animal products in 2010 and 2020](image-url)
CRITERIA/RUBRIC/MARKING GUIDELINES

- Correct heading ✓
- X-axis: Correctly calibrated with label (Products) ✓
- Y axis: Correctly calibrated with label (Price) ✓
- Correct units (c/kg) ✓
- Bar graph ✓
- Accuracy ✓

3.7 Differentiation between the internal and external forces

Internal forces - Those that have their origin on the farm and can be dealt with on the farm ✓

External forces - Those factors the farmer has no control over ✓

3.8 Definition of risk sharing as a strategy of management

The strategy in which the cost of consequences of a risk ✓ is distributed amongst several stakeholders ✓

QUESTION 4: BASIC AGRICULTURAL GENETICS

4.1 Variation

4.1.1 Identification of the number of cows with the highest milk yield

6 ✓

4.1.2 Identification of the factor leading to the differences in milk yield

Feeding/Nutrition ✓

4.1.3 Indication of the cause of the differences in milk production

Environmental ✓

4.1.4 TWO genetic causes of variation

- Meiosis/crossing over/recombination of genes ✓
- Fertilisation ✓
- Mutation ✓

(Any 2) (2)

4.2 Crossing of white rose with a red rose to produce pink flowers

4.2.1 Determination of the type of dominance

Incomplete dominance ✓

4.2.2 Punnett square determining the genotypes/phenotypes of the F₂

<table>
<thead>
<tr>
<th>Gametes</th>
<th>R</th>
<th>W</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>RR</td>
<td>RW</td>
</tr>
<tr>
<td>W</td>
<td>RW</td>
<td>WW</td>
</tr>
</tbody>
</table>

MARKING CRITERIA

- Correct gametes for parent 1 ✓
- Correct gametes for parent 2 ✓
- Correct offspring ✓
- Punnett square with gametes and offspring ✓
4.2.3 (a) Phenotypic ratio of the \( F_2 \) generation
1 red : 2 pink : 1 white ✓

(b) Calculation of the pink offspring
- \( 2 \times 700 \) ✓
- \( \frac{4}{4} = 350 \) ✓

(c) The percentage of red offspring - 25% ✓

4.3 Breeding systems

4.3.1 Identification of the animal breeding system
Cross breeding ✓

4.3.2 Reason for the answer
Two different breeds are crossed/Hereford and Nguni ✓

4.3.3 TWO characteristics of the offspring that makes it better
- Higher growth rate ✓
- More resistant to pests/parasites/diseases ✓

4.3.4 TWO advantages of inbreeding
- Uniform/homozygous offspring are produced ✓
- Farmer obtain pure-bred groups ✓
- Good characteristics from the ancestors are maintained ✓
- Bad recessive genes can be eliminated ✓
- Help with selection between family groups ✓
- Herd has greater prepotency ✓

4.4 Pedigree

4.4.1 Determination of homozygous or heterozygous
(a) 4 - Homozygous ✓
(b) 5 - Heterozygous ✓

4.4.2 Reason for the answer
The offspring has the recessive allele from the male parent/offspring 7 is homozygous recessive because it received one of its recessive allele from parent 5 ✓

4.4.3 Indicate the genotype of individual:
(a) 2 - Rr ✓
(b) 7 - rr ✓

4.5 Mutations

4.5.1 Definition of mutation
Is a sudden change ✓ in the genetic composition of an organism ✓
4.5.2 **TWO types of mutagenic agents**
- Physical ✓
- Chemical ✓
- Biological ✓

(Any 2) (2)

4.6 **Genetic modification technique in plants**

4.6.1 **Identification of the genetic modification technique**
Agrobacterium tumefaciens/bacterial carriers ✓

(1)

4.6.2 **Labelling structures**
- A - Recombinant plasmid ✓
- D - Transgenic plant/Genetically modified plant/GMO ✓

(1)

4.6.3 **Definition of genetically modified plant**
A plant whose DNA has been manipulated through technology ✓ to change its original DNA ✓

(2)

4.6.4 **ONE advantage of genetic modification**
- It is faster ✓
- More precise ✓
- Not limited to organisms of the same species ✓

(Any 1) (1)

[35]

TOTAL SECTION B: 105
GRAND TOTAL: 150