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basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

# NATIONAL SENIOR CERTIFICATE

## GRADE 12

## AGRICULTURAL SCIENCES P2

## NOVEMBER 2022

## MARKING GUIDELINES

**MARKS: 150**

**These marking guidelines consist of 11 pages.**

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## SECTION A

## QUESTION 1

| | | | | |
|---|---|---|---|---|
| 1.1 | 1.1.1 | C ✓✓ | | |
| | 1.1.2 | B ✓✓ | | |
| | 1.1.3 | D ✓✓ | | |
| | 1.1.4 | A ✓✓ | | |
| | 1.1.5 | B ✓✓ | | |
| | 1.1.6 | D ✓✓ | | |
| | 1.1.7 | C ✓✓ | | |
| | 1.1.8 | A ✓✓ | | |
| | 1.1.9 | D ✓✓ | | |
| | 1.1.10 | C ✓✓ | (10 x 2) | (20) |
| 1.2 | 1.2.1 | H ✓✓ | | |
| | 1.2.2 | F ✓✓ | | |
| | 1.2.3 | I ✓✓ | | |
| | 1.2.4 | B ✓✓ | | |
| | 1.2.5 | D ✓✓ | (5 x 2) | (10) |
| 1.3 | 1.3.1 | Controlled marketing ✓✓ | | |
| | 1.3.2 | Consolidation ✓✓ | | |
| | 1.3.3 | Incomplete dominance ✓✓ | | |
| | 1.3.4 | Electroporation ✓✓ | | |
| | 1.3.5 | Polyploidy ✓✓ | (5 x 2) | (10) |
| 1.4 | 1.4.1 | Fixing ✓ | | |
| | 1.4.2 | Interest ✓ | | |
| | 1.4.3 | Biometrics ✓ | | |
| | 1.4.4 | Atavism/throwback ✓ | | |
| | 1.4.5 | Gene ✓ | (5 x 1) | (5) |

**TOTAL SECTION A: 45**

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## SECTION B

## QUESTION 2: AGRICULTURAL MANAGEMENT AND MARKETING

### 2.1 Availability of agricultural products over a period of six months

**2.1.1 Indication of the quantities of product 1**
30 tons ✓ (1)

**2.1.2 Identification of the product**
Product 2 ✓ (1)

**2.1.3 Stating of the problem**
- There will be a surplus/spoilage/storage costs ✓
- The price of the product will be less ✓ (Any 1) (1)

**2.1.4 Factor hampering marketing of product 1**
- Seasonal fluctuation ✓
- Perishability ✓
- Accidents/theft ✓
- Lack of infrastructure ✓
- Lack of capital ✓
- Lack of market information ✓
- Long distances to markets ✓ (Any 1) (1)

**2.1.5 TWO factors influencing the demand**
- Price ✓
- Change in consumer income/buying power ✓
- Number of consumers ✓
- Tastes and preferences of consumers ✓
- Price of competing/complementing/substitute products ✓
- Range of products available ✓
- Usefulness of the product ✓
- The quality of the product ✓
- Festive season/fashion ✓
- Research ✓
- Socio-economic factors ✓
- Legislation ✓
- Advertising ✓
- Price expectations ✓ (Any 2) (2)

### 2.2 Marketing system

**2.2.1 Identification of the marketing system**
Free marketing ✓ (1)

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2.2.2 **Identification of the channels**

**A -** Farm gate marketing ✓ (1)
**B -** Fresh produce marketing ✓ (1)

2.2.3 **ONE advantage of CHANNEL A/farm gate**

(a) **Farmer -** No market chain costs/no transportation costs/ no intermediaries/higher income/immediate payment ✓ (1)
(b) **Consumer -** Products will be fresh/better quality/lower prices/ have bargaining power ✓ (1)

2.2.4 **ONE disadvantage of CHANNEL C/stock sale to sellers**

- Prices may be lower than the market price ✓
- Seller may not get the expected price/less profit ✓
- Small-scale farmers may not have money to take animals to auction sale ✓ (Any 1) (1)

2.3 **Entrepreneurship**

2.3.1 **Identification of THREE phases of entrepreneurship**

- Identifying the opportunity ✓
- Developing a business plan ✓
- Resource mobilization ✓
- Starting and managing the enterprise ✓ (Any 3) (3)

