



Province of the  
**EASTERN CAPE**  
EDUCATION

**NATIONAL  
SENIOR CERTIFICATE**

**GRADE 12**

**SEPTEMBER 2018**

**AGRICULTURAL SCIENCES P2  
MARKING GUIDELINE**

**MARKS: 150**

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This marking guideline consists of 9 pages.

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

- |     |        |                          |          |      |
|-----|--------|--------------------------|----------|------|
| 1.1 | 1.1.1  | A ✓✓                     |          |      |
|     | 1.1.2  | B ✓✓                     |          |      |
|     | 1.1.3  | C ✓✓                     |          |      |
|     | 1.1.4  | A ✓✓                     |          |      |
|     | 1.1.5  | D ✓✓                     |          |      |
|     | 1.1.6  | C ✓✓                     |          |      |
|     | 1.1.7  | B ✓✓                     |          |      |
|     | 1.1.8  | A ✓✓                     |          |      |
|     | 1.1.9  | B ✓✓                     |          |      |
|     | 1.1.10 | B ✓✓                     | (10 x 2) | (20) |
| 1.2 | 1.2.1  | H ✓✓                     |          |      |
|     | 1.2.2  | J ✓✓                     |          |      |
|     | 1.2.3  | B ✓✓                     |          |      |
|     | 1.2.4  | C ✓✓                     |          |      |
|     | 1.2.5  | F ✓✓                     | (5 x 2)  | (10) |
| 1.3 | 1.3.1  | Depreciation ✓✓          |          |      |
|     | 1.3.2  | Unskilled labour(ers) ✓✓ |          |      |
|     | 1.3.3  | Mutation ✓✓              |          |      |
|     | 1.3.4  | Co-dominance ✓✓          |          |      |
|     | 1.3.5  | Organogram ✓✓            | (5 x 2)  | (10) |
| 1.4 | 1.4.1  | Polyploidy ✓             |          |      |
|     | 1.4.2  | Control ✓                |          |      |
|     | 1.4.3  | Arable ✓                 |          |      |
|     | 1.4.4  | Monopsony ✓              |          |      |
|     | 1.4.5  | Green ✓                  | (5 x 1)  | (5)  |