2.3.2 **TWO other reasons for drafting a business plan**

- To test the feasibility/economic viability of the business idea ✓
- Helps to define goals ✓
- Outlines the roles and responsibilities of individuals ✓
- Provides time frames for completion of activities ✓
- Provides guidelines for decision making/to compare progress ✓
- To guide daily operations ✓
- Helps manager to plan for capital requirements ✓
- Provides clear strategies/objectives to follow ✓
- To ensure effective business management ✓
- Allows to foresee problems which reduces risks ✓
- Repositioning the business to deal with changes in a market ✓
- To gain knowledge about marketing opportunities/competitors ✓
- Attract investors/partners ✓ (Any 2) (2)

2.3.3 **Indication of success factors**

(a) Leadership/organization/management/interpersonal skills/ confidence ✓ (1)
(b) Risk taking/confidence/positive thinking ✓ (1)

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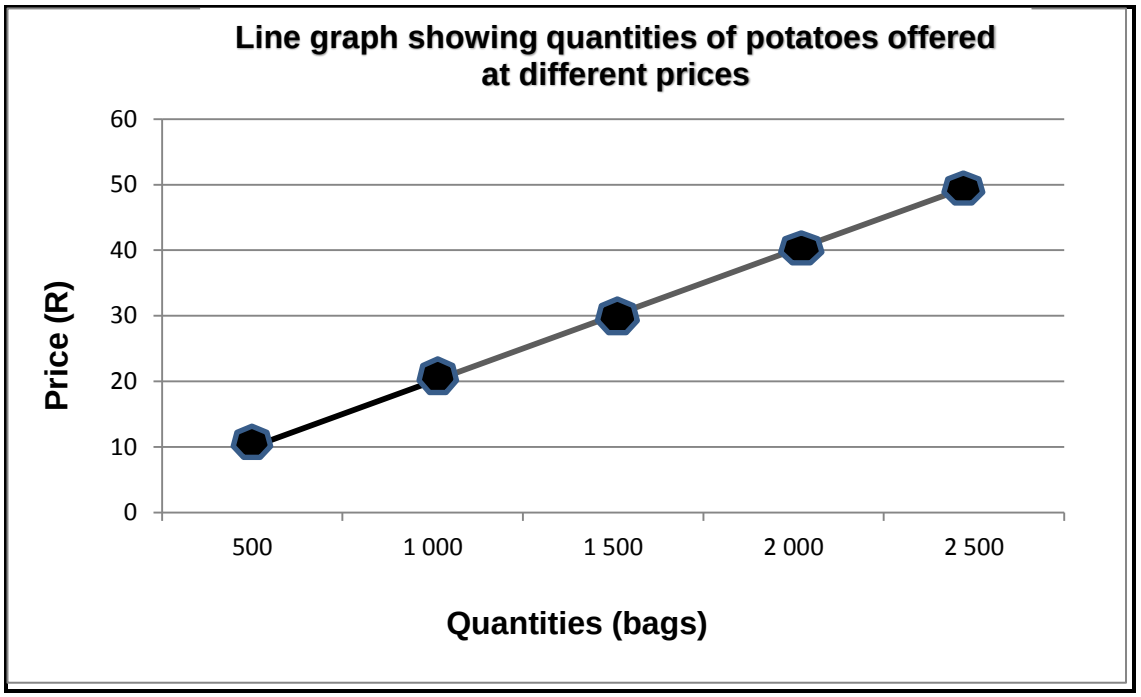
## 2.4 Supply

### 2.4.1 Line graph




**CRITERIA/RUBRIC/MARKING GUIDELINE**

- Correct heading ✓
- X-axis: Correctly calibrated and labelled (Quantities) ✓
- Y-axis: Correctly calibrated and labelled (Price) ✓
- Correct units (R and bag) ✓
- Line graph ✓
- Accuracy (80%+ correctly plotted) ✓ (6)

### 2.4.2 Law of supply

- The higher the price ✓ the higher the supply ✓
- The lower the price ✓ the lower the supply ✓ (Any 1) (2)

### 2.4.3 TWO factors other than price that contributed to supply

- Environmental conditions/nature ✓
- Availability of technology ✓
- Knowledge on production ✓
- Production costs ✓
- Subsidies/taxation/legislation ✓
- Number of suppliers ✓
- Price expectation/profit margin of the product ✓
- Demand of the product ✓
- Seasonal production ✓
- Political instability ✓
- Possibility of increasing/decreasing the supply of goods ✓
- Stability of the product ✓ (Any 2) (2)

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2.5 **Marketing chain**

2.5.1 **TWO costs increasing the price of a product**

- Production costs ✓
- Packaging costs ✓
- Processing costs
- Storage costs ✓
- Transportation/distribution costs ✓
- Grading costs ✓ (Any 2) (2)

2.5.2 **Stage at which the agribusiness chain can be improved**

(a) Storage ✓ (1)
(b) Farm ✓ (1)

2.5.3 **TWO ways of making the product known to the consumer**

- Advertising/radio/television/billboards/newspapers/internet/ brochures/posters/flyers ✓
- In-store promotion ✓
- Exhibitions/trade fares ✓
- Sponsorship ✓
- Direct mailing ✓
- Marketing agent ✓
- Personal selling ✓ (Any 2) (2)

**[35]**

**QUESTION 3: PRODUCTION FACTORS**

3.1 **Land**

3.1.1 **TWO other economic characteristics of land**

- Is required for production ✓
- Land is fixed/found in a specific environment ✓
- Indestructible ✓
- Land appreciates ✓
- Durability ✓
- Varies in production potential ✓
- Restrictedness ✓
- Passive factor for production/primary production factor ✓
- Source of wealth/can be bought/sold/used as a collateral ✓
- Subjected to the law of diminishing returns ✓ (Any 2) (2)

3.1.2 **TWO ways in which the productivity of land can be improved**

- Improving water management/supply ✓
- Restore land potential/responsible use of pesticides ✓
- Farm land more efficiently/consolidate uneconomic units ✓
- Crop rotation/intercropping/rotational grazing ✓
- Research ✓
- Use of scientific methods/technology/improve soil fertility/ precision farming ✓ (Any 2) (2)

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3.1.3 **TWO functions associated with land as a production factor**

- Asset (used as collateral in obtaining loans) ✓
- Provides space for agricultural activities ✓
- Provides food/feeding for humans/animals ✓
- Source of raw materials ✓
- Source of minerals ✓ (Any 2) (2)

3.2 **Labour productivity**

3.2.1 **Identification of the production factor**
Labour ✓ (1)

3.2.2 **Deduction of the relationship**
An increase in the number of workers ✓ resulted to the increase in output ✓ (2)

3.2.3 **TWO labour problems**

- Poor labour management/supervision/late arrival/theft ✓
- Scarcity of labour/lower wages ✓
- Lack of training/skills ✓
- HIV/AIDS/other diseases/absenteeism ✓
- Competition from industries ✓
- Socio-economic problems ✓
- Labour unrest ✓ (Any 2) (2)

3.2.4 **TWO ways to improve the economic conditions of farm workers**

- Paying higher wages ✓
- Providing incentives for workers ✓
- Paying bonuses ✓
- Providing medical insurance/pension ✓
- Supplying them with farm products at reduced prices ✓
- Entering into partnership deal with workers ✓
- Provide education and training to workers ✓ (Any 2) (2)

3.3 **Indication of labour legislations**

3.3.1 Basic Conditions of Employment Act/BCEA (Act 75 of 1997) ✓ (1)

3.3.2 Skills Development Act/SDA (Act 97 of 1998) ✓ (1)

3.3.3 Occupational Health and Safety Act/OHSA (Act 85 of 1993) ✓ (1)

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3.4 **Assets and liabilities**

3.4.1 **Identification of**

(a) **An asset**

- Value of the farm ✓
- Value of vehicles ✓
- Cash ✓
- Value of buildings ✓ (Any 1) (1)

(b) **A liability**

- Tractor loan ✓
- Bank overdraft ✓
- Mortgage loan ✓ (Any 1) (1)

3.4.2 **Calculation of the net worth of the farm**

Net worth = Assets **–** Liabilities ✓
= (R650 000+R50 000+R275 000+R3 500 000) **–** (R365 000+R150 000+R4 200 000)
= R4 475 000 ✓ **–** R4 715 000 ✓
= **–** R240 000 ✓ (4)

3.4.3 **Indication of the viability of a farming business**

Not viable ✓ (1)

3.4.4 **Reason**

Net worth is negative/**–**R240 000/no profit/loss/value of assets is less than the value of the liabilities ✓ (1)

3.5 **Capital items**

3.5.1 **Identification of the type of capital**

**(a)** **C -** Movable capital ✓ (1)
**(b)** **B -** Fixed capital ✓ (1)

3.5.2 **Indication of the problem of capital in F (tractor)**

Depreciation/loses value/high fuel costs ✓ (1)