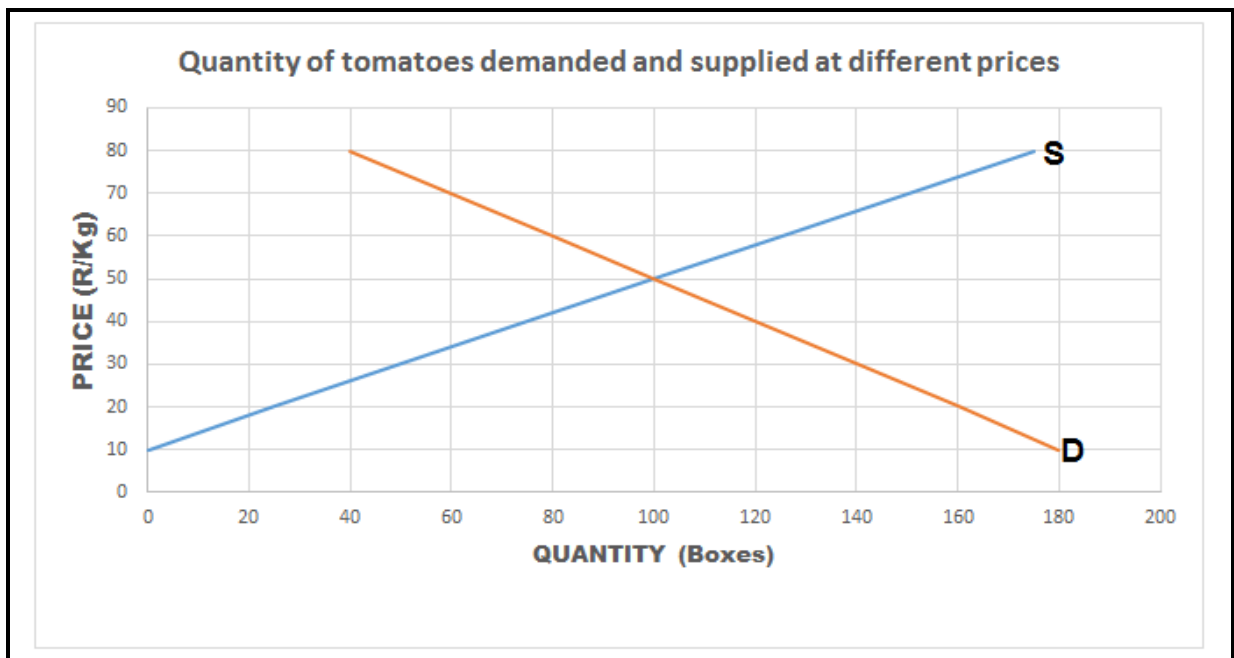
**TOTAL SECTION A: 45**

**SECTION B****QUESTION 2**

- 2.1 2.1.1 **Name given to the process of coming up with specifications**  
Standardisation ✓ (1)
- 2.1.2 **THREE specifications that should be met by the packaging material**
- Material used for packaging must not contain chemicals that can contaminate the produce ✓
  - The package should protect the produce from mechanical damage ✓
  - Packaging must identify and provide information about the produce ✓
  - Packaging must be recyclable or biodegradable ✓ (Any 3 x 1) (3)
- 2.1.3 **TWO factors that might hamper the marketing of apples**
- Perishability ✓
  - Ineffective control of production ✓
  - Seasonal fluctuation in production ✓
  - Accidents, theft and spoilage ✓
  - Low value in relation to volume ✓
  - Poor infrastructure ✓ (Any 2 x 1) (2)
- 2.2 **Marketing function**
- 2.2.1 Packaging ✓ (1)
- 2.2.2 Transport ✓ (1)
- 2.2.3 Processing ✓ (1)
- 2.2.4 Storage ✓ (1)
- 2.3 2.3.1 **TWO ways of advertising agricultural products**
- In-store promotions ✓
  - Direct mailing ✓
  - Trade fairs and exhibitions ✓
  - Mass media (newspapers, television, radio, magazines, billboards) ✓ (Any 2 x 1) (2)
- 2.3.2 (a) Green marketing – a marketing approach that is responding to increasing concern about the environment ✓ (1)
- (b) Eco-labelling – practice of putting labels onto products to promote them as environmentally friendly ✓ (1)

- 2.3.3. • Orderly marketing  
• Standardisation  
• Stable prices  
• Secure market outlets  
• Larger enterprises are able to obtain international contracts  
• Farmers can focus on their farming activities, rather than spending time on marketing their produce (Any 2 x 1) (2)
- 2.3.4. • Costs  
• Demand  
• Competition  
• Supply (Any 1 x 1) (1)
- 2.4 2.4.1 **Cause for the failure of the cooperative**  
The farmer did not co-operate with the other members of the co-operative ✓ (1)
- 2.4.2 **Principles to be applied in the functioning of a co-operative**  
• Members' economic participation ✓  
• Co-operation among members ✓  
• Voluntary and open membership ✓  
• Democratic member control ✓  
• Autonomy and independence ✓  
• Education, training and information ✓  
• Concern for community ✓ (Any 2 x 1) (2)
- 2.4.3 **Election of a co-operative director**  
They are supposed to be elected democratically, ✓ since co-operatives are autonomous and independent ✓ (2)
- 2.5 2.5.1 **Entrepreneurial success factors**  
• Innovative / creative ✓  
• Perseverance ✓  
• Hardworking ✓  
• Dynamism ✓  
• Market driven ✓  
• Interpersonal skills ✓  
• Decision-making skills ✓  
• Risk orientation ✓ (Any 2 x 1) (2)
- 2.5.2 **Document referred to in the passage**  
Business plan ✓ (1)
- 2.5.3 **Reasons for drawing up a business plan**  
• To determine the business' financial needs ✓  
• To secure funding ✓  
• To guide daily operations ✓  
• To test feasibility of a business idea ✓  
• To foresee problems or risks ✓ (Any 2 x 1) (2)

## 2.6 2.6.1 Line graph

**Criteria**

- Correct heading ✓
- X-axis correctly calibrated and labelled (Quantity) ✓
- Y-axis correctly calibrated and labelled (Price) ✓
- Correct units (Kg and R) ✓
- Line graph ✓
- Accuracy ✓

(6)

2.6.2 **Situation at a price of R7**

Oversupply / Surplus ✓

(1)

2.6.3 **Price at which tomatoes will be sold**

R5 ✓

(1)

**[35]**

**QUESTION 3**

- 3.1 3.1.1 **Budget type**  
Project/Partial budget ✓ (1)
- 3.1.2 **Motivation**  
Used to investigate the effect of changes in farm operations on profitability ✓✓ (2)
- 3.1.3 **Net change**  
= R8 000 ✓ – R6 000 ✓  
= R2 000 ✓ (3)
- 3.1.4 **Implication**  
The farmer can switch from manual weeding to herbicide use ✓  
because herbicide use is cheaper than manual weeding ✓ / the net change is positive ✓ (2)
- 3.1.5 **Importance of keeping financial records**  
Enables farmers to:  
  - Manage capital ✓
  - Analyse past and current performance ✓
  - Apply for funding from financial institutions ✓
  - Draw up budgets ✓
  - Provide information for tax purposes ✓ (Any 3 x 1) (3)
- 3.1.6 **ONE example of financial records**  
Labour records / Crop records / Livestock records / Mechanisation records / Inventory records / Records of Sales of Purchase  
(Any 1 x 1) (1)
- 3.2 3.2.1 **Consequences of lack of HIV/Aids awareness campaigns**  
  - Loss of skills and experience ✓
  - Labour shortages ✓
  - Absenteeism ✓ (Any 2 x 1) (2)
- 3.2.2 **Ways of reducing the spread of HIV/Aids on farms**  
  - Ensuring workers have access to condoms ✓
  - Ensuring workers have access to treatment for sexually transmitted diseases ✓
  - Ensuring access to anti-retroviral medication ✓ (Any 2 x 1) (2)
- 3.3 3.3.1 **Type of risk**  
Production risk ✓ / technical risk ✓ (1)
- 3.3.2 **Risk management strategy used by the farmer**  
Diversification ✓ (1)
- 3.3.3 **How the strategy assisted the farmer**  
Even though the maize crop/yield failed, ✓ the farmer got income from other enterprises ✓ helping him stay afloat (2)