3.5.3 **Types of credit**

**(a)** **D -** Short-term credit ✓ (1)
**(b)** **E -** Long-term credit ✓ (1)

3.6 **Management**

3.6.1 **Definition of management**

Effective combination and coordination of human, physical and financial resources ✓ to achieve a specific goal, usually maximising profits ✓ (2)

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3.6.2 **TWO management principles**

- Planning/setting goals ✓
- Implementation
- Leading/directing ✓
- Organization/coordination ✓
- Decision making ✓
- Communication ✓
- Motivation ✓
- Monitoring ✓
- Control ✓ (Any 2) (2)

3.6.3 **TWO risk management techniques**

- Diversification ✓
- Risk sharing ✓ (2)

**[35]**

## QUESTION 4: BASIC AGRICULTURAL GENETICS

4.1 **Breeding systems**

4.1.1 **(a) Crossing 1 -** Cross breeding ✓ (1)
**(b) Crossing 3 -** Inbreeding ✓ (1)

4.1.2 **Definition of inbreeding**
The breeding of closely related animals ✓ (1)

4.1.3 **ONE disadvantage of inbreeding**

- Leads to inbreeding depression ✓
- Loss of genetic variation ✓
- Increase the expression of lethal genes ✓
- Undesired genes are made more homozygous ✓
- Undesirable characteristic/deformities can be bred into the progeny ✓
- Leads to reduced vitality ✓
- Less resistance to diseases ✓
- An expensive system ✓ (Any 1) (1)

4.1.4 **TWO advantages of cross breeding**

- Produce hybrid vigour/heterosis ✓
- Development of new breeds ✓
- Increased adaptability ✓
- Increases genetic variation ✓
- More resistant to pests/diseases ✓
- Improves performance of animals ✓ (Any 2) (2)

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4.2 **Variation**

4.2.1 **TWO internal causes of variation**
- Mutation ✓
- Meiosis/crossing-over/recombination of genes ✓
- Random fertilisation ✓ (Any 2) (2)

4.2.2 **TWO importance of variation**
- Forms the basis of selection ✓
- Improves existing breeds/cultivars ✓
- Development of new breeds/plant cultivars ✓ (Any 2) (2)

4.3 **Selection**

4.3.1 Pedigree selection ✓ (1)

4.3.2 Family selection ✓ (1)

4.3.3 Mass selection ✓ (1)

4.3.4 Progeny selection ✓ (1)

4.4 **Punnett square**

4.4.1 **The genotype**
**(a) Female parent -** HhWW ✓ (1)
**(b) Number 17 -** hR ✓ (1)

4.4.2 **Determination of the phenotype**
**(a) Number 9 -** Polled and roan ✓ (1)
**(b) Number 16 -** Horned and white ✓ (1)

4.4.3 **Number of horned roan cattle**
2 ✓ (1)

4.4.4 **Number of polled red cattle**
0 ✓ (1)

4.5 **Sex chromosomes and determination**

4.5.1 **Sex chromosomes**
**(a) Number of sex chromosomes in goats -** 2 ✓ (1)
**(b) Pairs of autosomes in horses -** 31 ✓ (1)

4.5.2 **Sex determination**
**(a) Indication of the percentage chance -** 50% ✓ (1)
**(b) Determination of the ratio -** 1:1 ✓ (1)

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4.6 **Heritability**

4.6.1 **Definition of heritability**
The degree to which a characteristic ✓ is determined by genetic factors ✓ (2)

4.6.2 **Identification of characteristics**
**(a) Qualitative -** Eye colour ✓ (1)
**(b) Quantitative -** Milk production/fleece weight ✓ (1)

4.6.3 **Indication of the percentage of the environmental effect**
60% ✓ (1)

4.6.4 **Explanation of the relationship**
- The higher the heritability of the trait ✓ the higher the estimated breeding value ✓
- The lower the heritability of a trait ✓ the lower the estimated breeding value ✓ (Any 1) (2)

4.7 **Genetic modification**

4.7.1 **TWO advantages of genetic modification over traditional breeding methods**
- It is precise ✓
- It is faster ✓
- Not limited to organisms of the same species ✓ (Any 2) (2)

4.7.2 **TWO negative effects of GM crops on the environment**
- Leads to development of super weeds ✓
- Beneficial insects can be killed ✓
- Leads to the excessive use of herbicides/pollution ✓
- Reduces biodiversity ✓ (Any 2) (2)

**[35]**

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

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