- 3.3.4 **Other risk management strategies**
- Insurance ✓
  - Risk sharing ✓
- (2)
- 3.4 3.4.1 **Economic characteristics of land in the scenario**
- Urban development ✓
  - Land is limited ✓
- (2)
- 3.4.2 **THREE ways farmers can increase yields**
- Improving soil fertility ✓
  - Improving water management / irrigation ✓
  - Consolidation of uneconomical farming units ✓
  - Use of scientific farming methods ✓
- (Any 3 x 1) (3)
- 3.4.3 **TWO functions of land**
- Source of minerals ✓
  - Provides space for agricultural activities ✓
  - Provides food for humans and livestock ✓
  - Use of scientific farming methods ✓
- (Any 2 x 1) (2)
- 3.5 3.5.1 Occupational Health and Safety Act (Act no. 85 of 1993) ✓ (1)
- 3.5.2 Compensation for Occupational Injuries and Diseases Act (Act no. 130 of 1993) ✓ (1)
- 3.5.3 The Skills Development Act (Act no. 97 of 1998) ✓ (1)
- 3.5.4 **Ways of motivating farm workers**
- Fair remuneration ✓
  - Safe and secure housing ✓
  - Recreational facilities ✓
  - Training ✓
- (Any 3 x 1) (3)

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**QUESTION 4****4.1 4.1.1 Genotype of each of the parents**

Cow – TTBB ✓

Bull – ttbb ✓

(2)

**4.1.2 F<sub>2</sub> generation Punnet square**

♂ ♀	TB	Tb	tB	tb
TB	TTBB	TTBb	TtBB	TtBb
Tb	TTBb	TTbb	TtBb	Ttbb
tB	TtBB	TtBb	ttBB	ttBb
tb	TtBb	Ttbb	ttBb	ttbb

**Checklist**

• Gametes all correct ✓

(1)

• Dihybrid Punnet square ✓

(1)

• 1 mark for four correct genotypes in a row x 4 ✓✓✓✓

(4)

**4.1.3 Type of cross in the scenario**

Dihybrid cross ✓

(1)

**4.1.4 Reason**

Two genes / characteristics are involved in the cross ✓

(1)

**4.1.5 Classification of characteristics**

Qualitative ✓

(1)

**4.2. 4.2.1 Phenotypes of the feathers**

(a) white ✓

(b) white ✓

(c) black ✓

(3)

**4.2.2 Type of inheritance described in the passage**

Epistasis ✓

(1)

**4.3. 4.3.1 Characteristic that the farmer should not select for**

Weaning mass ✓

(1)

**4.3.2 Justification**

- Low heritability of 36% ✓ which means the trait is influenced more by the environment than genes ✓

(2)

**4.3.3 Provide a name for the use of statistics in biology to analyse genetic data of individuals in order to estimate true genetics and their breeding value**

Biometrics / Biostatistics ✓

(1)



- 4.4. 4.4.1 **Process mentioned**  
Genetic modification ✓ (1)
- 4.4.2 **TWO techniques that can be used to insert genes into the DNA of an organism**
- Electroporation ✓
  - Micro-injection ✓
  - Biolistics / Bioballistics ✓
  - Bacterial carriers ✓
  - Viral carriers ✓
  - Gene splicing ✓
  - Lipofection ✓
- (Any 2 x 1) (2)
- 4.4.3 **THREE reasons why plant breeders make use of the method above as opposed to traditional methods**
- Genetic engineering is precise ✓
  - Genetic engineering is not limited to individuals of the same species ✓
  - Genetic engineering is faster ✓
- (3)
- 4.4.4 **THREE reasons to support the banning of GMOs**
- Farmers in developing countries might not afford them ✓
  - Farmers cannot retain seeds ✓
  - GMOs might contain toxins or cause allergies ✓
  - Farmers may use excessive amounts of herbicides resulting in pollution ✓
  - Beneficial insects might be killed ✓
  - Genes might spread to wild plants ✓
- (Any 3 x 1) (3)
- 4.5 4.5.1. (a) Crossing over ✓ (1)
- (b) Recombination of genes ✓ (1)
- 4.5.2. **Mutation types**
- A – Deletion ✓
- B – Duplication ✓
- C – Inversion ✓ (3)
- 4.5.3. **Significance of mutation in plant and animal breeding**
- Results in variation ✓ which is the foundation for plant and animal breeding ✓
- (2)

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